



HURONIA ROAD

City of Barrie

Class EA - Phases 3 & 4 Report

Final Report



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Executive Summary

In order to identify the most appropriate road improvement strategy for Huronia Road from Yonge Street to Lockhart Road, a Municipal Class Environmental Assessment (EA) was initiated by the City of Barrie. Phases 1 & 2 of the 'Schedule C' Municipal Class EA process involved defining the problem, developing alternative solutions, and formulating measures to mitigate identified impacts. The preferred solution was identified as follows:

- widen to 3 lanes from Yonge Street to just north of Herrell Avenue;
- widen to 5 lanes from north of Herrell Avenue to just south of Mapleview Drive; and
- widen to 5 lanes from just south of Mapleview Drive to south of Lockhart Road with provisions for an interim widening to 3 lanes.

Following the identification of the preferred solution, a number of alternative design concepts were developed to implement the solution, based on the City of Barrie standard road cross-sections. To mitigate impacts of the road widening, modifications to the standards were considered, including reducing the lane widths, providing a sidewalk on one side only, reducing the boulevard widths and in some cases shifting the centreline of the road (all with the intent of reducing the overall road footprint and hence impacts). Consideration was also given to extending the TransCanada Trail system by providing a multi-use path on the east side of Huronia Road, from Loon Avenue to Lockhart Road. In essence, the design alternatives reflect varying cross-sections to implement the preferred solution in consideration of traffic operations, road users and safety, whilst minimizing the resulting impacts.

The design alternatives were assessed in terms of the impacts to the various environments as well as the potential to mitigate such impacts. The primary impacts identified relate to property requirements and impacts to the adjacent commercial, industrial and residential land uses. Impacts to the natural environment associated with the widening of Huronia Road can be mitigated through the design and implementation process.

The results of the evaluation process revealed that a combination of the design alternatives represent the best approach to implementing the preferred solution in that the environments are not consistent along the entire section of Huronia Road and impacts in one area may not exist in others. During the evaluation process, additional alternatives involving a combination of the alternatives presented to the public at PIC 2 were developed in order to minimize and, in some cases, eliminate impacts to existing commercial and residential properties.

The following summarizes the recommended preferred design alternatives:

- 3 Lane Section - Yonge Street to North of Herrell Avenue
 - Design Alternative 3-7 (centreline shift and reduced boulevard) - Yonge Street to Little Avenue
 - Design Alternative 3-6 (centreline shift) - Little Avenue to north of Herrell Avenue
- 5 Lane Section - North of Herrell to South of Mapleview Drive
 - Design Alternative 5-7 (centre line shift) - north of Herrell Avenue to south of Herrell Avenue
 - Design Alternative 5-5 (reduced boulevard width) - south of Herrell Avenue to Loon Avenue
 - Design Alternative 5-6 (City of Barrie standard c/w multi-use trail) - Loon Avenue to north of Mapleview Drive
 - Design Alternative 5-8 (centreline shift and reduced boulevard) - north of Mapleview Drive to south of Mapleview Drive
- 5 Lane Section - South of Mapleview Drive to Lockhart Road
 - Design Alternative 5-8 (centreline shift and reduced boulevard) - south of Mapleview Drive to south of Saunders Road
 - Design Alternative 5-1 (City of Barrie Standard) - south of Saunders Road to south of Lockhart Road
- Potential Interim 3 Lane Design Alternatives - South of Mapleview Drive to south of Lockhart Road
 - Design Alternative 3R-6 (centreline shift & reduced boulevard) - north of Saunders Road to south of Saunders Road
 - Design Alternative 3R-1 (City of Barrie Standard, modified) - south of Saunders Road to south of Lockhart Road

The recommended design alternatives were selected for the following reasons:

- resolves existing and future traffic capacity issues within the study area by increasing the number of lanes and hence road capacity;
- addresses the majority of the concerns and preferences expressed by the public;
- provides safe pedestrian linkages by providing sidewalks throughout the study area;
- minimizes impacts on adjacent residential property by recommending reduced number of lanes in residential areas;
- minimizes out of the way travel; and
- increases safety by improving turning movements.

As part of the Municipal Class EA process, the railway crossings and watercourse crossings on Huronia Road were also addressed in Phase 3 of the study. Detailed safety assessments of the railway crossings of Huronia Road immediately south of Ellis Drive, immediately south of Herrell Avenue and on Little Avenue immediately west of Huronia Road were undertaken. In consideration of the cross-product of rail and road traffic and the deficient sight lines, a warning system (to include both lights and bells) is currently warranted at all three grade crossings. As both train and traffic volumes increase, the warrant for gate control will also be met at all crossings.

There are 10 water crossings on Huronia Road from Yonge Street to south of Lockhart Road that have been considered for culvert extension or replacement. There are also 2 new proposed culverts, one on Huronia Road and the other on Saunders Road. Culvert crossings on arterial roads are typically designed to accommodate 100-year storm events. Hydraulic analyses were performed on the 10 existing culverts on Huronia Road to determine available capacity to convey the 100 year flow conditions. Water Crossings 7 to 10 can accommodate the the hydraulic requirements and therefore only require culvert extensions to provide suitable water crossings in consideration of the road widening. Culverts 1 to 6 do not meet the hydraulic requirements of the 100-year flow, and thus these undersized culverts are to be replaced with larger and longer culverts. The existing culvert on Saunders Road is within the proposed road improvements for Huronia Road and will need to be relocated further to the west to accommodate the road widening.

The preferred design alternatives will be presented to General Committee of Council for consideration. If endorsed by Council, the Phases 3 & 4 Environmental Study Report (ESR) along with the Phases 1 & 2 Environmental Study Report (completed in September 2009) will be placed on public record for the mandatory 30 calendar day public review period. A Notice of Study Completion will be posted on the City's website and in the local newspapers. Members of the public, stakeholders, special interest groups and external agencies who have expressed an interest and a desire to stay involved will also be provided with a copy of the Notice.

If concerns are raised during the review period which cannot be resolved in discussion with the Corporation of the City of Barrie, a person may request that the Minister of the Environment make an order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual environmental assessments. Requests must be received by the Minister at the address below within thirty (30) days of publication of the notice of Study Completion. A copy of the request must also be sent to the City. If no request is received, the project may proceed to Phase 5 Implementation (design and construction).

The Honourable John Wilkinson
Minister of the Environment
77 Wellesley Street West, 11th Floor, Ferguson Block
Toronto, Ontario M7A 2T5

1 Introduction

1.1 Phases 1 & 2 Summary

The City of Barrie initiated a Municipal Class Environmental Assessment (EA) to identify the most appropriate road improvement strategy for Huronia Road from Yonge Street to Lockhart Road, a distance of approximately 4.7 kilometres. Various improvements are being considered to address existing and future deficiencies with respect to pavement condition, infrastructure and road capacity.

This study is being completed in accordance with the planning and design process for a 'Schedule C' Class EA as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment document (October 2000, amended September 2007). Applying to all municipal road improvement projects, a number of study categories or schedules have been established recognizing the range of environmental impacts. The process corresponding to each is illustrated in Figure 1. Phases 1 and 2 of the Class EA process include defining the problem, development of alternative solutions, and formulation of measures to mitigate identified impacts.

In consideration of the existing conditions, the Problem Statement, which sets the framework for the study, is as follows:

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

Alternative solutions to address the Problem Statement included the following:

- do nothing (maintain existing conditions);
- reduce travel demands on Huronia Road;
- construct/designate alternative routes to Huronia Road;
- reconstruct Huronia Road (existing 2 lanes maintained) with intersection improvements; and
- reconstruct and widen Huronia Road (to 3, 4 or 5 lanes) with intersection improvements.

Following the completion of Phases 1 and 2 of the Class EA, the following preferred solution was selected:

- widen to 3 lanes from Yonge Street to just north of Herrell Avenue;
- widen to 5 lanes from just north of Herrell Avenue to just south of Mapleview Drive; and
- widen to 5 lanes from just south of Mapleview Drive to south of Lockhart Road with provisions for an interim widening to 3 lanes.

The provision of a continuous centre turn lane from Yonge Street to Lockhart Road is recommended given the need for left turn lanes at intersections to minimize impacts to through traffic and also to serve all of the residential and commercial access points along Huronia Road thereby improving operations for vehicles entering/exiting these areas. While there is limited development currently south of Ellis Drive, the abutting lands have the potential for future development and thus the provision of a centre turn lane is considered appropriate (as opposed to widening the road at a later date to accommodate such).

Given the existing residential development along Huronia Road in the vicinity of Little Avenue, a 3-lane section is considered the most appropriate. Through the implementation of additional improvements at the Huronia Road/Little Avenue intersection (ie. dedicated left turn lanes), adequate intersection operations (reasonable delays and queue lengths and acceptable levels of service) will be provided.

At Herrell Avenue, two lanes per direction are required to ensure appropriate intersection operations and queue lengths at the intersection given the through volumes on Huronia Road. With one lane per direction, an average queue of 250 metres and a 95th percentile queue of 400 metres would occur in the northbound direction during the PM peak hour (the critical time period), which is not considered acceptable. The transition from three lanes to five lanes should occur north of Herrell Avenue and south of Webb Street.

A 5-lane section south of Mapleview Drive is recommended in recognition of Simcoe County's *Transportation Master Plan* which recommends widening County Road 54 (the extension of Huronia Road) to four lanes in the future. The provision for an interim 3-lane section is recommended until such time that traffic volumes and development pressures warrant widening to the ultimate 5-lanes in the future. A portion of County Road 54 is now part of Barrie and will be renamed Huronia Road as part of the annexation lands, from Lockhart Road to 10th Line. Property should be acquired to accommodate five lanes ultimately with a staged implementation (a rural, 3-lane cross-section can be constructed initially, to be upgraded to an urban, 5-lane section as warranted).

In conjunction with the above, Huronia Road will be upgraded from its current rural cross-section to an urban cross-section, which includes the provision of curb and gutter, sidewalks, improved street lighting, and extended infrastructure services (water, sanitary sewers and stormwater sewers).

1.2 Phases 3 & 4 of the Class EA Study

The steps to complete Phases 3 & 4 are identified in Figure 1. Following endorsement of the Preferred Solution by Council and at the direction of Council, the Study proceeded to Phase 3 of the Municipal Class EA process, which involved the development of alternative design concepts for the preferred solution. The alternative design concepts have been assessed in consideration of their potential impacts to the various environments, and a recommended design concept identified. Similar to Phases 1 & 2, the development and assessment of the alternative design concepts were presented for review by the public and agencies at a Public Information Centre (PIC 2). Appropriate notification

preceded PIC 2. Following consideration of comments and concerns received, a preferred design alternative concept was selected. Upon endorsement of such by Council, Phase 3 of the Class EA process was completed. Phase 4 is the documentation of the planning and consultation process and methodology employed throughout the Study. The Phases 3 & 4 Class EA report will be placed on public record for a period of 30 days to allow for further public and stakeholder review and comment. A Notice of Completion will be published to inform the public and stakeholders of the study completion.

2 Alternative Design Concepts for the Preferred Solution

The study area has been defined to include Huronia Road from Yonge Street to Lockhart Road, as illustrated in Figure 2, and the immediately abutting lands recognizing that such could be impacted through the improvement strategy. Photographs of the existing conditions along Huronia Road are illustrated in Figure 3 and Figure 4.

To reflect the preferred solution and the limits of such, alternative design concepts were prepared based on the following road sections:

- Yonge Street to north of Herrell Avenue;
- north of Herrell Avenue to south of Mapleview Drive; and
- south of Mapleview Drive to south of Lockhart Road.

For each road section, a centre turn lane will be included to accommodate left turns at intersections and driveways. The provision of landscape median islands (in lieu of the centre turn lane) in areas where there are no driveways or entrances (existing or proposed in the future), such as between Loon Avenue and Mapleview Drive, was considered. However, to avoid potential conflicts with entrances to lands which may be developed in the future and to address wildlife crossing concerns expressed by the Lake Simcoe Region Conservation Authority (LSRCA), landscape medians are not recommended.

Where feasible, the provision of a trail within the existing and/or expanded Huronia Road right-of-way was considered to complement the existing TransCanada Trail systems (as per Figure 5) and in accordance with the objectives of the City's Active Transportation Plan.

2.1 Huronia Road - Yonge Street to north of Herrell Avenue

The design alternatives considered for the proposed 3-lane section of Huronia Road from Yonge Street to north of Herrell Avenue are illustrated in Figure 6 and are referenced Design Alternative 3-1 through Design Alternative 3-7 to reflect seven options of a 3-lane road section.

2.1.1 Design Alternative 3-1: City of Barrie Standard (23.0 m Right-of-Way)

Design Alternative 3-1 involves the reconstruction of Huronia Road and widening to provide a continuous 3-lane urban section, complete with appropriate infrastructure services (ie. curb and gutter, storm sewer, sidewalks, street lighting, etc.). The City of Barrie standard cross-section BSD-03 would be applied, which has a 23.0 metre right-of-way (ROW). The cross-section provides 3.5 metre travel lanes (one lane per direction), a 4.0 m centre turn lane, 3.5 metre boulevards, and 1.5 metre sidewalks on both sides of the road.

2.1.2 Design Alternative 3-2: Reduced Centre Lane Width (22.5 m ROW)

Design Alternative 3-2 deviates from the City of Barrie standard cross-section by reducing the centre lane width from 4.0 metres to 3.5 metres. The BSD-03 standard cross-section would be modified from the 23.0 metre right-of-way to a 22.5 metre right-of-way. All other elements remain unchanged from the standard cross-section.

2.1.3 Design Alternative 3-3: Reduced Lane Width (22.6 m ROW)

Design Alternative 3-3 deviates from the City of Barrie standard cross-section by reducing the travel lane width from 3.5 metres to 3.3 metres. The BSD-03 standard cross-section would be modified from the 23.0 metre right-of-way to a 22.6 metre right-of-way. All other elements remain unchanged from the standard cross-section.

2.1.4 Design Alternative 3-4: Sidewalk on One Side Only (20.5 m ROW)

Design Alternative 3-4 deviates from the City of Barrie standard cross-section by removing the sidewalk from one side of Huronia Road and reducing the boulevard width accordingly. The BSD-03 standard cross-section would be modified from the 23.0 metre right-of-way to a 20.5 metre right-of-way. All other elements remain unchanged from the standard cross-section.

2.1.5 Design Alternative 3-5: Reduced Boulevard Width (20.0 m ROW)

Design Alternative 3-5 deviates from the City of Barrie standard cross-section with a reduction in boulevard width on both sides of the road from 3.5 metres (measured from the sidewalk to the edge of the travelled lane) to 2.0 metres. The BSD-03 standard cross-section would be modified from the 23.0 metre right-of-way to a 20.0 metre right-of-way. All other elements remain unchanged from the standard cross-section.

2.1.6 Design Alternative 3-6: Proposed Centreline Shift on Huronia Road (23.0 m ROW)

For Design Alternative 3-6, BSD-03 standard cross-section would be applied and the centreline of the road would be shifted in consideration of the existing and widened right-of-ways and the desire to minimize potential impacts to abutting residential properties.

2.1.7 Design Alternative 3-7: Proposed Centreline Shift & Reduced Boulevard Width on Huronia Road (20.0 - 23.0 m ROW)

Design Alternative 3-7 deviates from the City of Barrie standard cross-section with a reduction in boulevard width on both sides of the roadway from 3.5 metres (measured from the sidewalk to the edge of the travelled lane) to 2.0 metres. The centreline of the road would also be shifted to minimize potential impacts to abutting residential properties (ie. road would not be centred in the right-of-way).

2.2 Huronia Road - north of Herrell Avenue to south of Mapleview Drive

The design alternatives considered for the proposed 5-lane section of Huronia Road from north of Herrell Avenue to south of Mapleview Drive are illustrated in Figure 7, and are referenced Design Alternative 5-1 through Design Alternative 5-8 to reflect eight options of a 5-lane road section.

2.2.1 Design Alternative 5-1: City of Barrie Standard (30.0 m Right-of-Way)

Design Alternative 5-1 involves the reconstruction of Huronia Road and widening to provide a continuous 5-lane urban section, complete with appropriate infrastructure services (ie. curb and gutter, storm sewer, sidewalks, street lighting, etc.). The City of Barrie standard cross-section BSD-07A would be applied, which has a 30.0 metre right-of-way. The cross-section provides 3.5 metre wide travel lanes (two lanes per direction), a 4.0 metre wide centre turn lane, 3.5 metre boulevards, and 1.5 metre sidewalks on both sides of the road.

2.2.2 Design Alternative 5-2: Reduced Centre Lane Width (29.5 m ROW)

Design Alternative 5-2 deviates from the City of Barrie standard cross-section by reducing the centre lane width from 4.0 metres to 3.5 metres. The BSD-07A standard cross-section would be modified from the 30.0 metre right-of-way to a 29.5 metre right-of-way. All other elements remain unchanged from the standard cross-section.

2.2.3 Design Alternative 5-3: Reduced Lane Width (29.2 m ROW)

Design Alternative 5-3 deviates from the City of Barrie standard cross-section by reducing the lane width from 3.5 metres to 3.3 metres. The BSD-07A standard cross-section would be modified from the 30.0 metre right-of-way to a 29.2 metre right-of-way. All other elements remain unchanged from the standard cross-section.

2.2.4 Design Alternative 5-4: Sidewalk on One Side Only (27.5 m ROW)

Design Alternative 5-4 deviates from the City of Barrie standard cross-section by removing the sidewalk from one side of Huronia Road and reducing the boulevard width accordingly. The BSD-07A standard cross-section would be modified from the 30.0 metre right-of-way to a 27.5 metre right-of-way. All other elements remain unchanged from the standard cross-section.

2.2.5 Design Alternative 5-5: Reduced Boulevard Width (27.0 m ROW)

Design Alternative 5-5 deviates from the City of Barrie standard cross-section with a reduction in boulevard width on both sides of the road from 3.5 metres (measured from the sidewalk to the edge of the travelled lane) to 2.0 metres (sidewalk to curb). The BSD-07A standard cross-section would be modified from the 30.0 metre right-of-way to a 27.0 metre right-of-way. All other elements remain unchanged from the standard cross-section.

2.2.6 Design Alternative 5-6: Proposed Multi-Use Trail (31.5 m ROW)

Design Alternative 5-6 will only be considered for the section of Huronia Road from Lockhart Road to Loon Avenue. The BSD-07A standard cross-section would be modified from the 30.0 metre right-of-way to a 31.5 metre right-of-way in order to provide a 3.0 metre wide multi-use trail instead of a 1.5 metre wide sidewalk on the east side of Huronia Road. The multi-use trail will terminate at Loon Avenue. Directly north of Loon Avenue, the proposed 1.5 m sidewalk will be aligned with the multi-use trail.

2.2.7 Design Alternative 5-7: Proposed Centreline Shift (30.0 m ROW)

For Design Alternative 5-7, BSD-07A would be applied and the centreline of the road would be shifted in consideration of the existing and widened right-of-ways and the desire to minimize potential impacts to abutting residential properties.

2.2.8 Design Alternative 5-8: Proposed Centreline Shift & Reduced Boulevard (28.5 - 30.0 m ROW)

Design Alternative 5-8 deviates from the City of Barrie standard cross-section with a reduction in boulevard width on the east side of the road from 3.5 metres to 2.0 metres.

2.3 Huronia Road - south of Mapleview Drive to South of Lockhart Road

The design alternatives considered for the ultimate 5-lane section of Huronia Road from south of Mapleview Drive to south of Lockhart Road are illustrated in Figure 7 and are described in Section 2.2 above.

The design alternatives considered for the potential interim 3-lane rural section of Huronia Road from south of Mapleview Drive to south of Lockhart Road are illustrated in Figure 8 and are referenced Design Alternative 3R-1 through Design Alternative 3R-6 to reflect six options of a 3-lane rural (R) road section.

2.3.1 Design Alternative 3R-1: City of Barrie Standard (36.0 m ROW)

Design Alternative 3R-1 involves the reconstruction of Huronia Road and widening to provide an interim 3-lane rural cross-section with open drainage ditches with a road platform constructed to accommodate the ultimate 5-lane cross-section and future urbanization, complete with appropriate infrastructure services (ie. open ditches, street lighting, etc.), including a 3.0 metre wide trail on the east side of Huronia Road. The City of Barrie standard cross-section BSD-05 was modified from two lanes to three lanes while maintaining the proposed 36.0 metre right-of-way. The cross section will provide 3.5 metre wide travel lanes (one lane per direction), a 4.0 metre wide centre turn lane, and a 2.0 metre shoulder (1.0 metre paved, 1.0 metre gravel). When the road is upgraded to five lanes, the

2.0 metre shoulders will be widened and converted to travel lanes with curb and gutter and storm sewer replacing the open ditches. A sidewalk will also be provided on the west side as part of the upgrades.

2.3.2 Design Alternative 3R-2: Reduced Centre Lane Width (35.5 m ROW)

Design Alternative 3R-2 deviates from Design Alternative 3R-1 by reducing the centre lane width from 4.0 metres to 3.5 metres thereby reducing the required right-of-way to 35.5 metres. The proposed 3.0 metre wide trail would also be provided with this design alternative.

2.3.3 Design Alternative 3R-3: Reduced Lane Width (35.6 m ROW)

Design Alternative 3R-3 deviates from Design Alternative 3R-1 by reducing the lane width from 3.5 metres to 3.3 metres, thereby reducing the required right-of-way to 35.6 metres. The proposed 3.0 metre wide trail would also be provided with this design alternative.

2.3.4 Design Alternative 3R-4: Reduced Boulevard Width (28.0 m Interim Road Allowance)

Design Alternative 3R-4 deviates from Design Alternative 3R-1 by reducing the boulevard widths and eliminating the proposed 3.0 metre wide trail thereby reducing the required right-of-way to 28.0 metres.

2.3.5 Design Alternative 3R-5: Proposed Centreline Shift on Huronia Road (36.0 m ROW)

Design Alternative 3R-5, is similar to Design Alternative 3R-1 however, the centreline of the road would be shifted in consideration of the existing right-of-ways and the desire to minimize potential impacts to abutting properties. The proposed 3.0 metre wide trail would also be provided with this design alternative.

2.3.6 Design Alternative 3R-6: Proposed Centreline Shift & Reduced Boulevard on Huronia Road (31.5 m ROW)

Design Alternative 3R-6 represents a combination of Design Alternatives 3R-4 and 3R-5 in that the centreline of the road would be shifted and the boulevard width reduced, thereby reducing the required right-of-way to 31.5 metres. The proposed 3.0 metre wide trail would also be provided with this design alternative. A 31.5 metre right-of-way is sufficient to accommodate the ultimate 5-lane widening in the future.

3 Environment Inventories

A description of the study area has been developed considering the alternative design concepts and the following environments:

- physical environment;
- natural environment
- social environment;
- cultural/heritage environment; and
- economic environment.

3.1 Physical Environment

3.1.1 Storm System

The entire area along Huronia Road within the study area uses ditches and surface flows as a storm drainage system, with the exception of a 260 metre section south of Little Avenue. As part of the Huronia Road upgrade, including the ultimate 5-lane section just south of Mapleview Drive to south of Lockhart Road, the open ditch drainage system will be replaced with a closed system consisting of curb and gutter, storm sewers, manholes and structures.

3.1.2 Sanitary System

A 600 mm diameter sanitary sewer is in place along Huronia Road from Yonge Street to approximately 165 metres to the south and then it changes to a 750 mm diameter pipe to Big Bay Point Road. An 825 mm sanitary sewer is in place along Huronia Road from Big Bay Point Road to Ellis Drive. There is no sanitary sewer system in place along Huronia Road from Ellis Drive to Pump Station 3 (150 metres north of Saunders Road). Rather, the sanitary sewer detours along Ellis Drive to Welham Road during this stretch, and connects back to Huronia Road along Saunders Road. There is a 975 mm sanitary sewer in place along Huronia from Pump Station 3 to Lockhart Road. A future trunk sewer extension is planned from Pump Station 3 to Mapleview Drive and is expected to be constructed in conjunction with the Mapleview Drive East road upgrade (currently being designed by others).

