

City of Mississauga

Burnhamthorpe Road West Improvements Municipal Class Environmental Assessment Study

Draft Environmental Study Report: Executive Summary

January 2020



Executive Summary

Introduction

Burnhamthorpe Road West is an east-west arterial road in the City of Mississauga. Within the study limits Burnhamthorpe Road provides a connection between the City of Mississauga in the east and Town of Oakville in the west, servicing local residential and commercial traffic as well as commercial and commuter traffic. East of Ninth Line, Burnhamthorpe Road West is within the City of Mississauga jurisdiction and ultimately terminates in the City of Toronto.

Between Ninth Line and Loyalist Drive, Burnhamthorpe Road West consists of a 2-lane road cross-section. East of Loyalist Drive, Burnhamthorpe Road West is a 4-lane road with an existing multi-use trail that is located on the north side of the road. West of Loyalist Drive (at the east study limit), the multi-use trail terminates and transitions the road into the 2-lane cross-section.

The 2-lane section of Burnhamthorpe Road between the west City limit and Loyalist Drive is reaching capacity during peak periods, creating queuing along the corridor that requires capacity and operational improvements to resolve this issue.

The City of Mississauga is undertaking a Schedule C Municipal Class Environmental Assessment Study to review the existing and future needs of the Burnhamthorpe Road West corridor. The study considers the City's planning principles to build a multi-modal city, which will support a successful, vibrant and active community with a reliance on a range of transportation modes including walking, cycling, transit and vehicles.

Needs and Justification

The needs and justification of the study are discussed in Section 2 of the Environmental Study Report (ESR) and summarized below.

Transportation Assessment

A transportation and traffic assessment was conducted as part of the study to review the existing and projected future transportation and traffic conditions to determine the future needs of the study area. The existing traffic operations can be summarized as follows:

- Several movements (i.e. right turn, left turn, through) operate at or above capacity at the following intersections during the AM and PM peak hour:
 - Burnhamthorpe Road & Ninth Line
 - Burnhamthorpe Road & Ridgeway Drive
- The westbound left-turn at Burnhamthorpe Road & Ninth Line is highly congested in the AM peak.
- The following turning movements result in excessive queuing that is sustained over multiple signal cycles:
 - Burnhamthorpe Road & Ninth Line
 - Eastbound through/right-turn in the AM peak hour
 - Burnhamthorpe Road & Ridgeway Drive:
 - Eastbound through/right-turn in the AM peak hour
 - Northbound left-turn in the PM peak hour.
- Burnhamthorpe Road & Winston Churchill Boulevard (outside of study area):
 - Westbound through in the PM peak hour

A screenline assessment was completed for future horizon years to assess the total east-west traffic demand and road capacity available considering other parallel roads in the area, thereby, identifying the capacity deficiency in the area.

The results of the screenline assessment indicate that under future conditions, existing demand on Burnhamthorpe Road will be over existing capacity. A review of the mid-block volumes on the Burnhamthorpe Road corridor indicate the following:

- With the 2021 scenario:
 - Total traffic conditions on Burnhamthorpe Road west of Ninth Line remain over capacity.
 - Total traffic conditions on Burnhamthorpe Road west of Ridgeway Drive are also over capacity.
- With the 2031 and 2041 scenarios:
 - Total traffic conditions continue to worsen and Burnhamthorpe Road remains over capacity west of Ninth Line and west of Ridgeway Drive.

Problems and Opportunities

Under existing conditions, several intersections within the study area are experiencing congestion and delays leading to significant queuing along Burnhamthorpe Road West. These poor traffic conditions are anticipated to worsen in the future as vehicle demand on Burnhamthorpe Road West increases.

There is an opportunity to improve Burnhamthorpe Road West to accommodate not only existing and future vehicle demand, but also active transportation. There is an opportunity to incorporate active transportation elements to match the cross-section elements to the east of the study area and promote active transportation connectivity to the west, particularly over the Highway 403. The possible improvements to Burnhamthorpe Road West also includes improvements to the streetscape of the corridor.

Existing Conditions

Existing conditions of the study area were collected and reviewed, including the following:

- Various background studies and reports (i.e. stormwater management reports, Highway 403 condition survey report, etc.);
- Data provided by the City of Mississauga (i.e. traffic data, tree survey data, etc.);
- Investigations undertaken as part of this Class EA study;
- Meetings with the Project Team;
- Meetings and correspondence with agencies including Ministry of Transportation and Halton Region;
- Consultation with members of the public;
- Site visits.

The existing conditions of the study area are discussed below.

Socio-Economic Environment

The City of Mississauga Official Plan (2017) designates the lands east of Ridgeway Drive as Residential Low Density. This section of road is comprised of a mix of uses including business employment, place of worship, schools and residential low density areas. West of Ridgeway Drive, land use is designated as Business Employment, with multiple businesses on the south side of Burnhamthorpe Road West and a secondary school on the north side.

There are two community features located within the study limits between Ninth Line and Loyalist Parkway, Loyola Catholic Secondary School and Iglesia Ni Christo Church. Loyola Catholic Secondary School is located on the north west corner of the Burnhamthorpe Road and Ridgeway Drive intersection. Iglesia Ni Christo is located on the north west corner of the Burnhamthorpe Road and Loyalist Drive intersection.

Natural Environment

A Natural Environment Assessment was conducted to document existing conditions, assess potential impacts to any natural heritage features present within the Study Area and provide recommendations and supporting documentation for the study.

Watercourses and Surface Drainage Features

The Study Area predominantly resides within the Loyalist Subwatershed, with portions to the north-east situated in the Sawmill Subwatershed within the greater Credit River Watershed under the administrative jurisdiction of the Credit Valley Conservation Authority (CVC). A small portion at the west end of the Study Area is situated within the Oakville East Urban Creeks watershed under the jurisdiction of Conservation Halton.

CIMA+ consulted with the CVC to obtain GIS data records for any tributaries crossing the Study Area. CVC records indicated the presence of an historic tributary crossing Burnhamthorpe Road West located approximately 202 m east of Colonial Drive East. Specifically, this tributary was identified to be present along Dolson Court, north of Burnhamthorpe Road West and connecting underneath the road and continuing southbound along Bangor Road. CVC records indicated dry conditions in both the early summer of 1954 and spring of 1965. The results of CIMA+'s field investigations have determined that this highly urbanized drainage path is intermittent and flow is considered either historical or extremely limited; conditions were dry (including the eastwest ditches along both the north and south sides of Burnhamthorpe Road West in this area). There is a major trunk storm sewer in this corridor (drainage path). Very little erosion scarring or changes in soil moisture were observed, and limited changes in species composition to hydrotolerant or hydrophilic vegetation species were observed in these areas at the time of the field investigation.

Drainage ditches are present on both the north and south sides of Burnhamthorpe Road West along the length of the Study Area, however, standing water was only observed in the naturalized ditches west of Highway 403. These ditches were predominantly occupied by Common Reed (*Phragmites australis*) with associates of Common Cattail (*Typha latifolia*). East of Highway 403, the manicured grass swales were dry and catch basins were observed to be present along their lengths.

Aquatic Habitat

CIMA+ evaluated existing conditions at all drainage features and tributary locations (present or historically mapped) throughout the Study Area. The features observed were evaluated based on data obtained from the background review, and observations during field investigations which included an assessment of substrate conditions, water presence and water quality, stream width, top of bank and water depth (if applicable), and aquatic and riparian vegetation community composition.

Standing waters and low flow conditions were observed in the drainage ditches and tributary features west of Highway 403. The previously mapped tributary features north and south of Burnhamthorpe Road East in this area were either recently plowed and barren drainage pathways (across the agricultural field to the north) or were densely established with invasive tall narrow leaved emergents (*P. australis*). Features east of Highway 403, are urban drainage swales established with actively maintained manicured grass, which are not connected to any natural

tributaries, nor exhibited hydrologic or ecological conditions capable of supporting any aquatic species.

None of the features evaluated within or adjacent to the Study Area meet the criteria of fish habitat based on the results of the site investigation. None of the features observed east of Highway 403 are considered suitable for supporting fish populations at any time throughout the year.

Terrestrial Habitat

Lands within the Study Area were assessed to determine the presence or absence of any vegetation species of conservation concern and evaluate habitat conditions. The assessment included detailed biological inventories and vegetation community characterization. Six community classes were identified across the Study Area.

Vegetation communities classified via standard ecological land classification (ELC) procedures and protocols are grouped to represent lands 0.5 hectares or greater, however, given the anticipated Project impacts, the following provides a summary of the main findings within the Study Area's Right-of-Way (ROW).

The greenspaces within the ROW associated with the Study Area east of Ridgeway Drive are characteristic of cultural urban features and are established with manicured grass intermixed with disturbance adapted graminoids and forbs. Streetscaping and naturalized trees were also inventoried as part of the assessment. No listed vegetation species covered under the Endangered Species Act (2007) were observed within the Study Area limits in this location. No vegetation species of conservation concern were observed within the Study Area limits in this location.

The greenspaces within the ROW associated with the Study Area between Ridgeway Drive and Ninth Line, included predominantly cultural features; manicured grass and establishment of invasive and disturbance adapted graminoids, forbs. Landscaping associated with adjacent developments (commercial/industrial to the south and institutional school sports field north of Burnhamthorpe Road West) as well as naturalized trees/shrubs were inventoried as part of the assessment. No listed vegetation species covered under the Endangered Species Act (2007) were observed within the Study Area limits in this location. No vegetation species of conservation concern were observed within the Study Area limits in this location.

Wildlife

Mammals

The Study Area falls within Ecoregion 7E (Lake Simcoe-Rideau). Representative mammalian fauna in this region include White-tailed Deer (*Odocoileus virginianus*), Northern Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Virginia Opossum (*Didelphis virginiana*), and Woodchuck (*Marmota monax*). Eastern Cottontail (*Sylvilagus floridanus*), and Grey Squirrel (*Sciurus carolinensis*) was observed in the Study Area, east of Highway 403.

No other mammals were observed at the time of the site investigation, however, portions of the undeveloped meadows may be utilized by deer populations should they occur in the area.

Birds

A review of available bird observation data from the Ebirds Canada and Ontario Breeding Bird Atlas (OBBA) databases was completed as part of the assessment. Records for 30 species have been observed within 10 km of the Study Area. A review of Ministry of Natural Resources and Forestry (MNRF) records indicated the historical presence of Henslow's Sparrow (*Ammodramus henslowii*) within a 1 km radius of the Study Area (last observation record dated 1932). This observation was taken into consideration as part of the assessment.

CIMA+ observed 17 bird species throughout the duration of the field investigations which included point counts taken from the right-of-way across the length of the Study Area. Point counts were taken in late May 2018 in the morning hours (between 7:20 am and 9:00 am). Visual and auditory observations outside of the point count stations were also noted. The dominant species observed through visual confirmation and/or auditory calls included American Robin (*Turdus migratorius*), Rock Pigeon (*Columba livia livia*), Mourning Dove (*Zenaida macroura*), Cedar Waxwing (*Bombycilla cedrorum*), American Goldfinch (*Spinus tristis*), Northern Cardinal (*Cardinalis cardinalis*), House Finch (*Haemorhous mexicanus*), European Starling (*Sturnus vulgaris*), American Crow (*Corvus brachyrhynchos*), Red-winged Blackbird (*Agelaius phoeniceus*), and Ring-billed Gull (*Larus delawarensis*).

One American Robin nest was observed in a Manitoba Maple tree adjacent to the recreational sports field on the north side of Burnhamthorpe Road West at the west end of the Study Area. No other wildlife nests were observed in the Study Area at the time of the site investigations.

Barn Swallows (*Hirundo rustica*) were listed in the Ebirds Canada database, however, no Barn Swallows were observed (visual or auditory) in the Study Area at the time of the site investigation. Barn Swallows are known to occasionally nest in culverts. All culverts were inspected during the site investigation; no Barn Swallows or other wildlife nesting structures were observed within any of the culverts present within the Study Area.

No SAR species were observed (visual or auditory) within or adjacent to the Study Area at the time of the investigations.

