

MONTROSE ROAD AND LYONS CREEK ROAD / BIGGAR ROAD MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Environmental Study Report - FINAL

November 2021

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APPENDICES

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- Appendix B – Drainage and Stormwater Management Report
- Appendix C – Natural Environmental Assessment
- Appendix D – Cultural Heritage Resource Assessment
- Appendix E – Stage 1 Archaeological Assessment
- Appendix F – Record of Consultation
- Appendix G – Preliminary Design Drawings

EXECUTIVE SUMMARY

Niagara Region has retained Parsons Inc. to conduct a Class Environmental Assessment (Class EA) Study to examine rehabilitation and improvement needs for Regional Road 98 (Montrose Road) and Regional Road 47 (Lyons Creek Road) / Biggar Road (See Figure ES-1). This study is being conducted in accordance with the planning and design process for 'Schedule C' projects as outlined in the Municipal Engineers Association "Municipal Class Environmental Assessment," (October 2000, as amended in 2007, 2011 and 2015).

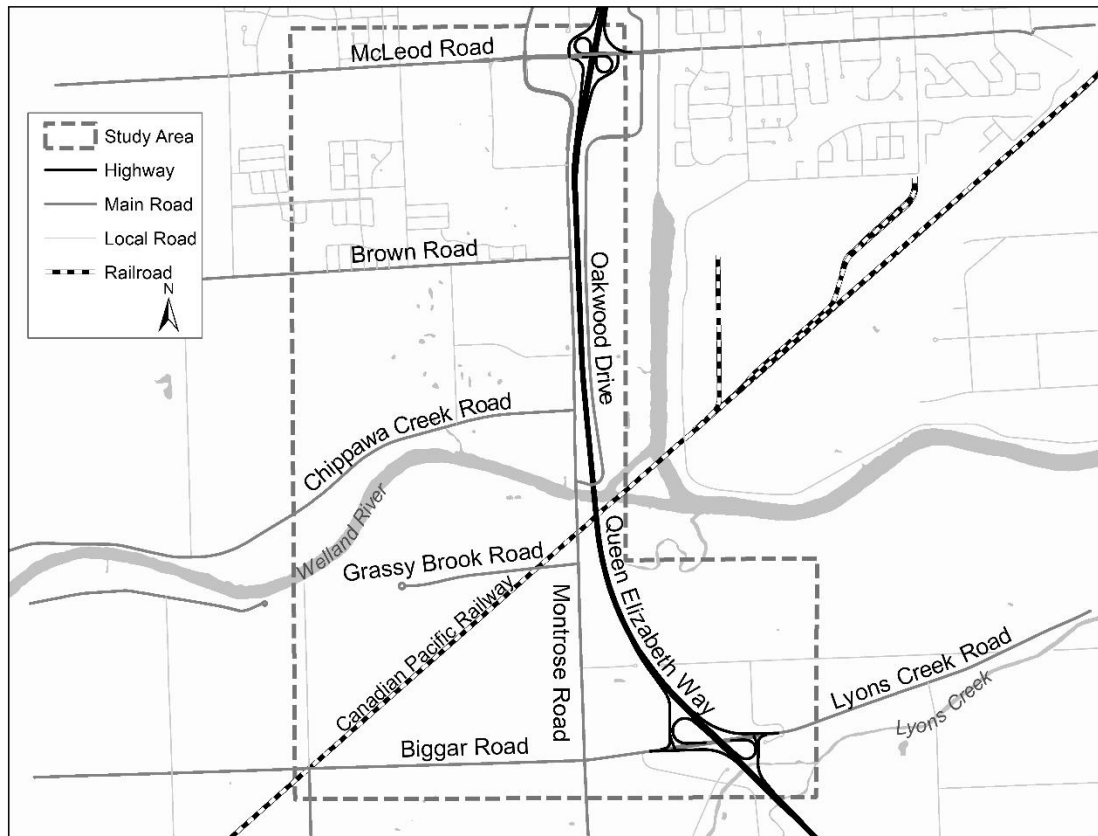


FIGURE ES-1. STUDY AREA

A number of background studies were undertaken for the study area to determine existing conditions and impacts and include the following:

