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**TO:** GENERAL COMMITTEE



**SUBJECT:** NEW HARVIE ROAD / BIG BAY POINT ROAD CROSSING OF HIGHWAY 400  
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT  
NOTICE OF COMPLETION

**WARD:** 6, 7 AND 8

**PREPARED BY AND  
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**SUBMITTED BY:** J. WESTON, M.A.Sc., P. Eng., PMP   
DIRECTOR OF ENGINEERING

**GENERAL MANAGER  
APPROVAL:** R. FORWARD, MBA, M.Sc., P. Eng.,  
GENERAL MANAGER OF INFRASTRUCTURE & GROWTH MANAGEMENT

**CHIEF ADMINISTRATIVE  
OFFICER APPROVAL:** C. LADD   
CHIEF ADMINISTRATIVE OFFICER 

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**RECOMMENDED MOTION**

1. That the preferred design alternative for the Phases 3 & 4 Municipal Class Environmental Assessment for Harvie Road / Big Bay Point Road / Highway 400 Transportation Improvements (Bryne Drive to Bayview Drive), be adopted as outlined in Staff Report ENG012-15.
2. That, in accordance with the requirements of the Class Environmental Assessment process, the Engineering Department publishes a Notice of Completion for the Harvie Road / Big Bay Point Road / Highway 400 Transportation Improvements Class EA associated with the crossing of Highway 400. The interchange will be subject to a separate Class EA.
3. That the design of the highway crossing be added to the 2015 Business Plan in the amount of \$1.5 million. Funding will be approximately \$975,000 (65%) from development charges and \$525,000 (35%) from the Tax Rate Capital Reserve.
4. That the capital budget for the Harvie Road / Big Bay Point Road / Hwy 400 Transportation Improvements Class EA (14-16-2320-0651-3591) be increased by \$250,000 to complete additional traffic analysis as required by the Ontario Ministry of Transportation to confirm that their selected preliminary preferred design alternative associated with the Hwy 400 Transportation Environmental Study Report Update is compatible with the proposed interchange. Funding will be approximately \$162,500 (65%) from development charges and \$87,500 (35%) from the Tax Rate Capital Reserve.
5. That the capital budget for the Bryne Drive Masterplan Update be increased by \$150,000. Funding will be approximately \$97,500 (65%) from development charges and \$52,500 (35%) from the Tax Rate Capital Reserve to complete Phase 1 & 2 of the Class EA and to undertake Phase 3 & 4 of the Class EA.

**PURPOSE & BACKGROUND**

6. The purpose of this study was to complete Phases 3 & 4 of the Class EA process, recommend the preferred design solution, and file a Notice of Completion (see Appendix A for Study Area). Specific tasks include the development of alternative design concepts, and the evaluation of the various design concepts in order to document the decision making process in determining the preferred design solution through to the preparation of the Environmental Study Report (ESR).

7. The Harvie Road / Big Bay Point Road / Highway 400 Transportation Improvements (Bryne Drive to Bayview Drive) Phases 3 & 4 Class EA ESR presents the recommended transportation improvements required in part to reduce existing traffic congestion and support growth in the south end of Barrie by connecting Harvie Road to Big Bay Point Road across Highway 400.
8. This report presents the preferred design alternative for connecting Harvie Road to Big Bay Point Road across Highway 400 that has been recommended as part of the Harvie Road / Big Bay Point Road / Highway 400 Transportation Improvements (Bryne Drive to Bayview Drive) Phase 3 & 4 Municipal Class Environmental Assessment (Class EA), and is part of the overall plan to address transportation issues in the south end of Barrie.
9. Please see Appendix B for Phase 1 & 2 Class EA background information and please note that the interchange will be subject to a separate Class EA study.
10. In 2004 and 2005, the Ontario Ministry of Transportation (MTO) completed a Transportation Environmental Study Report (TESR) and a Preliminary Design Report (PDR) for the Highway 400 which recommended that the highway be widened to a future eight (8) lanes, and land be protected for potential future ten (10) lanes from the City's south limits to Essa Road. The TESR is currently being updated by the MTO to study the highway widening and interchange alternatives. The alternatives that have been developed are based on the requirement for ten (10) lanes to accommodate future traffic demands.
11. The Bryne Drive Phase 1 & 2 Class EA update between Caplan Avenue and Essa Road was put on hold in 2010 through discussions with MTO pending the outcome of the Harvie Road / Big Bay Point Road / Highway 400 Transportation Improvements (Bryne Drive to Bayview Drive) Phases 3 & 4 Class EA study. The horizontal and vertical alignment of Bryne Drive is linked to the horizontal and vertical profile of the Harvie Road / Big Bay Point Road crossing, and MTO setbacks vary depending on whether a potential highway interchange is proposed.
12. On June 29, 2015, City Council adopted Motion 15-G-161 regarding the timing of the proposed transportation improvements as follows:

“That staff explore options to accelerate the Environmental Assessment and associated planning studies related to the Harvie Road / Big Bay Point Road crossing with the objective of accelerating the current construction start date to 2020/2021 and provide quarterly project status memos to City Council until project completion.”