Amphibians and Reptiles

CIMA+ biologists accessed the Ontario Reptile and Amphibians Atlas to perform a search of reptile and amphibian observations recorded within the 10 square-kilometre grid which covers the Study Area. 537 herpetofauna observation records were found, totalling 25 species, 16 species of which have been observed within the last 15 years. Six species of conservation concern were among the list.

One Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) was observed in the field edge adjacent to the agricultural development located at the north-west corner of Burnhamthorpe Road East and Ninth Line. No other herpetofauna species were observed during the field investigation. No roadkill, carapaces, snakeskins, egg shells, tracks, nests or other evidence of turtles or snakes were observed at the time of the field investigations.

Where records of listed species at risk or species of conservation concern were observed by others (conservation authority, MNR, wildlife atlases, etc.), they were included in the Species at Risk (SAR) Screening Assessment.

Species at Risk

A SAR Screening Assessment was completed to evaluate known SAR occurrences in the area against specific local habitat features identified during field investigations to determine the likelihood of SAR utilizing lands within or near the Study Area. Eight SAR were identified as being potentially present in the Study Area vicinity but not within the study area itself (i.e. outside of the area of impact).

Phase One Environmental Site Assessment

A Phase One Environmental Site Assessment (ESA) was conducted to determine the likelihood for the presence or absence of areas of potential environmental concern in relation to the proposed construction works where one or more contaminants of concern may have impacted the land or water on, in or under the study area. A review was conducted of the environmental, geological, and historical land use records, persons with knowledge of the property were interviewed and a site

reconnaissance was undertaken. The results of the review identified 30 potentially contaminating activities (PCAs) within the study area, of which two were directly adjacent to Burnhamthorpe Road West.

The PCAs were evaluated as possible areas of potential environmental concern (APECs) in relation to the proposed construction works on the basis of the observations noted during the site reconnaissance, the location and distance of the PCA from Burnhamthorpe Road, the nature and timeframe of the activity, the quantity and nature of substances involved in the PCA, the low permeability of the underlying silty clay soils that are typical of the area, and preferential transport pathways between the PCA location and Burnhamthorpe Road. The evaluation results identified five PCAs related to the potential presence of fill materials and the historical application of pesticides that are expected to contribute to two APECs on Burnhamthorpe Road.

The potential media impacts, if any, are anticipated to consist of the shallow soil conditions since the PCAs involve surface applications of pesticides and the presence of shallow fill materials that may exist within the road allowance or within the raised embankments for the Highway 403 overpass. In addition, low permeable silty clay soils likely underlie Burnhamthorpe Road which would help minimize the vertical migration of potential contaminants, and the depth to the water-bearing layers is more than approximately 10 m below grade.

In this regard, a Phase Two ESA involving an investigation of the shallow soil conditions is recommended to address the APECs identified on Burnhamthorpe Road that may impact the planned construction activities associated with the widening of Burnhamthorpe Road West.

Cultural Environment

Stage 1 Archaeological Assessment

A Stage 1 Archaeological Assessment was completed for the Burnhamthorpe Road West Improvements Class EA. The Stage 1 background assessment resulted in the identification of several features of archaeological potential within the vicinity of the study corridor. The closest and most relevant indicators of archaeological potential include a variety of secondary water sources (i.e., tributaries of the Credit River and Joshua's Creek), two historically-surveyed roadways (Burnhamthorpe Road West and Ninth Line), one church, one schoolhouse, twelve farmsteads, and one registered archaeological site. One historic community (Snider's Corners) is located adjacent to the southwestern extent of the study corridor however it is not located within the study area. It was determined that the study corridor contains no archaeological potential due to previous disturbance by past earth-moving construction activities. Since the study corridor does not contain archaeological potential, further assessment is not required.

Cultural and Built Heritage

A Cultural Heritage Resource Assessment (CHRA) was completed for the Burnhamthorpe Road West corridor within the study limits. The purpose of the assessment was to identify and evaluate the cultural heritage resources within the study area that may be impacted by improvements to Burnhamthorpe Road West. The CHRA included:

- Background research concerning the project context and historical context of the study area
- Consultation with the City of Mississauga, Town of Oakville, and Peel Art Gallery Museum + Archives (PAMA) staff regarding heritage matters in the study area
- Identification of any designated or recognized properties within the limits of the study area
- On-site inspection and photo documentation

After conducting historical research, consultation, and field survey, no cultural heritage resources were identified within the study area. Therefore, there are no concerns with respect to built heritage

resources and cultural heritage landscapes related to any proposed improvements to Burnhamthorpe Road West from Loyalist Drive to the West City Limit (Ninth Line) in the City of Mississauga.

Drainage and Stormwater Management

A Drainage and Stormwater Management Assessment was conducted to review the existing and future drainage conditions for the study area. To the west of the study area, stormwater drainage from Ninth Line to Ridgeway Drive drains to Joshua's Creek watershed, within the jurisdiction of the Conservation Halton (CH). To the east, stormwater drainage from approximately Ridgeway Drive to Loyalist Drive drains to the Loyalist Creek sub-watershed, within the jurisdiction of the Credit Valley Conservation Authority (CVC).

Burnhamthorpe Road West from Ninth Line to Ridgeway Drive, is a rural cross-section with existing gravel shoulders and ditching primarily draining to the Highway 403 drainage system, ultimately outletting to Joshua's Creek tributary. Burnhamthorpe Road West from Ridgeway Drive to Loyalist Drive is a semi-rural cross-section with a gravel shoulder and ditching, draining to a ditch inlet storm sewer system outletting to a 2100 mm trunk sewer at Bangor Road, ultimately draining to the Collegeway stormwater management facility, subsequently to Loyalist Creek tributary.

The existing storm sewer on Burnhamthorpe Road West ranges in size from a 375 mm to 675 mm concrete sewer. A review of the existing sewer capacity confirms that the storm sewer system has adequate capacity to accommodate proposed flows related to a widening of Burnhamthorpe Road.

Utilities

The utilities in the corridor include aerial hydro, telephone, cable, storm sewer and future watermain.

Alectra Utilities has hydro poles located primarily on the north side of Burnhamthorpe Road West within the study limits. Hydro poles are also located on the south side of the road at intersections and intermittently along the corridor.

Peel Region completed the construction of a watermain along Burnhamthorpe Road West within the study limits in late 2018/ early 2019. An existing storm sewer was present that was built when the road was reconstructed at the time of development.

Bell Canada has an existing conduit and buried cable on the south side of Burnhamthorpe Road. The facilities cross Burnhamthorpe intermittently.

Rogers Communications has facilities that cross Burnhamthorpe Road at Ridgeway Drive and Colonial Drive. East of Colonial Drive, the facilities are present on the south side of Burnhamthorpe Road extending past Loyalist Drive.

Alternative Solutions

Seven alternative solutions were examined as part of this Class EA study to address the problems and opportunities in the study area:

| Alternative Solution | Description |
|--------------------------------|--|
| Alternative Solution #1 | <p>Do Nothing</p> <p>Burnhamthorpe Road West would remain a two-lane road between Loyalist Drive and Ninth Line. There would not be any improvement to active transportation elements or to local intersections. Level of Service would decrease over time resulting in a relative decrease in air quality due to increased congestion.</p> |
| Alternative Solution #2 | <p>Diverting traffic or developing Transportation Demand Management (TDM) strategies</p> <p>Includes the promotion of the use of alternative modes of transportation including transit, cycling and walking in order to reduce vehicle volumes on Burnhamthorpe Road. TDM strategies also include measures to manage travel demand, such as carpooling and flexible work hours. These TDM strategies can be achieved through implementation of the City-wide TDM policies. TDM does not result in sufficient traffic reductions to adequately address future transportation needs. However, TDM strategies are included in the City's overall Transportation strategy and can be incorporated as part of an overall solution but TDM is not sufficient as a stand-alone solution.</p> |
| Alternative Solution #3 | <p>Resolving the deficiency elsewhere in the network</p> <p>Involves improvements to roadways adjacent to the immediate study area, such as Dundas Street and Eglinton Avenue, to reduce future traffic demand on Burnhamthorpe Road West. Given the built up nature of the lands surrounding Burnhamthorpe Road, there are no opportunities for new east-west roads that would attract traffic away from Burnhamthorpe Road. Dundas Street is an existing 6-lane arterial with limited opportunity for widening. Eglinton Avenue is 4-lanes west of Winston Churchill Boulevard (WCB) and 6-lanes east of WCB and would have limited opportunities for widening.</p> |
| Alternative Solution #4 | <p>Providing and/or improving active transportation facilities including extending the multi-use trail</p> <p>Implementation of new active transportation facilities on Burnhamthorpe Road West would support future traffic demands and improve accessibility for pedestrians and cyclists within the study area. Burnhamthorpe Road is identified as a proposed primary boulevard route within the Mississauga Cycling Master Plan (September 2010) and the implementation of a multi-use trail on the north side would provide connectivity to the existing active transportation network east of the study area.</p> |

| | |
|---------------------------------------|---|
| <p>Alternative Solution #5</p> | <p>Improving operations at localized intersections</p> <p>Improving traffic operations at intersections within the study area, such as the retiming of traffic signals and provision of turning lanes, would improve the overall efficiency of Burnhamthorpe Road West (i.e. maximize throughput) and the surrounding road network. The improvement of intersections as a stand-alone solution does not support the future traffic demand on Burnhamthorpe Road West and provides a marginal increase in Level of Service. However, improvements to localized intersections are incorporated in 'Improvement of Burnhamthorpe Road West from Loyalist Drive to the West City Limit through widening' solution.</p> |
| <p>Alternative Solution #6</p> | <p>Improving transit operations with safe access to transit stops</p> <p>Between Loyalist Drive and the West City Limit, Burnhamthorpe Road West is serviced by one bus route which operates between Colonial Drive and Ridgeway Drive, and Loyalist Drive and Winston Churchill Boulevard. Implementation or improvement of transit services on Burnhamthorpe Road West and the provision of transit infrastructure including transit stops can improve transit access to the study area, however this route (or corridor) is not identified in the City's long-range transportation policies.</p> |
| <p>Alternative Solution #7</p> | <p>Improvement of Burnhamthorpe Road West from Loyalist Drive to the West City Limit through widening</p> <p>Improvement of Burnhamthorpe Road West from Loyalist Drive to the West City Limit through widening involves widening the roadway to increase capacity with additional travel lanes, to support future traffic demands and deficiencies identified in the long-range transportation policies. This solution also includes improvements to localized intersections.</p> |

Alternative Solution #1 - 'Do Nothing,' is not a feasible solution as it would not address the problems and/or opportunities identified for the study corridor. Although this alternative is not feasible, it was included in the assessment as a benchmark for comparison purposes.

Implementing **Alternative Solution #2 - Travel demand management measures**, does not fully address the problems and/or opportunities identified for the study corridor. This alternative however, will be carried forward in the Class EA as part of the preferred solution.

Alternative Solution #3 - Resolving the deficiency elsewhere in the network, was also considered as an alternative solution. However, this alternative was identified in the City of Mississauga TMP and will be implemented separately as part of a city-wide transportation improvement strategy to support future travel demand. The TMP confirmed the need for improvements to Burnhamthorpe Road in addition to other roadways, and therefore any plans to improve other roadways as part of the city-wide transportation strategy does not eliminate the need to improve Burnhamthorpe Road.

Alternative Solution #4 - Providing and/or improving active transportation facilities, does not fully address the problems and/or opportunities identified for the study corridor given the magnitude of the projected increase in traffic volumes. However, this alternative was carried forward in the Class EA as part of the preferred solution.

Alternative Solution #5 - Improving operations at localized intersections, does not fully address the problems and/or opportunities identified for the study corridor as a stand-alone solution as it does not support the future traffic demand on Burnhamthorpe Road West and provides a marginal increase in Level of Service. This alternative was carried forward in the Class EA as part of the preferred solution as the improvement to Level of Service provides contributes to the preferred solution in conjunction with improvements through widening (Alternative #7).

Alternative Solution #6 - Improving transit operations with safe access to transit stops, was also considered as an alternative solution. However, modifications to the transit service within the study limits is not identified in the City's long-range transportation policies. Improvements to transit infrastructure (i.e. bus shelters) will be considered as part of the 'improvements to Burnhamthorpe Road West' alternative solution.