3.1.3 Utilities

The 3.5 metre boulevard provided in the City of Barrie cross-sections for an urban road allows for the provision of overhead and underground utilities. As the boulevard width is reduced, the width to accommodate overhead utilities is reduced, potentially forcing overhead utilities underground, at an

increased cost. However, following preliminary discussions with PowerStream, it was confirmed that overhead hydro lines can be accommodated within a reduced boulevard.

3.1.4 Lane Width

The through lane width of Huronia Road must accommodate vehicles of different types and sizes, travelling in the same direction, whereas the centre lane width must accommodate vehicles turning in opposite directions (and therefore should be wider to allow opposing vehicles to see beyond the other).

The alternative design solutions (ie. methods to implement the preferred solution) as previously presented, include consideration for 3.3 and 3.5 metre lanes. In considering traffic operations, the capacity of a through lane increases with its width - a wider lane can accommodate more traffic¹. As such, a 3.5 metre lane will have a higher capacity than a 3.3 metre lane, all else being equal. Safety also increases with lane width, up to a width of 3.7 metres (beyond which no further improvements are realized)².

To investigate the implications of a reduced lane width (recognizing 3.5 metres is a standard lane width in the City of Barrie), the intersection operational analyses were revised to reflect 3.3 metre lanes. While the overall intersection operations and levels of service remain acceptable, the average intersection delays increased in the order of 4 to 7 seconds during the critical PM peak hour at the key intersections (ie. Little Avenue, Big Bay Point Road, Mapleview Drive and Lockhart Road).

It is further noted as per the *Transportation Association of Canada* (TAC) guidelines, the lane widths for urban collector and arterial roads should be in the order of 3.5 to 3.7 metres. Only local roads are to have a lane width of less than 3.5 metres. The guidelines do however indicate reduced lane widths of 0.2 metres less (ie. 3.3 to 3.5 metres) can be considered where constraints are severe and the design speed is 60 km/h or less. However, in keeping with the City's practice of adopting design speeds of 20 km/h over the posted speed limit, the applicable design speed for Huronia Road is 70 km/h from Yonge Street to Herrell Avenue and 80 km/h from Herrell Avenue to Lockhart Road, and thus the reduction should not be applied. For reduced lane widths to be considered, the posted speed limit would need to be reduced to 40 km/h (to reflect a design speed of 60 km/h).

The centre turn lane should have a minimum width of 4.0 metres to provide sufficient opportunity for motorists to see beyond an opposing turning vehicle, thus ensuring the way is clear prior to completing a turn. At 3.5 metres, opposing vehicles may be directly opposite one another, thereby restricting the driver's viewpoint beyond the opposing vehicle. With a wider turn lane, the vehicles can be staggered, thus allowing increased visibility and hence increased safety for turning vehicles.

¹ *Geometric Design Guide for Canadian Roads*. Transportation Association of Canada, September 1999.

² Ibid

3.1.5 Traffic Operations

Phases 1 & 2 Analyses

An analysis of traffic operations along Huronia Road was undertaken as part of the initial stages of the Class EA process and otherwise documented in the Phases 1 & 2 report. The analysis consisted of the following:

- review of existing (2006) and 2016 traffic volumes and operations as per the *Huronia Road Traffic Impact Study*³;
- development and assessment of 2026 traffic projections in consideration of low and high growth scenarios;
- review of link operations along Huronia Road and identification of the corresponding lane requirements (ie. number of lanes per direction with consideration for a centre turn lane); and
- review of intersection operations along Huronia Road and identification of the corresponding lane requirements and intersection control at the intersections.

As part of the preliminary assessment of the alternative solutions developed in Phase 2 of the Municipal Class EA process, the ability of each solution to accommodate the above noted traffic volumes was investigated and a recommended solution identified (the assessment also considered factors other than traffic operations).

As part of the final assessment of the alternative solutions, the City of Barrie provided traffic projections for the 2031 horizon year, as per their City-wide transportation model (which was otherwise under development during the course of the study). The traffic projections were therefore revisited and revised to better reflect the anticipated growth as per the City's transportation model. Based on the revised 2026 volumes, and in consideration of the lane and intersection capacities, the following lane requirements were identified:

- one lane per direction from Yonge Street to north of Herrell Avenue;
- two lanes per direction from Herrell Avenue to just south of Maplevue Drive;
- one lane per direction from just south of Maplevue Drive to Lockhart Road, with provision for a second lane as the area develops;
- left turn lanes at all intersections;
- an eastbound right turn lane at Yonge Street; and

³ *Huronia Road Traffic Study*. Read Vorhees & Associates Ltd., June 2006.

- a continuous centre turn lane from Yonge Street to Ellis Drive (in consideration of the density of residential and commercial driveways).

It is noted the intersections will effectively dictate the lane requirements necessary, which in turn have been determined based on the provision of acceptable intersection delays, levels of service and queues on the major approaches.

The above were incorporated into the development of the alternative solutions and reflected in the preferred solution as previously noted.

Phases 3 & 4 Analyses

During the completion of Phases 3 and 4 of the Class EA process, the City continued to develop and refine its transportation model including consideration for various road improvements within the immediate area that could otherwise affect traffic operations on Huronia Road. In this respect, the previous traffic analyses were revisited to confirm the lane requirements as they relate to the preferred solution.

Revised model projections for the year 2031 were provided by the City which considered the alternative solutions as previously defined, in addition to the preferred solution, namely:

- Alternative 1: Do Nothing (2 lane Huronia Road from Yonge Street to Lockhart);
- Alternative 5: Widen to 3 lanes;
- Alternative 6: Widen to 4 lanes;
- Alternative 7: Widen to 5 lanes; and
- Preferred Solution: 3 lanes from Yonge Street to north of Herrell Avenue, 5 lanes to south of Mapleview Drive and ultimate 5 lanes from south of Mapleview Drive to south of Lockhart Road with potential interim 3 lanes.

The corresponding link volumes are provided in Table 1. As is evident, the volumes will increase as road capacity is increased (through the provision of additional lanes). As the transportation model is capacity constrained, if the number of lanes is restricted (and hence capacity is restricted), the model will only assign a certain volume and then traffic will have to use alternative routes (as per the model, the capacity of Huronia Road is 700 vehicles per hour per lane). For options with a centre lane, the transportation model identified an additional capacity of 350 vphpl.

The traffic projections prepared for the Phases 1 & 2 report for the year 2026 (last column of Table 1) were compared with the 2031 model results. While the projections are somewhat greater than the model, they are considered reasonable and thus the operational and link analyses undertaken were not otherwise updated (as per the model developers, the model numbers are not to be taken as exact figures, but rather an indicator as to future growth).

Table 1: 2031 PM Peak Hour Volumes

Road Section	Alt 1 Do Nothing		Alt 5 Widen to 3 lanes		Alt 6 Widen to 4 lanes		Alt 7 Widen to 5 lanes		Preferred Solution		2026 EA Volumes	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Yonge St to Little Ave	231	438	256	620	275	735	263	812	248	680	625	850
Little Ave to Herrell Ave	188	491	222	698	243	831	238	934	206	772	800	1100
Herrell Ave to Truman Rd	136	643	180	882	208	1040	223	1165	205	1027	650	1200
Truman Rd to Big Bay Point	412	465	451	694	459	838	453	937	458	829	600	950
Big Bay Point to Ellis Dr	399	513	490	731	535	894	560	1010	551	965	650	1100
Ellis Dr to Loon Ave	429	360	517	564	566	718	582	815	574	782	875	900
Loon Ave to Mapleview Dr	417	691	519	901	563	1047	567	1129	553	1104	850	1050
Mapleview Dr to Saunders Rd	654	678	817	804	862	861	884	871	814	834	1025	950
Saunders Rd to Lockhart Rd	812	488	962	583	1001	626	1019	632	955	602	900	825

In considering the preferred solution lane configuration and the link volumes corresponding to it (ie. Preferred Solution) the following lane requirements were confirmed:

- one lane per direction from Yonge Street to Herrell Avenue;
- two lanes per direction from Herrell Avenue to Mapleview Drive;
- ultimate two lanes per direction with potential interim configuration of one lane per direction from south of Mapleview Drive to Lockhart Road; and
- construction of a centre turn lane, which will accommodate left turn movements, thereby improvement capacity and hence operations of the through movement.

To accommodate the northbound travel queues at Herrell Avenue, it is recommended the transition from 3 to 5 lanes occur north of Herrell Avenue (as previously recommended). This will ensure the maximum capacity and hence best level of service through the intersection.

3.2 Natural Environment

An Environmental Impact Study of the preferred solution was completed by Azimuth Environmental Consulting for the Huronia Road widening entitled *Natural Environment Impact Assessment Report - Huronia Road Improvements*⁴. A summary of their findings is provided below, whereas the corresponding report is provided in Appendix C.

3.2.1 Aquatic Resources

Due to the proposed culvert extensions and ditch enclosures (ie. replacement of ditches with storm sewers), the Huronia Road widening has the potential to harmfully alter, disrupt or destroy (HADD) direct or indirect fish habitat. As such, acceptable measures must be presented and implemented to compensate for the loss in fish habitat. Watercourse culvert crossings and roadside ditches classified as either indirect or direct fish habitat will require provincial and federal review to protect the habitat.

Prior to undertaking work near the Huronia Road watercourses, permits are required from the Lake Simcoe Regional Conservation Authority (LSRCA). Such work must not adversely impact the existing flow regimes of these water systems.

The Department of Fisheries and Oceans (DFO) guidelines state that any replacement or proposed changes to culverts or ditches must improve upon the existing conditions of the culverts, ditches or fish habitat. The DFO does not have a favourable position towards new enclosures of potential fish habitat.

An application for a Federal Authorization for Works or Undertakings Affecting Fish Habitat may be required through the LSRCA due to culvert lengthening. The application may require development of a fish habitat compensation plan for the habitat lost by the enclosures of the watercourses/ ditches to ensure “no net loss” overall. The DFO is not required to accept any such compensation plan. Such an application will generate a Canadian Environmental Assessment Act (CEAA) review process.

3.2.2 Terrestrial Resources

Due to the proposed widening of Huronia Road, approximately 1.3 ha of woody vegetation will be affected, including sections adjacent to the Lovers Creek corridor. This loss of edge vegetation exposes internal plant material to the effects and impacts from wind, exposure, road salt spray, etc. The loss of vegetation may also have an impact on the ambient temperatures for the adjacent Lovers Creek, a well documented and significant cold water fish habitat. Vegetation restoration must offset the impacts from the culvert extensions and the open channel relocation proposed in the design concept. Once trees within the limit of clearing are removed, newly exposed trees should be examined in terms of safety hazards (potential to cause damage to life or property).

⁴ *Natural Environmental Impact Assessment Report*. Azimuth Environmental Consulting, Inc., August 2010.

None of the vegetation communities or vegetation within the study area are of federal or provincial conservation concern. There is a record on file with the Ontario Ministry of Natural Resources (OMNR) Natural Heritage Information Centre (NHIC) indicating the area may contain the habitat of a threatened or endangered species (Fogg's Goosefoot), however, there is no presence of a suitable habitat within the area and the species was not identified during field investigations.

3.2.3 Wetland

Implementation of the proposed road improvements will result in the approximate loss of 0.21 ha of wetland habitat. This does not represent a significant loss to the system.

3.2.4 Wildlife

Implementation of the proposed road improvements will result in the approximate loss of 1.29 ha of tree cover. This does not represent a significant loss to the system.

There will be the potential loss of amphibian breeding habitat in the study area. Loss is considered minimal as the majority of the features will remain after the preferred design alternatives are implemented. The loss of amphibian breeding habitat does not represent a significant loss to the system, with continued breeding within the area expected.

The proposed widening of Huronia Road is not expected to alter the movement of wildlife.

3.2.5 Conclusion

The proposed road improvements potentially pose a localized impact to the existing form and function of aquatic habitat found within Whiskey Creek, its tributaries, and the tributaries of Lovers Creek. Impacts associated with construction activity are temporary and can be adequately addressed through appropriate mitigation. There is the potential for a HADD considering the enclosure/culvert lengthening of existing fish habitat. To offset this risk, an appropriate compensation plan may be required that can result in a greater overall gain (ie. providing an overall improvement to the watershed).

3.2.6 Construction Mitigation

Work involving the watercourses or ditches should be completed 'in the dry', during low water levels. It is anticipated that in-water works will not be permitted between October 1 and June 30 near the Whiskey Creek and Lovers Creek (and associated tributaries), to be confirmed by the LSRCA/ MNR (ie. works would only be permitted from July 1 to September 30). Removal of vegetation should not occur between April 1 and July 31 to avoid impacting nesting birds.

Erosion and sediment control measures will be paramount considering the fish habitat of the Whiskey Creek and Lovers Creek. Best management practices must be in effect to minimize impacts. All

sediment controls are to be maintained until vegetation has been re-established to sufficiently stabilize any disturbed soils.

Any new culverts or culvert replacements should be installed with a minimum 20% embedment below the existing channel invert or design bottom of the watercourse and appropriate substrate material placed to improve the bottom conditions (as opposed to an exposed culvert). If possible, a similar bottom width as the existing structure should be provided. All culverts must provide for fish passage. The LSRCA has favoured the use of "open bottom" culverts where cold water fish habitat and ground water inputs are present.

Groundwater contributions potentially occur in ditch locations through the subject area. The LSRCA requires such contributions be maintained, therefore any proposed ditch enclosures should be perforated to permit ground water seepage.

All areas disturbed during construction should be restored immediately following completion of the works. All required maintenance activities must be conducted away from flowing roadside ditch and watercourses to avoid harm to the aquatic environment.

3.3 Social Environment

Property impacts have been considered from the acquisition of land at the following locations:

- land adjacent to the proposed Huronia Road right-of-way;
- land adjacent to the proposed right-of-way on roads intersecting Huronia Road;
- daylighting triangles (10 metre x 10 metre) to improve sight lines at the intersections; and
- property blocks (5 metre x 10 metre) at each end of every culvert on Huronia Road and Saunders Road, to allow for culvert maintenance and repairs to the water crossing.

The need for the 5 metre x 10 metre property blocks at the culvert ends will be further reviewed (as will all property impacts) during the detailed design stage, to confirm whether or not there is an existing easement owned by the City of Barrie or whether additional property will need to be acquired.

3.4 Cultural/ Heritage Environment

An archaeological assessment of Huronia Road⁵ was undertaken by AMICK Consulting Limited in 2005 as referenced in the Huronia Road Phases 1 & 2 EA Report. While background research indicated the high potential for archaeological resources of Native and Euro-Canadian origins in select locations, no archaeological deposits were encountered during the physical assessment of the area.

⁵ *Report on the 2005 Stage 1-2 Archaeological Assessment, Huronia Road Municipal Class EA Yonge Street to Lockhart Road (T05-HU)*. AMICK Consultants Limited, September 2005.

The study concluded that no further archaeological investigations are considered necessary for the undertaking. Furthermore, the City of Barrie Heritage Sites Inventory does not identify any heritage buildings along Huronia Road.

Based on a review of applicable mapping, there are no known First Nations lands or interests along Huronia Road that would otherwise be impacted. During the course of the study, additional correspondence with First Nations has been undertaken to confirm such.

3.4.1 Conclusion

In consideration of the above, the impacts to the cultural and heritage environment will be similar for all design alternatives.

3.4.2 Construction Mitigation

Should archaeological/heritage remains be found during site preparation or construction, the Ministry of Culture should be notified immediately and an appropriate course of action established.

3.5 Economic Environment

The general magnitude of construction and maintenance costs for the various design alternatives are expected to be similar. Thus, the cost to acquire property is the primary factor impacted by the various design alternatives.

The following land values have been referenced from the 2008 City of Barrie Development Charges document, based on the current zoning:

- low density residential \$269/m² (\$25/ft²)
- commercial - arterial \$376/m² (\$35/ft²)
- industrial - medium density \$215m/² (\$20/ft²)
- institutional - medium density \$269/m² (\$25/ft²)

No value is assumed for environmentally protected or open space land in that it cannot otherwise be developed. Notwithstanding, owners of such lands would be compensated for property required to accommodate the proposed road improvements.

4 Evaluation of Alternative Design Concepts

4.1 Impacts of Design Alternatives

An assessment of the potential impacts associated with each alternative is provided in Table 2 through Table 4 and discussed further below. Although there will be impacts to other environments, it is expected that property acquisition and the associated impacts will govern the evaluation and the selection of a preferred design alternative.

The alternatives to the City of Barrie standard for a 3-lane urban (BSD-03, 23.0 m right-of-way), 5-lane urban (BSD-07A, 30.0 m right-of-way), or 3-lane rural (BSD-05, 36.0 m right-of-way) cross-section were considered within the corresponding road sections (ie. Yonge Street to Herrell Avenue, Herrell Avenue to Mapleview Drive and Mapleview Drive to Lockhart Road). Where property constraints exist, other design alternatives were also considered to reduce the impacts associated with land acquisition.

4.1.1 Huronia Road - Yonge Street to North of Herrell Avenue (3 Lanes)

Design Alternative 3-1 would provide a 3-lane cross-section with a 23.0 metre right-of-way and sidewalks on both sides. Huronia Road from Yonge Street to north of Herrell Avenue has an existing road allowance which would require land acquisition in certain sections to accommodate the standard BSD-03 cross-section. There are several residential properties along the east and west side of Huronia Road that may be impacted through the implementation of the BSD-03 standard cross-section.

Design Alternative 3-2 would reduce the road allowance from 23.0 metres to 22.5 metres, by reducing the centre lane width. This reduction would reduce property impacts by 0.25 metres on either side of the road. However, in reducing the centre lane, the likelihood of a collision with vehicles occupying the centre turn lane would be increased (due to reduced site visibility past the opposing vehicle) and the level of safety would be reduced on Huronia Road.

Design Alternative 3-3 would reduce the road allowance from 23.0 metres to 22.5 metres, by reducing the through lane width. This reduction would reduce property impacts by 0.25 metres on either side of the road. However, in reducing the travel lanes, the likelihood of a collision with vehicles occupying these lanes would be increased on Huronia Road. Furthermore, the *Geometric Design Guide for Canadian Roads* stipulates that for two-lane or multilane roadways designated as an arterial with a rural or urban cross-section, the through lane width should not be less than 3.5 metres.

Table 2: Assessment of Design Alternatives - Yonge Street to north of Herrell Avenue

Evaluation Criteria	Design Alternative 3-1 City of Barrie Standard 23.0 m Road Allowance	Design Alternative 3-2 3.5 m Centre Lane 22.5 m Road Allowance	Design Alternative 3-3 3.3 m Lanes 22.6 m Road Allowance	Design Alternative 3-4 Sidewalk on One Side Only 20.5 m Road Allowance	Design Alternative 3-5 Reduced Boulevard Width 20.0 m Road Allowance	Design Alternative 3-6 Proposed Centreline Shift 23.0 m Road Allowance	Design Alternative 3-7 Proposed Centreline Shift and Reduced Boulevard Width 20.0 m Road Allowance	
Physical Environment	Road Operations & Railway Crossings	<ul style="list-style-type: none"> Greatest improvements to road operations and capacity. 	<ul style="list-style-type: none"> Slightly less improvement to road operation and capacity due to reduction in centre lane width. 	<ul style="list-style-type: none"> Slightly less improvement to road operations and capacity due to reduced lane width. 	<ul style="list-style-type: none"> Greatest improvement to road operations and capacity. 			
	Transit Operations	<ul style="list-style-type: none"> Based on existing traffic volumes, a grade crossing warning system (to include both lights and bells) is warranted at the Little Avenue crossing, west of Huronia Road. Opportunity to improve transit operations by constructing improved bus stop amenities. 						
	Pedestrian Operations	<ul style="list-style-type: none"> Improved pedestrian traffic safety with additional of sidewalks on both sides of the road. 			<ul style="list-style-type: none"> Reduced pedestrian traffic safety with sidewalk on only one side of the road. 	<ul style="list-style-type: none"> Improved pedestrian traffic safety with addition of sidewalks on both sides of the road. 		
	Pavement Condition	<ul style="list-style-type: none"> Pavement condition improved through reconstruction of roadway. 						
	Road Safety	<ul style="list-style-type: none"> Increase in driver comfort and safety with addition of centre turn lane. 	<ul style="list-style-type: none"> Slightly reduced driver comfort and safety with reduced centre lane width over Alternatives 3-1, 3-4, 3-5 and 3-6. 	<ul style="list-style-type: none"> Slightly reduced driver comfort and safety with reduced lane width over Alternatives 3-1, 3-4, 3-5 and 3-6. Reduction in posted speed to 50 km/h required to accommodate reduced lane width in parts of the study area. 	<ul style="list-style-type: none"> Increase in driver comfort and safety with addition of centre turn lane. 			
	Utilities & Services	<ul style="list-style-type: none"> Relocation of utilities required to accommodate expanded roadway. Opportunity to improve municipal services as part of road reconstruction work. 						
Natural Environment	Fisheries/ Aquatic Impacts	<ul style="list-style-type: none"> Greatest fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less fisheries and aquatic habitat in wetland areas impacted by wetland road platform and extended structures over Alternatives 3-1 and 3-6. 		<ul style="list-style-type: none"> Least fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less fisheries and aquatic habitat in wetland areas impacted by wetland road platform and extended structures over Alternatives 3-1 and 3-6. 	
	Wildlife/ Terrestrial Impacts	<ul style="list-style-type: none"> Greatest impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures over Alternatives 3-1 and 3-6. 		<ul style="list-style-type: none"> Least impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures over Alternatives 3-1 and 3-6. 	
	Vegetation Impacts	<ul style="list-style-type: none"> Greatest loss of woody vegetation as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less loss of woody vegetation as a result of widened road platform and extended culvert structures over Alternatives 3-1 and 3-6. 		<ul style="list-style-type: none"> Least loss of woody vegetation as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest loss of woody vegetation as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less loss of woody vegetation as a result of widened road platform and extended culvert structures over Alternatives 3-1 and 3-6. 	