## **ANALYSIS**

### **Consultation**

13. The Public Information Centre (PIC) associated with Phases 3 and 4 of the Class EA was held on Thursday, April 23, 2015, to receive public comments regarding the proposed alternative design solutions associated with the Harvie Road / Big Bay Point Road / Highway 400 Transportation improvements. The following design alternatives were presented at the PIC.

#### *Alternative 1 - "Do Nothing"*

The "Do Nothing" alternative corresponds to the existing conditions. Under this option, no highway crossing would be constructed.

#### *Alternative 2a – Highway Crossing over Highway 400, Over Railway Crossing & Standard Geometrics*

This alternative incorporates the recommended improvements based on the Multi-Modal Active Transportation Master Plan with seven (7) lanes of vehicular traffic from Bryne Drive to Bayview Drive over Highway 400 and a grade separated railway crossing, with sidewalks and buffered bike lanes on both sides.

*Alternative 2b – Highway Crossing Over Highway 400, Remove Railway Crossing & Reduced Geometrics*

This alternative is similar to Alternative 2a except with reduced road geometrics in certain areas, and removes the railway crossing on Big Bay Point Road within the Study Area.

*Alternative 3a – Highway Crossing Under Highway 400, At-Grade Railway Crossing & Standard Geometrics*

This alternative incorporates the recommended improvements based on the MMATMP with seven (7) lanes of vehicular traffic from Bryne Drive to Bayview Drive under Highway 400 and an at-grade railway crossing, with sidewalks and buffered bike lanes on both sides.

*Alternative 3b – Highway Crossing Under Highway 400, At-Grade Railway Crossing & Reduced Geometrics*

This alternative is similar to Alternative 3a except with reduced road geometrics in certain areas.

*Alternative 3c – Highway Crossing Under Highway 400, Raising Grade of Highway 400, At-Grade Railway Crossing & Reduced Geometrics*

This alternative is similar to Alternative 3a except with reduced road geometrics in certain areas, and includes raising the profile of Highway 400.

14. Comments received throughout the Class EA process, along with the responses to those comments, are summarized in the ESR which is available in the Councillors' Lounge for review and on the City of Barrie website at [www.barrie.ca/eastudies](http://www.barrie.ca/eastudies). Areas of major concern include (see Appendix C for additional information):

- Potential increase of traffic and noise in the residential areas
- Impacts on the environment (Whiskey Creek, floodplain aquatic habitat, groundwater)

15. Preferred rankings were received and the results are as follows with *Alternative 2b – Highway Crossing over Highway 400, Over Railway Crossing & Standard Geometrics* being the preferred design alternative:

Alternative	Number of Preferred Rankings	Percent (%)
1	7	17%
2a	12	29%
2b	16	38%
3a	4	9%
3b	2	5%
3c	1	2%
Total	42	100%

16. First Nations groups were circulated as part of the public consultation process. Archeologic sites have been identified that will need to be further investigated as part of the detail design. The preferred design alternative has minimized impacts to the archeological sites.
17. Other agencies including the MTO and the Lake Simcoe Region Conservation Authority (LSRCA) were also consulted as part of this study. The MTO and the LSRCA have both endorsed the preferred design alternative associated with the Highway crossing subject to specific details being worked out during detail design.

### Preferred Design Alternative

18. The design alternatives were evaluated in consideration of comments received to determine the best design alternative based on the evaluation criteria identified in the ESR. The evaluation criteria included technical, physical, social/cultural, natural, and economic components. A modified phased implementation of Alternative 2b was recommended as the Preferred Design Alternative.

The Preferred Design Alternative for the Harvie Road / Big Bay Point Road crossing includes the following (see Appendix D):

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

The Preferred Design Alternative has minimized property impacts along the Study Area by incorporating reduced cross section geometrics (lane widths) outside of the MTO corridor.

The Preferred Design Alternative minimizes driveway, utility, and natural environment impacts by incorporating an alignment shift to the north and recommending that the existing railway spur be removed on Big Bay Point Road between Fairview Road and Bayview Drive. The existing railway spur serviced the former Molson Brewery; Barrie Collingwood Railway has confirmed that it is no longer required.

The Preferred Design Alternative is consistent with the recommendations in the Multi-Modal Active Transportation Master Plan (MMATMP).

### Related Projects

19. In consideration of the overall transportation network in the City's south end, this project has been developed and coordinated with transportation improvement projects identified in the MMATMP for the Harvie Road and Big Bay Point Road Study Area between Bryne Drive and Bayview Drive.