Alternative Solution #7 - Improvements to Burnhamthorpe Road West through widening was identified in the City of Mississauga long-range transportation policies. Further, this alternative solution was justified by the needs analysis completed during Phase 1 of this Class EA. Improving Burnhamthorpe Road West through widening combined with transportation demand management and active transportation, is the only solution among the alternatives considered that fully addresses the problems and/or opportunities identified in this study.

Based on the analysis and evaluation of alternative solutions and feedback received from the public and stakeholders, the preferred planning solution was selected as a combination of the following:

- Improvement of Burnhamthorpe Road West from Loyalist Drive to the West City Limit through widening
 - Providing and/or improving active transportation facilities including extending the multi-use trail
 - Improving operations at localized intersections
- Diverting traffic or developing Transportation Demand Management strategies

Phase 1 and 2 Consultation

During Phases 1 and 2 of the study, the public was notified of the commencement of the Class EA and invited to attend a Public Information Centre (PIC) to review the study progress and provides comments. Meetings with stakeholders and agencies were held to receive feedback on the preliminary preferred solution prior to the PIC. The consultation activities undertaken during Phases 1 and 2 of the Class EA are discussed below.

Notice of Study Commencement

The Notice of Study Commencement was prepared to inform agencies and the public of the initiation of the Class EA study. The notice was advertised in Mississauga News the on January 11 and January 18, 2018. It was mailed to approximately 1,312 landowners in the study area.

Invitations to participate in the study were mailed to approximately 24 agency representatives. The invitations were sent with the Notice of Commencement and accompanying reply form to indicate interest in participating in the study.

Public Information Centre No.1

The Notice of Public Information Centre No. 1 was prepared to inform the public and agencies of the opportunity to review the project and provide input. The Notice was advertised in the Mississauga News on February 22 and March 1, 2018. The Notice was emailed or mailed to 19 agency representatives and 1,359 property owners and interested members of the public on February 22, 2018. A covering letter was provided with the Notice to agencies.

The Notice of Public Information Centre No. 1 outlined the purpose of the meeting and identified the time, date, and location for the PIC. The Notice invited public comments on the study by either attending the PIC or contacting the project team.

The PIC was held on March 7, 2018 from 6:00 PM to 8:00 PM at the Erin Mills Twin Arena All Purpose Room (AODA accessible) at 3205 Unity Drive in the City of Mississauga. The PIC was held in an open-house format where the public was invited to review display boards, ask questions, and discuss comments with the project team. The display boards described the following:

- Welcome and Introduction
- Purpose of Public Information Centre No. 1
- Study Context and Overview
- Comment Received to Date
- Survey Results
- Municipal Class EA Process and Study Schedule
- Planning and Policy Context
 - Growth and Transportation
 - Cycling & Transit
- Existing Conditions
 - Land Use, Natural Heritage and Tree Inventory
 - Cultural Heritage
 - Transportation
- Future Conditions Without Improvements
- Problem and Opportunity Statement
- Alternative Solutions
- Evaluation Criteria
- Analysis and Evaluation of Alternative Solutions
- Preferred Alternative Solution
- Consideration of Design Concepts
- Initial Look at Design Concepts
- Next Steps

A sign-in sheet and comment sheets were provided to record attendance and obtain written comments. Thirty-seven (37) people signed into the PIC and twelve (12) comments were received through comment sheets and email correspondence.

The following general comments were submitted and noted by the project team during the PIC:

Traffic Operations and Traffic Safety

- Desire to widen Burnhamthorpe Road and provide additional traffic lanes

- Heavy truck volumes and consideration for a by-law restricting commercial vehicles along this section of Burnhamthorpe Road
- Concerns that widening the road will lead to an increase in vehicle traffic
- Consideration for the provision of a dedicated “kiss & go” drop-off for Loyola High School or police enforcement at this location
- Excessive vehicle speeds on Burnhamthorpe Road
- Need for improved signal timing and advanced left-turns at all intersections in the study area
- Need for traffic calming along Burnhamthorpe Road (i.e. speed bumps)

Parking

- Insufficient parking at Iglesia Ni Cristo church resulting in cars parking along the shoulder of Burnhamthorpe Road and suggestions that a shuttle service could be considered to relocate the parking

Social Impacts

- Noise concerns related to vehicle volumes and discussion regarding noise barriers

Transit

- Consideration for bus pull-offs at mid-block transit stops
- Desire for an increase in transit service

Streetscaping and Illumination

- Relocation of hydro poles to a buried facility and additional illumination
- Concern that the recently installed hydro poles will require relocation if Burnhamthorpe Road is widened to 4-lanes
- Desire for improved landscaping and maintenance of existing trees

Active Transportation and Pedestrian/Cyclist Safety

- Request for sidewalks and multi-use path on both sides of the roadway that are accessible for wheelchairs
- Existing safety hazard for students crossing Burnhamthorpe Road via the Bangor Road sidewalk opening which can be misleading causing pedestrians to cross Burnhamthorpe Road without a pedestrian crossing
- Consideration for a dedicated pedestrian underpass at Bangor Road across to Dolson Court
- Desire for bicycle lanes
- Concerns regarding high bicycle speeds if dedicated facilities are provided

Ministry of Transportation

Two meetings were held with the Ministry of Transportation (MTO) as part of the study. The first meeting was held on January 19, 2018 in advance of Public Information Centre No. 1. The purpose of the meeting was to introduce the study and receive feedback from MTO on the proposed cross-section over Highway 403.

A second meeting with MTO was held during Phase 3 of the study.

Iglesia Ni Cristo

Two meetings were held with representatives of Iglesia Ni Cristo. The first meeting was held on April 4, 2018. The congregation currently utilizes the shoulders of Burnhamthorpe Road West

within the study limits for overflow parking during services. The purpose of the meeting was to provide Iglesia Ni Cristo with an overview of the study and discuss the preferred solution as well as options regarding the parking, as the gravel shoulders along Burnhamthorpe would no longer be available if widened to 4-lanes with an urban cross-section.

A second meeting with Iglesia Ni Cristo was held during Phase 3 of the study.

Indigenous Communities

At the onset of the study, the Ministry of Environment, Conservation and Parks was contacted to confirm the list of Indigenous Communities that were identified as being potentially interested in the study. The following communities were identified and confirmed by MECP:

- Six Nations of the Grand River
- Haudenosaunee Confederacy
- Mississaugas of the New Credit First Nation
- Huron Wendat (they will be notified if artifacts are discovered through any archaeological studies completed)

The communities identified above were sent a copy of the Notice of Study Commencement and Notice of Public Information Centre No.1. Comments in response to the notice were received from Huron Wendat. A copy of the correspondence is provided in Appendix I.

Alternative Design Concepts

Five alternative design concepts were examined as part of this Class EA study for the preferred solution (Section 5):

| Alternative Design Concept | Description |
|---|--|
| <p>Alternative Design Concept #1</p> | <p>‘Do Nothing’</p> <p>Burnhamthorpe Road West would remain a two-lane road between Loyalist Drive and Ninth Line. There would not be any improvement to active transportation elements or to local intersections. Level of Service would decrease over time resulting in a relative decrease in air quality due to increased congestion.</p> |
| <p>Alternative Design Concept #2</p> | <p>Widen Burnhamthorpe Road West to 4 Lanes</p> <p>Involves widening the roadway to increase capacity with additional travel lanes, to support future traffic demands and deficiencies identified in the long-range transportation policies. This solution also includes improvements to localized intersections. The alternative includes a multi-use trail on the north side of Burnhamthorpe Road within the study limits.</p> <p>An example of Alternative Design Concept #2 at the Burnhamthorpe Road and Ridgeway Drive intersection is provided in Figure 1.</p> <p>An example of Alternative Design Concept #2 150 metres west of Loyalist Drive is provided in Figure 2.</p> |

| Alternative Design Concept | Description |
|--------------------------------------|---|
| Alternative Design Concept #3 | <p>Widen Burnhamthorpe Road West to 4 Lanes with In-Boulevard Parking on the South Side</p> <p>Involves widening the roadway to increase capacity with additional travel lanes, to support future traffic demands and deficiencies identified in the long-range transportation policies. This option also includes the provision of approximately 150 metres of in boulevard parking on the south of Burnhamthorpe Road west of Loyalist Drive and a multi-use trail on the north side of Burnhamthorpe Road within the study limits.</p> <p>An example of Alternative Design Concept #3 150 metres west of Loyalist Drive is provided in Figure 3.</p> |
| Alternative Design Concept #4 | <p>Widen Burnhamthorpe Road West to 4 Lanes with Intersection Improvements at Ridgeway Drive</p> <p>Involves widening the roadway to increase capacity with additional travel lanes, to support future traffic demands and deficiencies identified in the long-range transportation policies. This option also includes double left turn lanes northbound at Ridgeway Drive to improve intersection operations and a multi-use trail on the north side of Burnhamthorpe Road within the study limits.</p> <p>An example of Alternative Design Concept #4 at the Burnhamthorpe Road and Ridgeway Drive intersection is provided in Figure 4.</p> |
| Alternative Design Concept #5 | <p>Widen Burnhamthorpe Road West to 4 Lanes with a Roundabout at Ridgeway Drive</p> <p>Involves widening the roadway to increase capacity with additional travel lanes, to support future traffic demands and deficiencies identified in the long-range transportation policies. This option also includes a roundabout at the intersection of Burnhamthorpe Road and Ridgeway Drive and a multi-use trail on the north side of Burnhamthorpe Road within the study limits.</p> <p>An example of Alternative Design Concept #5 at the Burnhamthorpe Road and Ridgeway Drive intersection is provided in Figure 5.</p> |

Alternative Design Concept #1 - 'Do Nothing,' was included in the set of alternatives as a baseline measure of the effects of the other alternatives on the environment.

Assessment of Alternative Design Concepts

Each of the five alternative design concepts were assessed for effectiveness based on their advantages and disadvantages. The alternatives were evaluated to determine the recommended alternative design concept based on the following factors:

| Evaluation Category | Evaluation Factor |
|-----------------------------------|---|
| Transportation and Transit | <ul style="list-style-type: none">• Level of Service (LOS)• Traffic Safety• Compatibility with Existing Network and City Planning Policies |
| Natural Environment | <ul style="list-style-type: none">• Terrestrial• Wildlife |
| Socio-Economic | <ul style="list-style-type: none">• Land Use• Air Quality• Noise• Archaeology• Cultural/ Built Heritage• Accessibility |
| Climate Change | <ul style="list-style-type: none">• Climate Change |
| Engineering | <ul style="list-style-type: none">• Drainage• Utilities• Staging• Implementation• Property Impacts |
| Economic | <ul style="list-style-type: none">• Cost |