- Detailed Traffic Assessment
- Drainage and Stormwater
- Natural Environmental Assessment
- Cultural Heritage Resource Assessment
- Stage 1 Archaeological Assessment
- Plans and Policy Reviews

PUBLIC CONSULTATION

Public consultation is an important part of the Municipal Class EA process. The following are the key points of contact during the EA study:

| Key Point of Contact | Date | Means of Notification |
|--|---------------------------------|--------------------------------------|
| Notice of Study Commencement and Online PIC #1 | June 10/11 and 17/18, 2020 | Newspaper, Mail, Email, City website |
| Online Public Information Centre #1 | June 24, 2020 | Newspaper, Mail, Email, City website |
| Online Public Information Centre #2 | September 23, 2020 | Newspaper, Mail, Email, City website |
| Online Public Information Centre #3 | April 21, 2021 | Newspaper, Mail, Email, City website |
| Notice of Study Completion | October 28 and November 4, 2021 | Newspaper, Mail, Email, City website |

In addition to the key points of contacts above, the project team also consulted with key technical agencies and stakeholders throughout the EA. Key stakeholders and consultation activities include:

- Multiple meetings and rounds of design review with:
 - Ontario Ministry of Transportation (MTO)
 - Niagara Health
 - City of Niagara Falls
 - Utilities
- Correspondence and initial contact with:
 - Canadian Pacific Railway (CPR)
 - Ministry of the Environment, Conservation and Parks (MECP)
 - Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)
 - Niagara Peninsula Conservation Authority (NPCA)
- Multiple meetings and correspondence with local businesses, residents, and property owners

PROBLEM AND OPPORTUNITY STATEMENT

Based on the review of existing provincial, regional and local plans and policies and the findings of the traffic analysis, the following Problem / Opportunity Statement was developed for the EA study:

Within the study area, Montrose Road and Lyons Creek Road/Biggar Road is located in an area of existing, new and proposed development. As identified in the Region's Transportation Master Plan (TMP, 2017), this existing and continued development requires road improvements to manage the demands of increased traffic volumes (both vehicular and active transportation). The TMP also identifies this section of Montrose Road and Lyons Creek Road/Biggar Road as an active transportation route, but facilities do not exist to adequately accommodate cyclists or pedestrians.

Opportunities exist to improve the form and function of Montrose Road and Lyons Creek Road/Biggar Road. These include:

- *Create an improved roadway for all modes of transportation (vehicular, active transportation, and transit) based on the Complete Streets approach;*
- *Improve road safety for all road users (i.e., Vision Zero);*
- *Enhance the transportation corridor to facilitate regional and local movement of people and goods;*
- *Address future travel demand associated with population and employment growth; and,*
- *A long-term vision of street design that supports mixed use development.*

ALTERNATIVE SOLUTIONS

Alternative Solutions are high-level, planning options to address the Problem / Opportunity Statement and include a "Do Nothing" scenario. The following Alternative Solutions were evaluated against the environmental factors relevant to the study, such as the natural, social, cultural and economic environments.

1. Do Nothing – Existing transportation system is not changed
2. Limit Development – Restrict development of surrounding lands now and in the future
3. Improve Alternative Routes – Undertake improvements to other parallel road corridors
4. Local Roadway/Intersection Improvements – Modify roadway and intersections locally to improve operations
5. Additional Lanes (Capacity Increase) – Increase traffic capacity through widening
6. Accommodate Other Travel Modes – Improve facilities for other modes of travel such as walking, cycling and transit

Based on the evaluation, Alternatives 1, 2, and 3 are not recommended as they do not accommodate the anticipated traffic demand, are not supported by local and regional plans, and do not address the Problem / Opportunity Statement.