As identified in the MMATMP, transportation improvements are needed on the following roads to minimize traffic issues in other areas and to maximize the utilization of the new highway crossing, thereby reducing traffic congestions on Essa and Mapleview:

- Big Bay Point Road – Bayview Drive to Huronia Road
- Harvie Road – Veterans Drive to Bryne Drive
- Harvie Road – Essa Road to Veterans Drive
- Bryne Drive – from north of Caplan Avenue to south of Essa Road
- Bayview Drive – Big Bay Point Road to Little Ave

### Interchange

20. The Notice of Completion planned for Phases 3 and 4 will not include the potential future interchange. In order to obtain MTO approval for the future interchange, additional traffic analysis is required to provide MTO with the necessary information required for their approval.
21. The additional property requirements for a potential interchange are shown in Appendix E. The additional property requirements are potentially required to implement the interchange south bound on / off ramps and the north bound off ramp.

22. MTO's current planning study (TESR) will confirm the future Highway 400 widening requirements as well as alignments. The number of lanes on Highway 400 will influence the operation/weaving and need/justification associated with the interchange. The City will undertake an additional traffic analysis once MTO has determined the preliminary preferred design alternative identified in the TESR to confirm compatibility with the proposed interchange. The preliminary preferred design alternative is scheduled to be identified by the end of 2015. The TESR update will provide guidance on the alignment of the preliminary preferred design alternative and identify potential improvements at the adjacent Mapleview and Essa Interchanges.
23. It is important to complete the additional traffic analysis as soon as possible in order to facilitate the design of the crossing. If the additional traffic analysis concludes that the interchange is not needed or feasible, it will simplify the detailed design of the recommended crossing over Highway 400. Should the additional traffic analysis conclude that the interchange is needed and feasible; the Highway Interchange will be subject to a future separate Class EA study.

### Staging

24. Different staging options were analysed in the ESR and the option of building a five lane road over the existing 6 lane Highway 400 was recommended for the following reasons:
- Lowest present value cost.
  - MTO's current 5 year capital plan has not budgeted for the Highway 400 widening. For the purposes of the analysis, it was assumed that it would be 25 years before the existing 6 lane Highway 400 is widened to 10 lanes.
  - Defers construction of portions of a bridge structure that will not be needed for many years.
  - MTO has advised that additional traffic analysis is required to assess the need and feasibility of an interchange.
  - This Class EA study concluded that an interchange can only be implemented once Highway 400 is widened to a minimum of 8 lanes with auxiliary lanes due to weaving issues.
  - Without an interchange, a seven lane Highway 400 crossing may never be needed
25. It is recommended that the crossing over Highway 400 be designed for the ultimate 7 lane configuration compatible with a future interchange and Highway 400 widening, but constructed for 5 lanes in the interim.

Construction is anticipated to be undertaken in two stages as follows:

- Stage 1 would be the interim 5 lane Harvie Road / Big Bay Point Road crossing over the existing 6 lane Highway 400.
- Stage 2 would be the ultimate 7 lane Harvie Road / Big Bay Point Road crossing over the widened 10 lane Highway 400 and would include the Highway interchange ramps.

Staging will be confirmed in consultation with the MTO during detail design.

### Next Steps

26. It is recommended that the Preferred Design Alternative for the ultimate 7 lane Hwy Crossing over Highway 400, and protection of land for a potential future interchange be adopted by Council at this time, in order that a Notice of Completion can be filed as required as part of the Class EA process. The Notice of Completion is the final point in the public process where the public can express their concerns if they feel issues raised through the Class EA process have not been sufficiently addressed. If there are no Part II Requests received, Phases 3 and 4 of the Class EA process can be considered complete and the City can proceed with the implementation of the Preferred Design Alternative.

27. Subject to available funding, it is proposed that a consultant be procured in 2015 in order to complete the design by 2017. Next steps also include property acquisition in 2018, utilities in 2019, and construction in 2020-2021 (subject to future budget approval).
28. Staff will provide quarterly project status memos to City Council until project completion.

### **ENVIRONMENTAL MATTERS**

29. This project has followed the guidelines for a Municipal Class EA and technical, physical, social/cultural, natural, and economic matters have been considered in the development of the recommendations. The Phase 3 & 4 Class EA report discusses how environmental matters have been considered in the development of the recommended preferred design alternative. The evaluation process considered criteria for technical, physical, social/cultural, natural, and economic criteria such as traffic, pedestrians, cyclists, transit, property, noise, utilities, municipal services, and driveway grades/operations.

### **ALTERNATIVES**

30. The following alternative is available for consideration by General Committee:

**Alternative #1** General Committee could alter the proposed recommendation by selecting another Design Alternative.

This Alternative is not recommended because the Preferred Design Alternative provides for transportation improvements which minimize the effects to the physical, natural, social, cultural/heritage, and economic (financial) environments.

**Alternative #2** General Committee could choose to consider the additional funding for the completion of the traffic analysis and the Bryne Drive Masterplan Update as part of the 2016 Business Plan development.