Evaluation Criteria	Design Alternative 3-1 City of Barrie Standard 23.0 m Road Allowance	Design Alternative 3-2 3.5 m Centre Lane 22.5 m Road Allowance	Design Alternative 3-3 3.3 m Lanes 22.6 m Road Allowance	Design Alternative 3-4 Sidewalk on One Side Only 20.5 m Road Allowance	Design Alternative 3-5 Reduced Boulevard Width 20.0 m Road Allowance	Design Alternative 3-6 Proposed Centreline Shift 23.0 m Road Allowance	Design Alternative 3-7 Proposed Centreline Shift and Reduced Boulevard Width 20.0 m Road Allowance	
Land Impacts	<ul style="list-style-type: none"> Greatest impact to wetland as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less impact to wetland as a result of widened road platform and extended culvert structures over Alternatives 3-1 and 3-6. 			<ul style="list-style-type: none"> Least impact to wetland as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest impact to wetland as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less impact to wetland as a result of widened road platform and extended culvert structures over Alternatives 3-1 and 3-6. 	
Property/ Development Impacts	<ul style="list-style-type: none"> Greatest impacts to private property and development due to expanded road platform and right-of-way. 	<ul style="list-style-type: none"> Slightly less impacts to some private property and development due to reduced right-of-way over Alternatives 3-1 and 3-6. 			<ul style="list-style-type: none"> Least impact to private property and development due to expanded road platform and right-of-way. 	<ul style="list-style-type: none"> Greatest impacts to private property and development due to expanded road platform and right-of-way. 	<ul style="list-style-type: none"> Least impact to private property and development due to expanded road platform and right-of-way. 	
Social Environment	Aesthetics	<ul style="list-style-type: none"> Greatest opportunity to enhance aesthetics due to elimination of ditches and maximum boulevard width. 			<ul style="list-style-type: none"> Least opportunity to enhance aesthetics due to minimum boulevard width. 	<ul style="list-style-type: none"> Greatest opportunity to enhance aesthetics due to elimination of ditches and maximum boulevard width. 	<ul style="list-style-type: none"> Least opportunity to enhance aesthetics due to minimum boulevard width. 	
	Noise Impacts	<ul style="list-style-type: none"> Temporary noise impacts during construction to be mitigated through operation and equipment time of day restrictions during construction. No significant change in noise impacts on adjacent properties between design alternatives. 						
	Driver Comfort	<ul style="list-style-type: none"> Maximum driver comfort. 	<ul style="list-style-type: none"> Slightly reduced driver comfort due to reduced centre turn lane width. 	<ul style="list-style-type: none"> Slightly reduced driver comfort due to reduced lane width. 	<ul style="list-style-type: none"> Maximum driver comfort. 			
Construction Impacts	<ul style="list-style-type: none"> Temporary disruption to traffic flow during construction can be mitigated through appropriate traffic management measures and staging of construction. No significant change in construction impacts between design alternatives. 							
Cultural Heritage Environment	Archaeological & Heritage Impacts	<ul style="list-style-type: none"> Archaeological or heritage impacts not anticipated. 						
	First Nations Impacts	<ul style="list-style-type: none"> First Nations impacts not anticipated. 						
Economic Environment	Maintenance & Construction Costs	<ul style="list-style-type: none"> Greatest maintenance costs. 	<ul style="list-style-type: none"> Slightly less maintenance costs due to reduced centre turn lane width over Alternatives 3-1, 3-5 and 3-6. 	<ul style="list-style-type: none"> Slightly less maintenance costs due to reduced lane width over Alternatives 3-1, 3-5 and 3-6. 	<ul style="list-style-type: none"> Reduced sidewalk maintenance 	<ul style="list-style-type: none"> Potential snow clearing issues with reduced boulevard width resulting in increased costs. 	<ul style="list-style-type: none"> Greatest maintenance costs. 	<ul style="list-style-type: none"> Potential snow clearing issues with reduced boulevard width resulting in increased costs.
		<ul style="list-style-type: none"> Highest construction costs. 	<ul style="list-style-type: none"> Slight reduction in construction costs compared to Alternatives 3-1, 3-5 and 3-5 due to reduced centre lane width. 	<ul style="list-style-type: none"> Slight reduction in construction costs compared to Alternatives 3-1, 3-5 and 3-6 due to reduced lane width. 	<ul style="list-style-type: none"> Slight reduction in construction costs compared to Alternatives 3-1, 3-5 and 3-6 due to sidewalk only on one side. 	<ul style="list-style-type: none"> Highest construction costs. 		
	Land Acquisition Costs	<ul style="list-style-type: none"> Highest land acquisition costs. 	<ul style="list-style-type: none"> Slight reduction in land acquisition costs due to minor reduction to right-of-way width. 			<ul style="list-style-type: none"> Minor land acquisition costs. 		<ul style="list-style-type: none"> Provides opportunity to reduce land acquisition requirements and costs due to alignment shift.

Table 3: Assessment of Design Alternatives - north of Herrell Avenue to south of Mapleview Drive

Evaluation Criteria	Design Alternative 5-1 City of Barrie Standard 30.0 m Road Allowance	Design Alternative 5-2 3.5 m Centre Lane 29.5 m Road Allowance	Design Alternative 5-3 3.3 m Lanes 29.2 m Road Allowance	Design Alternative 5-4 Sidewalk on One Side Only 27.5 m Road Allowance	Design Alternative 5-5 Reduced Boulevard Width 27.0 m Road Allowance	Design Alternative 5-6 Proposed Multi-Use Trail 31.5 m Road Allowance	Design Alternative 5-7 Proposed Centreline Shift 30.0 m Road Allowance	Design Alternative 5-8 Proposed Centreline Shift & Reduced Boulevard 31.5 m Road Allowance	
Physical Environment	Road Operations & Railway Crossings	<ul style="list-style-type: none"> Greatest improvement to road operation and capacity. 	<ul style="list-style-type: none"> Slightly less improvement to road operation and capacity due to reduction in centre lane width. 	<ul style="list-style-type: none"> Slightly less improvement to road operation and capacity due to reduced lane width. 	<ul style="list-style-type: none"> Greatest improvement to road operation and capacity. 				
	Transit Operations	<ul style="list-style-type: none"> Based on existing traffic volumes, a grade crossing warning system (to include both lights and bells) is warranted at the crossing located at Huronia Road, south of Herrell Avenue, and at Huronia Road, south of Ellis Drive. 							
	Pedestrian Operations	<ul style="list-style-type: none"> Improved pedestrian traffic safety with addition of sidewalks on both sides of the road. 			<ul style="list-style-type: none"> Reduced pedestrian traffic safety with sidewalk on only one side of the road. 	<ul style="list-style-type: none"> Improved pedestrian traffic safety with addition of sidewalks on both sides of the road. 	<ul style="list-style-type: none"> Improved pedestrian traffic safety and active transportation route with addition of sidewalk on the west side and a multi-use trail on the east side of the road. 		
	Pavement Condition	<ul style="list-style-type: none"> Pavement condition improved through reconstruction of roadway. 							
	Road Safety	<ul style="list-style-type: none"> Increase in driver comfort and safety with addition of centre turn lane and second through lane. 	<ul style="list-style-type: none"> Slightly reduced driver comfort and safety with reduced centre lane width. 	<ul style="list-style-type: none"> Slightly reduced driver comfort and safety with reduced lane width. Reduction in posted speed to 50 km/hr. required to accommodate reduced lane width in parts of the study area. 	<ul style="list-style-type: none"> Increase in driver comfort and safety with addition of centre turn lane and second through lane. 				
	Utilities & Services	<ul style="list-style-type: none"> Relocation of utilities required to accommodate expanded roadway. Opportunity to improve municipal services as part of road reconstruction work. 							
Natural Environment	Fisheries/Aquatic Impacts	<ul style="list-style-type: none"> Greatest impacts to fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures over Alternatives 5-1, 5-6, 5-7 and 5-8. 		<ul style="list-style-type: none"> Least fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest impacts to fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures. 			
	Wildlife/Terrestrial Impacts	<ul style="list-style-type: none"> Greatest impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures over Alternatives 5-1, 5-6, 5-7 and 5-8. 		<ul style="list-style-type: none"> Least impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures. 			
	Vegetation Impacts	<ul style="list-style-type: none"> Greatest loss of woody vegetation as a result of widened road platform and extended culvert structures 	<ul style="list-style-type: none"> Slightly less loss of woody vegetation as a result of widened road platform and extended culvert structures over Alternatives 5-1, 5-6, 5-7 and 5-8. 		<ul style="list-style-type: none"> Least impact to woody vegetation as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest loss of woody vegetation as a result of widened road platform and extended culvert structures 			

Evaluation Criteria	Design Alternative 5-1 City of Barrie Standard 30.0 m Road Allowance	Design Alternative 5-2 3.5 m Centre Lane 29.5 m Road Allowance	Design Alternative 5-3 3.3 m Lanes 29.2 m Road Allowance	Design Alternative 5-4 Sidewalk on One Side Only 27.5 m Road Allowance	Design Alternative 5-5 Reduced Boulevard Width 27.0 m Road Allowance	Design Alternative 5-6 Proposed Multi-Use Trail 31.5 m Road Allowance	Design Alternative 5-7 Proposed Centreline Shift 30.0 m Road Allowance	Design Alternative 5-8 Proposed Centreline Shift & Reduced Boulevard 31.5 m Road Allowance	
Land Impacts	<ul style="list-style-type: none"> Greatest impact to wetland as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less impact to wetland as a result of widened road platform and extended culvert structures over Alternatives 5-1, 5-6, 5-7 and 5-8. 			<ul style="list-style-type: none"> Least impact to wetland as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest impact to wetland as a result of widened road platform and extended culvert structures. 			
Social Environment	Property/Development Impacts	<ul style="list-style-type: none"> Greatest impacts to private property and development due to expanded road platform and right-of-way. 	<ul style="list-style-type: none"> Slightly less impacts to some private property and development due to reduced right-of-way over Alternatives 5-1, 5-6, 5-7 and 5-8. 			<ul style="list-style-type: none"> Least impact to private property and development due to expanded road platform and right-of-way. 	<ul style="list-style-type: none"> Greatest impacts to private property and development due to expanded road platform and right-of-way. 		
	Aesthetics	<ul style="list-style-type: none"> Greatest opportunity to enhance aesthetics due to elimination of ditches and maximum boulevard width. 			<ul style="list-style-type: none"> Least opportunity to enhance aesthetics due to minimum boulevard width. 	<ul style="list-style-type: none"> Greatest opportunity to enhance aesthetics due to elimination of ditches and maximum boulevard width. 			
	Noise Impacts	<ul style="list-style-type: none"> Temporary noise impacts during construction to be mitigated through operation and equipment time of day restrictions during construction. No significant change in construction impacts between design alternatives. 							
	Driver Comfort	<ul style="list-style-type: none"> Maximum driver comfort. 	<ul style="list-style-type: none"> Slightly reduced driver comfort due to reduced centre turn lane width. 	<ul style="list-style-type: none"> Slightly reduced driver comfort due to reduced lane width. 	<ul style="list-style-type: none"> Maximum driver comfort. 				
	Construction Impacts	<ul style="list-style-type: none"> Temporary disruption to traffic flow during construction can be mitigated through appropriate traffic management measures and staging of construction. No significant change in construction impacts between design alternatives. 							
Cultural Heritage Environment	Archaeological & Heritage Impacts	<ul style="list-style-type: none"> Archaeological heritage impacts not anticipated. 							
	First Nations Impacts	<ul style="list-style-type: none"> First Nations impacts not anticipated. 							
Economic Environment	Maintenance & Construction Costs	<ul style="list-style-type: none"> Greatest maintenance costs. 	<ul style="list-style-type: none"> Slightly less maintenance costs due to reduced centre turn lane width. 	<ul style="list-style-type: none"> Slightly less maintenance costs due to reduced lane width. 	<ul style="list-style-type: none"> Reduced sidewalk maintenance. 	<ul style="list-style-type: none"> Potential snow clearing issues with reduced boulevard width resulting in increased costs. 	<ul style="list-style-type: none"> Greatest maintenance costs. 		
		<ul style="list-style-type: none"> Highest construction costs. 	<ul style="list-style-type: none"> Slight reduction in construction costs. 	<ul style="list-style-type: none"> Slight reduction in construction costs due to reduced lane width. 	<ul style="list-style-type: none"> Slight reduction in construction costs due to sidewalk only on one side. 	<ul style="list-style-type: none"> Highest construction costs. 	<ul style="list-style-type: none"> Highest construction costs. 		
	Land Acquisition Costs	<ul style="list-style-type: none"> Highest land acquisition costs. 	<ul style="list-style-type: none"> Slight reduction in land acquisition costs due to reduction to right-of-way width. 				<ul style="list-style-type: none"> Provides opportunity to reduce land acquisition requirements and costs due to alignment shift. 		

Table 4: Assessment of Design Alternatives - south of Maplevue Drive to Lockhart Road

Evaluation Criteria	Design Alternative 3R-1 City of Barrie Standard 36.0 m Interim Road Allowance	Design Alternative 3R-2 3.5 m Centre Lane 35.5 m Interim Road Allowance	Design Alternative 3R-3 3.3 m Lanes 35.6 Interim Road Allowance	Design Alternative 3R-4 Reduced Boulevard Width 28.0 m Interim Road Allowance	Design Alternative 3R-5 Proposed Centreline Shift 36.0 m Interim Road Allowance	Design Alternative 3R-6 Proposed Centreline Shift & Reduced Boulevard 31.5 m Interim Road Allowance	
Physical Environment	Road Operations & Railway Crossings	<ul style="list-style-type: none"> Greatest improvement to road operation and capacity. 	<ul style="list-style-type: none"> Slightly less improvement to road operation and capacity due to reduction in centre lane width. 	<ul style="list-style-type: none"> Slightly less improvement to road operation and capacity due to reduced lane width. 	<ul style="list-style-type: none"> Greatest improvement to road operation and capacity. 		
	Transit Operations	<ul style="list-style-type: none"> No railway crossings Opportunity to improve transit operations by constructing improved bus stop amenities. 					
	Pedestrian Operations	<ul style="list-style-type: none"> Improved pedestrian traffic safety with addition of multi-use trail. 			<ul style="list-style-type: none"> No opportunity to improve pedestrian traffic safety due to elimination of multi-use trail. 	<ul style="list-style-type: none"> Improved pedestrian traffic safety with addition of multi-use trail. 	
	Pavement Condition	<ul style="list-style-type: none"> Pavement condition improved through reconstruction of roadway. 					
	Road Safety	<ul style="list-style-type: none"> Increase in driver comfort and safety with addition of centre turn lane. 	<ul style="list-style-type: none"> Slightly reduced driver comfort and safety with reduced centre lane width. 	<ul style="list-style-type: none"> Slightly reduced driver comfort and safety with reduced lane width over Alternatives 3R-1, 3R-4 and 3R-5. Reduction in posted speed to 50 km/h required to accommodate reduced lane width in parts of the study area. 	<ul style="list-style-type: none"> Increase in driver comfort and safety with addition of centre turn lane. 		
	Utilities & Services	<ul style="list-style-type: none"> Relocation of utilities required to accommodate expanded roadway. Opportunity to improve municipal services as part of road reconstruction work. 					
Natural Environment	Fisheries/ Aquatic Impacts	<ul style="list-style-type: none"> Greatest fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures over Alternatives 3R-1 and 3R-5. 	<ul style="list-style-type: none"> Least fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Least fisheries and aquatic habitat in wetland areas impacted by widened road platform and extended culvert structures. 	
	Wildlife/ Terrestrial Impacts	<ul style="list-style-type: none"> Greatest impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures over Alternatives 3R-1 and 3R-5. 	<ul style="list-style-type: none"> Least impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Least impact to wildlife/terrestrial habitat as a result of widened road platform and extended culvert structures. 	
	Vegetation Impacts	<ul style="list-style-type: none"> Greatest loss of woody vegetation as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less loss of woody vegetation as a result of widened road platform and extended culvert structures over Alternatives 3R-1 and 3R-5. 	<ul style="list-style-type: none"> Least loss of woody vegetation as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest loss of woody vegetation as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Least loss of woody vegetation as a result of widened road platform and extended culvert structures. 	
	Land Impacts	<ul style="list-style-type: none"> Greatest impact to wetland as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Slightly less impact to wetland as a result of widened road platform and extended culvert structures over Alternatives 3R-1 and 3R-5. 	<ul style="list-style-type: none"> Least impact to wetland as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Greatest impact to wetland as a result of widened road platform and extended culvert structures. 	<ul style="list-style-type: none"> Least impact to wetland as a result of widened road platform and extended culvert structures. 	

Evaluation Criteria	Design Alternative 3R-1 City of Barrie Standard 36.0 m Interim Road Allowance	Design Alternative 3R-2 3.5 m Centre Lane 35.5 m Interim Road Allowance	Design Alternative 3R-3 3.3 m Lanes 35.6 Interim Road Allowance	Design Alternative 3R-4 Reduced Boulevard Width 28.0 m Interim Road Allowance	Design Alternative 3R-5 Proposed Centreline Shift 36.0 m Interim Road Allowance	Design Alternative 3R-6 Proposed Centreline Shift & Reduced Boulevard 31.5 m Interim Road Allowance	
Social Environment	Property/ Development Impacts	<ul style="list-style-type: none"> Greatest impacts to private property and development due to expanded road platform and right-of-way. 	<ul style="list-style-type: none"> Slightly less impact to some private property and development due to reduced right-of-way over Alternatives 3R-1 and 3R-5. 		<ul style="list-style-type: none"> Least impact to private property and development due to expanded road platform and right-of-way. 	<ul style="list-style-type: none"> Greatest impacts to private property and development due to expanded road platform and right-of-way. 	<ul style="list-style-type: none"> Least impact to private property and development due to expanded road platform and right-of-way.
	Aesthetics	<ul style="list-style-type: none"> Greatest opportunity to enhance aesthetics due to reconstruction of ditches within maximum boulevard width. 			<ul style="list-style-type: none"> Least opportunity to enhance aesthetics due to minimum boulevard width. 	<ul style="list-style-type: none"> Greatest opportunity to enhance aesthetics due to reconstruction of ditches within maximum boulevard width. 	<ul style="list-style-type: none"> Least opportunity to enhance aesthetics due to minimum boulevard width.
	Noise Impacts	<ul style="list-style-type: none"> Temporary noise impacts during construction to be mitigated through operation and equipment time of day restrictions during construction. No significant change in noise impacts on adjacent properties between design alternatives. 					
	Driver Comfort	<ul style="list-style-type: none"> Maximum driver comfort. 	<ul style="list-style-type: none"> Slightly reduced driver comfort due to reduced centre turn lane width. 	<ul style="list-style-type: none"> Slightly reduced driver comfort due to reduced lane width. 	<ul style="list-style-type: none"> Maximum driver comfort. 		
	Construction Impacts	<ul style="list-style-type: none"> Temporary disruption to traffic flow during construction can be mitigated through appropriate traffic management measures and staging of construction. No significant change in construction impacts between design alternatives. 					
Cultural Heritage Environment	Archaeological & Heritage Impacts	<ul style="list-style-type: none"> Archaeological or heritage impacts not anticipated. 					
	First Nations Impacts	<ul style="list-style-type: none"> First Nations impacts not anticipated. 					
Economic Environment	Maintenance & Construction Costs	<ul style="list-style-type: none"> Greatest maintenance costs. 	<ul style="list-style-type: none"> Slightly less maintenance costs due to reduced centre turn lane width. 	<ul style="list-style-type: none"> Slightly less maintenance costs due to reduced lane width. 	<ul style="list-style-type: none"> Potential snow clearing issues with reduced boulevard width resulting in increased costs. 	<ul style="list-style-type: none"> Greatest maintenance costs. 	<ul style="list-style-type: none"> Potential snow clearing issues with reduced boulevard width resulting in increased costs.
		<ul style="list-style-type: none"> Highest construction costs. 	<ul style="list-style-type: none"> Slight reduction in construction costs due to reduced centre lane width. 	<ul style="list-style-type: none"> Slight reduction in construction costs due to reduced lane width. 	<ul style="list-style-type: none"> Slight reduction in construction costs due to elimination of multi-use trail. 	<ul style="list-style-type: none"> Highest construction costs. 	
	Land Acquisition Costs	<ul style="list-style-type: none"> Highest land acquisition costs. 	<ul style="list-style-type: none"> Slight reduction in land acquisition costs due to minor reduction to right-of-way width. 		<ul style="list-style-type: none"> Lowest land acquisition costs. 	<ul style="list-style-type: none"> Provides opportunity to reduce land acquisition requirements and costs due to alignment shift. 	<ul style="list-style-type: none"> Lowest land acquisition costs.

Sidewalk would only be provided on one side of the road under Design Alternative 3-4, reducing the road allowance from 23.0 metres to 20.5 metres. Property impacts would be reduced by 1.25 metres on either side of the road. Providing a sidewalk on only one side of the road along this section of Huronia Road is not considered practical in consideration of the adjacent land uses and pedestrian traffic safety concerns. By providing sidewalk on both sides of the road for a three lane road, the City of Barrie would expand their active transportation network and reduce the potential for pedestrian crossings, thereby reducing the potential for vehicle-pedestrian conflicts.

The 3.5 metre wide boulevards of the BSD-03 cross-section which would accommodate utilities, are to be reduced under Design Alternative 3-5, reducing the overall road allowance from 23.0 to 20.0 metres. Property impacts under this design alternative would be reduced by the greatest margin: 1.5 metres on either side of the road. Although land acquisition costs may be reduced due to the reduced width of the right-of-way, there may be increased costs associated with potentially forcing overhead utilities underground.

Design Alternative 3-6 would provide the standard BSD-03 cross-section and permit the centreline to shift according to the property constraints. This would see the centreline shifted to the west between Herrell Avenue and Little Avenue.

Design Alternative 3-7 which is a combination of Design Alternatives 3-5 and 3-6 was developed following PIC 2 to further mitigate impacts to residential properties on Huronia Road, north of Little Avenue, by reducing boulevard widths in conjunction with shifting the road centreline.

4.1.2 Huronia Road - North of Herrell Avenue to South of Maplevue Drive (5 Lanes)

Design Alternative 5-1 would provide a 5-lane cross-section with a 30.0 metre right-of-way and sidewalks on both sides. Huronia Road from north of Herrell Avenue to south of Maplevue Drive has an existing road allowance which varies from 20.0 metres to 35.0 metres wide. As a result, land acquisition in certain sections is required to accommodate the standard BSD-07A cross-section.

Design Alternative 5-2 would reduce the road allowance from 30.0 metres to 29.5 metres, by reducing the centre lane width. This reduction would reduce property impacts by 0.25 metres on either side of the road. However, in reducing the centre lane, the likelihood of a collision with vehicles occupying the centre turn lane would be increased (due to reduced site visibility past the opposing vehicle) and the level of safety would be reduced on Huronia Road.

Design Alternative 5-3 would reduce the road allowance from 30.0 metres to 29.0 metres, by reducing the through lane width. This reduction would reduce property impacts by 0.5 metres on either side of the road. Similar to Design Alternative 5-2, in reducing the travel lanes, the likelihood of a collision with vehicles occupying these lanes would be increased on Huronia Road. However, the *Geometric Design Guide for Canadian Roads* stipulates that for two-lane or multilane roadways designated as an arterial with a rural or urban cross-section, the through lane width should not be less than 3.5 metres.

Consideration was also given to the fact Huronia Road from Mapleview Drive to Big Bay Point Road is designated as a truck route which would potentially increase the severity of potential collisions due to the size and weight of the vehicles.

Sidewalk would only be provided on one side of the road under Design Alternative 5-4, reducing the road allowance from 30.0 metres to 27.5 metres. Property impacts would be reduced by 1.25 metres on either side of the road. Providing only one sidewalk on this section of Huronia Road is not considered practical in consideration of the adjacent land uses and pedestrian traffic safety concerns. By providing sidewalk on both sides of the road for a 5-lane road, the City of Barrie would expand their active transportation network and reduce the number of pedestrian crossings, thereby reducing the potential for vehicle-pedestrian conflicts.

The 3.5 metre wide boulevards of the BSD-07A cross-section which would accommodate utilities, is to be reduced under Design Alternative 5-5, reducing the road allowance from 30.0 metres to 27.0 metres. Property impacts under this design alternative would be reduced by the greatest margin: 1.5 metres on either side of the road. Although land acquisition costs may be reduced due to the reduced width of the right-of-way, there may be increased costs associated with potentially forcing overhead utilities underground.

Design Alternative 5-6 would provide a 3.0 metre multi-use trail on the east side of Huronia Road, with a 1.5 metre sidewalk on the west side, increasing the road allowance from the 30.0 metre standard to 31.5 metres. An extension of the TransCanada Trail has been considered for Huronia Road from Loon Avenue to Lockhart Road. Although it is desirable to reduce the right-of-way and therefore the property requirements, the implementation of Design Alternative 5-6 would contribute to the completion of the TransCanada Trail through the south end of Barrie, expanding the active transportation network for the City.

Design Alternative 5-7 was developed to mitigate impacts to abutting residential properties in the vicinity of Herrell Avenue by shifting the road centreline. This option is made possible based on the understanding the existing water booster facility will be decommissioned.

Design Alternative 5-8 is a combination of Design Alternatives 5-5 and 5-7, and was developed following PIC 2 to further mitigate impacts to commercial properties in the vicinity of Mapleview Drive.

4.1.3 Huronia Road - South of Mapleview Drive to South of Lockhart Road (3 Lanes, Ultimate 5 Lanes)

Design Alternative 3R-1 would provide an interim 3-lane cross-section with rural open drainage ditches. The road platform would be constructed to accommodate the ultimate 5-lane cross-section and future urbanization.