Based on the evaluation, the preferred Alternative Solutions are a combination of Alternatives 4, 5, and 6 as they best address projected traffic growth and planned developments in the study area and include improvements for intersections, other travel modes, and access. These are the preferred Alternative Solutions brought forward to Phase 3 of the Municipal Class EA for which Alternative Design Concepts were developed for.

ALTERNATIVE DESIGN CONCEPTS

The alternative design concepts are options to implement the recommended alternative solutions from Phase 2 of the Municipal Class EA. Phase 3 of the Municipal Class EA process requires that those alternative design concepts are developed and that all reasonable and feasible solutions shall be identified and described. The alternative design concepts were evaluated against the environmental factors relevant to the study, such as the natural, socio-cultural, transportation and economic environments. The following identifies all alternative design concepts considered. The preferred alternative design concept is shown in **bolded blue font**.

Road Right-of-Way (ROW) Cross Sections

The road right-of-way (ROW) for all roads in the study area would accommodate an urbanized cross section (i.e., curb and gutter) with two lanes per direction, and a median barrier or turning lane, as

appropriate. Two alternatives were considered for how Active Transportation (AT) can be accommodated:

| No. | Alternative Design Concepts | Description |
|-----|--|--|
| 1 | Separated Multi-Use Path (MUP) on the west/north | A 3.0m to 4.0m MUP that accommodates different forms of active transportation on the west side of Montrose Road/north side of Biggar Road/Lyons Creek Road. The MUP forms part of the boulevard and is fully separate from the travel lanes. |
| 2 | On-street bike lanes on both sides | A 1.5m on-street bike lane on each side of the ROW separated from the travel lanes with a painted buffer only. Sidewalks will be provided on both sides of the road, where appropriate either now or in the future. |

The MUP is preferred as it offers a wide enough platform to accommodate pedestrians and cyclists and is physically separated from cars. The MUP will also be constructed on the west/north side of the road, closer to where most future developments will be located. Thus, this options provides safer options and access.

Montrose Road Widening

For the purpose of the evaluation of the alternative design concepts, Montrose Road was divided into four sections:

- Section 1: McLeod Road to Canadian Drive
- Section 2: Canadian Drive to Chippawa Creek Road
- Section 3: Chippawa Creek Road to Grassy Brook Road
- Section 4: Grassy Brook Road to Lyons Creek Road/Biggar Road

Generally, the alternatives considered widening along the centreline, to the east, or to the west.

Section 1: McLeod Road to Canadian Drive

This section of Montrose Road has already been widened to a four lane configuration in support of Niagara Square. As such, roadway widening options were not assessed in this section. However, opportunities to improve access and safety were reviewed in order to:

- Minimize left turns to reduce potential for collisions
- Facilitate safe and efficient traffic flow in/out of the various existing and planned developments
- Addition of active transportation facilities and bus bays

The following concepts were considered:

| No. | Alternative Design Concepts | Description |
|-----|--|---|
| 1 | Do Nothing | Leave as is, no changes are made |
| 2 | Keep Existing Traffic Signals with a Continuous Median | No changes to the existing intersection controls and locations, however improvements can be made to existing signals. Implement a continuous median through Section 1, limiting left turns. |

- | | | |
|---|--|---|
| 3 | Implement Roundabout at the first “bend” south of McLeod Road with a Continuous Median | Implement a roundabout at the first “bend” south of McLeod Road to facilitate access for drivers to the other side of the median. Implement a continuous median through Section 1, limiting left turns. |
| 4 | Implement Roundabout at Niagara Square Drive with Continuous Median | Replace the existing traffic signals at Niagara Square Drive with a roundabout to facilitate access for drivers to the other side of the median. Implement a continuous median through Section 1, limiting left turns. |

A roundabout and median is preferred as it would improve the safety and access of this section of Montrose Road overall by allowing drivers to easily circulate through the roundabout to change travel direction and access properties on the other side of the median.