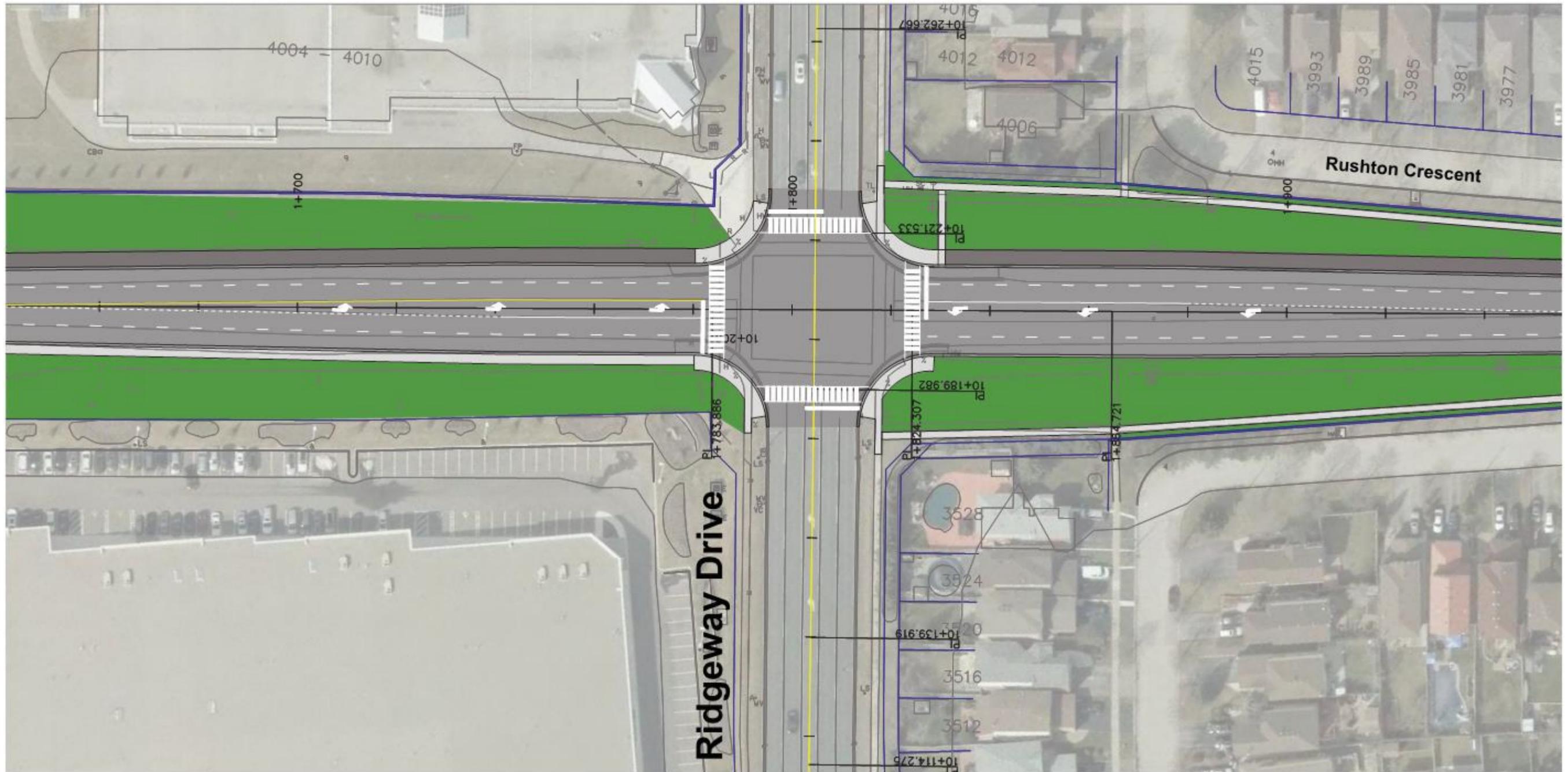


Figure 1: Alternative Design Concept #2 - Widen Burnhamthorpe Road West to 4 Lanes (No intersection Improvements at Ridgeway Drive)

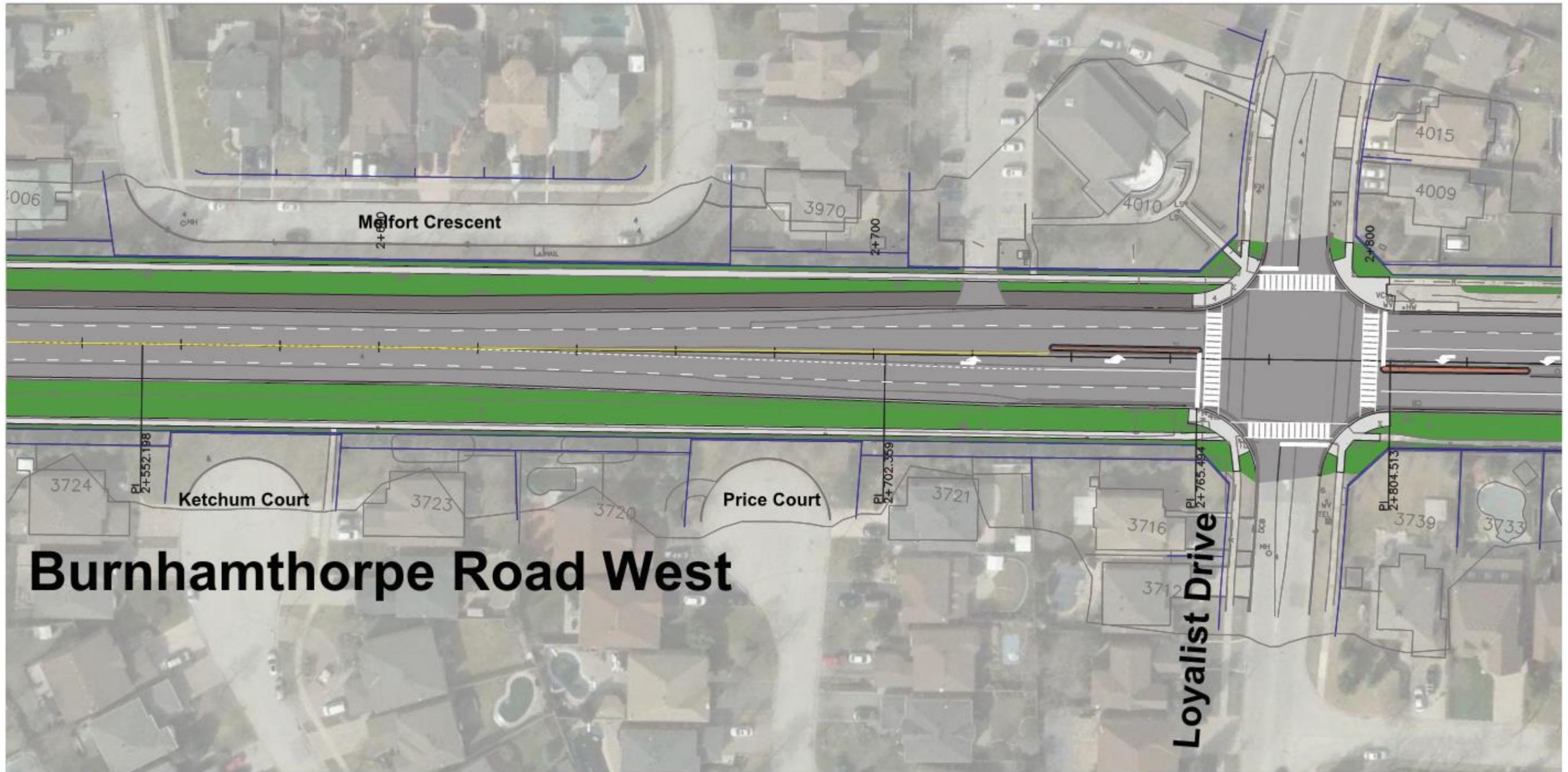


Figure 2: Alternative Design Concept #2 - Widen Burnhamthorpe Road West to 4 Lanes (No In-Boulevard Parking on the South Side)

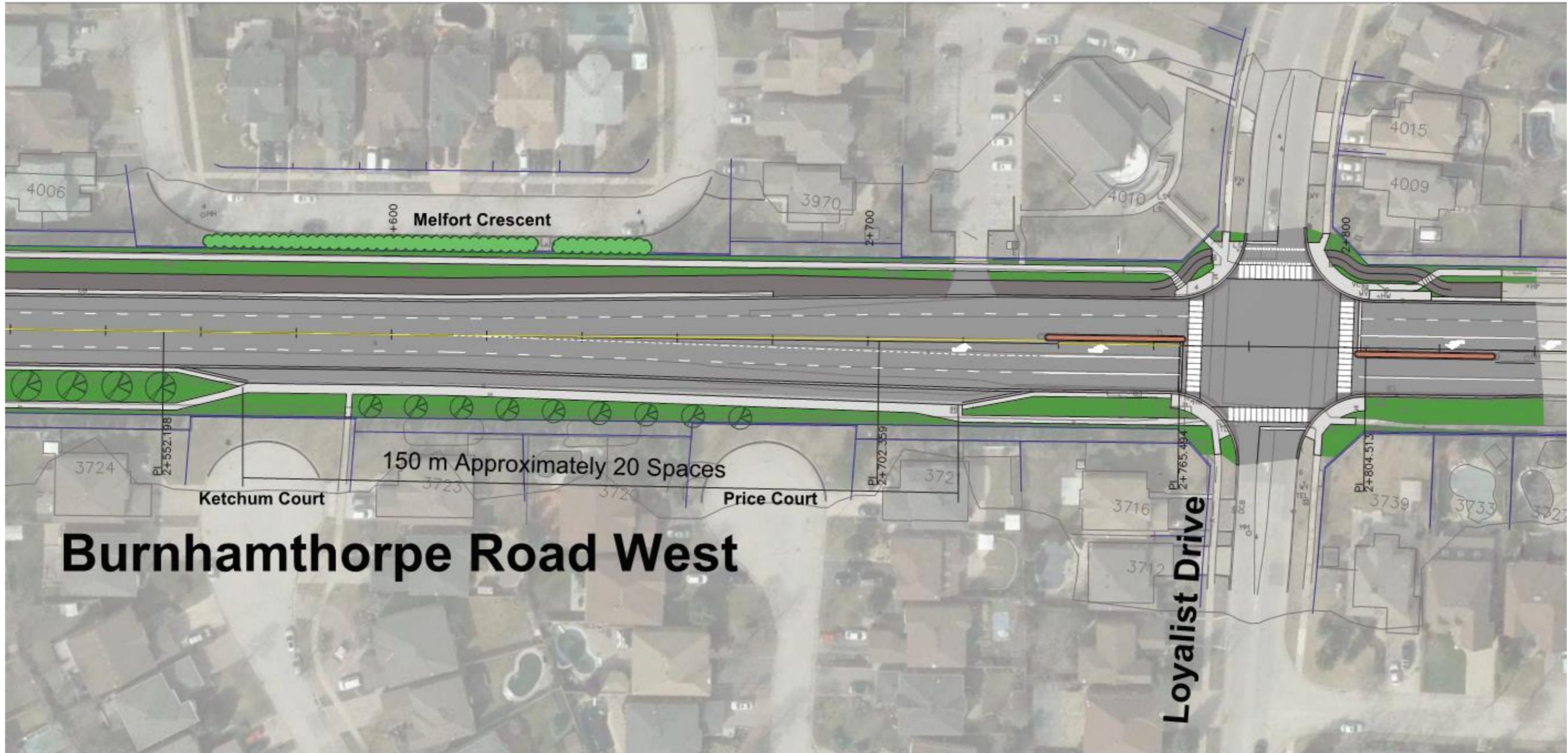


Figure 3: Alternative Design Concept #3 - Widen Burnhamthorpe Road West to 4 Lanes with In-Boulevard Parking on the South Side