Design Alternatives 3R-1, 3R-2, 3R-3, 3R-5 and 3R-6 would provide a 3.0 metre multi-use trail on the east side of Huronia Road. The implementation of these design alternatives would contribute to the extension of the TransCanada Trail to the south end of Barrie. In addition, upon up-grading from the interim 3-lane rural to the ultimate 5-lane urban cross-section in the future, a sidewalk would be provided on the west side of Huronia Road.

Some land acquisition is required to accommodate Design Alternative 3R-1. Design Alternatives 3R-2 and 3R-3 would reduce property impacts by reducing the lane width. As discussed previously, the *Geometric Design Guide for Canadian Roads* stipulates that for two lane or multilane roadways designated as an arterial with a rural or urban cross-section, the through lane width should not be less than 3.5 metres. The reduction in lane width would result in small reductions in property impacts between 0.5 metres and 1.0 metre. However, there would be an increase risk of a collision as the travel width for vehicles travelling on Huronia Road would be reduced.

Design Alternative 3R-4 is similar to design alternative 3R-1 without the 3.0 metre multi-use trail.

Design Alternative 3R-5 would provide the same cross-section as Design Alternative 3R-1 but would be shifted to limit potential impacts to abutting properties.

Design Alternative 3R-6 is a combination of Design Alternatives 3R-4 and 3R-5, and was developed following PIC 2 to further reduce property impacts by shifting the road centreline and reducing boulevard widths within a 31.5 metre right-of-way. This right-of-way would be sufficient to accommodate the ultimate 5-lane widening in the future.

5 Stakeholder Consultation - PIC 2

In completing a 'Schedule C' Class EA, there are three points of mandatory stakeholder contact as per the following (refer also to Figure 1):

- the first point occurs towards the end of Phase 2 when a notice is issued inviting stakeholder comment and input via a Public Information Centre (referred to as PIC 1);
- the second point occurs towards the end of Phase 3 when a second Public Information Centre is held; and
- the third point of contact is upon completion of the planning process at which time a Notice of Completion is provided.

In keeping with the chronological order in documenting events in the order they occurred, the first point of contact was discussed in the Phases 1 and 2 report. The second and third points of contact are discussed in Chapters 5 and 9 of this report.

5.1 Purpose

The purpose of Public Information Centre 2 was to:

- review the preferred solution from Phases 1 & 2;
- present the design concept alternatives under consideration to implement the preferred solution;
- seek input and comments for consideration in the selection of the final preferred design alternative; and
- provide opportunities for public to ask questions.

5.2 Notification

In accordance with the Municipal Class EA guidelines, a notification of Public Information Centre 2 was issued inviting stakeholder comment and input. Stakeholders include review agencies, the public and special interest groups and thus notices were directed to each, in the same manner in which the Notice of Public Information Centre 1 was disseminated. Notification included:

- ads published in the Barrie Examiner on two separate occasions preceding the public information centre; and
- letters and comment sheets were mailed to property owners directly affected advising of the open house.

Copies of the notices and distribution list are provided in Appendix D.

5.3 Public Information Centre 2

Public Information Centre 2 was held on Thursday, November 25, 2010 from 4:00 PM to 7:00 PM at Barrie City Hall and was attended by 24 individuals. No formal presentation was made but rather people were welcome to drop in during the above hours to review the materials and ask questions. Representatives from the City of Barrie, and the consultant project team were in attendance to answer any questions and provide assistance as necessary.

Various display boards were prepared for viewing by the public. Display boards addressed the following:

- study purpose and introduction which described the reasoning behind the undertaking;
- the Municipal Class EA process and those tasks relevant to this study;
- a review of the preferred solution selected at the end of Phase 2 of the Municipal Class EA process;
- 3-lane and 5-lane design concepts typical cross-sections;
- assessment of 3-lane and 5-lane design alternatives;
- plan and profile aerial drawings of the preliminary preferred 3-lane and 5-lane design options;
- evaluation of alternatives scoring matrix;
- the remaining steps to completion; and
- who to contact for additional information.

The draft Phases 3 & 4 report was also made available to all interested agencies and the public to review online at www.barrie.ca on November 12, 2010. Copies of the draft report were also made available for review at the City of Barrie Clerk's Office and Engineering Department, as well as at the Barrie Public Library.

Input was received from stakeholders either at PIC 2 or shortly thereafter, via the comment sheets provided. All comment sheets returned are included in Appendix D.

5.4 Public Comments

Table 5 contains the comments received from the public and corresponding responses.

Table 5: Summary of Public Comments & Responses

ID #	Public Comments	Response to Comments
1	<p>From Alt. 3 Section: My concern is how the City of Barrie plans to protect the mature trees already in existence along the road line? As they provide privacy and homes for wildlife in the area.</p>	<ul style="list-style-type: none"> Some trees within the existing and/or expanded rights-of-way may need to be removed to accommodate road improvements. However, every reasonable effort will be made to identify and protect trees and their root systems during construction through provisions in the contract. To minimize impacts to property and trees within the existing road allowance from Yonge Street to north of Herrell Avenue, a combination of design alternatives 3-6 and 3-7 which involve shifting the centreline of road and reducing boulevard width has been identified as the preferred design alternative.
3	<p>From Alt. 3 Section: We would like to see sidewalks on the west side of Huronia Rd. only for this section of roadway, as there is a short section of sidewalk near Little Ave. already. There is little growth along this section of road because of mature properties & no need for sidewalk expansion to both sides of the road.</p> <p>From Alt. 5 Section: Rather than a small section of multi-use trail, include a designated bicycle lane on the roadway.</p> <p>From Alt. 3R Section: I think a multi-use trail through an industrial/commercialized area is ridiculous & will see little use other than as a sidewalk.</p>	<ul style="list-style-type: none"> City of Barrie arterial road standards include sidewalks on both sides of the road to provide safe movement of pedestrian traffic. To minimize impacts to property within the existing road allowance from Yonge Street to north of Herrell Avenue, the preferred design alternative includes shifting the centreline of road and reducing boulevard width. <p>Current Trans Canada trail provides bike route from Loon Avenue to Yonge Street through available green space, commercial and residential lands, east of Huronia Road (see Figure 5 in the ESR). The proposed road improvements include the extension of the Trans Canada trail along the east side of Huronia Road from Loon Avenue south to Lockhart Road. The option of providing dedicated bicycle lanes on Huronia Road was considered but was less desirable than the off road option.</p> <ul style="list-style-type: none"> The proposed extension of the Trans Canada trail from Loon to Lockhart is considered appropriate and in keeping with the City's Active Transportation initiative as it will provide opportunities for residents travelling to/from the commercial and residential lands to utilize the trail. In support of the City's Active Transportation initiative, the preferred design alternative includes provisions for a 3 meter multi use trail on the east side of Huronia Road from south of Mapleview Drive to Lockhart Road..
4	<p>From Alt. 3 Section: Against proposal. Will not protect residential neighbourhood from increased traffic.</p> <p>From Alt. 5 Section: Against plan will increase traffic in residential areas.</p>	<ul style="list-style-type: none"> The proposed preferred design alternative generally does not increase the number of through lanes in residential areas (with the exception of the area around Herrell Avenue). A center turning lane and turning lanes at the intersections will increase safety at the intersections and make it easier to access existing properties. Traffic volume will increase over time but will be limited by the capacity of the available through lanes. Huronia Road north of Big Bay Point Road is not a permissive truck route. These means that trucks cannot use Huronia Road between Big Bay Point Road and Yonge Street unless their destination is one of the properties along this stretch of road. Transportation improvements south of Herrell may increase traffic in residential roads north of Herrell Avenue but traffic volume in residential areas would be limited by the capacity of the available through lanes which isn't changing from the existing condition..
5	<p>From Alt. 3 Section: Parking reduction: a 3.5m blvd. width takes away too much driveway and parking space. If we were to park between the sidewalk & edge of asphalt we would not favour pedestrians travelling between our vehicles. A 2m blvd. keeps the pedestrian use at the end of our driveway and is preferred if we have to have a sidewalk.</p> <p>One sidewalk along the East side of Huronia as that is the side that has Herrell Ave., Webb St., and the townhouse residents just north of Little is preferred. One sidewalk means less maintenance for snow removal and would be accommodating for amount of pedestrian traffic along Huronia. The East side is also the most travelled for people heading to the retail businesses. If one sidewalk is utilized, the East side of Huronia is suggested.</p> <p>This Notice was delivered within a week and a half notice of the PIC. I could not attend and would appreciate more notice. Also more detail in the design alternative (ie. which side of the single sidewalk, which direction would the centreline shift be). For Huronia between Yonge and Herrell I believe that it is residential homes and 3 lanes except for turning for Herrell, Little and Webb is just allowing increased traffic and for traffic to speed around you as your trying to turn into your driveway. I understand you're trying to accommodate the increased traffic however for that section of road a two lane with extended shoulders for pull over traffic would be accommodating for slower traffic and residential home owners to be able to park along side of the road if needed.</p>	<ul style="list-style-type: none"> The preferred design alternative maintains the minimum required drive way length of 7 metres as per the City Zoning By-law to accommodate parking. Proposed transportation improvements will be generally contained within the existing 20 metre ROW between Little Avenue and Yonge Street (by reducing the boulevard width) so property and parking impacts will be minimized. Suggestion for location of sidewalk just on the east side of Huronia south of Little Avenue was considered during evaluation of alternatives. However, in order to improve pedestrian traffic safety on Huronia Road between Yonge Street and Herrell Avenue, the preferred design alternative includes sidewalks on both sides of Huronia Road. Sidewalks on the west side of Huronia South of Little Avenue would allow pedestrians to walks south to Big Bay Point Road without having to cross Huronia Road to use the sidewalk. Public Notices are typically provided 2 weeks in advance of a public meeting. Notwithstanding, opportunities to provide additional advance notice will be considered in the future. To improve traffic operations and minimize impacts to property from Yonge Street to Herrell Avenue, the preferred design alternative involves shifting the centreline of road to the west (with the exception of a short section at Yonge Street where a minor shift is proposed on the east side of the existing centreline) and reducing boulevard width has been identified as the preferred design alternative. The traffic analysis completed during the study has confirmed that 1 lane in each direction complete with a centre turn lane is required to accommodate future traffic conditions/volumes and improve road operations and safety. Excessive speeding is not anticipated to occur as a result of the proposed continuous center median turn lane. The provision of a center turn lane will improve the operation and capacity of Huronia Road and will improve safety for vehicles turning left into driveways. Huronia Road is classified as a high volume arterial road and as such, provisions for wide shoulders to accommodate on street parking is

ID #	Public Comments	Response to Comments
		not recommended due to traffic / pedestrian safety concerns associated with the type and volume of traffic they are designed to accommodate. Typically on street parking is provided on low volume local residential roads only. Driving on shoulders is not permitted, likewise driving in parking lane not permitted.
11	<p>From Alt. 3 Section: 1. The CC Tatham Plan and Profile Drawing PP-6 shows a continuous centre median along Huronia Rd. We represent a client who owns land on the west side of Huronia Rd. in this section and the median could impede or restrict two way industrial truck access to the site. We request that the median be removed.</p> <p>2. Design Alternative 5-1 notes that full municipal water, storm and sanitary will be installed along Huronia Rd. We note that no services (water or sanitary) exist currently along Huronia Rd. south of the residential street on the east side. We request that any alternative adopted include the provision for full service in this section.</p>	<ul style="list-style-type: none"> Provision of a landscape median island was revisited during the evaluation process. In order to avoid potential conflicts with entrances to lands which may be developed in the future and address concerns expressed by LSRCA, landscape median islands are no longer being proposed. Extension of municipal services to fill in gaps along Huronia Road will be completed in conjunction with the proposed road improvements.
14	<p>From Alt. 3R Section: Drainage problems of industrial lands in vicinity of Saunders Rd. - west of Huronia - need to be addressed. Specifically, my property - 343 Saunders - west property line - full length - Saunders to rear water course & front ditch (water course) on Saunders.</p>	<ul style="list-style-type: none"> Drainage improvements within industrial lands west of Huronia Road are outside the limits of this study. We note the subject drainage channel along the north, west and south side of 343 Saunders Road are un-named tributaries of Lovers Creek. As such, they are environmentally sensitive cold water fisheries resources. Any proposed alterations by the land owner will be subject to LSRCA's environmental protection policies and permitting requirements. Drainage improvements are proposed to convey 1:100 year storm across Huronia Road.
16	<p>We will be unable to attend the presentation at City Hall this afternoon because of the weather - Carole uses a scooter. We will fill out and return the comments form.</p> <p>We have concerns that the shaky integrity of the residential section of Huronia-and zoned as such- from Yonge to Big Bay Point is not addressed or protected by your proposal. We also have accessibility concerns if construction on Huronia Rd. took place. Since Carole uses a scooter crossing mounds of dirt and or ruts could not be tolerated.</p> <p>The new Ward 8 rep Ms. Robinson is aware of residents concerns regarding traffic and in fact published a letter addressing these concerns during her campaign.</p> <p>We will of course follow up with her once she is sworn in.</p>	<ul style="list-style-type: none"> During construction every reasonable effort will be made to provide suitable road/sidewalk surface for vehicular and pedestrian traffic. However, due to construction staging and traffic management constraints, it may be necessary for traffic/pedestrians to travel on a gravel surface temporarily until the final surface is constructed. As part of the proposed road improvements, sidewalks will be constructed on both sides of Huronia Road to accommodate safe pedestrian movements. At all intersections the sidewalk will be depressed to accommodate accessibility standards.
17	<p>From Alt. 5 Section: -Environmental concerns with swamp/low areas - (south of Loon Ave.) -Trees on east side of Huronia just north of Loon Avenue should remain as green space (Block lights from road for town houses). -Noise/disruptions from construction equipment</p>	<ul style="list-style-type: none"> Based on findings of the environmental impact study, wetland loss is not anticipated to be significant and will be limited to the edges. To mitigate property and tree/vegetation impacts on Huronia Road from Loon Avenue to Herrell Avenue, the preferred design alternative includes reduced boulevard width. Temporary noise impacts during construction to be mitigated through provisions in the construction contract in accordance with the City of Barrie noise by-laws which restrict working hours and requires equipment to be properly maintained and have appropriate noise attenuators.
18	<p>From Alt. 3 Section: -Would like to see sidewalks on east side. No one would lose property. -Would like to discuss grading on my property when time comes.</p> <p>From Alt. 5 Section: Does not matter.</p> <p>From Alt. 3R Section: Does not matter.</p>	<ul style="list-style-type: none"> City of Barrie arterial road standards include sidewalks on both sides of the road to provide safe movement of pedestrian traffic. To minimize impacts to property within the existing road allowance from Yonge Street to north of Herrell Avenue, the preferred design alternative includes shifting the centreline of road and reducing boulevard width has been identified as the preferred design alternative. No additional residential property is required on the west side of Huronia with the except close to Little Avenue. Grading design can be reviewed during future detail design phase upon request to the City.
19	<p>Our first choice for beginning projects would be Huronia and Mapleview. This is the highest priority.</p> <p>Another grave concern - left hand turn from Ardagh onto Essa. This is increasingly a bottleneck. The advance needs to be adjusted so more than 3 cars can get through.</p>	<ul style="list-style-type: none"> Comment noted. Construction phasing schedule to be determined during future detail design phase in conjunction with the city's annual budgeting process. The area around Mapleview Drive would be one of the higher priorities. Concern with regard to operation of Ardagh/Essa intersection has been forwarded to City of Barrie traffic section for review.

ID #	Public Comments	Response to Comments
20	<p>From Alt. 3 Section: Design 3-4 sidewalk on one side only - Potential danger for pedestrians particularly schoolchildren. Design 3-5 snow removal and costs.</p>	<ul style="list-style-type: none"> City of Barrie arterial road standards include sidewalks on both sides of the road to provide safe movement of pedestrian traffic. To minimize impacts to property within the existing road allowance from Yonge Street to north of Herrell Avenue, the preferred design alternative includes shifting the centreline of road and reducing boulevard width has been identified as the preferred design alternative. No additional residential property is required on the west side of Huronia with the except close to Little Avenue. Sidewalk maintenance requirements including snow removal will be budgeted for in accordance with current policies and annual budgeting process.
21	<p>From Alt. 3 Section: n/a</p> <p>From Alt. 5 Section: n/a</p> <p>I am not sure which section of the road this applies to however; my concern is for the segment that transects the Lovers Creek Wetland because it currently causes regular wildlife mortality. Mitigation that funnels small animals thru culverts should be explored in this section. In addition signage for drivers and reduced lighting in wildlife habitat should be incorporated at the detail design stage.</p> <p>From Alt. 3R Section: The greatest concern expressed by our staff is safety in parking lots adjacent to the road. These areas are unlit at night and street lights that cover these areas would be appreciated. Secondly, we often walk/bike along the gravel shoulder (and see other - sometimes with children). A path adjacent to the road would reduce this safety hazard.</p>	<ul style="list-style-type: none"> Due to the existing high traffic volumes on Huronia Road, it is expected that wildlife movement is currently significantly restricted. As such the proposed road improvements will not alter wildlife crossing movements. Opportunities to reduce wildlife mortalities by improving crossing movements will be provided through the instillation of larger span open bottom culverts. Additional signage will be considered at detail design. Parking lot lighting is a site plan development requirement. As per City of Barrie arterial road standards, street lighting will be considered during detail design. However, lighting encroachment outside of the municipal right-of-way on private lands is typically avoided. To improve traffic operations and pedestrian safety on Huronia Road between Maplevue Drive and Lockhart Road, the preferred design alternative includes provisions for a 3 meter multi use trail on the east side of the road. In the future when this section of Huronia is upgraded to a full 5 lane urban design standard (to address increased development and traffic pressures), sidewalks will be provided on the west side of Huronia Road.
22	<p>From Alt. 5 Section: -Preliminary designs show a landscape median along my property frontage. This is an individual parcel in industrial zoning so I request that the median be eliminated. -Please ensure sanitary and water services are included in the sketch of Huronia from Loon Ave. to Maplevue Dr.</p>	<ul style="list-style-type: none"> Provision of a landscape median island was revisited during the evaluation process. In order to avoid potential conflicts with entrances to lands which may be developed in the future and address concerns expressed by LSRCA, landscape median islands are no longer being proposed. Extension of municipal services to fill in gaps along Huronia Road will be completed in conjunction with the proposed road improvements.
23	<p>From Alt. 3 Section: I agree with the plan as designed. 3 lanes will be a good thing. Sidewalk both sides.</p> <p>From Alt. 5 Section: I live at 287 Huronia Rd. I have no issues with the current plan of 5 lanes down to 3, but I would like to see the road shifted further to the west to avoid losing any of my driveways as it is pretty short as it is. Sidewalk both sides please!!</p> <p>From Alt. 3R Section: I agree with the City's current plan.</p>	<ul style="list-style-type: none"> Comment noted. To improve traffic operations and mitigate impacts to property on Huronia Road between Herrell Avenue and Little Avenue, the preferred design alternative includes a centreline shift (to the west) and sidewalks on both sides of the road. Comment noted.
24	<p>From Alt. 3 Section: Sidewalk on east side of road only.</p>	<ul style="list-style-type: none"> City of Barrie arterial road standards include sidewalks on both sides of the road to provide safe movement of pedestrian traffic. To minimize impacts to property within the existing road allowance from Yonge Street to north of Herrell Avenue, the preferred design alternative includes shifting the centreline of road and reducing boulevard width has been identified as the preferred design alternative. No additional residential property is required on the west side of Huronia with the except close to Little Avenue.
25	<p>From Alt. 3 Section: Sidewalk on one side only. Sidewalk on west side. - Reason - would not cut all sidewalks in half on east side. West side has larger driveways.</p>	<ul style="list-style-type: none"> The preferred design alternative maintains the minimum required drive way length of 7 metres as per the City Zoning By-law to accommodate parking. Proposed transportation improvements will be generally contained within the existing 20 metre ROW between Little Avenue and Yonge Street (by reducing the boulevard width) so property and parking impacts will be minimized. <p>City of Barrie arterial road standards include sidewalks on both sides of the road to provide safe movement of pedestrian traffic. To minimize impacts to property within the existing road allowance from Yonge Street to north of Herrell Avenue, the preferred design alternative includes shifting the centreline of road and reducing boulevard width has been identified as the preferred design alternative. No additional residential property is required on the west side of Huronia with the except close to Little Avenue.</p>
26	<p>From Alt. 3 Section: There should be a provision for all off-road bicycling between Loon and Yonge; either a continuation of the planned path to go in south of Loon or at least a dedicated bicycle lane.</p>	<ul style="list-style-type: none"> Current Trans Canada trail provides bike route from Loon Avenue to Yonge Street through available green space, commercial and residential lands, east of Huronia Road (see Figure 5 of the ESR).

ID #	Public Comments	Response to Comments
	From Alt. 5 Section: See Alt. 3 Section	
27	From Alt. 3 Section: Would like sidewalk on east. The people down the road won't lose too much property. From Alt. 5 Section: Does not matter. From Alt. 3R Section: Does not matter.	<ul style="list-style-type: none"> City of Barrie arterial road standards include sidewalks on both sides of the road to provide safe movement of pedestrian traffic. To minimize impacts to property within the existing road allowance from Yonge Street to north of Herrell Avenue, the preferred design alternative includes shifting the centreline of road and reducing boulevard width has been identified as the preferred design alternative. No additional residential property is required on the west side of Huronia with the except close to Little Avenue.
28	From Alt. 3 Section: It should be three lanes all the way through. From Alt. 5 Section: It should be three lanes all the way through. From Alt. 3R Section: 3 lanes all the way.	<ul style="list-style-type: none"> The results of the traffic analysis confirmed that, based on future traffic projections, one lane in each direction plus a continuous centre turn lane is required from north of Herrell Avenue to Yonge Street, whereas two lanes in each direction plus a continuous centre turn lane is required from north of Herrell Avenue to Lockhart Road to alleviate capacity and congestion deficiencies.
29	From Alt. 3 Section: You have covered our concerns by the inclusion of two sidewalks, curbs and sewer etc. Thank you From Alt. 5 Section: No concerns. Thank you From Alt. 3R Section: We seldom travel south of Mapleview on Huronia. Therefore we are unable to comment or rate the proposed changes.	<ul style="list-style-type: none"> Comments noted
30	From Alt. 3 Section: My main concern is sidewalks on both sides. We have children attending Assikinack and Innisdale on Little Ave. and need a safe way to get there. When would this finally be happening? It seems like the process is still taking forever. We have already put our "two cents" in years ago. Just get it done already. From Alt. 5 Section: No comment. From Alt. 3R Section: No comment.	<ul style="list-style-type: none"> To improve traffic operations and pedestrian traffic safety on Huronia Road between Yonge Street and Little Avenue, the preferred design alternative includes sidewalks on both sides of Huronia Road. The 2011-2014 Business Plan includes funds to install lights and bells for the two railway crossings on Huronia Road (2012), the one railway crossing on Little Avenue (2012), and traffic signals at Loon Avenue (2011). Future Business Plans will consider the inclusion of the other transportation improvements identified in this staff report.
31	From Alt. 3 Section: This road needs much thought. Very busy road and dangerous to walk.	<ul style="list-style-type: none"> To improve traffic operations and pedestrian traffic safety on Huronia Road between Yonge Street and Herrell Avenue, the preferred design alternative includes sidewalks on both sides of Huronia Road.