Section 2: Canadian Drive to Chippawa Creek Road

On Montrose Road, from Canadian Drive to Chippawa Creek Road, the following three widening alternatives were considered:

| No. | Alternative Design Concepts | Description |
|-----|-----------------------------|---|
| 1 | Widen along Centreline | Widen and add lanes along the centreline (i.e. expand to both sides). |
| 2 | Widen to the East | Widen and add lanes to the east only. |
| 3 | Widen to the West | Widen and add lanes to the west only. |

While this alternative would have impacts on the west, including natural environmental impacts to the woodland edge, wetlands, and Warren Creek, it is the only technically feasible option due to the constraint of the QEW on the east.

Section 3: Chippawa Creek Road to Grassy Brook Road

This section of Montrose Road includes the crossing over the Welland River. As the bridge and roadway designs will be dependent on each other (i.e. if you widen the bridge to the west, the approaches will also be located to the west), both the bridge and roadway alternatives are considered together under this section. The following widening alternatives were considered:

| No. | Alternative Design Concepts | Description |
|-----|-----------------------------|---|
| 1 | Widen along Centreline | Widen Montrose Road and the bridge on both sides. |
| 2 | Widen to the East | Widen Montrose Road and the bridge to the east only. |
| 3 | Widen to the West | Widen Montrose Road and the bridge to the west only. |

Widening the existing bridge to the east has significant environmental impacts, however these impacts can be minimized through mitigation measures or compensation. This alternative reduces significant property and building impacts located northwest of the bridge. The option to twin the bridge was also considered, however, the option to widen the bridge was selected as this would allow a continuous platform as opposed to twinning which would leave a gap.

Section 4: Grassy Brook Road to Lyons Creek Road / Biggar Road

On Montrose Road, from Grassy Brook Road to Lyons Creek Road / Biggar Road, the following three widening alternatives were considered:

| No. | Alternative Design Concepts | Description |
|-----|-----------------------------|---|
| 1 | Widen along Centreline | Widen and add lanes along the centreline (i.e. expand to both sides). |
| 2 | Widen to the East | Widen and add lanes to the east only. |
| 3 | Widen to the West | Widen and add lanes to the west only. |

Widening along the centreline is preferred as it balances impacts to natural features and property requirements on both sides of the road.

Biggar Road Widening

For the section of Biggar Road, from Montrose Road westerly 0.85km, the following three widening alternatives were considered:

| No. | Alternative Design Concepts | Description |
|-----|-----------------------------|---|
| 1 | Widen along Centreline | Widen and add lanes along the centreline (i.e. expand to both sides). |
| 2 | Widen to the North | Widen and add lanes to the north only. |
| 3 | Widen to the South | Widen and add lanes to the south only. |

Widening along the centreline is preferred as it balances impacts between several factors including natural features, property impacts, and the hospital site.

Lyons Creek Road Widening

For the section of Lyons Creek Road, from Montrose Road easterly to the QEW west ramp terminal, the following three widening alternatives were considered:

| No. | Alternative Design Concepts | Description |
|-----|-----------------------------|---|
| 1 | Widen along Centreline | Widen and add lanes along the centreline (i.e. expand to both sides). |
| 2 | Widen to the North | Widen and add lanes to the north only. |
| 3 | Widen to the South | Widen and add lanes to the south only. |

Widening along the centreline is preferred as it balances impacts between property and natural features, and will have the least impacts to the interchange and the bridge over the QEW.

Montrose Road and Lyons Creek Road/Biggar Road Intersection

This study presents an opportunity to reconsider and re-evaluate the appropriate intersection control (i.e. stop sign, traffic signals, roundabouts) at key intersections through the study area. Depending on the context, different intersection controls can improve safety, traffic operations, efficiency, etc. This intersection is currently signalized, however, this EA study reviewed the opportunity to replace the

intersection with a roundabout. The intersection control alternatives considered for this intersection are:

1. Traffic Signals
2. Roundabout

Traffic signals were preferred as they better accommodate anticipated future traffic volumes and turning movements at the intersection.