This Alternative is not recommended as both of these components require approval and commitment of funding to initiate the procurement process in order to complete these studies as soon as possible to maintain the accelerated construction start date of 2020 as per Council Motion 15-G-161.

**Alternative #3** General Committee could choose not to consider additional funding for the completion of the traffic analysis associated with the interchange as part of the 2016 Business Plan development.

This Alternative is not recommended because resolving the outstanding interchange issues are essential to the detail design of the Highway Crossing. If it is determined that the interchange is not needed or not feasible, the detail design of the recommended Harvie / Big Bay / 400 Highway 400 Crossing would be simplified.

### **FINANCIAL**

31. The 2015 - 2019 Business Plan includes design funds of \$1.5 million (\$747,525 + \$747,525) in 2017/2018 and property acquisition funds of \$1,495,050 in 2019. The 10 year capital outlook includes utilities in 2020 and construction in 2021-2022.
32. There will be an increase to the operating costs for the new Highway Crossing and the associated road widening between Bryne Drive and Bayview Drive. It is anticipated that the new roadway would be operated by the City of Barrie.

33. It is recommended that the design phase be accelerated to 2015 and added to the 2015 Business Plan in the total amount of \$1.5 million and cash flowed as follows:

- 2015 \$50,000
- 2016 \$725,000
- 2017 \$725,000

Approval of this funding would allow the procurement process to proceed in 2015 in order to retain a consultant to undertake the detailed design. Cash flows for design work would primarily occur in 2016 and 2017 but funds will need to be committed in 2015 so that an RFP can be issued this fall. Funding will be approximately \$1,125,000 (65%) from development cost charges and \$525,000 (35%) from the Tax Rate Capital Reserve

34. The following is proposed in the 2016-2020 Business Plan and 10 year capital outlook:

- Design 2016 to 2017
- Property Acquisition 2018
- Utilities 2019
- Construction 2020 to 2021

35. It is recommended that the capital budget for the Harvie Road / Big Bay Point Road / Hwy 400 Municipal Class EA (14-16-2320-0651-3591) be increased by \$250,000 from \$600,000 to \$850,000. Funding will be approximately \$162,500 (65%) from development charges and \$87,500 (35%) from the Tax Rate Capital Reserve. This funding is requested to complete additional traffic analysis required by MTO to finalize the assessment of the need and feasibility of the interchange with respect to the future widening of Highway 400 and proximity of the Essa and Mapleview interchanges.

36. To complete Phase 1 & 2 of the Bryne Drive Master Plan Update, which was put on hold in 2010 and to complete Phase 3 & 4, additional funding in the amount of \$150,000 is required. Funding will be approximately \$97,500 (65%) from development cost charges and \$52,500 (35%) from the Tax Rate Capital Reserve. If the additional funding is approved, the Bryne Drive Master Plan Update is anticipated to be completed in 2016.

37. The table and paragraphs below provide information on the estimated capital costs for the project.

Current development charges included the following costs:

**Available Funding**

Description	Total Cost (\$ million)	DC (\$ million)	Tax (\$ million)
2014 Development Charge Background Study (includes cost for interchange and staging works)	\$45.7	\$30.1	\$15.6
Whiskey Creek Area Specific DC	\$3.8	\$3.8	\$0
Total	\$49.5	\$33.9	\$15.6

The updated total estimated cost of the proposed seven lane Highway 400 crossing including the interchange is \$61 to 71 million (including staging works of \$5 to \$15 million).

The cost estimate has increased over previous cost estimates as additional elements were identified in the Phase 3 & 4 Class EA process, which includes a greater level of design detail. The following elements were identified and incorporated into the updated cost estimate:

- Utility relocates
- Highway 400 staging works
- Bike lanes
- Retaining walls
- Drainage improvements
- Fill
- Updated cost estimate extends from the realigned Bryne Drive to Bayview Drive

The estimated cost includes land acquisition, new culverts under Hwy 400, 15% Design, 10% utility relocates, 30% Contingency and 1.76% HST. The costs are based on Barrie road costs and 2011 MTO Parametric Estimating Guide. Costs are expressed in 2015 dollars and do not carry any escalation allowance for work undertaken in future fiscal periods.

For the 2014 Development Charge (DC) Background Study and the Harvie Road / Big Bay / Hwy 400 Municipal Class EA, project cost estimates assumed that there would be no grants and/or cost sharing. If grants and/or cost sharing are successfully negotiated, overall costs would be reduced.