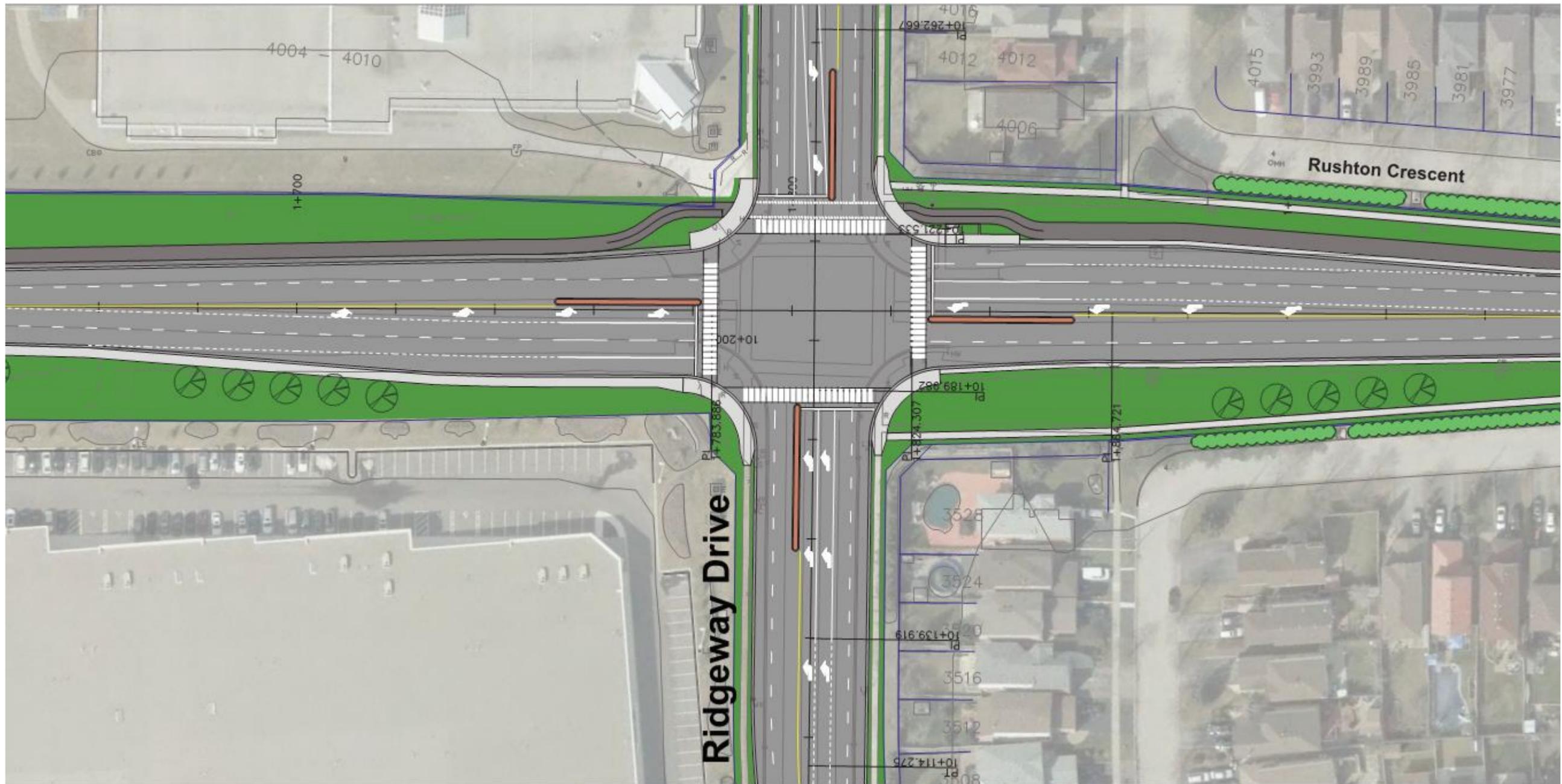


Figure 4: Alternative Design Concept #4 - Widen Burnhamthorpe Road West to 4 Lanes with Intersection Improvements at Ridgeway Drive

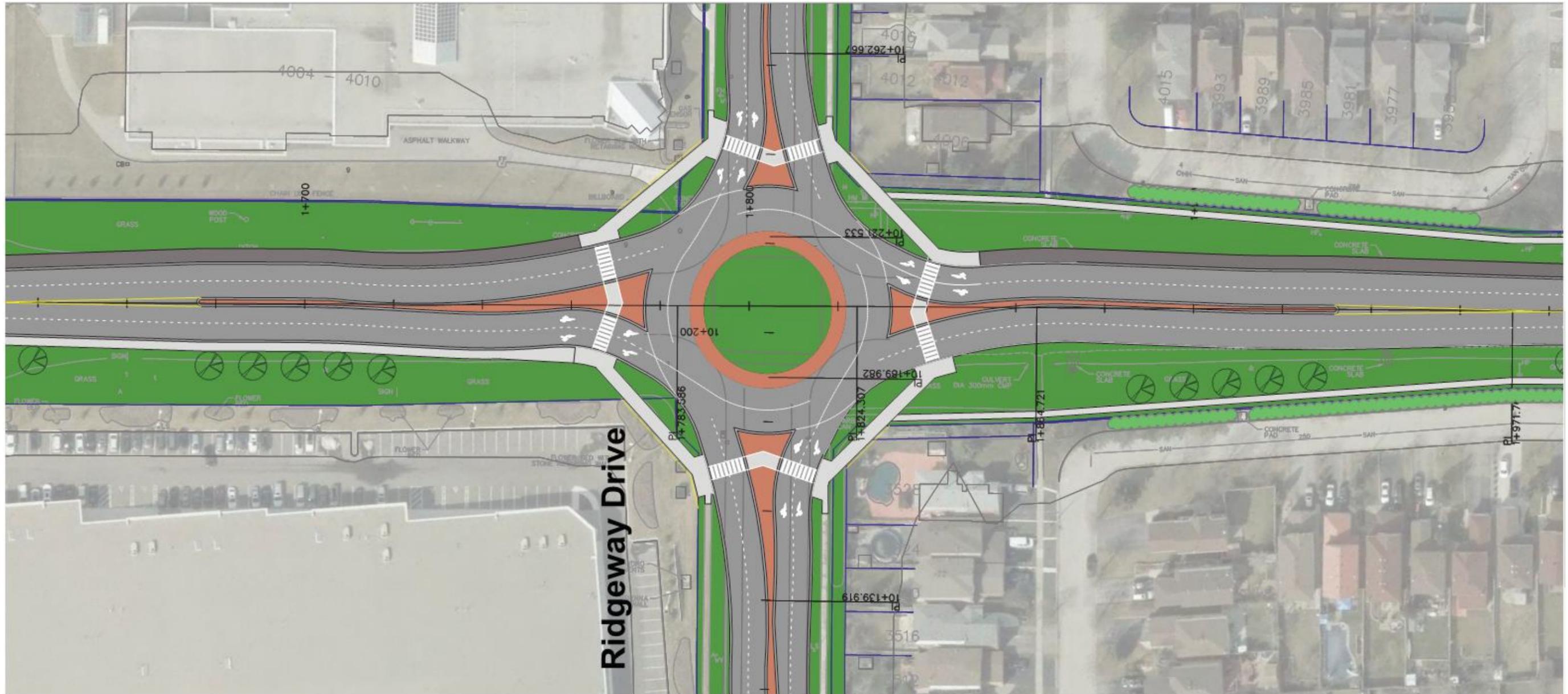


Figure 5: Alternative Design Concept #5 - Widen Burnhamthorpe Road West to 4 Lanes with a Roundabout at Ridgeway Drive

Alternative Design Concept #1 – ‘Do Nothing’, is was not selected as the recommended alternative design concept as the future traffic demand and safety deficiencies within the study area are not addressed.

Both **Alternative Design Concept #2 - Widen Burnhamthorpe Road West to 4 Lanes** and **Alternative Design Concept #3 - Widen Burnhamthorpe Road West to 4 Lanes with In-Boulevard Parking on the South Side**, address some of the operational and safety deficiencies within the study area however, during the PM peak, westbound queues at Burnhamthorpe Road & Ridgeway Drive may extend to the signal at Burnhamthorpe Road & Colonial Drive.

Alternative Design Concept #3 - Widen Burnhamthorpe Road West to 4 Lanes with In-Boulevard Parking on the South Side provides on-road parking to accommodate vehicles that currently park on the shoulder of Burnhamthorpe Road. The on-road parking has been carried forward to the preferred design concept (to be revisited during detailed design).

Alternative Design Concept #5- Widen Burnhamthorpe Road West to 4 Lanes with a Roundabout at Ridgeway Drive, addresses the future traffic demand and safety deficiencies within the study area, including the queuing at the intersection of Ridgeway Drive and Burnhamthorpe Road. The implementation of a roundabout would have impacts to properties on all four corners of the intersection and has the highest cost compared to other alternative design concepts. Pedestrians would also be required to cross two lanes of traffic and a PXO is required on all legs of the roundabout.

Alternative Design Concept #4 - Widen Burnhamthorpe Road West to 4 Lanes with Intersection Improvements at Ridgeway Drive, addresses future traffic demand and safety deficiencies within the study area, including the queuing at the intersection of Ridgeway Drive and Burnhamthorpe Road. There are no impacts to private property or green space associated with this design concept. Therefore, Alternative Design Concept #4 was identified as the preferred alternative.

Based on the evaluation of alternative design concepts and feedback received from the public and stakeholders, Widen Burnhamthorpe Road West to 4 Lanes with Intersection Improvements at Ridgeway Drive was selected as the preliminary preferred alternative design.

Elements of the Preferred Alternative include:

- Widening to 4-thorough lanes within the existing right-of-way
- Sidewalks on both sides of the road
- A multi-use trail on the north side
- Approximately 150 metres of in-boulevard parking on the south of Burnhamthorpe Road west of Loyalist Drive (to be revisited at detailed design)
- No significant structural impacts to the Highway 403 Bridge (discussed further in the ESR Section 6.2)
- No impacts to street trees adjacent to the roadway
- Intersection design compliance with Accessibility for Ontarians with Disabilities Act (AODA)
- Improvements at local intersections without impacting property
- Intersection improvements at Ridgeway Drive & Burnhamthorpe Road
- Enhanced landscaping features

Phase 3 Consultation

The public was engaged at a second PIC in Phase 3 of the study where the technically preferred alternative design concept was presented for public review and comments. Additional meetings with stakeholders and agencies were held to receive feedback on the technically preferred

alternative design concept. The consultation activities undertaken during Phase 3 of the Class EA are discussed below

Notice of Public Information Centre No.2

The Notice of Public Information Centre No. 2 was prepared to inform the public and agencies of the opportunity to review and provide comments on the alternative design concepts and the preliminary preferred design. The Notice was advertised in the Mississauga News on June 7 and 14, 2018. The Notice was emailed or mailed to 19 agency representatives and 1,332 property owners and interested members of the public on June 6, 2018. A covering letter was provided with the Notice to agencies.

The Notice of Public Information Centre No. 2 outlined the purpose of the meeting and identified the time, date, and location for the PIC. The Notice invited public comments on the study by either attending the PIC or contacting the project team.

Public Information Centre No. 2

The PIC was held on June 19, 2018 from 6:00 PM to 8:00 PM at the South Common Community Centre Arbour Green Room (AODA accessible) at 2233 South Millway in the City of Mississauga. The PIC was held in an open-house format where the public was invited to review display boards, ask questions, and discuss comments with the project team. The display boards described the following:

- Welcome and Introduction
- Purpose of Public Information Centre No. 2
- Study Context and Overview
- Municipal Class EA Process and Study Schedule
- Summary of Public Information Centre No. 1
- Existing Conditions
 - Land Use, Natural Heritage and Tree Inventory
 - Cultural Heritage
 - Transportation
- Future Conditions Without Improvements
- Recommended Planning Solution
- Future Conditions
 - Noise
 - Air Quality
 - Stormwater Management
- Alternative Design Concepts
 - Typical Cross-Section
 - Typical Cross-Section with In Boulevard Parking
- Evaluation Criteria
- Analysis and Evaluation of Alternative Design Concepts
- Preliminary Preferred Alternative Design
- Ridgeway Drive and Burnhamthorpe Road Intersection
- Typical Cross-Section Over Highway 403
- Enhanced Landscaping Features

- **Next Steps**

A sign-in sheet and comment sheets were provided to record attendance and obtain written comments. Twenty (20) people signed into the PIC and ten (10) comments were received through comment sheets and emails. A copy of the PIC display boards was also available on City's website.

The following general comments were submitted and noted by the project team during the PIC:

- Desire for improved signal timing along the corridor.
- Support for a buffer between the multi-use path and travel lanes.
- Concern regarding vehicles stopping on the road in non-designated areas near Loyola High School to drop students off.
- Support for not carrying forward the roundabout at Ridgeway Drive.
- Support for intersection improvements at Ridgeway Drive.
- Concerns regarding noise levels and preference for natural solutions (i.e. landscaping) rather than noise walls.
- Desire for noise attenuation.
- Request for a truck prohibition within the study limits.
- Request for a pedestrian crossing at the Dolson Court opening and traffic calming.
- Support for additional landscaping.
- Desire for a 50 km/h speed limit because of the proximity to the school.
- Support for the in-boulevard parking on Burnhamthorpe Road.
- Request for the in-boulevard parking to be provided on the north side.
- Opposition to the widening of Burnhamthorpe Road.
- Opposition to the in-boulevard parking on Burnhamthorpe Road.

Ministry of Transportation

A second meeting with the Ministry of Transportation (MTO) was held on June 12, 2018. The purpose of the meeting was to discuss the proposed Highway 403 structure cross-section and receive MTO's feedback.