Lyons Creek Road / QEW Underpass Bridge

The existing Lyons Creek Road bridge over the QEW (owned by MTO) has a bridge deck with a constrained width that cannot accommodate auxiliary right-of-way features for active transportation (sidewalk, Multi-Use Paths, bike lanes). As widening of the bridge is not technically feasible due to the bridge type, short and long term options were considered on how to incorporate active transportation features in this section of Lyons Creek Road. The short term options considered the reconfiguration of lanes and features within the existing bridge deck width. The long term options considered the construction of a new underpass structure. The alternative designs considered include:

| No. | Alternative Design Concepts | Description |
|-----|--|--|
| 1 | Uni-directional Facilities with Barrier Walls | Bike lanes on each side of the bridge, with a small buffer and barrier wall separating the bike lane from traffic. Substandard buffers for travel lanes. |
| 2 | MUP on the North Side with a Barrier Wall | Include a 3.0m MUP on the north side only with a small buffer and barrier wall separating the bike lane from traffic. Substandard buffers for travel lanes. |
| 3 | Repaint the Bridge Deck and Use the Buffer as a Bike Lane | Remove the median island and repaint the Bridge Deck to accommodate wider buffers that can also be used as bike lanes. Substandard buffers and median. |
| 4 | Extend Curb for a Sidewalk and Widen Travel Lane for Shared Cars and Bikes | Extend curbs for use as a sidewalk on both sides and widen curbside travel lane as a shared lane that can be used by both vehicles and bikes. Substandard buffers and median. |
| 5 | Future Bridge Replacement by MTO with MUP on the North Side | At such time that MTO determines a need to replace the bridge, the new bridge deck can be built to accommodate a 4.0m MUP on the north side with all lane, buffer, and median widths meeting design standards. |
| 6 | Future Bridge Replacement by MTO with AT path on both sides | At such time that MTO determines a need to replace the bridge, the new bridge deck can be built to accommodate a 3.0m AT path on both sides with all lane, buffer, and median widths meeting design standards. |
| 7 | New Separate MUP Structure to the North of the Existing Bridge | Construct a new separate structure north of the existing bridge that can accommodate a 4.0m MUP. Existing bridge will not be impacted. |
| 8 | Do Nothing | The existing bridge will be left as is. |

Do Nothing is the preferred alternative. While no formal active transportation facility is provided, this alternative can work as an interim solution as it is not anticipated there will be much active transportation need across the bridge under the current context. The area can be monitored and as development progresses, the need for a facility can be reviewed. Other alternatives were ruled out due to sub-standard designs that would be unsafe or high costs.

Lyons Creek Road / QEW Ramps Intersection

In consultation with MTO, intersection control options for the intersections of the on and off ramps at the Lyons Creek Road interchange were reviewed. This includes the Fort Erie-Bound Ramp off-ramp terminal (also referred to as the west ramp terminal) and the Toronto-bound off-ramp terminal (also referred to as the east ramp terminal). The intersection control alternatives considered for these intersections are:

1. Traffic Signals
2. Roundabout

Traffic signals are preferred for the intersection control at the QEW interchange. Traffic signals are able to accommodate future traffic demand while still operating well and support active transportation and EMS vehicles to and from the hospital. There are minimal other impacts to the surrounding area.