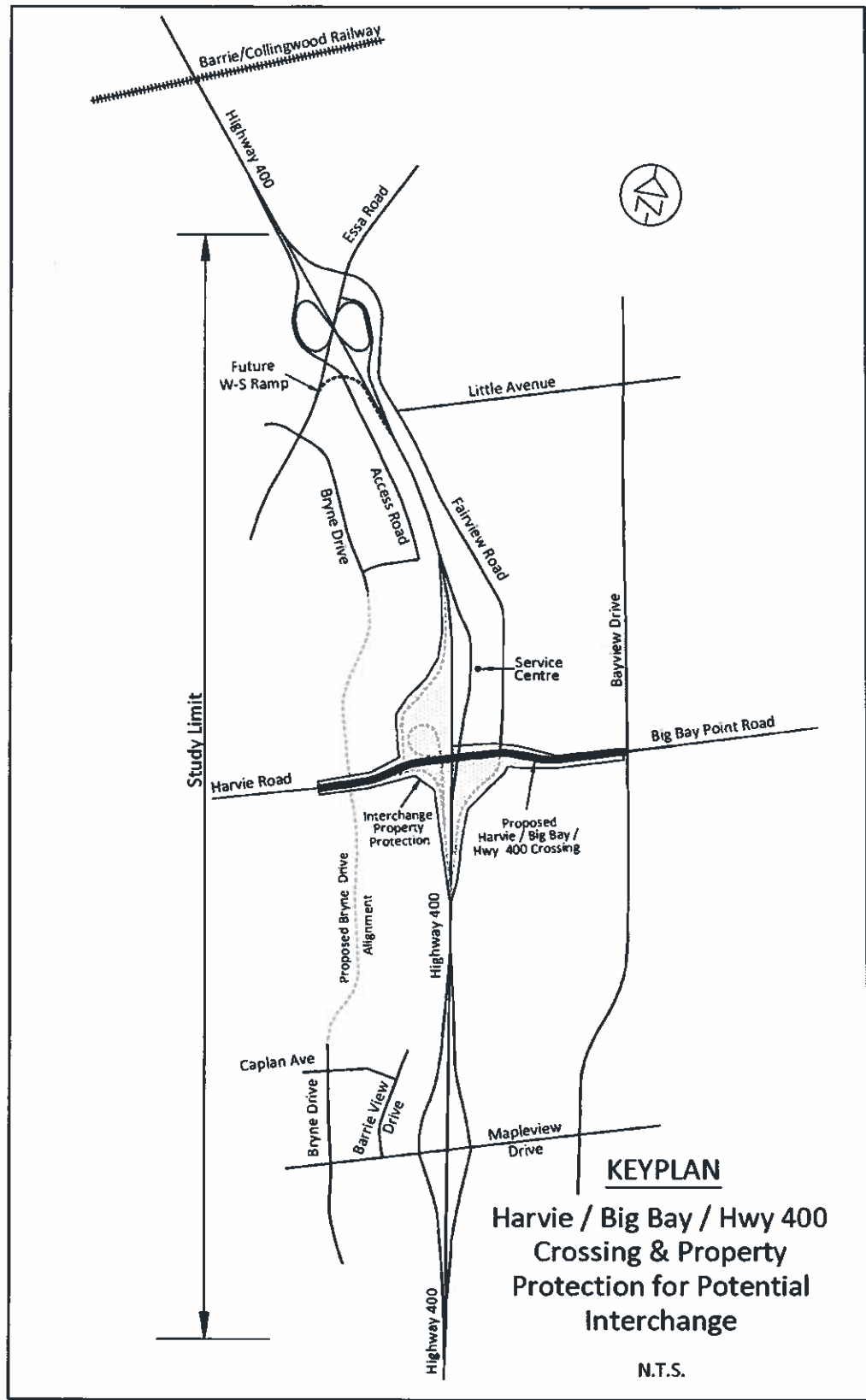
The total estimated cost of constructing the interim 5 lane Harvie Road / Big Bay Point Road crossing over the existing 6 lane Highway 400 is estimated to be approximately \$33.6 million. This cost estimate assumes approximately \$7.5 million for Highway 400 staging works (actual Highway 400 staging costs are estimated to range from \$5 - \$15 million and depends on the resolution of some outstanding issues which would be resolved during detail design). This cost will be included in the recommended 2016 – 2020 capital plan.

#### **LINKAGE TO 2014 – 2018 COUNCIL STRATEGIC PLAN**

38. The recommendation(s) included in this Staff Report support the following goals identified in the 2014-2018 Strategic Plan:
- Responsible Spending
  - Well Planned Transportation
39. This Class EA completes Phase 3 & 4 of the process and implementation of the Preferred Design Alternative provides necessary linkages within the City's transportation system in the south end of Barrie. The Preferred Design Alternative will also provide key elements for Active Transportation such as bicycle lanes and sidewalks. This linkage is also critical in planning for, and accommodating future growth in the City of Barrie.