ID #	Public Comments	Response to Comments
32	<p>From Alt. 3 Section: It is understood the sidewalk for economic reasons may only be constructed on the east side against existing properties.</p>	<ul style="list-style-type: none"> City of Barrie arterial road standards include sidewalks on both sides of the road to provide safe movement of pedestrian traffic. To minimize impacts to property within the existing road allowance from Yonge Street to north of Herrell Avenue, the preferred design alternatives includes shifting the centreline of road and reducing boulevard width has been identified as the preferred design alternative. No additional residential property is required on the west side of Huronia with the except close to Little Avenue.
33	<p>From Alt. 3 Section: There is no provision for a bike lane, both sides, similar to Veteran's Drive (Innisfil Side Road 5). Huronia Rd. (Side Road 10) is similar to Veteran's Drive with no steep grades. It is in a residential district, close to schools and parks.</p> <p>From Alt. 5 Section: There is no provision for a bike lane, both sides, similar to Veteran's Drive (Innisfil Side Road 5). Huronia Rd. (Side Road 10) is similar to Veteran's Drive with no steep grades. The Concession Roads are Barrie's arterial roads and provision should be made for safe bicycle riding.</p> <p>Lakeshore Rd. north of Tiffin and Lakeshore Rd. east of the Tiffin interchange provide safe separated bike lanes. The Tiffin - Lakeshore intersection has no safe separated spaces for cyclists. Why not? Do none of the staff ride bicycles?</p>	<ul style="list-style-type: none"> Current Trans Canada trail provides bike route from Loon Avenue to Yonge Street through available green space, commercial and residential lands, east of Huronia Road (see Figure 5 in the ESR). The proposed road improvements include the extension of the Trans Canada trail along the east side of Huronia Road from Loon Avenue south to Lockhart Road. The option of providing dedicated bicycle lanes on Huronia Road was considered but was less desirable than the off road option. Comment relating to Tiffin/Lakeshore intersection is outside the scope of the Huronia Road Class EA, however comment has been forwarded to the City of Barrie traffic department for their review.
43	<p>It was a pleasure to speak to you with regards to the Huronia road upgrades. As indicated on concern I have right now is the bottleneck created between Welham Road and Huronia Road. As per our conversation I understand that construction is planned for 2011 to take care of this. However, I am wondering if something can be modified with the lights at the Huronia Road intersection to allow workers from the plaza to get better access to Mapleview going West. Currently there are several exits in the plaza directly onto Mapleview but due to the bottleneck but this is extremely dangerous (might want to consider even temporarily changing this as there have been numerous accidents this year). The only other option is to exit onto Huronia road going North and take the intersection. However, due to the bottlenecking there are a lot of aggressive drivers going East that run red lights at the intersection and as such the left turning light(West onto Mapleview) is way too short and only allows for a couple of cars per light to get through. As a result most people actually go South on Huronia Road and take #10 West. Not very convenient.</p>	<ul style="list-style-type: none"> Comment with regard to operation of traffic signals at Mapleview/Huronia forwarded to City of Barrie traffic department. Improvements on Mapleview Drive East including the intersection with Huronia Road are currently being designed. These improvements which involve road widening to accommodate additional through and turn lanes will improve the capacity and operation of Mapleview Drive as well as traffic entering / exiting the adjacent commercial plaza. Construction will start this year.
45	<p>From Alt. 3 Section: Heavy transport. Drag strip traffic concerns</p>	<ul style="list-style-type: none"> Huronia Road north of Big Bay Point Road is not a permissive truck route. These means that trucks cannot use Huronia Road between Big Bay Point Road and Yonge Street unless their destination is one of the properties along this stretch of road. Barrie Police enforce posted speeds on City roads including Huronia Road.
47	<p>From Alt. 3 Section: City Council final decision.</p> <p>From Alt. 5 Section: The storm sewers under Huronia (south of R.R. to Mapleview) shall be of size and depth to receive the drainage of all lands west of Huronia. The storm sewer manholes, catch basins at points of ditches (watercourse) crossing Huronia north of Mapleview shall accommodate the flows from west. See also our letter to city and engineering dept of October 2, 2010.</p> <p>From Alt. 3R Section: Leave to final decision by city council.</p> <p>Letter: Enclosed please find a contour copy from Official City of Barrie files of our lands discussed within.</p> <p>You will note that the surface drainage from our lands are easterly towards Lovers Creek.</p>	<ul style="list-style-type: none"> Upstream water flows through the lands on the west side of Huronia Road opposite the subject property are tributaries of the Lovers Creek watershed. The culvert crossing on Huronia Road conveys flows from the tributary to the lands on the east side of Huronia. These lands have been classified as a PSW by MNR and as such are environmentally sensitive and protected. The preliminary cost estimate to divert the regional flows is approximately \$9.6 million if constructed as part of road reconstruction (costs do not include design, taxes or property acquisition). Given the costs and the potential negative environmental effects on the Lovers Creek tributary east of Huronia Road, the proposed creek diversion is not currently recommended. A meeting will be held with the LSRCA and the property owner to discuss this proposed diversion and potentially other options. Installation of an over sized storm sewer system redirecting the flows around the subject property (ie. on Huronia road and east on Mapleview) is problematic due to the impact to the stream flows, fish habitat and ecological function of the downstream wetland. Alterations to the watercourse to accommodate development of the subject property are subject to MNR, DFO and LSRCA approval and are outside the scope of the Huronia Road Class EA. As a result, provisions cannot be made at this time. Meeting will be held with City, LSRCA , CCTA and property owner to discuss stream diversion costs and development opportunities and constraints.

ID #	Public Comments	Response to Comments
	<p>The bulk of the surface drainage from the surrounding lands particularly the City of Barrie lands west of Huronia, originating in Lot 10, Concession 12 east of Welham Road and south of Big Bay Point Road (part of the approximately 4,000 acres that we owned that was eventually acquired by the City of Barrie from our bankers who held the mortgage on the lands) drains naturally in a south easterly direction and crosses our lands towards Lovers Creek.</p> <p>It is fully understood by me that when the drainage crosses Huronia Road, on reconstruction of Huronia Road, that adequate storm catch basins will be installed on Huronia Road at that point to stop the drainage originating on the City lands west of Huronia Road continuing to affect our lands.</p> <p>We have owned the lands since 1972 and in 2005 He tried to develop the lands for residential use but encountered opposition from the MOE.</p> <p>I feel that once the storm drainage is intercepted in the storm sewers to be installed on Huronia Road and Mapleview that it may be possible to eliminate the MOE objections and develop our lands residentially at that time.</p>	
48	<p>From Alt. 3 Section: Storm water management.</p>	<ul style="list-style-type: none"> ▪ Storm water management will be assessed at detail design.
58	<p>We live on Garden Drive which is the residential street that parallels Huronia Road on the other side of the train tracks and serves as an alternative route between Yonge and Little Avenue. The other route is Yonge street as the other option to link to Little Avenue, or further is Bayview Drive. We had received the notification regarding feedback for the proposed designs for the improvements of Huronia Road from Yonge to Lockhart Road. I know the date to provide feedback to you, Mr. Scheunemann, has been expired; however, I still need to provide you both feedback of concerns we have on Garden Drive. For background information, we are a family of 4 with two children aged 11 and 6, and many of our neighbours also have young children. We live on the side of Garden Drive that does not have a sidewalk so our children have to cross Garden Drive at our driveway to access the safe sidewalk across the street. Due to narrow space between driveways, cars are often park at both ends of our driveway therefore limiting safe visual assessment for oncoming cars for our children, let alone us adults.</p> <p>Already, Garden Drive is an autobahn road, so to speak, as some people do way more than 60 km/hr down this road as there are no speed bumps or stop signs along the street to slow down traffic. Our primary concern is for our children and the neighbourhood children. We live so close to Assikinack Public School so many families with young children live on this street. When this construction begins on Huronia Road, traffic will most certainly come zooming up Garden Drive to link from Yonge street to Little Avenue as they will not want to make the effort to go to Yonge Street or Bayview street further away. This is of HUGE concern as it is bad enough now with no methods to deter speeding drivers along this lengthy, uncontrolled street as it is (uncontrolled meaning no speed bumps or stop signs). This residential street will become the new Huronia Road for sure as drivers will not want to drive to Yonge or Bayview and deal with traffic let alone traffic lights!</p> <p>Our proposal for you both to consider or to support us on Garden Drive: temporary speed bumps all the way along this street, much like they had on Eccles Street during their construction, at both ends and in the middle of Garden Drive at Trillium Crescent. These speed bumps could then be removed upon completion of Huronia Road construction.</p> <p>For the long term after construction, as some of us believe too, it would be beneficial to have a permanent 3 way stop at the corner of Trillium Crescent and Garden Drive (by house #73 on Garden Drive). This marks a good half-way point along this route to further deter the speeding of traffic along the current Garden Drive.</p> <p>It would be valuable for someone to assess this concern and actually radar-detect drivers' speeds along this route. Huronia is a very busy street, and Garden Drive is at high risk for becoming the "new" Huronia with even higher risk of one of our children or ourselves to becoming killed or injured. Another point is luckily this winter, we don't have tall snow banks to see around but if we do in the future during the construction time of Huronia Road, this will also make the above points even more unsafe for our children and ability to exit our driveway.</p> <p>One final note to Mr. Scheunemann, at least one sidewalk along Huronia Road would be most welcome so we can walk safely along that street to access the shopping or the park further down the road.</p>	<ul style="list-style-type: none"> ▪ Concerns noted. ▪ Suggested traffic calming measures and traffic control modifications on Garden Drive have been forwarded to the City traffic department for consideration. ▪ The proposed transportation improvements on Little Avenue will increase road capacity (thereby keeping through traffic on Huronia instead of the adjacent local residential roads which were not designed to accommodate the additional traffic), and improve road operations and safety particularly at each intersection through the provision of dedicated left turn lanes. ▪ Mitigative measures to reduce temporary impacts on Garden Drive during the construction of Huronia Road will be assessed at detail design. ▪ The preferred design alternative for Huronia Road north of Loon Avenue calls for sidewalks on both sides.

5.5 Agency Comments

Comments from external agencies are provided in Table 6, along with the corresponding responses.

Table 6: Summary of Agency Comments & Responses

ID #	Agency Comments	Response to Comments
12	<p>Rama First Nation acknowledges receipt of your letter of November 5, 2010, which was received on November 8, 2010.</p> <p>At this time we have no concerns or comments. Please continue to provide further information to Rama First Nation in regards to this matter.</p> <p>We appreciate your taking the time to share this important information with us.</p>	<ul style="list-style-type: none"> ▪ Comments noted ▪ Future correspondence relating to the Class EA study including Notice of Study Completion will continue to be provided.
15	<p>Thank you for your e-mail with regard to the above Environmental Assessment (EA).</p> <p>Public Health Protection and Prevention Branch is interested in the public health aspects of this EA and wishes to be kept informed of any further developments. The local Board of Health has a more direct role in reviewing these matters and recommend that you advise them of this EA. For your convenience we have provided the contact information for the appropriate local Medical Officer of Health for the area in which the EA is located.</p>	<ul style="list-style-type: none"> ▪ Comment noted ▪ Will keep Ministry on contact list for future Notices
39	<p>I am writing in response to your letter of November 5th, 2010 inquiring about any claims that may affect the subject property. I regret that we were unable to respond earlier. Thank you for your invitation to the Public Information Centre, held on November 25, 2010. Unfortunately, we are unable to attend; however, the following information regarding active litigation may be useful to you as it could affect the lands that you are concerned with.</p> <p>We can inform you that our inventory includes active litigation in the vicinity of this property. They are Alderville Indian Band, Beausoleil Indian Band, Chippewas of Georgina Island Indian Band, Chippewas of Rama Indian Band, Curve Lake Indian Band, Hiawatha Indian Band, Mississaugas of Scugog Indian Band v. HTMQ and Ontario (Third Party), Federal Court of Canada, filed in Montreal, Court file reference # T-195-92; and</p> <p>Moose Deer Point First Nation, Chief Edward Williams suing on his own behalf and on behalf of the members of Moose Deer Point First Nation v. Her Majesty the Queen in Right of Ontario, Superior Court of Justice File #01-CV-220612CM.</p> <p>I am unable to comment with respect to the possible effect of these claims as the cases have not yet been adjudicated and any statement regarding the outcome of the litigation would be speculative at this point. It is recommended that you consult legal counsel as to the effect these actions could have on the lands you are concerned with.</p> <p>If you are interested in further details about these claims, copies of the pleadings can be obtained from the Court for a fee. Please contact the appropriate Court Registry Office and make reference to the court file numbers listed above.</p> <p>We cannot make any comments regarding claims filed under other departmental policies. For information on any claims you should also contact Don Boswell of the Specific Claims Branch at (819) 953-1940 to inquire about any Specific Claims. To inquire about any current Comprehensive Claims, please contact Nicole Cheechoo of Treaty and Aboriginal Government Central Operations at (819) 997-3499.</p> <p>If you have any further questions please do not hesitate to contact me at (819)994-1947.</p>	<ul style="list-style-type: none"> ▪ Comments noted and forwarded to City of Barrie legal department to investigate and advise if there are any land disputes within the project limits which may be impacted by the proposed improvements.

ID #	Agency Comments	Response to Comments
40	<p>Thank you for the opportunity to provide comment on the above matter. Over the past few years, the Simcoe Muskoka District Health Unit has been assisting municipalities throughout our region to plan for and build healthy communities. We have been doing this primarily by providing our 26 upper and lower tier municipalities with feedback on Official Plans and other strategic documents as they are being created or reviewed. Our feedback includes the provision of policy recommendations and implementation suggestions that incorporate the principles of healthy community design and land use planning.</p> <p>The physical environment is an important determinant of individual and community health. Evidence indicates there is a connection between how a community is designed and a person's ability to be physically active; to be safe from vehicle-related injury when walking, cycling or driving; to have access to safe, affordable and nutritious food; to feel a sense of connection to where they live; and their exposure to air and/or water pollution. Therefore, it is crucial that municipalities provide a built environment that supports people to be healthy. There are many ways a municipality can do this, including:</p> <ul style="list-style-type: none"> • Increase urban residential density; • Increase land use mix; • Protect agricultural land; • Increase road and pathway connectivity to promote walking and cycling; • Provide public transit; • Provide recreational facilities, meeting places and parks, including bike lanes and paths; • Enhance streetscape design to improve aesthetics and safety for pedestrians and cyclists; • Adopt bylaws for smoke-free outdoor spaces; • Provide shade shelters in parks and other open spaces; • Improve access to healthy foods through zoning and neighbourhood design to support grocery stores, farmers' markets and community gardens. <p>To assist municipalities in developing healthy design policy and implementing these types of interventions, the health unit has created <i>Healthy Community Design: Policy Statements for Official Plans</i>. This resource contains policy statements and implementation activities that can be incorporated into a municipality's Official Plan or other strategic documents. By adopting healthy design policies municipalities can protect and preserve their most valuable assets: people and the natural environment.</p> <p>We appreciate your request for our comments. However, since we are primarily engaged in commenting on Official Plans, we are not able to provide detailed reviews of specific site plans or assessments at this time. I do urge you to consider the policies and healthy design principles included in the resource mentioned above and apply them to any decisions you make regarding the matter before you.</p> <p>For further information on healthy community design, please contact <i>Your Health Connection</i> at 705-721-7520 or 1-877-721-7520 or visit the Healthy Places section of our website at www.simcoemuskokahealth.org.</p>	<ul style="list-style-type: none"> • Comments noted.
41	<p>The Simcoe Muskoka Catholic District School Board has received your correspondence dated November 5, 2010, regarding our comments on the preferred alternative design solution for the Municipal Class Environmental Assessment (EA) for Huronia Road, located in the City of Barrie. Our Board understands that the study area for the improvements to Huronia Road is between Yonge Street and Lockhart Road.</p> <p>Our Board regards Huronia Road as a key transportation link for our elementary and secondary schools in the City of Barrie and provides the preferred link between Barrie and Innisfil.</p> <p>As you will note on the attached comment sheet, the Board prefers the options 3-, 5-1 and 3R-1. As long as there are only partial closures during the construction of these roadways and traffic was allowed to travel along the roadway during the road enhancements with either no or minimal delays, it would not affect current special needs busing in that area. There are currently no special needs bus stop locations along the Huronia area that is under this class EA.</p> <p>We are interested in any transportation impacts that this study will entail, as this may affect our bus routes, walking areas, and access to our</p>	<ul style="list-style-type: none"> • The proposed improvements on Huronia Road involve road widening and reconstruction to urban arterial design standards including extension of municipal services, storm sewers, curb and gutter, sidewalks, street lighting and extension of the Trans Canada multi use trail from Loon Avenue south to Lockhart. <p>1. . The 2011-2014 Business Plan includes funds to install lights and bells for the two railway crossings on Huronia Road (2012), the one railway crossing on Little Avenue (2012), and traffic signals at Loon Avenue (2011). Future Business Plans will consider the inclusion of the other transportation improvements identified in this staff report.</p> <ul style="list-style-type: none"> • Further notice will be provided to assist in addressing and temporary disruption to bus routes and schedules. • During construction, the Contractor will be responsible for implementing an acceptable traffic control plan which will minimize disruption to traffic on Huronia Road. • City of Barrie will provide further construction timing and traffic control information to the School Board during detail design and prior to the start of construction.

ID #	Agency Comments	Response to Comments
	<p>schools. We would like to request the following information:</p> <ol style="list-style-type: none"> 1) Proposed changes and project timelines, as this relates to our bus scheduling; 2) Proposed traffic control measures; 3) Road closures during construction. <p>We want to confirm our continued interest, and involvement in the Municipal Class Environmental Assessment (EA) process. If you have any further questions or comments, you may contact the undersigned at 705-722-3559 ext. 250.</p>	
44	<p>I am responding to the email that you sent on November 18, 2010, to my former colleague Alejandro Cifuentes. I apologise for my late reply. As part of the Class Environmental Assessment process, the Ministry of Tourism and Culture (MTC) has an interest in the conservation of cultural heritage resources including:</p> <p style="padding-left: 40px;">Archaeological resources; Built heritage resources; and Cultural heritage landscapes.</p> <p>Based on your email, and having reviewed the EA reports for the above mentioned project available on the City's website, MTC has the following comments.</p> <p>Archaeology The Ministry received the Stage 1-2 Archaeological Assessment completed in 2005 by AMICK Consultants Ltd.. This report has been reviewed to ensure that the licensed archaeologist has met the terms and conditions of his or her licence, including ministry requirements for fieldwork and reporting. The report has been accepted into the Provincial Register, and therefore there are no outstanding concerns related to archaeology for this project.</p> <p>However, and as noted in the Environmental Study Report for Phase 1 & 2, if you encounter archaeological or cultural material during the course of your project work, you need to know that previously unknown or unassessed archaeological material are subject to section 48(1) of the Ontario Heritage Act. Please notify the Ministry of Tourism and Culture at 416-212-0644 or toll free at 1-866-454-0049. All activities impacting the archaeological material must cease immediately and a licensed archaeologist is to carry out archaeological fieldwork, in compliance with sec. 48(1) of the OHA.</p> <p>In the event that human remains are encountered during project work, you must immediately notify the police, the coroner's office and the Registrar of Cemeteries. The Cemeteries Regulation Unit of the Ministry of Consumer Services may be contacted at toll free 1-800-889-9768. In situations where the remains are associated with archaeological resources, the Ministry of Tourism and Culture should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.</p> <p>Built Heritage and Cultural Heritage Landscapes: Section 4.4.2 <u>Built Heritage</u> of the Phase 1 & 2 Final ESR stated that: "The City of Barrie Heritage Sites Inventory identifies buildings of architectural or historical merit. There are no heritage buildings along Huronia Road within this inventory." As a result, the evaluation of design alternatives in all Phases indicates that the proposed alternatives would not have an impact on built heritage resources. It should be noted that identification of built heritage resources and cultural heritage landscapes should not be limited to those resources which are included on a Municipal Heritage Register as a result of either listing or designation under the Ontario Heritage Act. The study area should be screened for <u>all known and potential</u> cultural heritage resources.</p> <p>I have attached our Ministry's standard checklist for identifying potential heritage resources within the study area. When completing this checklist, you should contact the municipal heritage committee or any relevant community heritage organizations. MTC understands that City Council adopted a motion on September 28, 2009 regarding selection of the preferred alternative; however the EA study is not yet complete. Therefore MTC suggests that the checklist be completed in order to confirm whether or not there are any potential built heritage or cultural heritage resources that may be impacted by the project. If resources are identified, they should be considered as part of the evaluation of <i>design alternatives</i>.</p>	<ul style="list-style-type: none"> ▪ Comments noted ▪ Checklist to identify any potential heritage sites to be completed in consultation with the City of Barrie planning department.

ID #	Agency Comments	Response to Comments
46	<p>Thank you for circulating Ontario Realty Corporation (ORC) on your Notice of PIC. The ORC is the strategic manager of the government's real property with a mandate of maintaining and optimizing value of the portfolio, while ensuring real estate decisions reflect public policy objectives of the government.</p> <p>Our preliminary review of your notice and supporting information indicates that ORC-managed property is not within your study area. We have no other concerns with this undertaking. Please remove ORC from your circulation list with respect to this project.</p>	<ul style="list-style-type: none"> ▪ Comments noted ▪ ORC to be removed from Class EA contact mailing list.
53	<p>I am writing in response to your letter of November 5, 2010 inquiring about claims in the above noted area.</p> <p>In determining your duty to consult, you may wish to contact the First Nations in the vicinity of your area of interest to advise them of your intentions. To do this you may:</p> <p>find the Reserves in your area of interest by consulting a map of the region such as the Province of Ontario Ministry of Aboriginal Affairs online map at http://www.aboriginalaffairs.gov.on.ca/english/services/firstnations.asp; then search for the First Nations located on those Reserves by using the INAC Search by Reserve site at http://pse5-esd5.aincinac.gc.ca/fnp/Main/Search/SearchRV.aspx?lang=eng.</p> <p>To determine the First Nations in your area of interest who have submitted claims please consult the Reporting Centre on Specific Claims at http://pse4-esd4.aincinac.gc.ca/SCBRI/Main/ReportingCentre/External/External Reporting .aspx?lang=eng.</p> <p>It should be noted that the reports available on the INAC website are updated regularly and therefore, you may want to check this site often for updates. In accordance with legislative requirements, confidential information has not been disclosed.</p> <p>Please rest assured that it is the policy of the Government of Canada as expressed in The Specific Claims Policy and Process Guide that:</p> <p>"in any settlement of specific native claims the government will take third party interests into account. As a general rule, the government will not accept any settlement which will lead to third parties being dispossessed."</p> <p>We can only speak directly to claims filed under the Specific Claims Policy in the Province of Ontario. We cannot make any comments regarding potential or future claims, or claims filed under other departmental policies. This includes claims under Canada's Comprehensive Claims Policy or legal action by a First Nation against the Crown. You may wish to contact the Assessment and Historical Research Directorate at (819) 994-6453, the Consultation and Accommodation Unit at (613) 944-9313 and Litigation Management and Resolution Branch at (819) 934-2185 directly for more information.</p> <p>You may also wish to visit http://www.ainc-inac.gc.ca/lai/mr/is/acp/acp-eng.asp on the INAC website for information regarding the Federal Action Plan on Aboriginal Consultation and Accommodation.</p> <p>To the best of our knowledge, the information we have provided you is current and up-to-date. However, this information may not be exhaustive with regard to your needs and you may wish to consider seeking information from other government and private sources (including Aboriginal groups). In addition, please note that Canada does not act as a representative for any Aboriginal group for the purpose of any claim or the purpose of consultation.</p>	<ul style="list-style-type: none"> ▪ Comments noted and forwarded to City of Barrie legal department to investigate and advise if there are any land disputes within the project limits which may be impacted by the proposed improvements.
54	<p>Draft ESR was reviewed within the context of water quality and quantity of Lovers Creek and Whiskey Creek, floodplain and erosion management, fisheries management and the implementation of the Federal fisheries Act, natural heritage management and wetland protection and the implementation of Ontario Regulation 179/06.</p> <p>Based on the implementation of this EA, it appears fish habitat may be adversely affected as a result of the transportation improvements. Consideration should be given to reducing the length of culvert crossings by employing spanned walkways, removing landscape medians in crossing areas, replacing closed bottom culverts with open bottom structures, confirming the quality and quantity of fish habitat at each crossing and maintaining the tributary west of Huronia by Herrell as an open watercourse.</p>	<ul style="list-style-type: none"> ▪ Fish habitat quality and quantity was confirmed at each culvert crossing ▪ Measures to mitigate fisheries impacts include in water work timing restrictions, sediment and erosion control measures, use of open bottom culvert designs, site restoration provisions and construction operation constraints. ▪ The landscape median island originally proposed on Huronia Road south of Loon Avenue is no longer being considered due to potential access conflicts to adjacent lands which may be developed in the future. ▪ Reducing the length of culvert extensions and/or new culvert crossings by utilizing spanned walkways problematic due to grading and property constraints. ▪ No tributary and no fish habitat in the vicinity of Herrell on the west side of Huronia Road.