Following ongoing correspondence and coordination with the MTO project team, a meeting with MTO Senior Management was held on June 24, 2019 to receive final sign-off on the recommended cross-section for the Highway 403 structure. At the meeting, the MTO approved a revised cross-section. A complete structural review of the recommended structure cross-section will be completed during detailed design in coordination with MTO.

Iglesia Ni Cristo

A second meeting with representatives of Iglesia Ni Cristo was held on June 8, 2018 to provide an overview of the preliminary recommended plan to be presented at PIC No. 2. The recommended plan included in-boulevard parking on the south side of Burnhamthorpe Road west of Loyalist Drive.

Indigenous Communities

The following Indigenous Communities were contacted during Phase 3 of the study with a copy of the Notice of Public Information Centre No.2:

- Six Nations of the Grand River
- Haudenosaunee Confederacy
- Mississaugas of the New Credit First Nation

- Huron Wendat

No comments were received from the Indigenous Communities in response to the Notice of Public Information Centre No. 2

Halton Region

A meeting with Halton Region was held on June 13, 2018 to provide an overview of the preliminary recommended alternative and discuss the approved roundabout at Ninth Line (Halton Region project).

City of Mississauga Council

During Phase 4, the study recommendations were taken to City of Mississauga Council for endorsement. At the meeting Council advised to remove the in-boulevard parking on the south side of Burnhamthorpe Road from the preferred design concept for the EA. Instead, a separate independent parking study will be undertaken by the City of Mississauga to assess possible alternatives to the parking concerns raised by Iglesia Ni Cristo Church and local residents.

Description of the Recommended Plan

Typical Cross-Section

The typical cross-section for the recommended plan is illustrated below. The cross-section was developed based on a 70 km/h design speed. The features provided in the typical cross-section include the following:

- 35 metre right-of-way
- Four 3.5 metre lanes (2 lanes in each direction)
- 1.5 metre sidewalks on both sides
- 3.5 metre multi-use trail on the north side
- 1.0 metre splash pad on the north side

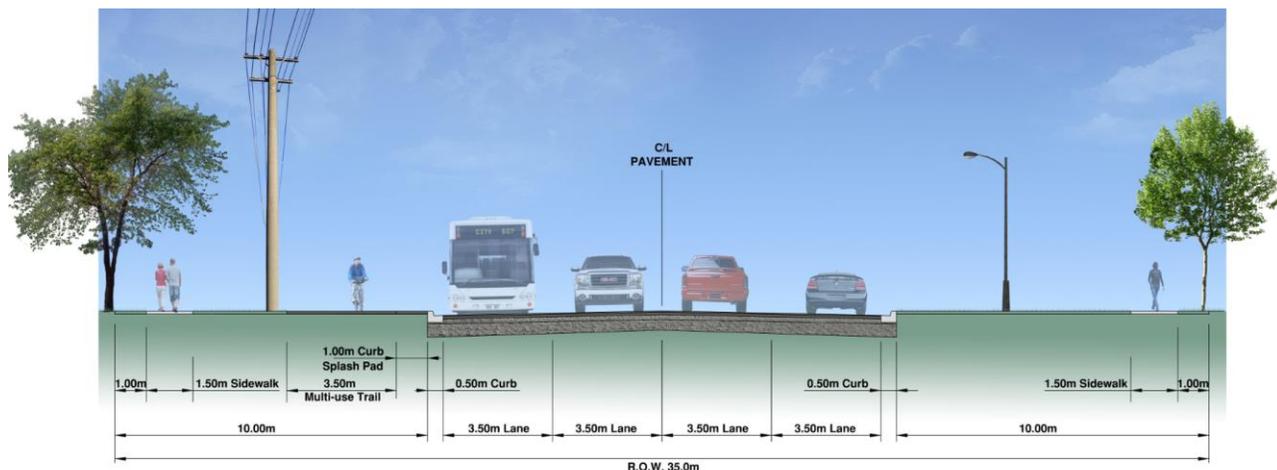


Figure 6: Typical Cross-Section

In areas where right-of-way is constrained (i.e. intersections), the cross-section has been modified in order to avoid impacts to private property.

The concept plan for the recommended design concept is provided at the end of this Executive Summary.

Intersections

A summary of the recommended improvements for each intersection are illustrated below.

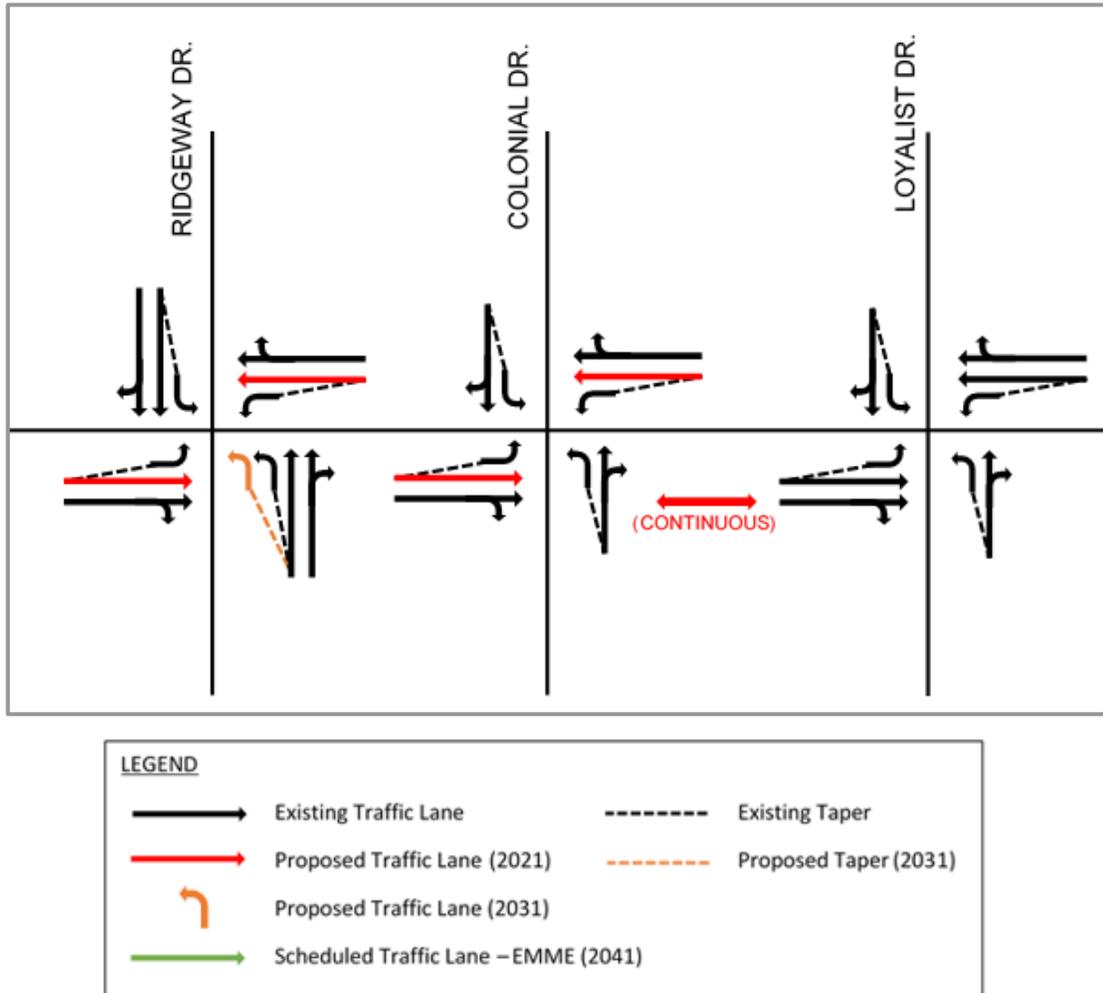


Figure 7: Recommended Intersection Improvements

The recommended plan includes the following elements at the Burnhamthorpe Road/Ridgeway Drive intersection:

- Additional northbound left-turn lane
- Additional eastbound through lane
- Exclusive westbound right-turn lane
- Additional westbound through lane

The recommended plan includes the following elements at the Burnhamthorpe Road/Colonial Drive intersection:

- Additional eastbound through lane
- Additional westbound through lane

Highway 403 Crossing

In consultation with MTO the recommended cross-section for the structure over Highway 403 was confirmed to include the following:

- A 0.3 m limited widening of the structure (in conjunction with the parapet wall replacement)
- A new parapet wall on the north side with a bicycle height railing
- A new 3.17 m raised multi-use trail on the north side
- 0.5 m painted buffer on the north side
- Four 3.5 m travel lanes
- 1.6 m raised sidewalk on the south side
- 0.7 m shoulder on the south side

The recommended cross-section for the Highway 403 structure is illustrated below.

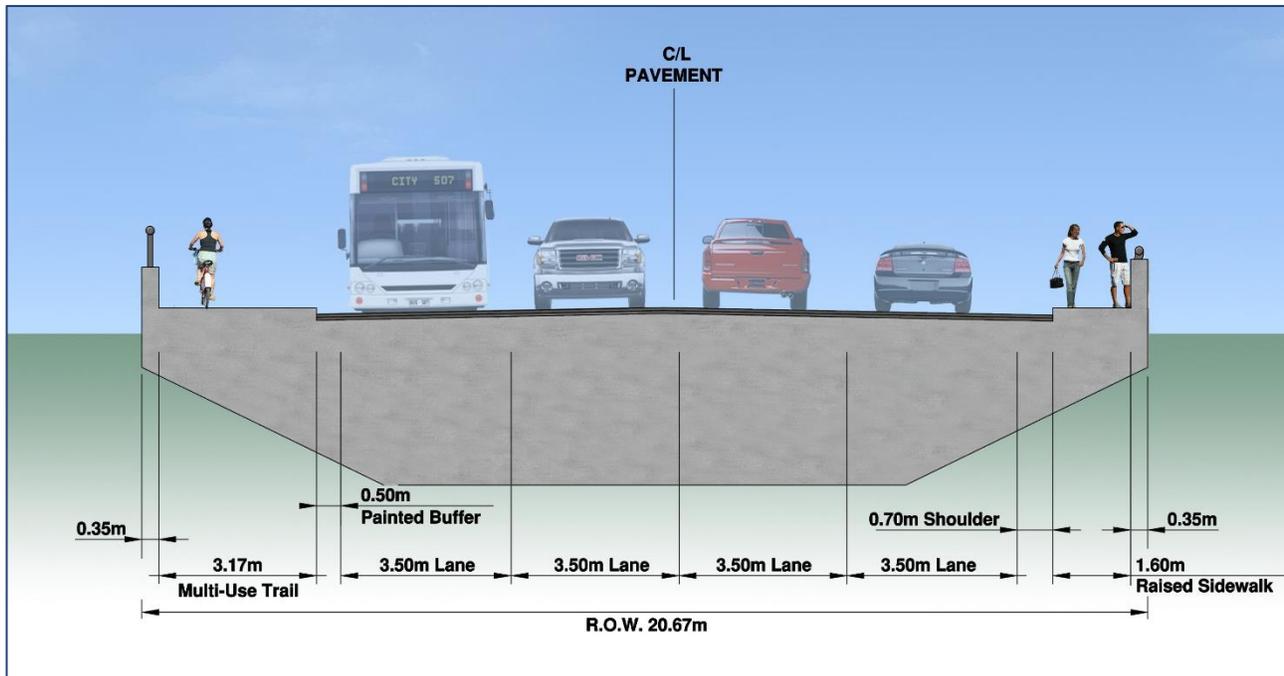


Figure 8: Typical Cross-Section - Highway 403 Structure

All of the elements provided in the recommended cross-section meet or surpass the minimum requirements outlined in the MTO Bikeway Design Manual and Canadian Highway Bridge Design Code. In order to meet the desired widths, full reconstruction of the Highway 403 structure would be required at a significant cost. A 0.3 metre limited widening of the structure will be undertaken in conjunction with the parapet wall replacement on the north side in order to provide adequate width for the multi-use trail. MTO confirmed that the 0.7 metre shoulder on the south side and 0.5 metre painted buffer on the north side are acceptable given that this is a constrained corridor. The travel lane widths are consistent with the recommended typical cross-section for Burnhamthorpe Road to the east.