**Appendix A – Study Area**



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**Appendix B – Harvie Road / Big Bay Point Road / Phase 1 & 2 Class EA**

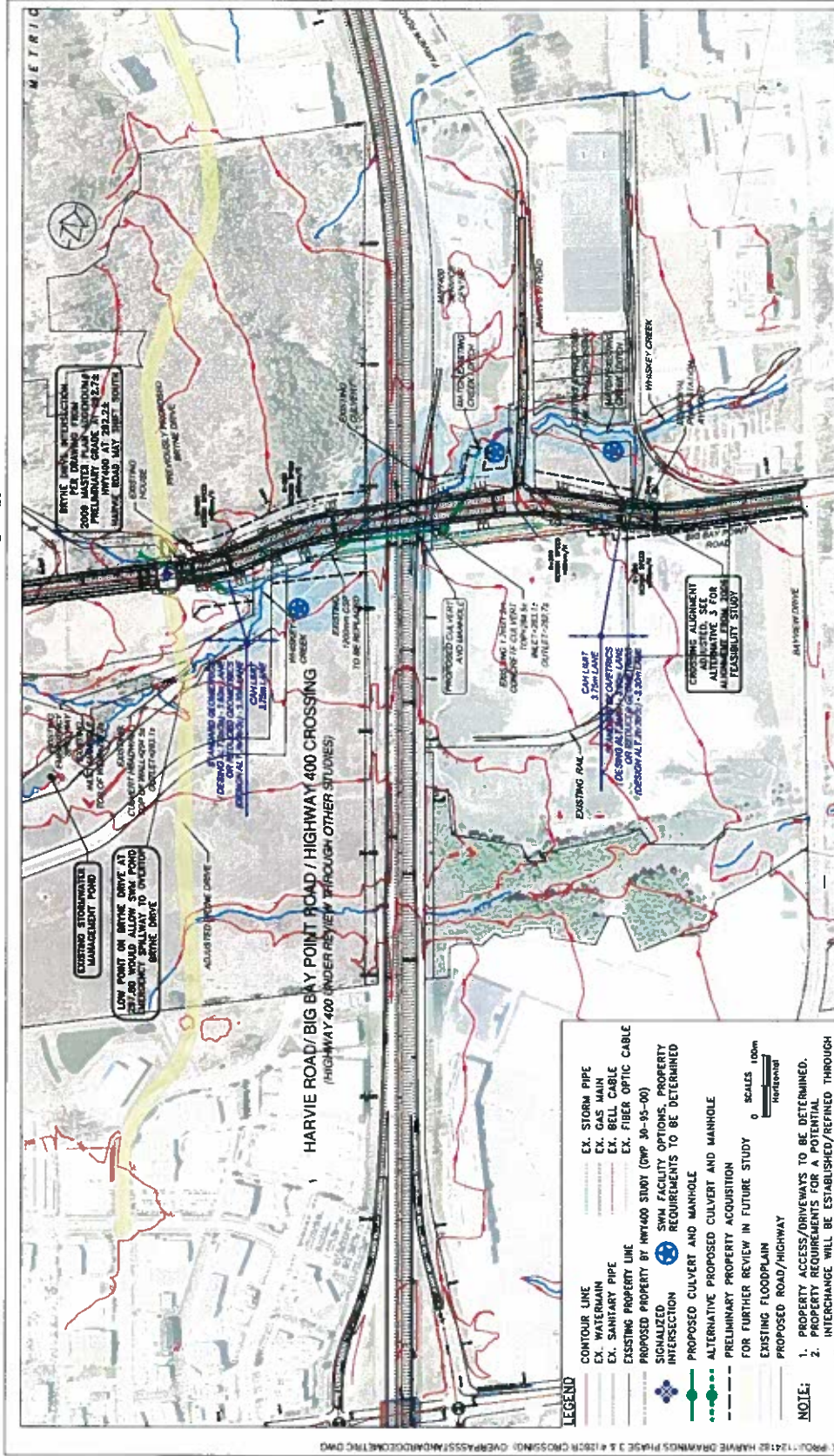
**BACKGROUND**

1. The Notice of Commencement for the Harvie Road / Big Bay Point Road / Highway 400 Phase 1 & 2 Class EA was issued on November 5<sup>th</sup> and 6<sup>th</sup> 2010 and PIC #1 was held on November 17, 2010.
2. On March 5, 2012, City Council adopted Motion 12-G-049 regarding the Harvie Road / Big Bay Point Road / Highway 400 Transportation Improvements (Bryne Drive to Bayview Drive) Phase 1 & 2 Class EA as follows:
  - “1. That the Preferred Alternative for the Municipal Class Environmental Assessment for Harvie Road/Big Bay Point Road/Highway 400 from east of the future alignment of Bryne Drive to west of Bayview Drive (Phases 1 & 2) be adopted as outlined in Staff Report ENG005-12 and as follows:
    - a) That the proposed structure crossing Highway 400 will have six (6) through lanes and one (1) turning lane for a total of seven (7) lanes;
    - b) That Harvie Road / Big Bay Point Road be constructed with three (3) through lanes in each direction for a total of six (6) lanes, including a new crossing at Highway 400, plus operational improvements at intersections; and
    - c) That property be protected for a future potential highway interchange and refined as part of phases 3 & 4 of the Harvie Road / Big Bay Point Road / Highway 400 Class EA.
  2. That in accordance with the requirements for a Schedule "C" Class EA study, the Engineering Department continues with Phases 3 & 4 of the Class EA process which includes the development and evaluation of alternative designs, a second PIC, and the recommendation to Council for a preferred design for transportation improvements at Harvie Road / Big Bay Point Road / Highway 400.”