ID #	Agency Comments	Response to Comments
	<p>A site meeting to further discuss the proposed relocation of a Lovers Creek tributary from the west side of Huronia to the east side near Saunders should be arranged.</p> <p>From a natural heritage perspective, the ESR should identify comprehensive mitigation during construction, appropriate compensatory measures for feature loss, suitable means to reduce wildlife mortalities by instituting eco-passages and proper methods to maintain amphibian breeding habitat. A site meeting to discuss these comments further should be arranged.</p> <p>Permit approval from the conservation authority will be required prior to implementation within areas regulated by Ontario Regulation 179/06.</p>	<ul style="list-style-type: none"> ▪ Relocation of the Lovers Creek tributary located adjacent to the west side of Huronia Road, south of Saunders Road provides an excellent opportunity to significantly improve the quality of fish habitat by eliminating the detrimental impacts associated with the existing watercourse being exposed to road runoff, sedimentation and winter road salt treatment. Fish habitat improvement. Furthermore, by providing direct fish habitat and increased access/productivity that currently does not exist, the new channel will mitigate any potential negative impacts to fish habitat due to the proposed road widening and culvert extensions. ▪ Recommendations with regard to mitigating natural heritage impacts during construction including timing restrictions, sediment and erosion control measures, culvert design, site restoration and maintenance operations. ▪ The proposed road improvements may require a Federal Authorization for Works or Undertakings Affecting Fish Habitat through LSRCA. In support of such an application, a fish habitat compensation plan may be required. Compensation requirements and opportunities will be determined in consultation with LSRCA during the final design and permit approval stage. ▪ Due to the existing high traffic volumes on Huronia Road, it is expected that wildlife movement is currently significantly restricted. As such the proposed road improvements will not alter wildlife crossing movements. Opportunities to reduce wildlife mortalities by improving crossing movements will be provided through the installation of larger span open bottom culverts. <p>ESR will include following note:</p> <p><i>"Prior to any site alteration and development, permit approval from the LSRCA shall be obtained in accordance with the following:</i></p> <ul style="list-style-type: none"> ▪ Ontario Regulation 179/06 under the Conservation Authorities Act ▪ Level III Fish Habitat Agreement (LSRCA-DFO) under the Fisheries Act ▪ Lake Simcoe Protection Plan under the Lake Simcoe Protection Act "

5.6 Summary of Major Comments

A summary of the major public and review agency comments and concerns is provided in Table 7.

Table 7: Summary of Major Public & Review Agency Comments & Concerns

Comments	Response
Protection of existing mature trees within the road allowance.	<ul style="list-style-type: none"> Some trees within the existing and/or expanded rights-of-way may need to be removed to accommodate road improvements. However, every reasonable effort will be made to identify and protect trees and their root systems during construction through provisions in the contract. In developed areas the boulevard width was adjusted to minimize impact to property.
Pedestrian safety and need for sidewalks on one and/or both side(s) of the road	<ul style="list-style-type: none"> Comment noted Will keep Ministry on contact list for future Notices
Request for bicycle lanes	<ul style="list-style-type: none"> Providing dedicated bicycle lanes on Huronia Road was considered but deemed problematic due to potential safety concerns associated with the volume of vehicular and truck traffic on Huronia Road. As a result and given the available existing TransCanada Trail system, provisions for on street bike lanes are not recommended. In support of the City's Active Transportation initiative, a combination of design alternatives 5-6 and 5-8 which include provisions for a 3 metre multi-use trail on the east side of Huronia Road from Loon Avenue to south of Mapleview Drive East has been identified as the preferred design alternatives.
Increased traffic volumes and speeding due to proposed road improvements	<ul style="list-style-type: none"> NO additional through lanes are proposed in residential areas. Centre turn lane will improve access to adjacent property.
Impact to driveway parking space	<ul style="list-style-type: none"> Boulevard width was reduced in residential areas to minimize impact to adjacent properties. Transportation improvements will maintain the minimum required driveway length of 7 metres as per the City Zoning By-Law.
Impact of proposed landscape median island to access future development lands.	<ul style="list-style-type: none"> Landscape median has been removed.
Heavy truck traffic on Huronia Road north of Big Bay Point Road	<ul style="list-style-type: none"> City of Barrie's permissive truck route on Huronia Road does not extend north of Big Bay Point Road. Speeding and use of heavy trucks on Huronia Road north of Big Bay Point Road is an enforcement issue.
Traffic congestion at Mapleview Drive intersection	<ul style="list-style-type: none"> Improvements on Mapleview Drive East including the intersection with Huronia Road are currently being designed. These improvements which involve road widening to accommodate additional through and turn lanes will improve the capacity and operation of Mapleview Drive East as well as traffic entering/exiting the adjacent commercial plaza.
Impact to watercourses	<ul style="list-style-type: none"> The proposed road improvements may require a Federal Authorization for Works or Undertakings Affecting Fish Habitat through LSRCA. In support of such an application, a fish habitat compensation plan may be required. Compensation requirements and opportunities will be determined in consultation with LSRCA during the final design and permit approval stage.
Accessibility concerns during construction	<ul style="list-style-type: none"> Proposed upgrades to Huronia Road, which will involve a combination of the design alternatives considered, will include full road reconstruction and new asphalt surface. Every reasonable effort will be made during construction to provide suitable road surface for vehicular and pedestrian traffic. However, due to construction staging and traffic management constraints, it may be necessary for traffic to travel on a gravel surface temporarily until base asphalt can be placed.

Comments	Response
Wildlife impact	<ul style="list-style-type: none"> Due to the existing high traffic volumes on Huronia Road, it is expected that wildlife movement is currently significantly restricted. As such the proposed road improvements will not alter wildlife crossing movements. Opportunities to reduce wildlife mortalities by improving crossing movements will be provided through the installation of larger span open bottom culverts.
Protection of wetlands	<ul style="list-style-type: none"> Based on findings of the environmental impact study, wetland loss is not anticipated to be significant and will be limited to the edges. To mitigate property and tree/vegetation impacts on Huronia Road from Loon Avenue to Herrell Avenue, design alternative 5-5 which involves a reduced boulevard width has been identified as the preferred design alternative.
Diversion of a tributary to Lovers Creek on Huronia Road from approximately 560 metres north of Maplevue Drive East southerly to Maplevue Drive East, then easterly outfalling at the main channel to Lovers creek to reduce drainage issues associated with development west of Lovers Creek, north of Maplevue Drive East and east of Huronia Road (Part of the South ½ Lot 11, Concession 12)	<ul style="list-style-type: none"> The preliminary cost estimate to divert the regional flows is approximately \$9.6 million if constructed as part of the road reconstruction (costs do not include design, taxes or property acquisition). Given the costs and the potential negative environmental effects on the Lovers Creek tributary east of Huronia Road, the proposed creek diversion is not currently recommended. A meeting will be held with the LSRCA and the property owner to discuss this proposed diversion and potentially other options.

6 Assessment of Design Alternatives

It is recognized that some of the evaluation criteria are more important than others in the overall assessment. For example, the ability of the alternative to ensure appropriate traffic operations is considered more important than the resulting construction costs. In this regard, further to the identification of effects and impacts, each alternative has been ranked based on a weighted scoring system. Weights have been assigned to the evaluation criteria to reflect their relative importance (a weight of 3 indicates greatest importance whereas a weight of 1 indicates least importance) and scores have been established for each criteria under each alternative to reflect the associated degree of impact (score of -2 denotes a negative impact, 0 denotes no impact and +2 denotes a positive impact).

The resulting weighted scoring system and ranking is presented in Tables 8 through 16 for the respective road sections.

6.1 Selection of Preferred Design Concept

The various design alternatives have been evaluated and scored based on the physical, natural, social, cultural heritage and economic environmental impacts, available mitigation measures and comments received from the public and external agencies. The results of the evaluation process suggest a combination of several design alternatives provides the best overall solution. In this manner, impacts to private property can be mitigated by incorporating design features from various alternatives. Such design features include shifting the centreline line and reducing boulevards widths in strategic locations. For those sections of Huronia Road where the appropriate right-of-way exists and/or where additional property can be readily obtained without significantly impacting existing residential or commercial developments, implementation of the City of Barrie standard design cross-section is preferred.

The recommended preferred designs alternatives for Huronia Road are summarized below (see also Figure 9).

6.1.1 Huronia Road - Yonge Street to North of Herrell Avenue (3 Lanes)

Yonge Street to Little Avenue

Design Alternative 3-7 which involves a minor centre line shift and reduced boulevard width is recommended from Yonge Street to Little Avenue to mitigate property impacts. The existing right-of-way, which varies from 20.0 metres to 23.0 metres, will be sufficient to accommodate one 3.5 metre through lane in each direction and a 4.0 metre wide continuous two way centre turn lane and 1.5 metre

Table 8: Weighted Scoring Assessment - Yonge Street to Little Avenue

Evaluation Criteria		Design Alternative 3-1 City of Barrie Standard 23 m Road Allowance		Design Alternative 3-2 3.5 m Centre Lane 22.5 m Road Allowance		Design Alternative 3-3 3.3 m Lanes 22.6 m Road Allowance		Design Alternative 3-4 Sidewalk on One Side Only 20.5 m Road Allowance		Design Alternative 3-5 Reduced Boulevard Width 20 m Road Allowance		Design Alternative 3-6 Proposed Centreline Shift 23 m Road Allowance		Design Alternative 3-7 Proposed Centreline Shift & Reduced Boulevard Width 23 m Road Allowance		
Environment & Criteria	Weight	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	
Physical Environment	road operations & railway crossings	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6
	transit operations	3	2	6	1	3	-1	-3	-1	-3	2	6	2	6	2	6
	pedestrian operations	2	2	4	2	4	2	4	-2	-4	1	2	2	4	2	4
	pavement condition	3	2	6	2	6	2	6	2	6	2	6	2	6	2	6
	road safety	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6
	utilities & services	2	2	4	2	4	2	4	2	4	-1	-2	2	4	0	0
	Sub-total			32		23		17		15		24		32		28
Natural Environment	fisheries/ aquatic impacts	1	-2	-2	-1	-1	-1	-1	0	0	0	0	0	0	0	0
	wildlife/ terrestrial impacts	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	vegetation impacts	1	-2	-2	-1	-1	-1	-1	0	0	0	0	0	0	0	0
	Wet land impacts	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total			-4		-2		-2		0		0		0		0
Social Environment	property/ development impacts	3	-2	-6	-2	-6	-2	-6	0	0	0	0	-1	-3	1	3
	aesthetics	2	2	4	2	4	2	4	2	4	2	4	2	4	2	4
	noise impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	driver comfort	2	2	4	-1	-2	-2	-4	2	4	2	4	2	4	2	4
	construction impacts	1	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Sub-total			2		-6		-8		6		6		3		9	
Cultural Heritage Environment	archaeological & heritage impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	First Nations impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total			0		0		0		0		0		0		0
Economic Environment	maintenance & construction costs	1	-2	-2	-2	-2	-2	-2	1	1	0	0	-2	-2	-2	-2
	land acquisition costs	2	-2	-4	-1	-2	-1	-2	0	0	0	0	0	0	0	0
	Sub-total			-6		-4		-4		1		0		-2		-2
TOTAL SCORE				24		11		3		22		30		33		35

WEIGHT		
1	2	3

Weight reflects the relative importance of each assessment criteria to the other (a value of 1 denotes less importance, whereas 3 denotes greater importance)

SCORE				
-2	-1	0	1	2

Score reflects the effect of the alternative (a value of +2 denotes a positive effect, 0 denotes no effect, whereas -2 denotes a negative effect).

Table 9: Weighted Scoring Assessment - Little Avenue to north of Herrell Avenue

Evaluation Criteria		Design Alternative 3-1 City of Barrie Standard 23 m Road Allowance		Design Alternative 3-2 3.5 m Centre Lane 22.5 m Road Allowance		Design Alternative 3-3 3.3 m Lanes 22.6 m Road Allowance		Design Alternative 3-4 Sidewalk on One Side Only 20.5 m Road Allowance		Design Alternative 3-5 Reduced Boulevard Width 20 m Road Allowance		Design Alternative 3-6 Proposed Centreline Shift 23 m Road Allowance		Design Alternative 3-7 Proposed Centreline Shift & Reduced Boulevard Width 23 m Road Allowance		
Environment & Criteria	Weight	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	
Physical Environment	road operations & railway crossings	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6
	transit operations	3	2	6	1	3	-1	-3	-1	-3	2	6	2	6	2	6
	pedestrian operations	2	2	4	2	4	2	4	-2	-4	1	2	2	4	2	4
	pavement condition	3	2	6	2	6	2	6	2	6	2	6	2	6	2	6
	road safety	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6
	utilities & services	2	2	4	2	4	2	4	2	4	-1	-2	2	4	-1	-2
	Sub-total			32		23		17		15		24		32		26
Natural Environment	fisheries/ aquatic impacts	1	-2	-2	-1	-1	-1	-1	0	0	0	0	0	0	0	0
	wildlife/ terrestrial impacts	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	vegetation impacts	1	-2	-2	-1	-1	-1	-1	0	0	0	0	0	0	0	0
	Wet land impacts	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total			-4		-2		-2		0		0		0		0
Social Environment	property/ development impacts	3	-2	-6	-2	-6	-2	-6	0	0	0	0	-1	-3	0	0
	aesthetics	2	2	4	2	4	2	4	2	4	2	4	2	4	2	4
	noise impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	driver comfort	2	2	4	-1	-2	-2	-4	2	4	2	4	2	4	2	4
	construction impacts	1	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
	Sub-total			2		-6		-8		6		6		3		6
Cultural Heritage Environment	archaeological & heritage impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	First Nations impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total			0		0		0		0		0		0		0
Economic Environment	maintenance & construction costs	1	-2	-2	-2	-2	-2	-2	1	1	0	0	-2	-2	-2	-2
	land acquisition costs	2	-2	-4	-1	-2	-1	-2	0	0	0	0	0	0	0	0
	Sub-total			-6		-4		-4		1		0		-2		-2
TOTAL SCORE				24		11		3		22		30		33		30

WEIGHT		
1	2	3

Weight reflects the relative importance of each assessment criteria to the other (a value of 1 denotes less importance, whereas 3 denotes greater importance)

SCORE				
-2	-1	0	1	2

Score reflects the effect of the alternative (a value of +2 denotes a positive effect, 0 denotes no effect, whereas -2 denotes a negative effect).

Table 10: Weighted Scoring Assessment - north of Herrell Avenue to south of Herrell Avenue

Evaluation Criteria		Design Alternative 5-1 City of Barrie Standard 30 m Road Allowance		Design Alternative 5-2 3.5 m Centre Lane 29.5 m Road Allowance		Design Alternative 5-3 3.3 m Lanes 29.2 m Road Allowance		Design Alternative 5-4 Sidewalk on One Side Only 27.5 m Road Allowance		Design Alternative 5-5 Reduced Boulevard Width 27 m Road Allowance		Design Alternative 5-6 Proposed Multi-Use Trail 32.5 m Road Allowance		Design Alternative 5-7 Proposed Centreline Shift 30.0 m Road Allowance		Design Alternative 5-8 Proposed Centreline Shift & Reduced Boulevard 31.5 m Road Allowance		
Environment & Criteria	Weight	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	
Physical Environment	road operations & railway crossings	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6	2	6
	transit operations	3	2	6	1	3	-1	-3	-1	-3	2	6	2	6	2	6	2	6
	pedestrian operations	2	2	4	2	4	2	4	-2	-4	1	2	2	4	2	4	2	4
	pavement condition	3	2	6	2	6	2	6	2	6	2	6	2	6	2	6	2	6
	road safety	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6	2	6
	utilities & services	2	2	4	2	4	2	4	2	4	-1	-2	2	4	2	4	2	4
Sub-total			32		23		17		15		24		32		32		32	
Natural Environment	fisheries/ aquatic impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2	-1	-1	-1	-1
	wildlife/ terrestrial impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2	-1	-1	-1	-1
	vegetation impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2	-1	-1	-1	-1
	Wet land impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2	-1	-1	-1	-1
Sub-total			-8		-4		-4		-4		-4		-8		-4		-4	
Social Environment	property/ development impacts	3	-2	-6	-2	-6	-2	-6	-1	-3	-1	-3	-2	-6	2	6	1	3
	aesthetics	2	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
	noise impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	driver comfort	2	2	4	-1	-2	-2	-4	2	4	2	4	2	4	2	4	2	4
	construction impacts	1	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-2	-2	-1	-1	-1	-1
Sub-total			2		-6		-8		4		4		0		13		10	
Cultural Heritage Environment	archaeological & heritage impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	First Nations impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total			0		0		0		0		0		0		0		0	
Economic Environment	maintenance & construction costs	1	-2	-2	-2	-2	-2	-2	-2	1	1	-1	-1	-2	-2	-2	-2	-2
	land acquisition costs	2	-2	-4	-2	-4	-2	-4	-1	-2	-1	-2	-2	-4	-1	-2	-1	-2
Sub-total			-6		-6		-6		-1		-3		-6		-4		-4	
TOTAL SCORE				20		7		-1		14		21		18		37		34

WEIGHT		
1	2	3

SCORE				
-2	-1	0	1	2

Weight reflects the relative importance of each assessment criteria to the other (a value of 1 denotes less importance, whereas 3 denotes greater importance)

Score reflects the effect of the alternative (a value of +2 denotes a positive effect, 0 denotes no effect, whereas -2 denotes a negative effect).

Table 11: Weighted Scoring Assessment - south of Herrell Avenue to Loon Avenue

Evaluation Criteria		Design Alternative 5-1 City of Barrie Standard 30 m Road Allowance		Design Alternative 5-2 3.5 m Centre Lane 29.5 m Road Allowance		Design Alternative 5-3 3.3 m Lanes 29.2 m Road Allowance		Design Alternative 5-4 Sidewalk on One Side Only 27.5 m Road Allowance		Design Alternative 5-5 Reduced Boulevard Width 27 m Road Allowance		Design Alternative 5-6 Proposed Multi-Use Trail 32.5 m Road Allowance		Design Alternative 5-7 Proposed Centreline Shift 30.0 m Road Allowance		Design Alternative 5-8 Proposed Centreline Shift & Reduced Boulevard 31.5 m Road Allowance		
Environment & Criteria	Weight	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	
Physical Environment	road operations & railway crossings	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6	2	6
	transit operations	3	2	6	1	3	-1	-3	-1	-3	2	6	2	6	2	6	2	6
	pedestrian operations	2	2	4	2	4	2	4	-2	-4	1	2	2	4	2	4	2	4
	pavement condition	3	2	6	2	6	2	6	2	6	2	6	2	6	2	6	2	6
	road safety	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6	2	6
	utilities & services	2	2	4	2	4	2	4	2	4	0	0	2	4	2	4	2	4
Sub-total			32		23		17		15		26		32		32		32	
Natural Environment	fisheries/ aquatic impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	0	0	-2	-2	-1	-1	-1	-1
	wildlife/ terrestrial impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	0	0	-2	-2	-1	-1	-1	-1
	vegetation impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	0	0	-2	-2	-1	-1	-1	-1
	Wet land impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	0	0	-2	-2	-1	-1	-1	-1
Sub-total			-8		-4		-4		-4		0		-8		-4		-4	
Social Environment	property/ development impacts	3	-2	-6	-2	-6	-2	-6	-1	-3	2	6	-2	-6	2	6	1	3
	aesthetics	2	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
	noise impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	driver comfort	2	2	4	-1	-2	-2	-4	2	4	2	4	2	4	2	4	2	4
	construction impacts	1	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-2	-2	-1	-1	-1	-1
Sub-total			2		-6		-8		4		13		0		13		10	
Cultural Heritage Environment	archaeological & heritage impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	First Nations impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total			0		0		0		0		0		0		0		0	
Economic Environment	maintenance & construction costs	1	-2	-2	-2	-2	-2	-2	-2	1	1	-1	-1	-2	-2	-2	-2	-2
	land acquisition costs	2	-2	-4	-2	-4	-2	-4	-1	-2	-1	-2	-2	-4	-2	-4	-1	-2
Sub-total			-6		-6		-6		-1		-3		-6		-6		-4	
TOTAL SCORE				20		7		-1		14		36		18		35		34

WEIGHT		
1	2	3

SCORE				
-2	-1	0	1	2

Weight reflects the relative importance of each assessment criteria to the other (a value of 1 denotes less importance, whereas 3 denotes greater importance)

Score reflects the effect of the alternative (a value of +2 denotes a positive effect, 0 denotes no effect, whereas -2 denotes a negative effect).

Table 12: Weighted Scoring Assessment - Loon Avenue to north of Mapleview Drive

Evaluation Criteria		Design Alternative 5-1 City of Barrie Standard 30 m Road Allowance		Design Alternative 5-2 3.5 m Centre Lane 29.5 m Road Allowance		Design Alternative 5-3 3.3 m Lanes 29.2 m Road Allowance		Design Alternative 5-4 Sidewalk on One Side Only 27.5 m Road Allowance		Design Alternative 5-5 Reduced Boulevard Width 27 m Road Allowance		Design Alternative 5-6 Proposed Multi-Use Trail 31.5 m Road Allowance		Design Alternative 5-7 Proposed Centreline Shift 30.0 m Road Allowance		Design Alternative 5-8 Proposed Centreline Shift & Reduced Boulevard 31.5 m Road Allowance		
Environment & Criteria	Weight	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	
Physical Environment	road operations & railway crossings	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6	2	6
	transit operations	3	2	6	1	3	-1	-3	-1	-3	2	6	2	6	2	6	2	6
	pedestrian operations	2	2	4	2	4	2	4	-2	-4	1	2	2	4	1	2	1	2
	pavement condition	3	2	6	2	6	2	6	2	6	2	6	2	6	2	6	2	6
	road safety	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6	2	6
	utilities & services	2	2	4	2	4	2	4	2	4	-2	-4	2	4	2	4	2	4
Sub-total			32		23		17		15		22		32		30		30	
Natural Environment	fisheries/ aquatic impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	wildlife/ terrestrial impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	vegetation impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Wet land impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Sub-total			-8		-4		-4		-4		-4		-4		-4		-4	
Social Environment	property/ development impacts	3	-2	-6	-2	-6	-2	-6	-1	-3	2	6	0	0	-2	-6	-2	-6
	aesthetics	2	2	4	2	4	2	4	2	4	1	2	2	4	2	4	2	4
	noise impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	driver comfort	2	2	4	-1	-2	-2	-4	2	4	2	4	2	4	2	4	2	4
	construction impacts	1	-2	-2	-2	-2	-2	-2	-1	-1	-2	-2	-1	-1	-1	-1	-1	-1
Sub-total			2		-6		-8		4		10		7		1		1	
Cultural Heritage Environment	archaeological & heritage impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	First Nations impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total			0		0		0		0		0		0		0		0	
Economic Environment	maintenance & construction costs	1	-2	-2	-2	-2	-2	-2	-2	1	1	-2	-2	-2	-2	-2	-2	-2
	land acquisition costs	2	-2	-4	-2	-4	-2	-4	-1	-2	-1	-2	-1	-2	-2	-4	-1	-2
Sub-total			-6		-6		-6		-1		-4		-4		-6		-4	
TOTAL SCORE				20		7		-1		14		26		27		21		20

WEIGHT		
1	2	3

SCORE				
-2	-1	0	1	2

Weight reflects the relative importance of each assessment criteria to the other (a value of 1 denotes less importance, whereas 3 denotes greater importance)

Score reflects the effect of the alternative (a value of +2 denotes a positive effect, 0 denotes no effect, whereas -2 denotes a negative effect).