As part of a separate Halton Region project, a roundabout is planned for the intersection of Burnhamthorpe Road (future William Halton Parkway) and Ninth Line (. The roundabout plans were received from Halton Region and reviewed as part of the study. The future curb lines of the roundabout align with the proposed curb lines of the recommended plan.

Structural Review

A structural review of the recommended cross-section was completed by Doug Dixon and Associates (DDA). A copy of the Structural Review Memo can be found in Appendix O of the ESR.

The following provides a summary of DDA's assessment of the impacts associated with the recommended cross-section and the modifications to the Highway 403 bridge.

The additional loading associated with the recommended cross-section and the 0.3 metre widening is estimated to be 3.7% of the rehabilitated mass (18.6 kN/m total additional dead load) which is not anticipated to result in any issues related to serviceability or ultimate performance of the bridge. This percentage (3.7%) is well within general tolerance for estimating loads and is adequately provided for in the load factors provided to the dead and live loads that would have been used in the 2012 evaluation at the time of the most recent rehabilitation to the structure. No impact to the structural integrity of the voided, post tensioned deck is anticipated.

The bridge bearings were also replaced during the 2012 rehabilitation when the bridge was converted to a semi-integral configuration. The new bearings are 600 mm x 500 mm x 80 mm elastomeric laminated. Using the calculated uniformly distributed load for the proposed multi-use trail of 18.6 kN/m, provides an additional reaction of approximately 200 kN to be carried by only the most northerly bearings. This is a conservative approximation of the increased reaction in the north bearing.

The Serviceability Limit State (SLS) capacity of this size of bridge is 1350 kN. Adding the additional 200 kN to the MRC calculated reactions (2012 rehabilitation) of 1145 kN provides a conservative upper limit estimate of the total dead load reaction equal to the SLS capacity of 1350 kN. Based on the structural review, no issues were found relating to the existing bearings ability to carry the dead load if the multi-use pathway is added.

To maintain a parapet wall that complies with the current Test Level (TL) and has been crash tested, the approach recommended is to remove the existing north parapet. The method of removing the existing parapet wall will be determined at the time of detailed design, however, saw cutting may be the most cost effective.

The 0.3 metre widening of the deck would be completed next, followed by the construction of the new raised multi-use trail.

To avoid transverse and longitudinal stressing tensions (over the pier) as well as tendon anchorages, ground penetrating radar or other similar testing methods would be used to identify possible conflict locations before the dowels are installed. As required, the location of the dowels can be adjusted nominally to avoid any interference.

A new parapet wall would be constructed on the sidewalk to meet the requirements of SS110-57. A metal railing on top of the parapet to meet the requirements for a bicycle height barrier would be installed. This could be the standard railing SS110-85.

The existing sign board must be mounted on the north parapet over the southbound lane of Highway 403 would need to be removed, salvaged, temporarily installed on ground mounted supports during construction and reinstated at the conclusion of the work.

Additional structural details and calculations are provided in the structural review memo (Appendix O of the ESR). A complete evaluation and assessment of the existing bridge will be completed during detailed design. This will include serviceability and ultimate limit states for shear and bending in the superstructure, a review of the capacity of the existing bearings in load as well as the transverse bending in the deck over the piers.

Geotechnical

A Preliminary Geotechnical Investigation was completed for the study area to explore the subsurface conditions within the project limits and based on the data obtained, to provide preliminary geotechnical recommendations for road widening, pavement design, and management options for soil that may be removed during construction.

Based on the results of the investigation, the preliminary recommendations for the pavement rehabilitation of Burnhamthorpe Road include full depth reclamation (pulverizing) of the existing asphalt with the underlying granular material, followed by grading and compacting the pulverized material, and placement of new Granular Base and Hot Mix Asphalt (HMA). Due to the thickness of the existing asphalt and limitations on the maximum depth of pulverization (400 mm), milling of the existing asphalt in advance of pulverization is recommended. After milling, the remaining pavement should be pulverized to a depth of 400 mm so that the blended material contains a maximum of 50 percent of asphalt coated aggregate, as permitted by OPSS.MUNI 330. The pulverized material should be graded and compacted (as required), prior to the placement of new granular base material. The recommended asphalt lift types and thicknesses shall consist of:

| | |
|--------|-------------------|
| 40 mm | HL1 |
| 50 mm | HDBC |
| 50 mm | HDBC |
| 200 mm | Granular 'A' Base |

In all pavement widening areas (beyond existing shoulder rounding or curb and gutters), the surficial topsoil should be removed with the underlying subgrade graded as required. The preliminary recommended pavement structure for widening of Burnhamthorpe Road shall consist of:

| | |
|--------|-----------------------------|
| 40 mm | HL1 |
| 50 mm | HDBC |
| 50 mm | HDBC |
| 200 mm | Granular 'A' Base |
| 400 mm | Granular 'B' Type I Subbase |

Stormwater Management

The proposed widening of Burnhamthorpe Road West will include a grassed boulevard ranging in width from 4.5 m on one side of the road and 7.5 m on the other side of the road, a 3.0 m multi-use trail, 0.5 m curb and gutter, a four-lane urban roadway and a grassed ditch. Burnhamthorpe Road will be widened evenly on both sides, maintaining the existing road centreline. Curbs and storm sewers will be used for Burnhamthorpe Road for directing the surface runoff to appropriate outlets. An opportunity exists to utilize LID methods to treat some of the surface runoff before collection by the storm sewer system. Grassed swales, bio-swales and tree planters will be investigated at detailed design. Based on a ROW of 35.0 m, the roadway cross-section will have an approximate proposed imperviousness of 61.4%, which is equivalent to a 0.7 runoff coefficient. This is an increase in impervious area of approximately 25.7% from existing conditions.

The minor system for the proposed conditions will be designed to convey the 1:10 year flow as per City of Mississauga's design standards. At the east and west limits, the existing storm sewer system will be utilized. The assessment confirms that the existing sewers on Burnhamthorpe Road were designed adequately for the four lane widening. In general, outlets for the proposed minor system will remain the same as the existing condition.

Generally, the existing storm sewer will be utilized as part of the proposed system. However, it is anticipated that modifications such as relocating catch basin inlets and sewer leads will be required to accommodate the widening. A section of new storm sewer will be required from approximately 175 m west of Ridgeway Drive to Ridgeway Drive to Outlet 3.

The existing storm sewers have sufficient capacity to handle the additional flows due to the increased impervious areas.

The proposed major drainage system will be provided by overland flow within Burnhamthorpe's road right-of-way. Generally, the drainage system will remain unchanged, and there are no major changes to the major system drainage patterns as part of the future improvements.

The existing storm sewers discharge to two separate stormwater management facilities which have been retrofitted to meet current design standards as identified by the City of Mississauga and Credit Valley Conservation design criteria. As such, the existing SWM ponds provide Burnhamthorpe Road with a basic level of water quality, quantity and erosion control. The proposed strategy for managing the impacted study area will be to enhance the water quality treatment by implementing a multi-component approach.

An evaluation of stormwater management alternatives were considered as part of the stormwater management strategy. The alternative solutions included permeable pavement, curb extension bioretention, traditional SWM facilities, Oil Grit Separators, Enhanced Grass Swale, and underground storage facilities. The evaluation considered relative cost, construction feasibility, and stormwater objectives.

It was concluded, in combination with the existing ponds, that pre-treatment with an Oil Grit Separators (OGS) for Outlet 3 and enhanced grass swales at Outlet 4 would provide the most feasible and effective treatment train approach to achieve the stormwater management objectives.

Landscaping

All trees within the study area are located behind the existing sidewalks along Burnhamthorpe Road West and will not be impacted as a result of the widening to four lanes. Where there is sufficient boulevard space, additional street tree plantings will be provided to enhance the screening effect while improving urban tree canopy cover and aesthetic appeal. Additional plantings are also proposed behind the fence of the window streets to improve privacy.

Noise

An Environmental Noise Assessment was conducted for the Burnhamthorpe Road West corridor to assess the future "build" and "no-build" sound levels from road traffic noise sources in the area. These predictions were used to assess potential impacts according to the applicable guidelines and specify mitigation measures, where required.

The results show that changes in sound levels resulting from the proposed project are expected to be no higher than approximately 1 to 2 dBA. No investigation of noise mitigation was undertaken because there were no changes in sound levels greater than the criteria set out in the Protocol.

Air Quality

An Air Quality assessment was conducted to assess the local air quality impacts due to the widening of Burnhamthorpe Road West for existing conditions (2017) and future build conditions (2042). The study also included an assessment of total greenhouse emissions due to the project and an overview of construction impacts. The assessment concluded the following:

- The maximum combined concentrations for the future build scenario were all below their respective MOECC guidelines or CAAQS, with the exception of annual PM_{2.5}, 24-hr PM₁₀, 24-hr TSP and annual benzene. Note that for each of these contaminants, background concentrations alone exceeded the guideline.
- Frequency Analysis determined that there were no additional days on which exceedances of PM₁₀ or TSP occurred between the 2017 Existing and 2041 Future Build scenarios. For both PM₁₀ and TSP, exceedances of the guideline occurred less than 1% of the time.
- Overall, maximum predicted concentrations are similar between the 2017 Existing and 2041 Future Build scenarios, with little or no increase occurring as a result of the project.

- Mitigation measures are not warranted, due to the small number of days which are expected to exceed the guideline.
- Total GHG emissions were predicted to decrease in the study area. Overall, there was a 15% decrease in total GHG emissions predicted between the Existing and Future Build scenarios.

Utilities

Potential areas of conflict have been identified based on the preliminary utility information. At the intersections of Burnhamthorpe Road & Ridgeway Drive and Burnhamthorpe Road & Colonial Drive, the existing signal poles will be removed and relocated to suit the intersection widening. Illumination poles in conflict on the south side will also be removed and relocated.

Illumination

The existing illumination in the study area is from luminaires mounted on the existing hydro poles on the north side of the right-of-way. Full illumination is proposed for the project and can be accommodated by providing complementary lighting on the south side of the right-of-way.

Property Requirements

Given that the City has secured a 35 metre right-of-way along the study corridor, the recommended plan can be implemented without additional property requirements.

Cost Estimate

The estimated capital cost associated with the proposed improvements including engineering, construction, and other project costs is approximately \$12,000,000.

It should be noted that this cost estimate does not include property costs or the costs associated with the modifications to the Highway 403 bridge. A detailed cost estimate for the structure will be completed during detailed design following the structural review.