**Appendix C - Summary of Major Issues Raised in PIC**

<u>Major Issue</u>	<u>Response/Mitigation</u>
Access to Fairview Drive will be difficult from adjacent properties due to additional traffic volume.	Future growth in traffic volume on Fairview Road will be minimized by the new highway crossing connecting Harvie and Big Bay. The MMATMP suggests that 5 lane on Fairview Road may be required beyond 2031 (includes a turning lane in the centre of the road).
Rail road Crossing.	The preferred design alternative proposes to remove the existing railway spur.
Increased cut through traffic on adjacent residential streets.	As part of the detailed design, traffic calming measures will be considered on impacted residential streets.
Impact to Molson archaeological site	The archaeological site has been cleared.
Bryne Drive needs to be connected	Bryne Drive is subject to a Schedule C Class EA. Funding is being considered for inclusion in the 2016-2020 Capital Plan to connect Bryne Drive before the new highway crossing connecting Harvie to Big Bay is opened to the public.
Bicycle paths should take the form of multi-use trails instead of on-road bike lanes in order to see higher numbers of cyclists using the infrastructure, which will in-turn bring more people by different modes of transportation to the area.	The proposed multiuse trail would conflict with driveways and pedestrians, and be a potential safety issue over the Highway. Multiuse trails are also less compatible with commuter cyclists.
Concerned about impact of Crossing / Interchange on Harvie Road	The Highway 400 crossing connecting Harvie Road to Big Bay Point Road is one of the critical elements needed to resolving the traffic issues in the south end of Barrie. The Harvie Road EA between Bryne and Veteran's is subject to a separate Class EA process but this Class EA recommends that reduced geometrics and four lanes be considered. Also, funding is being considered in the 2016-2020 Capital Plan to connect Bryne Drive which will minimize cut through traffic on Harvie Road west of Bryne.
Impacts on Whiskey Creek, floodplain aquatic habitat, groundwater and stormwater management.	The preferred design alternative includes an alignment shift to the north which will minimize the impact to the natural environment. Additional mitigation measures will be considered as part of the detail design, including the potential of retaining walls which will reduce the footprint of the recommended transportation improvements.

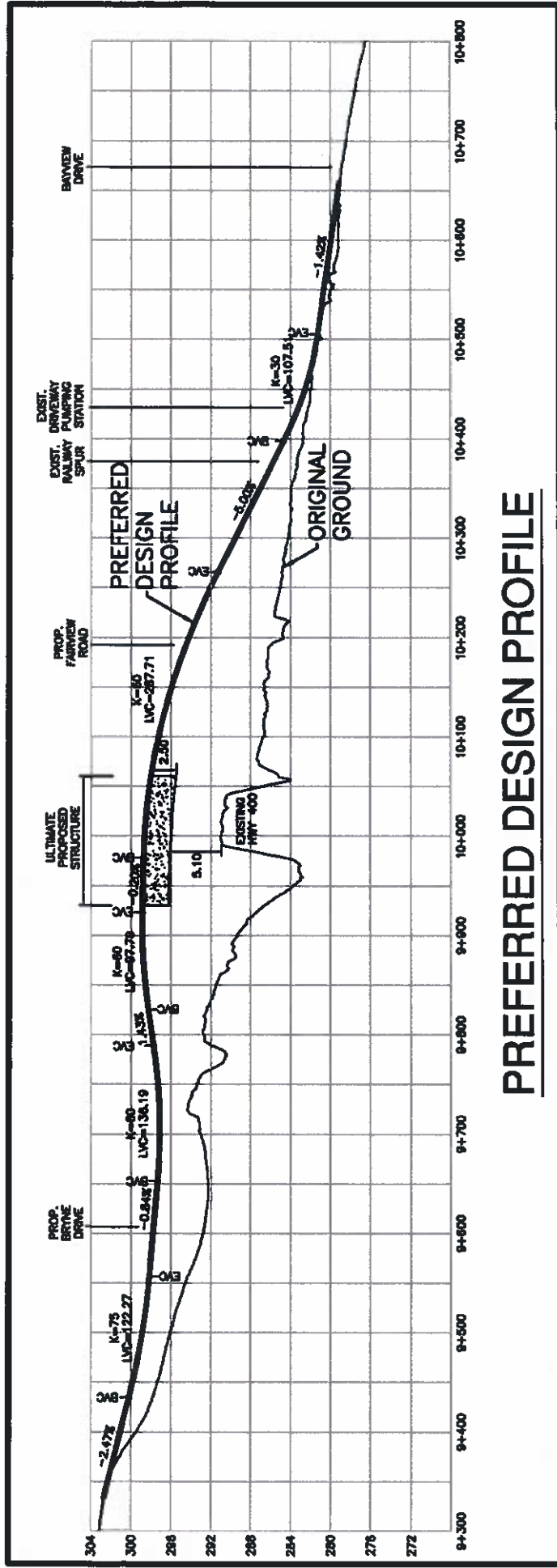
Appendix D – Preferred Design Alternative