Table 13: Weighted Scoring Assessment - north of Mapleview Drive to south of Saunders Road

Evaluation Criteria		Design Alternative 5-1 City of Barrie Standard 30 m Road Allowance		Design Alternative 5-2 3.5 m Centre Lane 29.5 m Road Allowance		Design Alternative 5-3 3.3 m Lanes 29.2 m Road Allowance		Design Alternative 5-4 Sidewalk on One Side Only 27.5 m Road Allowance		Design Alternative 5-5 Reduced Boulevard Width 27 m Road Allowance		Design Alternative 5-6 Proposed Multi-Use Trail 32.5 m Road Allowance		Design Alternative 5-7 Proposed Centreline Shift 30.0 m Road Allowance		Design Alternative 5-8 Proposed Centreline Shift & Reduced Boulevard 31.5 m Road Allowance		
Environment & Criteria	Weight	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	
Physical Environment	road operations & railway crossings	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6	2	6
	transit operations	3	2	6	1	3	-1	-3	-1	-3	2	6	2	6	2	6	2	6
	pedestrian operations	2	2	4	2	4	2	4	-2	-4	1	2	2	4	2	4	2	4
	pavement condition	3	2	6	2	6	2	6	2	6	2	6	2	6	2	6	2	6
	road safety	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6	2	6
	utilities & services	2	2	4	2	4	2	4	2	4	-1	-2	2	4	2	4	2	4
Sub-total			32		23		17		15		24		32		32		32	
Natural Environment	fisheries/ aquatic impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2	-1	-1	0	0
	wildlife/ terrestrial impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2	-1	-1	0	0
	vegetation impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2	-1	-1	0	0
	Wet land impacts	1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2	-1	-1	0	0
Sub-total			-8		-4		-4		-4		-4		-8		-4		0	
Social Environment	property/ development impacts	3	-2	-6	-2	-6	-2	-6	-1	-3	-1	-3	-2	-6	2	6	2	6
	aesthetics	2	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
	noise impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	driver comfort	2	2	4	-1	-2	-2	-4	2	4	2	4	2	4	2	4	2	4
	construction impacts	1	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-2	-2	-1	-1	-1	-1
Sub-total			2		-6		-8		4		4		0		13		13	
Cultural Heritage Environment	archaeological & heritage impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	First Nations impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total			0		0		0		0		0		0		0		0	
Economic Environment	maintenance & construction costs	1	-2	-2	-2	-2	-2	-2	-2	1	1	-1	-1	-2	-2	-2	-2	-2
	land acquisition costs	2	-2	-4	-2	-4	-2	-4	-1	-2	-1	-2	-2	-4	-1	-2	-1	-2
Sub-total			-6		-6		-6		-1		-3		-6		-4		-4	
TOTAL SCORE				20		7		-1		14		21		18		37		41

WEIGHT		
1	2	3

SCORE				
-2	-1	0	1	2

Weight reflects the relative importance of each assessment criteria to the other (a value of 1 denotes less importance, whereas 3 denotes greater importance)

Score reflects the effect of the alternative (a value of +2 denotes a positive effect, 0 denotes no effect, whereas -2 denotes a negative effect).

Table 14: Weighted Scoring Assessment - south of Saunders Road to south of Lockhart Road

Evaluation Criteria		Design Alternative 5-1 City of Barrie Standard 30 m Road Allowance		Design Alternative 5-2 3.5 m Centre Lane 29.5 m Road Allowance		Design Alternative 5-3 3.3 m Lanes 29.2 m Road Allowance		Design Alternative 5-4 Sidewalk on One Side Only 27.5 m Road Allowance		Design Alternative 5-5 Reduced Boulevard Width 27 m Road Allowance		Design Alternative 5-6 Proposed Multi-Use Trail 32.5 m Road Allowance		Design Alternative 5-7 Proposed Centreline Shift 30.0 m Road Allowance		Design Alternative 5-8 Proposed Centreline Shift & Reduced Boulevard 31.5 m Road Allowance		
Environment & Criteria	Weight	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	
Physical Environment	road operations & railway crossings	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6	2	6
	transit operations	3	2	6	1	3	-1	-3	-1	-3	2	6	2	6	2	6	2	6
	pedestrian operations	2	2	4	2	4	2	4	-2	-4	1	2	2	4	2	4	2	4
	pavement condition	3	2	6	2	6	2	6	2	6	2	6	2	6	2	6	2	6
	road safety	3	2	6	1	3	1	3	2	6	2	6	2	6	2	6	2	6
	utilities & services	2	2	4	2	4	2	4	2	4	-1	-2	2	4	2	4	2	4
	Sub-total			32		23		17		15		24		32		32		32
Natural Environment	fisheries/ aquatic impacts	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	wildlife/ terrestrial impacts	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	vegetation impacts	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Wet land impacts	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total			2		2		2		2		2		2		2		2
Social Environment	property/ development impacts	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	aesthetics	2	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
	noise impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	driver comfort	2	2	4	-1	-2	-2	-4	2	4	2	4	2	4	2	4	2	4
	construction impacts	1	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-2	-2	-1	-1	-1	-1
Sub-total			6		0		-2		7		6		6		6		6	
Cultural Heritage Environment	archaeological & heritage impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	First Nations impacts	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total			0		0		0		0		0		0		0		0
Economic Environment	maintenance & construction costs	1	-1	-1	-1	-1	-1	-1	-1	1	1	-1	-1	-2	-2	-2	-2	-2
	land acquisition costs	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total			-1		-1		-1		1		-1		-2		-2		-2
TOTAL SCORE				39		24		16		25		31		38		38		38

WEIGHT		
1	2	3

SCORE				
-2	-1	0	1	2

Weight reflects the relative importance of each assessment criteria to the other (a value of 1 denotes less importance, whereas 3 denotes greater importance)

Score reflects the effect of the alternative (a value of +2 denotes a positive effect, 0 denotes no effect, whereas -2 denotes a negative effect).

Table 15: Weighted Scoring Assessment - Potential Interim 3 Lane - north of Saunders Road to south of Saunders Road

Evaluation Criteria		Design Alternative 3R-1 City of Barrie Standard 36m Road Allowance		Design Alternative 3R-2 3.5 m Centre Lane 35.5 m Road Allowance		Design Alternative 3R-3 3.3 m Lanes 35.6 m Road Allowance		Design Alternative 3R-4 Reduced Boulevard Width 28.0 m Road Allowance		Design Alternative 3R-5 Proposed Centreline Shift 36.0 m Road Allowance		Design Alternative 3R-6 Proposed Centreline Shift & Reduced Boulevard 31.5 m Road Allowance		
Environment & Criteria	Weight	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	
Physical Environment	road operations & railway crossings	3	2	6	1	3	1	3	2	6	2	6	2	6
	transit operations	3	2	6	1	3	-1	-3	2	6	2	6	2	6
	pedestrian operations	2	2	4	2	4	2	4	1	2	2	4	2	4
	pavement condition	3	2	6	2	6	2	6	2	6	2	6	2	6
	road safety	3	2	6	1	3	1	3	2	6	2	6	2	6
	utilities & services	2	2	4	2	4	2	4	-1	-2	2	4	2	4
Sub-total			32		23		17		24		32		32	
Natural Environment	fisheries/ aquatic impacts	1	0	0	0	0	0	0	0	0	0	0	0	
	wildlife/ terrestrial impacts	1	0	0	0	0	0	0	0	0	0	0	0	
	vegetation impacts	1	0	0	0	0	0	0	0	0	0	0	0	
	Wet land impacts	1	0	0	0	0	0	0	0	0	0	0	0	
Sub-total			0		0		0		0		0		0	
Social Environment	property/ development impacts	3	-2	-6	-2	-6	-2	-6	0	0	-2	-6	0	0
	aesthetics	2	0	0	0	0	0	0	0	0	0	0	0	
	noise impacts	2	0	0	0	0	0	0	0	0	0	0	0	
	driver comfort	2	2	4	-1	-2	-2	-4	2	4	2	4	2	4
	construction impacts	1	-2	-2	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2
Sub-total			-2		-10		-12		3		-4		2	
Cultural Heritage Environment	archaeological & heritage impacts	2	0	0	0	0	0	0	0	0	0	0	0	
	First Nations impacts	2	0	0	0	0	0	0	0	0	0	0	0	
Sub-total			0		0		0		0		0		0	
Economic Environment	maintenance & construction costs	1	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	
	land acquisition costs	2	-2	-4	-2	-4	-2	-4	0	0	-2	-4	0	
Sub-total			-6		-6		-6		-2		-6		-2	
TOTAL SCORE				24		7		-1		25		22		32

WEIGHT		
1	2	3

Weight reflects the relative importance of each assessment criteria to the other (a value of 1 denotes less importance, whereas 3 denotes greater importance)

SCORE				
-2	-1	0	1	2

Score reflects the effect of the alternative (a value of +2 denotes a positive effect, 0 denotes no effect, whereas -2 denotes a negative effect).

Table 16: Weighted Scoring Assessment - Potential Interim 3 Lane - south of Saunders Road to south of Lockhart Road

Evaluation Criteria		Design Alternative 3R-1 City of Barrie Standard 36m Road Allowance		Design Alternative 3R-2 3.5 m Centre Lane 35.5 m Road Allowance		Design Alternative 3R-3 3.3 m Lanes 35.6 m Road Allowance		Design Alternative 3R-4 Reduced Boulevard Width 28.0 m Road Allowance		Design Alternative 3R-5 Proposed Centreline Shift 36.0 m Road Allowance		Design Alternative 3R-6 Proposed Centreline Shift & Reduced Boulevard 31.5 m Road Allowance		
Environment & Criteria	Weight	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	Score	Weighed Score	
Physical Environment	road operations & railway crossings	3	2	6	1	3	1	3	2	6	2	6	2	6
	transit operations	3	2	6	1	3	-1	-3	2	6	2	6	2	6
	pedestrian operations	2	2	4	2	4	2	4	1	2	2	4	2	4
	pavement condition	3	2	6	2	6	2	6	2	6	2	6	2	6
	road safety	3	2	6	1	3	1	3	2	6	2	6	2	6
	utilities & services	2	2	4	2	4	2	4	-1	-2	2	4	2	4
Sub-total			32		23		17		24		32		32	
Natural Environment	fisheries/ aquatic impacts	1	0	0	0	0	0	0	0	0	0	0	0	
	wildlife/ terrestrial impacts	1	0	0	0	0	0	0	0	0	0	0	0	
	vegetation impacts	1	0	0	0	0	0	0	0	0	0	0	0	
	Wet land impacts	1	0	0	0	0	0	0	0	0	0	0	0	
Sub-total			0		0		0		0		0		0	
Social Environment	property/ development impacts	3	0	0	-2	-6	-2	-6	0	0	-2	-6	-1	-3
	aesthetics	2	0	0	0	0	0	0	0	0	0	0	0	0
	noise impacts	2	0	0	0	0	0	0	0	0	0	0	0	0
	driver comfort	2	2	4	-1	-2	-2	-4	2	4	2	4	2	4
	construction impacts	1	-2	-2	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2
Sub-total			2		-10		-12		3		-4		-1	
Cultural Heritage Environment	archaeological & heritage impacts	2	0	0	0	0	0	0	0	0	0	0	0	
	First Nations impacts	2	0	0	0	0	0	0	0	0	0	0	0	
Sub-total			0		0		0		0		0		0	
Economic Environment	maintenance & construction costs	1	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	
	land acquisition costs	2	-2	-4	-2	-4	-2	-4	0	0	-2	-4	-2	-4
Sub-total			-6		-6		-6		-2		-6		-6	
TOTAL SCORE				26		7		-1		25		22		25

WEIGHT		
1	2	3

Weight reflects the relative importance of each assessment criteria to the other (a value of 1 denotes less importance, whereas 3 denotes greater importance)

SCORE				
-2	-1	0	1	2

Score reflects the effect of the alternative (a value of +2 denotes a positive effect, 0 denotes no effect, whereas -2 denotes a negative effect).

wide sidewalks on both sides. The boulevard width will be reduced from 5.5 metres to 4.0 metres in areas where the existing right-of-way is only 20.0 metres.

The proposed construction of the eastbound right turn lane on Burton Avenue is to be maintained to improve intersection operations. In addition, the recommended 10 metre x 10 metre daylighting triangle at the northwest corner of the Huronia Road/Burton Avenue/ Yonge Street intersection is also required to ensure proper sight lines and visibility are maintained.

Design Alternative 3-7 is recommended for the following reasons:

- provides the necessary lane configuration as per the Phases 1 and 2 Class EA report;
- maintains appropriate lane widths (as per City of Barrie & MTO standards) thereby providing maximum benefit in terms of road capacity, driver comfort and safety;
- provides sufficient boulevard width to accommodate utilities;
- minimizes impacts to residential properties;
- provides sidewalks on both sides of the road as per City of Barrie arterial road standards;
- maintains acceptable operations and level of service at the Little Avenue intersection; and
- minimizes impacts to residential driveways.

Little Avenue to North of Herrell Avenue

Design Alternative 3-6, which involves shifting the centreline to the west, is recommended to mitigate impacts to private residential properties located on the east side of Huronia Road. The existing right-of-way is sufficient to accommodate one 3.5 metre through lane in each direction and a 4.0 metre wide continuous two-way centre turn lane and 1.5 metre sidewalks on both sides.

Design Alternative 3-6 is recommended for the following reasons:

- provides the necessary lane configuration as per the Phases 1 and 2 Class EA report;
- maintains appropriate lane widths (as per City of Barrie & MTO standards) thereby providing maximum benefit in terms of road capacity, driver comfort and safety;
- provides the standard 23.0 metre right-of-way;
- eliminates impacts to residential properties;
- provides sidewalks on both sides of the road as per City of Barrie arterial road standards;
- minimizes impacts to residential driveways;

- utilizes available lands owned by the City on the west side of Huronia Road; and
- the impacts to the water pumping station are acceptable given the City's plans to decommission the facility.

6.1.2 Huronia Road - North of Herrell to South of Mapleview Drive (5 Lanes)

North of Herrell to South of Herrell

Design Alternative 5-7, which involves shifting the centreline to the west from north of Herrell Avenue to approximately 150 metres south of Herrell Avenue, is recommended to mitigate impacts to private residential properties located on the east side of Huronia Road. A property widening of approximately 2.5 metres to 10.2 metres is required to accommodate two 3.5 metre through lanes in each direction and a southbound dedicated left turn lane at the intersection and 1.5 metre sidewalks on both sides. The impacted lands are owned by the City and are situated within the AC/DC railway corridor. Shifting the road towards the west is not anticipated to impact the operation of the railway or pose a safety concern for vehicular and pedestrian traffic as a sufficient setback from the railway and the new road will be maintained. The existing water booster station on the west side of Huronia Road opposite Herrell Avenue will be decommissioned to accommodate the road improvements. Decommissioning will involve abandoning the well (well 10) at an estimated cost of \$11,000. Additional costs associated with removing the pump house and associated yard piping has not been determined at this point. Potential impacts to the hydro substation were reviewed in consultation with PowerStream to ensure the operation of this facility is not adversely impacted. Access to the hydro substation will be relocated to the west side. Widening adjacent to the City owned soccer field immediately south of the residential development on Herrell Avenue will be required to accommodate the road and sidewalk improvements.

Design Alternative 5-7 is recommended for the following reasons:

- provides the necessary lane configuration as per the Phases 1 and 2 Class EA report;
- maintains appropriate lane widths (as per City of Barrie & MTO standards) thereby providing maximum benefit in terms of road capacity, driver comfort and safety;
- provides standard 30.0 metre right-of-way;
- eliminates impacts to residential properties;
- provides sidewalks on both sides of the road as per City of Barrie arterial road standards; and
- utilizes available lands owned by the City on the west and east sides of Huronia Road.

South of Herrell Avenue to Loon Avenue

Design Alternative 5-5, which involves a reduced boulevard width, is recommended from south of Herrell Avenue to Loon Avenue to mitigate property impacts. The existing right-of-way, which varies from 23.0 metres to 26.0 metres, will need to be widened to 27.0 metres to accommodate two 3.5 metre through lanes in each direction and a 4.0 metre wide continuous two-way centre turn lane and 1.5 metre wide sidewalks on both sides. The City of Barrie standard boulevard width of 5.5 metres will be reduced to 4.0 metres which is considered sufficient to accommodate utilities and sidewalks. Due to the close proximity of the building at 352 Huronia Road and the commercial parking lots at 431, 421, 419, 374, 366, 373, 369, 359 and 349 Huronia Road, the sidewalk along the front of these properties will be located along the back of the curb. It will also be increased in width from 1.5 metres to 2.0 metres wide to accommodate snow storage and maintenance as per City of Barrie curb face sidewalk standards, and to provide a greater separation between pedestrians and traffic.

The recommended 10 metre x 10 metre daylighting triangles at the Huronia Road/Truman Road and Huronia Road/Big Bay Point Road intersections are required to ensure proper sight lines and visibility are maintained.

Design Alternative 5-5 is recommended for the following reasons:

- provides the necessary lane configuration as per the Phases 1 and 2 Class EA report;
- maintains appropriate lane widths (as per City of Barrie & MTO standards) lane widths thereby providing maximum benefit in terms of road capacity, driver comfort and safety;
- provides sufficient boulevard width to accommodate utilities;
- minimizes impacts to commercial properties and parking lots; and
- provides sidewalks on both sides of the road as per City of Barrie arterial road standards.

Loon Avenue to North of Maplevue Drive

Design Alternative 5-6, which involves implementing the City of Barrie standard design cross-section with a 3.0 metre wide multi-use trail on the east side, is recommended from Loon Avenue to north of Maplevue Drive. The existing right-of-way, which varies from 20.0 metres to 30.0 metres, will need to be expanded to provide a 31.5 metre wide right-of-way throughout this section of Huronia Road to accommodate two 3.5 metre through lanes in each direction, a 4.0 metre wide continuous two-way centre turn lane, a 1.5 metre wide sidewalk on the west side, and a 3.0 metre wide multi-use trail on the east side.

Design Alternative 5-6 is recommended for the following reasons:

- provides the necessary lane configuration as per the Phases 1 and 2 Class EA report;

- maintains appropriate lane widths (as per City of Barrie & MTO standards) thereby providing maximum benefit in terms of road capacity, driver comfort and safety;
- provides standard 30.0 metre right-of-way, plus an additional 1.5 metre to accommodate a 3.0 metre wide multi-use trail;
- minimizes impacts to adjacent private properties;
- provides a pedestrian sidewalk on the west side of the road and an extension of the TransCanada Trail on the east side of the road; and
- the impacts to natural environmental features are not considered significant and are not anticipated to adversely affect the local ecological functions and systems.

North of Mapleview Drive to South of Saunders Road

Design Alternative 5-8, which involves a centreline shift and reduced boulevard, is recommended from north of Mapleview Drive to south of Saunders Road to mitigate property impacts. The existing 30.0 metre right-of-way will be sufficient to accommodate two 3.5 metre through lanes, a 4.0 metre wide median lane (5.0 metre wide median required to accommodate a 2.0 metre traffic island and a 3.0 metre dedicated left turn lane on the north and south approaches to the Huronia Road & Mapleview Drive intersection), and 1.5 metre sidewalks on both sides. The City of Barrie standard boulevard width of 5.5 metres will be reduced to 4.0 metres on the east side to accommodate the 3.0 metre trail.

Design Alternative 5-8 is recommended for the following reasons:

- provides the necessary lane configuration as per the Phases 1 and 2 Class EA report;
- maintains appropriate lane widths (as per City of Barrie & MTO standards) thereby providing maximum benefit in terms of road capacity, driver comfort and safety;
- provides sufficient boulevard width to accommodate utilities;
- minimizes impacts to commercial properties and parking lots; and
- provides sidewalks on both sides of the road as per City of Barrie arterial road standards.

South of Saunders Road to South of Lockhart Road

Design Alternative 5-1, which involves applying the City of Barrie standard BSD-07A is recommended from south of Saunders Road to south of Lockhart Road. The existing right-of-way will be sufficient to accommodate the ultimate 5-lane urban cross section consisting of two 3.5 metre through lanes, a 4-5 metre wide median lane (5.0 metre wide median required to accommodate a 2.0 metre traffic island and a 3.0 metre dedicated left turn lane on the north and south approaches to the Huronia Road and

Lockhart Road intersection), a 1.5 metre sidewalk on the west side and a 3.0 metre wide multi-use trail on the east side of the road.

Design Alternative 5-1 is recommended for the following reasons:

- provides the necessary ultimate lane configuration as per Phases 1 and 2 of the Class EA report;
- maintains appropriate lane widths (as per City of Barrie & MTO standards) thereby providing maximum benefit in terms of road capacity, driver comfort and safety;
- provides standard boulevard width to accommodate utilities;
- existing right-of-way (of 36 metres) sufficient to accommodate standard road cross section thereby minimizing impacts to commercial properties.

Potential Interim 3-Lane - North of Saunders Road to South of Saunders Road

Design Alternative 3R-6, which involves a centreline shift and reduced boulevard is recommended from north of Saunders Road to south of Saunders Road to minimize impacts to the abutting commercial properties. The existing 28.6 metre wide right-of-way will need to be expanded to provide a 31.5 metre right-of-way throughout this section of Huronia Road to accommodate the interim 3-lane rural cross-section consisting of one 3.5 metre through lane in each direction, a 4.0 metre wide continuous two-way centre turn lane and a 3.0 metre wide multi-use trail on the east side of the road.

Design Alternative 3R-6 is recommended for the following reasons:

- provides the necessary interim lane configuration as per the Phases 1 and 2 Class EA report;
- maintains appropriate lane widths (as per City of Barrie and MTO standards) thereby providing maximum benefit in terms of road capacity, driver comfort and safety;
- minimizes impacts to commercial properties; and
- provides an opportunity to extend the TransCanada Trail system thereby improving pedestrian and recreational uses.

Potential Interim 3-Lane - South of Saunders Road to south of Lockhart Road

Design Alternative 3R-1, which involves applying City of Barrie standard BSD-05 (modified), is recommended from south of Saunders Road to south of Lockhart Road. The existing right-of-way will be sufficient to accommodate the interim 3-lane rural cross-section consisting of one 3.5 metre through lane in each direction, a 4.0 metre wide continuous two-way centre turn lane and a 3.0 metre multi-use trail on the east side of the road.

To accommodate the relocation of a tributary of the Lovers Creek watershed currently located adjacent to the west side of Huronia Road, a property widening of approximately 10 metres is proposed along the north frontage of 731 Huronia Road. The actual property requirements required to accommodate the relocated tributary will be subject to the completion of a natural channel design satisfactory to the approval authorities (LSRCA and DFO).

Design Alternative 3R-1 is recommended for the following reasons:

- provides the necessary interim lane configuration as per the Phases 1 and 2 Class EA report;
- maintains appropriate lane widths (as per City of Barrie & MTO standards) thereby providing maximum benefit in terms of road capacity, driver comfort and safety;
- existing road allowance is sufficient to accommodate interim 3-lane cross-section;
- minimizes impacts to commercial properties;
- provides an opportunity to extend the TransCanada Trail system thereby improving pedestrian and recreational uses;
- the impacts to the natural heritage features are not considered significant and are not anticipated to adversely affect the local ecological functions and systems; and
- the proposed relocation of the Lovers Creek tributary represents a significant fish and fish habitat improvement.

6.1.3 Preferred Design Alternative

Figure 9 illustrates the location of the preferred design alternative for Huronia Road.