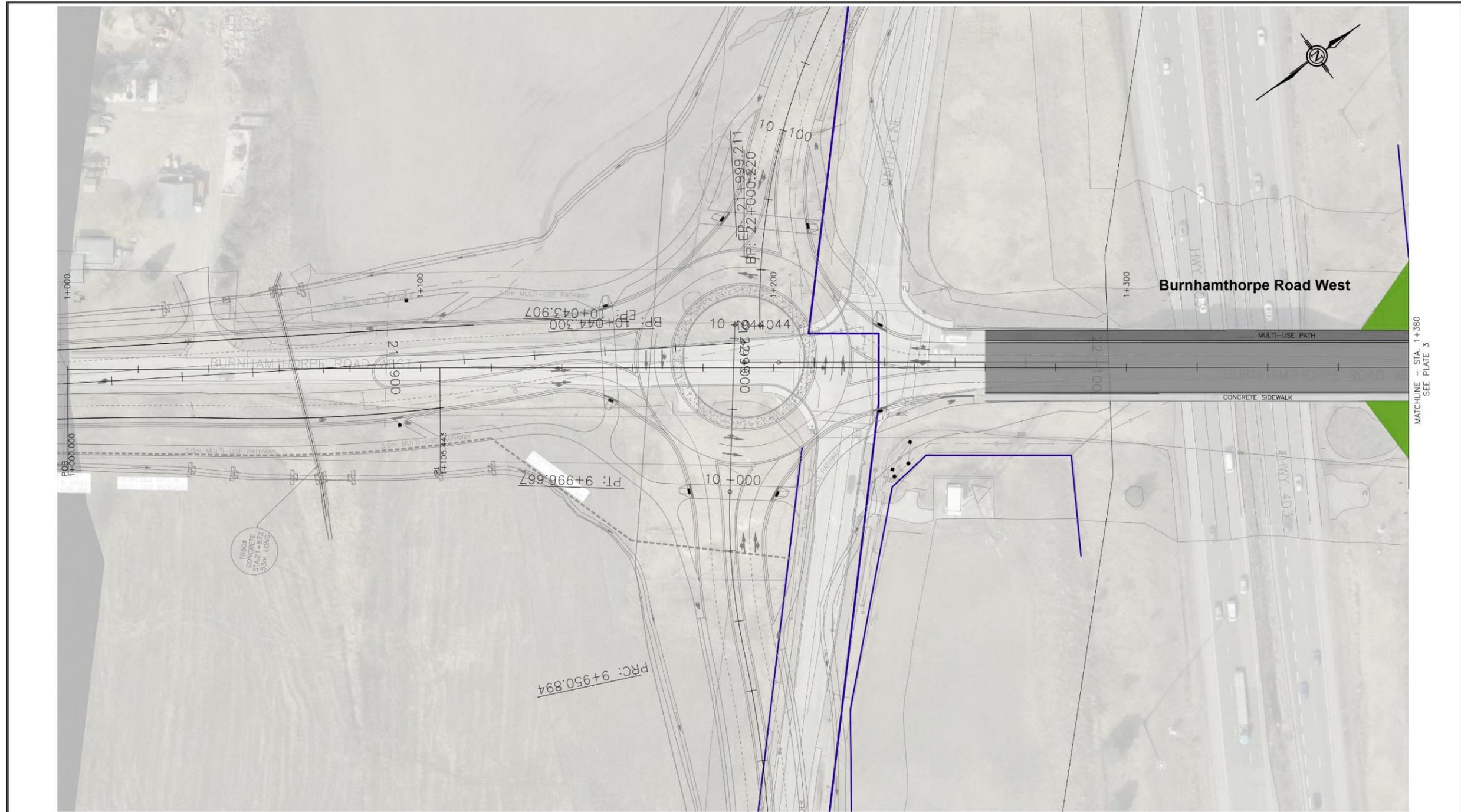
Mitigation and Commitments to Further Work

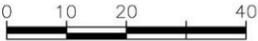
In consultation with agencies, the preliminary preferred design has mitigated negative impacts to the environment where possible. Where impacts cannot be entirely avoided, mitigation measures and commitments for detailed design and construction have been developed to minimize or avoid impacts. A detailed list of mitigations and commitments to further work is provided in Section 7 of the ESR.

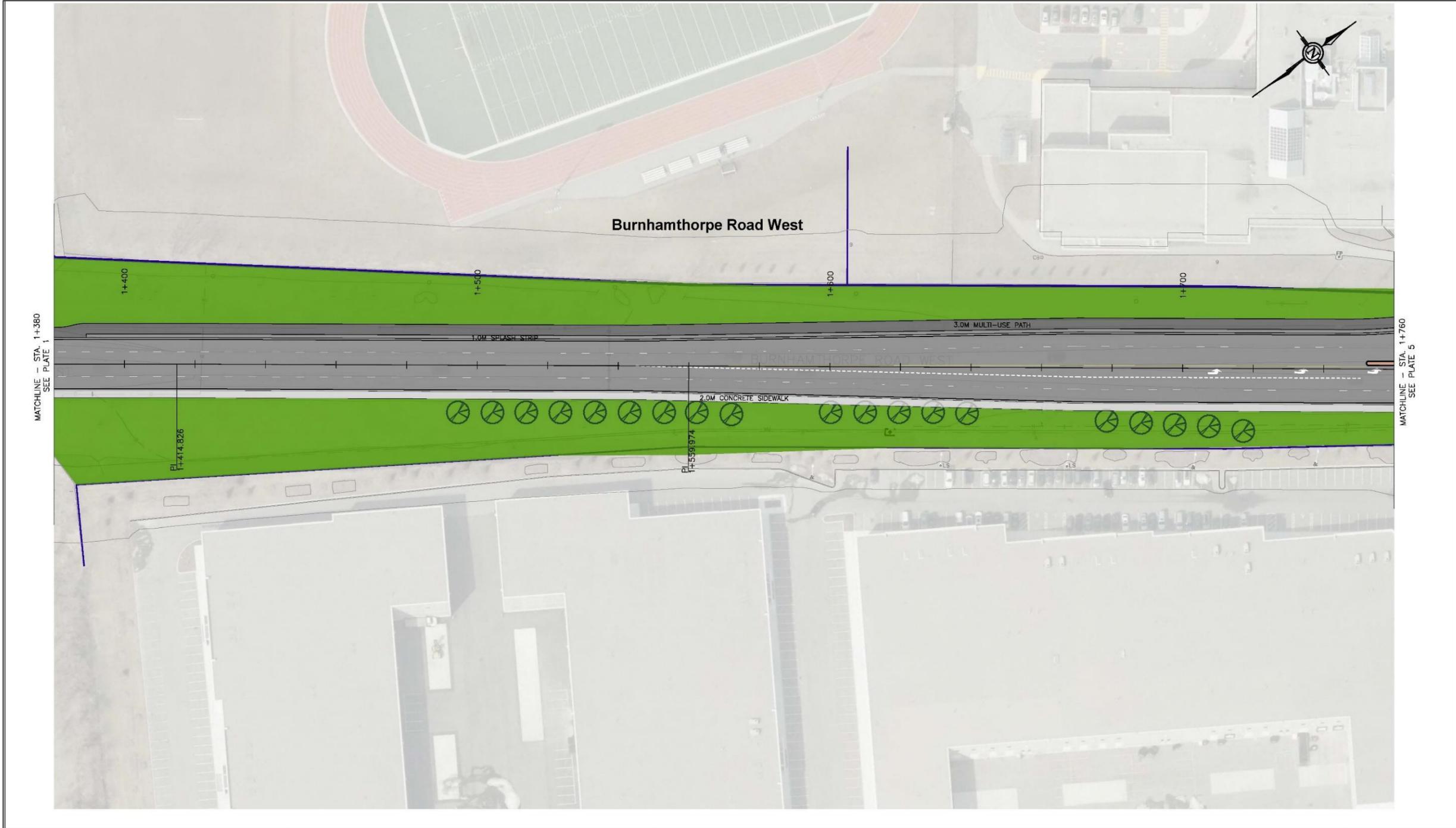
In general, there are no significant issues that required mitigation measures. Mitigation measures have been proposed for the following aspects of the environment:

- Natural Environment
 - Designated Areas
 - Species at Risk
 - Permitting
- Archaeology
- Environmental Site Assessment
- Highway 403 Structure/ Ministry of Transportation
- Intersections
- Noise and Vibration
- Air Quality
- Streetscape Plan and Tree Management
- Drainage and Stormwater Management
- Geotechnical

- Utilities & Municipal Services
- Construction Monitoring



| | | | | | | | | | | | | | | | |
|---|---|--|--|---|---|--|---|--|---|---|--|---|---|--|------------|
|  T: 289-288-0287 400-3027 Harvester Rd, Burlington ON L7N 3G7 CANADA SCALE 1:1000  | BURNHAMTHORPE RD. WEST IMPROVEMENT FROM STA. 1+000 TO STA. 1+380 CITY OF MISSISSAUGA BURHAMTHORPE ROAD WEST CLASS ENVIRONMENTAL ASSESSMENT STUDY BURNHAMTHORPE TO LOYALIST DRIVE | LEGEND <table border="0"> <tr> <td> EXISTING PROPERTY LINE</td> <td> 3.0M MULTI-USE PATH</td> <td> 1.0M SPLASH STRIP</td> </tr> <tr> <td> FUTURE PROPERTY LINE</td> <td> CURB/GUTTER</td> <td></td> </tr> <tr> <td> PROPOSED PAVEMENT</td> <td> CONCRETE SIDEWALK</td> <td></td> </tr> <tr> <td> RAISED MEDIAN</td> <td> SOD</td> <td></td> </tr> </table> |  EXISTING PROPERTY LINE |  3.0M MULTI-USE PATH |  1.0M SPLASH STRIP |  FUTURE PROPERTY LINE |  CURB/GUTTER | |  PROPOSED PAVEMENT |  CONCRETE SIDEWALK | |  RAISED MEDIAN |  SOD | | PLATE 1 |
|  EXISTING PROPERTY LINE |  3.0M MULTI-USE PATH |  1.0M SPLASH STRIP | | | | | | | | | | | | | |
|  FUTURE PROPERTY LINE |  CURB/GUTTER | | | | | | | | | | | | | | |
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|  RAISED MEDIAN |  SOD | | | | | | | | | | | | | | |



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 400-3027 Harvester Rd, Burlington ON L7N 3G7 CANADA

SCALE
 1:1000

BURNHAMTHORPE RD. WEST IMPROVEMENT
 FROM STA. 1+380 TO STA. 1+760

CITY OF MISSISSAUGA
 BURHAMTHORPE ROAD WEST
 CLASS ENVIRONMENTAL ASSESSMENT STUDY
 BURNHAMTHORPE TO LOYALIST DRIVE

LEGEND

| | | |
|------------------------|---------------------|-------------------|
| EXISTING PROPERTY LINE | 3.0M MULTI-USE PATH | 1.0M SPLASH STRIP |
| FUTURE PROPERTY LINE | CURB/GUTTER | |
| PROPOSED PAVEMENT | CONCRETE SIDEWALK | |
| RAISED MEDIAN | SOD | |

PLATE
 3



| | | | | | | | | | | | | | | | |
|--|--|--|--|---|---|--|---|--|---|---|--|---|---|--|-------------------------------------|
|  <p>T: 289-288-0287 400-5027 Harvester Rd, Burlington ON L7N 3G7 CANADA</p> <p>SCALE 1:1000</p>  | <p>BURNHAMTHORPE RD. WEST IMPROVEMENT FROM STA. 1+760 TO STA. 2+140</p> <p>CITY OF MISSISSAUGA BURHAMTHORPE ROAD WEST CLASS ENVIRONMENTAL ASSESSMENT STUDY BURNHAMTHORPE TO LOYALIST DRIVE</p> | <p>LEGEND</p> <table border="0"> <tr> <td> EXISTING PROPERTY LINE</td> <td> 3.0M MULTI-USE PATH</td> <td> 1.0M SPLASH STRIP</td> </tr> <tr> <td> FUTURE PROPERTY LINE</td> <td> CURB/GUTTER</td> <td></td> </tr> <tr> <td> PROPOSED PAVEMENT</td> <td> CONCRETE SIDEWALK</td> <td></td> </tr> <tr> <td> RAISED MEDIAN</td> <td> SOD</td> <td></td> </tr> </table> |  EXISTING PROPERTY LINE |  3.0M MULTI-USE PATH |  1.0M SPLASH STRIP |  FUTURE PROPERTY LINE |  CURB/GUTTER | |  PROPOSED PAVEMENT |  CONCRETE SIDEWALK | |  RAISED MEDIAN |  SOD | | <p>PLATE 5</p> |
|  EXISTING PROPERTY LINE |  3.0M MULTI-USE PATH |  1.0M SPLASH STRIP | | | | | | | | | | | | | |
|  FUTURE PROPERTY LINE |  CURB/GUTTER | | | | | | | | | | | | | | |
|  PROPOSED PAVEMENT |  CONCRETE SIDEWALK | | | | | | | | | | | | | | |
|  RAISED MEDIAN |  SOD | | | | | | | | | | | | | | |



CIMA+
 T: 289-269-0287
 400-9027 Harvester Rd, Burlington ON L7N 3G7 CANADA

SCALE
 1:1000

BURNHAMTHORPE RD. WEST IMPROVEMENT
 FROM STA. 2+140 TO STA. 2+540

CITY OF MISSISSAUGA
 BURHAMTHORPE ROAD WEST
 CLASS ENVIRONMENTAL ASSESSMENT STUDY
 BURNHAMTHORPE TO LOYALIST DRIVE

LEGEND

- EXISTING PROPERTY LINE
- FUTURE PROPERTY LINE
- PROPOSED PAVEMENT
- RAISED MEDIAN
- 3.0M MULTI-USE PATH
- CURB/GUTTER
- CONCRETE SIDEWALK
- SOD
- 1.0M SPLASH STRIP

PLATE
 7