PREFERRED DESIGN ALTERNATIVE PLAN (280m RADIUS) 2b  
HARVIE ROAD / BIG BAY POINT ROAD  
CROSSING OVER HIGHWAY 400  
(PHASE 3 AND 4 EA)

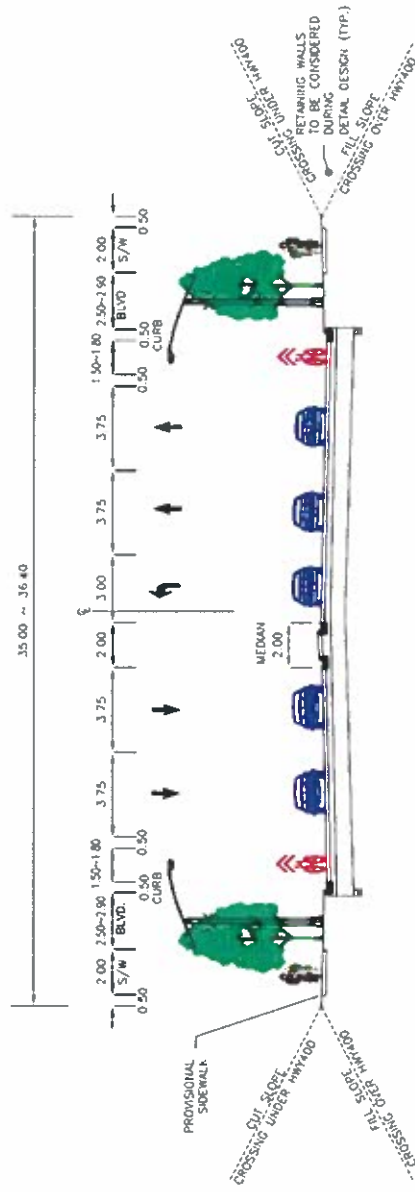
HARVIE ROAD / BIG BAY POINT ROAD / HIGHWAY 400 CROSSING  
(HIGHWAY 400 UNDER REVIEW THROUGH OTHER STUDIES)

Preferred Design Alternative - Profile

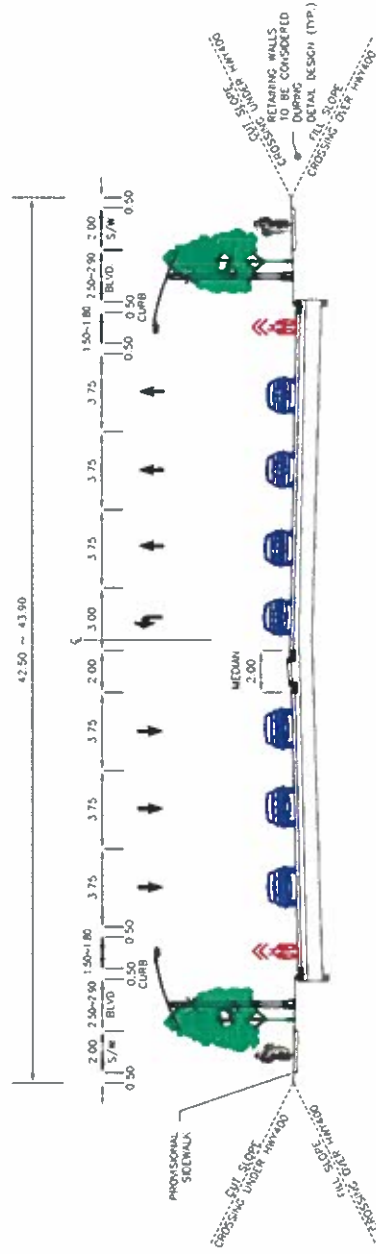


PREFERRED DESIGN PROFILE

**Preferred Design Alternative – Interim and Ultimate MTO Typical Sections Over the Highway 400 Corridor**



M.T.O. 3.75m LANE WIDTH  
INTERIM TYPICAL SECTION – C.A.H. GEOMETRICS



M.T.O. 3.75m LANE WIDTH  
ULTIMATE TYPICAL SECTION – C.A.H. GEOMETRICS