6.2 Impact Mitigation

The Municipal Class EA guidelines recommend that significant features and impacts should be avoided where possible. However, where they cannot be avoided, every effort should be made to mitigate the adverse impacts. Manners in which impacts are to be mitigated, either in the development of the alternatives, or as part of the detail design and implementation, are noted below.

6.2.1 Stormwater Management

With respect to stormwater quality control, such will be provided through the use of structure sumps and oil/grit separators. Enhanced protection to achieve 80% removal of suspended solids will be provided through the use of an oil/ grit separator, or approved equal, at the downstream reach of the drainage system prior to discharging runoff to the existing outlets.

This study did not involve a storm management study, which will be dealt with at the detail design phase. As a result, stormwater quantity control may be warranted. Should an opportunity to acquire property within the study limits become available, consideration should be given to constructing a stormwater detention pond to provide additional quality control. Consideration should also be given to utilizing existing lands owned by the City adjacent to Huronia Road for the purpose of constructing quantity and quality control facilities.

6.2.2 Impacts to Private Wells

No private wells have been identified in close proximity to the project limits that would be impacted by the proposed works. To extend or replace culverts as part of the Huronia Road widening, a permit to take water (PTTW) may be required at the design phase subject to the findings of a geotechnical investigation. In this case, all necessary mitigating measures would be applied to any private wells within the appropriate proximity of the work.

6.2.3 Parking Improvements at Huronia Park North (Soccer Fields)

The proposed widening of Huronia Road will no longer permit on-street parking. As such, the Huronia Park North parking area may need to be expanded to accommodate parking needs. Given the available City owned open lands which the sports facility is located on, opportunities to increase parking are available. Further details will be addressed during detail design.

6.2.4 Summary of Identified Concerns & Mitigation Measures

The identified environmental concerns associated with the construction of the project are summarized in Table 17 as are mitigation measures where they have been recommended to minimize or eliminate changes to the environmental conditions described in this report.

Table 17: Summary of Mitigating Measures

Potential Negative Effect	Mitigating Measures
Safety	<ul style="list-style-type: none"> ▪ Provide sidewalks and pedestrian crossings. ▪ Follow Ontario Traffic Manual for proper signing and pavement markings.
Impact on Road Capacity During Construction	<ul style="list-style-type: none"> ▪ Ontario Traffic Manual shall be followed to ensure safe lane closures/ temporary conditions. ▪ It is recommended that construction activities in the Huronia Road/ Mapleview Drive area be completed during non-peak hours if and whenever possible.
Major Services/ Utility Conflicts	<ul style="list-style-type: none"> ▪ Coordinate with utility companies in identifying services and possible conflicts and relocation strategies.
Fisheries & Aquatic Habitat	<ul style="list-style-type: none"> ▪ 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.

Potential Negative Effect	Mitigating Measures
	<ul style="list-style-type: none"> Minimize road dedication.
Wildlife Habitat	<ul style="list-style-type: none"> Maintain vegetated corridors. Revegetate disturbed areas with wildlife beneficial plantings. Stage work to avoid bird breeding periods. Minimize road dedication.
Vegetation	<ul style="list-style-type: none"> Revegetation of disturbed areas with native seed mix immediately following final grading. Delineate tree/vegetation protection areas using construction fencing. Minimize site clearing activities. Minimize road dedication.
Groundwater Resources	<ul style="list-style-type: none"> Delineate and properly prepare refuelling areas to prevent soil contamination due to fuel spills. Identify and protect groundwater upwelling/source areas from contamination and flow disturbance. All underground services should have clay cut-off plugs installed in areas where the groundwater table is elevated. 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.
Water Quality/ Stormwater Management	<ul style="list-style-type: none"> Provision for spill control in construction contract. Fast, accurate reporting of spill to Ministry of the Environment. Pollution prevention and source control by best management land use practices and best management stormwater practices. Equipment maintenance and refuelling away from watercourses. Temporary stockpiling of materials away from watercourses. Implementation of erosion and sedimentation controls and regular monitoring and reporting of maintenance after every major rainfall event. Revegetation of disturbed areas immediately following final grading. 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/new quantity and quality ponds or oil/grit removal systems.
Aesthetics	<ul style="list-style-type: none"> Landscape boulevards.
Noise	<ul style="list-style-type: none"> Reduce traffic congestion.
Archaeological/ Cultural Heritage Resources	<ul style="list-style-type: none"> If archaeological or cultural heritage features are encountered during construction, work will cease immediately and the Ministry of Tourism & Culture is to be contacted at (416) 212-0644 or toll-free at (866) 454-0049.
Impact on Existing Businesses	<ul style="list-style-type: none"> Notify public agencies and adjacent owners of construction scheduling. Ensure access is maintained as well as garbage, recycling and green bin pickup.

6.2.5 Monitoring

Monitoring objectives include:

- monitoring of individual measures and issues (ie. erosion and sedimentation control, waste handling and storage);
- monitoring of overall effectiveness of control measures; and

- ongoing identification of areas of potential concern.

City of Barrie and/or their designated construction inspectors will make regular visits to the work site to ensure mitigation measures described in this report and in the subsequent contract document provisions are carried out effectively. The timing and frequency of these visits will coincide with the schedule of the construction operations and will be adjusted to reflect the sensitivity of site concerns and the development of unforeseen environmental problems during and after construction. The inspectors will use a standardized inspection report form, which will detail any concerns, and further actions required. A copy of the form is to be provided to the contract administrator and contractor with noted action items to be signed off as completed.

During short-term and long-term intervals of construction activity, the project site will be regularly monitored to ensure all environmental protection measures are operating effectively.

In addition to the site specific monitoring requirements, an audit of environmental performance for the project may be undertaken. Such an audit may include:

- the review of long-term effectiveness of mitigation measures;
- the review of inspection reports, notes and the resolution of noted concerns;
- the review of comments and concerns received from regulatory agencies and public interest groups and how these issues were addressed; and
- recommended modifications to mitigation measures or procedures as required.

6.2.6 Environmental Approvals

Prior to any site alteration and development, permit approval from the LSRCA shall be obtained in accordance with the following:

- Ontario Regulation 179/06 under the Conservation Authorities Act;
- Level III Fish Habitat Agreement (LSRCA-DFO) under the Fisheries Act; and
- Lake Simcoe Protection Plan (LSPP) under the Lake Simcoe Protection Act.

6.3 Land Acquisition

Implementation of the preferred design alternatives will require the acquisition of lands to accommodate the road improvements. The cost of such land was considered during the evaluation of the economic environment. Table 18 provides a summary of the land requirements and costs.

Table 18: Land Requirements & Costs

Land Use	Land Value	3 Lane Design Alt Yonge to north of Herrell		5 Lane Design Alt north of Herrell to south of Mapleview Drive		5 Lane Design Alt (Interim 3 Lane Rural) south of Mapleview to Lockhart	
		Area	Cost	Area	Cost	Area	Cost
Low Density Residential (R)	\$268/m ²	864.1 m ²	\$232,443	247.7 m ²	\$66,631	-	-
Commercial - Arterial (C)	\$376/m ²	45.6 m ²	\$17,146	23.7 m ²	\$8,911	-	-
Industrial - Medium Density (M)	\$215/m ²	-	-	10,569.5 m ²	\$2,272,442	3,299.2	\$709,328
Institutional - Medium Density	\$269/m ²	-	-	-	-	-	-
Environmentally Protected Lands (EP)	\$0/m ²	-	-	-	-	-	-
Open Space (OS)	\$0/m ²	842.9 m ²	\$0.00	1,316.2 m ²	\$0.00	-	-
TOTAL		1,752.60	\$249,588	15,030.2	\$2,347,985	4,954.4	\$709,328
Total (without EP or OS Lands)		909.7	\$249,588	10,840.9	\$2,347,985	3,299.2	\$709,328

6.4 Construction Cost

Preliminary construction costs estimates have been prepared for the preferred design alternatives based on cost data provided in the Phases 1 and 2 Class EA report (which reflect 2008 costs). These costs estimated will be reviewed during the budgeting process to reflect economic and pricing changes based on current or time of construction conditions.

Table 19 below provides a preliminary estimate of construction costs for the ultimate road improvements. It is noted that a separate cost estimate is provided for the potential interim 3-lane improvements from north of Saunders Road to south of Lockhart Road. However, these costs should not be included in the overall construction cost estimate to avoid duplicating costs accounted for in the ultimate 5 lane construction estimate for this section of Huronia Road.

Table 19: Preliminary Estimate of Construction Costs

Preferred Alternative	Cost per metre	3 Lane Design Alt Yonge to north of Herrell		5 Lane Design Alt north of Herrell to south of Mapleview Drive		5 Lane Design Alt (Interim 3 Lane Rural) south of Mapleview to Lockhart	
		Length	Cost	Length	Cost	Length	Cost
Alternative 5-1 (0+780 - 1+680)	\$3128					900m	\$2,815,560
Alternative 5-8 (1+680 - 2+420)	\$3128			740m	\$2,315,016		
Alternative 5-6 (2+420 - 3+120)	\$3128			700m	\$2,189,880		
Alternative 5-5 (3+120 - 4+250)	\$3128			1130m	\$3,535,092		
Alternative 5-7 (4+250 - 4+570)	\$3128			320m	\$1,001,088		
Alternative 3-6 (4+570 - 5+100)	\$2257	530m	\$1,196,316				
Alternative 3-7 (5+100 - 5+715)	\$2257	615m	\$1,388,178				
TOTAL		1,145m	\$2,584,494,	2,890m	\$9,041,076	900m	\$2,815,560
Interim Alt 3R-1 (0+780 - 1+680)	\$2200*					900m	\$1,800,000
Interim Alt 3R-6 (1+680 - 2+000)	\$2200*					320m	\$640,000
TOTAL INTERIM		-	-	-	-	1220m	\$2,440,000

* 3-Lane rural cost per metre derived from 3 lane urban cost minus curb and gutter and storm sewer costs.

7 Huronia Road Railway Crossings

Detailed safety assessments of the railway crossings of Huronia Road immediately south of Ellis Drive and Huronia Road immediately south of Herrell Avenue were undertaken. In addition, the crossing on Little Avenue immediately west of Huronia Road was completed in that it is on the same spur line. The assessment was completed by C.C. Tatham & Associates in August 2010. Copies of the detailed safety assessments are included in Appendix E.

7.1 Objectives

The fundamental objectives of the safety assessment are to:

- reduce crash risk within the grade crossing environment;
- minimize the frequency and severity of preventable crashes;
- consider the safety of all grade crossing users;
- verify compliance of the technical standards referred to in the *Railway Safety Act/Grade Crossing Regulations* and contained in the *RTD 10 Road/Railway Grade Crossing Technical Standards and Inspection, Testing and Maintenance Requirements* document⁶; and
- ensure all the crash mitigation measures/factors aimed to eliminate or reduce the identified safety problems are fully considered, evaluated and documented for review/action by the appropriate authorities.

7.2 Existing Conditions

Existing conditions at the crossings were determined in accordance with the *Canadian Road/Railway Grade Crossing Detailed Safety Assessment Field Guide*. For the purpose of these reports, Huronia Road is considered in a north-south orientation, while the rail line is described in an east-west orientation. At the Little Avenue crossing, Little Avenue is considered in an east-west orientation, while the rail line is described in a north-south orientation.

Huronia Road is a major arterial road within the City of Barrie, with a posted speed limit of 60 km/h in the area of the crossings. Based on 8-hour traffic counts completed at the intersections of Huronia Road with Ellis Drive and Herrell Avenue (March 2010), the daily volume on Huronia Road at the adjacent crossings crossing is estimated at 7000 and 6000 vehicles respectively.

⁶ *RTD 10 Road/Railway Grade Crossing Technical Standards and Inspection, Testing and Maintenance Requirements*. Transport Canada, October 24, 2002.

Little Avenue is a major arterial road within the City of Barrie, with a posted speed limit of 50 km/h in the area of the crossing. Based on an 8-hour traffic count completed at the intersection of Huronia Road and Little Avenue (March 2010), the daily volume on Little Avenue at the crossing is estimated at 7000 vehicles.

With respect to rail traffic, the Allandale Community Development Corporation (ACDC) currently operates on average one train a day (two crossings) on the Beeton Subdivision, at a speed of 17 km/h (10 mph).

Photographs of the railway crossings and additional details with respect to the road and railway approaches are provided in the field data forms, attached as Appendix E. As the grade crossings do not currently have a warning system in place (ie. it is currently a passive crossing consisting of warning signs only), the forms corresponding to such were employed.

7.3 Assessment of Existing Conditions

For purposes of the assessment, and in consideration of the arterial road classification for Huronia Road, a B-Train Double (BTD) combination vehicle, which is 25 metres in length, was selected as the appropriate design vehicle (as per the *Canadian Road/Railway Grade Crossing Detailed Safety Assessment Field Guide*). Given the truck restrictions on Little Avenue in the immediate area, a bus (intercity bus) was considered the most appropriate design vehicle (length of 14 metres) and hence has been considered in the assessment. In comparison, a standard single unit bus is approximately 12 metres in length.

The key findings of the detailed safety assessment, including suggested remediation measures, are identified in the detailed safety assessments as they relate to the following:

- location of grade crossing;
- grade crossing surface;
- road geometry;
- sight lines;
- signs & pavement markings; and
- illumination.

The key deficiencies relate to sight lines. As detailed in the railway safety assessments, the sightlines at the rail crossing are deficient. Improved sight lines are expected from the clearance of vegetation from the road and rail right-of-way, as well as within the sight distances noted in the assessments.

7.4 Grade Crossing Warrants

As per the RTD 10 guidelines, unrestricted grade crossings for vehicular use shall have a grade crossing warning system (ie. lights and bells) if:

- the cross-product of the daily road and train volumes is 1,000 or more (cross-product = daily road volumes x daily train volumes); or
- the grade crossing does not include a sidewalk and the maximum railway operating speed exceeds 80 mph; or
- the grade crossing includes a sidewalk and the maximum railway operating speed exceeds 60 mph; or
- there are two or more tracks and trains may be passing one another; or
- the sightlines or alternative measures are not provided, including where trains, engines, railway cars, or other railway equipment, standing or stored, may obscure driver or pedestrian sightlines of a train approaching; or
- the maximum railway operating speed exceeds 15 mph, there is a stop sign or traffic signals controlling vehicular traffic on that part of the road leading away from the grade crossing, and the distance between the front of a vehicle in the first stopped position at the stop sign or traffic signals and a rail in the grade crossing surface is:
 - less than 30 metre for a stop sign; or
 - 30 metre or more for a stop sign, unless a traffic study indicates that queued traffic will not encroach within 2.4 metre of the rail nearest the road intersection; or
 - less than 60 metre for traffic signals; or
 - 60 metre or more for traffic signals, unless a traffic study indicates that queued traffic will not encroach within 2.4 m of the rail nearest the road intersection.

Where grade crossing warning systems are installed, they shall include gates if:

- the cross-product is 50,000 or more; or
- the maximum railway operating speed is 50 mph or more; or
- there are two or more tracks where trains may be passing one another; or
- the sightlines along the railway right-of-way for a driver or pedestrian stopped at the grade crossing are not sufficient, including where trains, engines, railway cars or other railway equipment, standing or stored, may obscure the driver's or pedestrian's sightlines of a train approaching the grade crossing.

Under existing conditions, the cross-product of daily road and train volumes exceeds 1000 (6000 to 7000 vehicles per day x two train crossings per day) and the available sight lines are restricted. Therefore, a grade warning system is recommended (ie. lights and bells).

Projected rail traffic through to the year 2017 was provided by ACDC for the Beeton Subdivision, as follows (freight traffic):

- operating speeds in some areas may reach 50 km/h while the maximum operating speed at the crossing is 16 km/h (10 mph);
- six return trains daily (12 train crossings in total);
- four return trips during the day (07:00 to 23:00) and two during the night (23:00 to 07:00);
- normal operations will include weekday and weekend movements; and
- train configuration normally 1 locomotive and up to 15 cars.

At the rail crossings, future volumes upwards of 15,000 to 20,000 are expected over the next 10 to 20 years. As such, the cross-product of vehicle and train volumes will exceed 50,000 and thus gates will be warranted in future, in addition to lights and bells.

7.5 Grade Crossing Warning System

In consideration of the cross-product of rail and road traffic and the deficient sight lines, a warning system (to include both lights and bells) is currently warranted at the grade crossing on Huronia Road south of Ellis Drive, at the crossing on Huronia Road south of Herrell Avenue and at the Little Avenue crossing west of Huronia Road. The distance between the rail crossing and the signalized intersection at Huronia Road and Little Avenue further warrants an active warning system at the crossing. As both train and traffic volumes increase, the warrant for gate control will also be met.

It is noted the safety assessment of the grade crossings on Huronia Road and on Little Avenue cover physical features which may affect road and rail user safety and it has sought to identify potential safety hazards. However, no guarantee is made that every deficiency has been identified. Further, if all the recommendations in this assessment were to be addressed, this would not confirm the crossing is 'safe'; rather, adoption of the recommendations should improve the level of safety at the facility. Train whistling was not otherwise addressed at this crossing.

8 Huronia Road Water Crossings

8.1 Existing Conditions

There are 10 existing water crossings along the subject length of Huronia Road, from Yonge Street to south of Lockhart Road, that have been considered for culvert extension or replacement. There are also two proposed culverts (P1 and P2), one on Huronia Road and the other on Saunders Road. Each has been examined with respect to their hydraulic capacities, details of which are summarized in Table 20.

Table 20: Huronia Road Water Crossings

Water Crossing (Number and Chainage)		Creek	Existing or Proposed	Sufficient Capacity	Sufficient Length
1	5+115	main branch of Whiskey Creek	twin 1800mm	no, replace with 6000mm x 1500mm Hyspan concrete culvert	new
2	4+235	tributary to Whiskey Creek	size unknown	no, replace	new
3	2+921	tributary to Whiskey Creek	1500mm x 16.3m	no, replace with 2-1500mm	new
4	2+750	tributary to Lovers Creek	400mm x 14.8m	no, replace with 700mm	new
5	2+640	tributary to Lovers Creek	400mm	no, replace with 800mm	new
6	2+044	cold water tributary to Lovers Creek	1400mm x 16.5m	no, replace with 5.5m x 900mm	new
7	1+858	tributary to Lovers Creek	1000mm x 20.1m	yes	extension required
8	1+515	tributary to Lovers Creek	2700mm x 25.0m	yes	extension required
9	1+230	tributary to Lovers Creek	2000mm x 23.0m	yes	extension required
10	0+958	tributary to Lovers Creek	1800mm	yes	extension required
P1	Saunders Rd	new	proposed 750mm	new	new
P2	1+667	new	proposed 2700mm	new	new

Hydraulic analyses were performed on the 10 existing culverts and the two new proposed culverts based on the 100 year flow conditions. Water Crossings 7 to 10 meet the hydraulic requirements and therefore only require an extension of the culvert in order to provide a suitable water crossing in consideration of the road widening. Culverts 1 to 6 do not meet the hydraulic requirements of the 100 year flow, thus, these undersized culverts are to be replaced.

8.2 Channel Relocation/Realignment

Water Crossing 8 (1+515) conveys a cold water stream from west to east of Huronia Road. West of Huronia Road, the stream runs north along the road through four culverts under commercial access driveways before connecting to a tributary of Lovers Creek to head further west. The proposed widening of Huronia Road will impact this channel on the west side of the road as the existing stream is within the proposed right-of-way. In consideration of the road widening and subsequent impacts to the stream, three options have been investigated:

- conveying the stream via closed pipe;
- shifting the stream to the west; and
- relocating the stream.

The provision of a closed pipe to convey the stream north alongside Huronia Road is not desirable, mainly as the waterway has been identified as a cold water stream. Shifting the stream further west would bring the stream closer to the development properties. At such a location, the channel would likely be impacted by the road operations and in future, other mitigating measures may be required, possibly requiring a closed system. The recommended solution is to relocate the stream to the east side of Huronia Road and connect to the existing tributary by creating a natural channel. Further north, the stream would travel via Water Crossing P2 to the existing Lovers Creek tributary flowing to the west. The relocation of the stream and provision of the natural channel on the east side of Huronia Road would represent such a significant improvement to the existing conditions from a natural environment perspective that it would compensate for other impacts associated with the road widening.

The existing culvert on Saunders Road is within the proposed improvements for Huronia Road and will need to be replaced further to the west. Water Crossing 7 will be extended and the existing ditch will be realigned to allow the flow to connect between the proposed culvert on Saunders Road and Water Crossing 7 north of Saunders Road.

8.3 Culvert Improvement Costs

A preliminary assessment of the cost associated with replacing and/or extending culvert crossings on Huronia Road is provided in Table 21.

Table 21: Culvert Improvement Costs

Water Crossing (Number and Chainage)		Proposed Improvement	Estimated Supply and Install Cost*
1	5+115	new 28m - 6000mm x 1500mm Hyspan	\$504,000
2	4+235	new 32m - 500mm CSP	\$12,560
3	2+921	new 2 x 34m - 1500mm CSP	\$240,210
4	2+750	new 32m - 1500mm CSP	\$113,040
5	2+640	new 32m - 800mm CSP	\$32,154
6	2+044	new 39m - 5500mm x 900mm Hyspan	\$386,100
7	1+858	extension - 11m - 1000mm CSP	\$17,270
8	1+515	extension - 10m - 2000mm box culvert	\$145,800
9	1+230	extension - 15m - 2000mm box culvert	\$120,000
10	0+958	extension - 31m - 1800mm CSP	\$157,690
P1	Saunders Rd	new 18m - 750mm CSP	\$15,896
P2	1+667	new 36m - 2700mm box culvert	\$524,880
TOTAL			\$2,269,600

* Estimated cost based on culvert end area x length x \$2,000/metre

9 Completion of Municipal Class EA Process

As previously discussed, the process to complete the Huronia Road Municipal Class Environmental Assessment is detailed in Figure 1.

9.1 Phases 1 & 2

The previous report, summarized in Section 1.1, addressed Phases 1 & 2 as follows:

Phase 1: Problem or Opportunity

- Task 1: Identify problem or opportunity
- Task 2: Discretionary public consultation to review problem or opportunity

Phase 2: Alternative Solutions

- Task 1: Identify alternative solutions to the problem
- Task 2: Inventory natural, social, economic environment
- Task 3: Identify impact of alternative solutions on the environment
- Task 4: Evaluate alternative solutions and identify recommended solution
- Task 5: Consult review agencies & public re: problem or opportunity & alternative solutions
- Task 6: Select preferred solution

9.2 Phase 3

Phase 3 of the Class EA process has developed alternative design concepts for the preferred solution (ie. it addressed various road designs to implement the preferred solution). This report addressed Phases 3 & 4 and has documented the completion of the following:

Phase 3: Alternative Design Concepts for Preferred Solutions

- Task 1: Identify alternative design concepts for preferred solution
- Task 2: Detail inventory of natural, social & economic environment
- Task 3: Identify impact of alternative designs on environment & mitigating measures
- Task 4: Evaluate alternative designs

- Task 5: Identify recommended design alternatives

9.3 Phase 4

Phase 4 of the Class EA process involves the preparation of the Environmental Study Report (ESR) to document the planning and public consultation process and methodology employed throughout the study. The preferred design alternatives will be presented to General Committee of Council for consideration. If endorsed by Council, this Phase 3 & 4 Environmental Study Report (ESR) along with the Phase 1 & 2 Environmental Study Report (completed in September 2009) will be placed on public record for the mandatory 30 calendar day public review period. A Notice of Study Completion will be posted on the City's website and in the local newspapers. Members of the public, stakeholders, special interest groups and external agencies who have expressed an interest and a desire to stay involved will be provided with a copy of the Notice.

If concerns are raised during the review period which cannot be resolved in discussion with the Corporation of the City of Barrie (City), a person may request that the Minister of the Environment make an order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual environmental assessments. Requests must be received by the Minister at the address below within thirty (30) days of publication of the notice of Study Completion. A copy of the request must also be sent to the City. If no request is received, the project may proceed to Phase 5 Implementation (design and construction).

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