Willodell Road Intersection

Due to the proximity of the Willodell Road intersection to the west ramp terminal of the QEW at Lyons Creek Road resulting in potential queuing and safety concerns, different intersection options were considered. At PIC #3, the project team presented an option that would restrict Willodell Road to right turns in and right turns out only (i.e. no left turns in and out) through the implementation of a median. Community feedback received from PIC #3 led the project team to explore more alternatives to address the issue at this intersection. The full set of options considered include:

| No. | Alternative Design Concepts | Description |
|-----|---|--|
| 1 | Do Nothing | Intersection remains as is with no median allowing full moves access in and out of Willodell Road. |
| 2 | Implement Continuous Median, no U-turns at Montrose Road | A median restricts access to right-in right-out only at Willodell Road. Cars wanting to turn left onto Willodell Road would need to turn left on Montrose Road to Carl Road. |
| 3 | Implement Continuous Median, U-turns accommodated during left turn phase at Montrose Road | A median restricts access to right-in right-out only at Willodell Road. Cars wanting to turn left onto Willodell Road would need to turn make a U-turn at Montrose Road to drive eastbound. |
| 4 | Allow left-in, right-in right-out at Willodell Road using signage only | Left-in is allowed from Lyons Creek Road onto Willodell Road, however left turns out are not allowed. Only signs would be implemented to indicate the left turn. |
| 5 | Allow left-in, right-in right-out at Willodell Road using channelization | Left-in is allowed from Lyons Creek Road onto Willodell Road, however left turns out are not allowed. Only signs would be implemented to indicate the left turn. A new left turn channel will be implemented on Lyons Creek Road to store cars waiting to turn left. |

| | | |
|----|---|--|
| 6 | Implement new mid-block signalized intersection further west of existing intersection | A new signalized intersection that requires realigning Willodell further west of the existing would allow for full moves access. |
| 7 | Realign Willodell Road east to the QEW off-ramp | Realign Willodell Road to the east to line up with the QEW off-ramp signalized intersection, allowing full moves access. |
| 8 | Implement Continuous Median, build new east-west local road connection Montrose Road to McCredie Road from about 350-400m south of Lyons Creek Road | A median restricts access to right-in right-out only at Willodell Road. Cars wanting to turn left onto Willodell Road would need to turn make a left turn at Montrose Road. Build a new east-west local road for drivers to access Willodell Road without using Carl Road. |
| 9 | Median U-turn traffic signal on Montrose Road about 350m south of Lyons Creek Road | A U-turn traffic signal that would facilitate U-turns making them safer and easier to maneuver in traffic. |
| 10 | New public road allowance to allow drivers to circle back | Construct new public road allowance on private land in the northeast quadrant of Montrose Road / Lyons Creek Road for drivers to circle back |

Option 5 maintains the key movements at the Willodell Road intersection, is physically configured so as to limit left-out, and includes a left turn lane to minimize potential impacts to the west ramp terminal. Some environmental and property impacts are associated with this option.

PREFERRED DESIGN

Road Design and Speed

The road right-of-way (ROW) is nominally 30m throughout the study area, except at certain locations where up to 37m of road ROW width is required to accommodate additional turning lanes. The typical cross section for Montrose Road/Lyons Creek Road/Biggar Road is shown in Figure ES-2 and includes:

- 4 x 3.5m driving lanes
- 2.0m median OR 4.0m centre left turning lane (where appropriate)
- 3.0 - 4.0m Multi-Use Path on the west side of Montrose Road and north side of Lyons Creek Road/Biggar Road
- 1.8m sidewalk on the east side of Montrose Road, in select locations, or protected for future construction as appropriate.

Niagara Region has adopted a vision to develop “Complete Corridors” (also called Complete Streets) which integrates land use planning, transportation planning, and urban design. The purpose of Complete Corridors is to design a public ROW that supports all modes of travel (cars, transit, pedestrians, cyclists, etc.) which also helps people of all ages and abilities travel within the Region. This corridor best resembles the ‘Urban General – Wide’ typology. Given this context, it was most appropriate to provide a multi-use path on the west side of Montrose Road to provide a safer environment for active transportation uses. Other elements that were considered was the implementation of a raised median island for safety and a boulevard for added buffer and plantings.

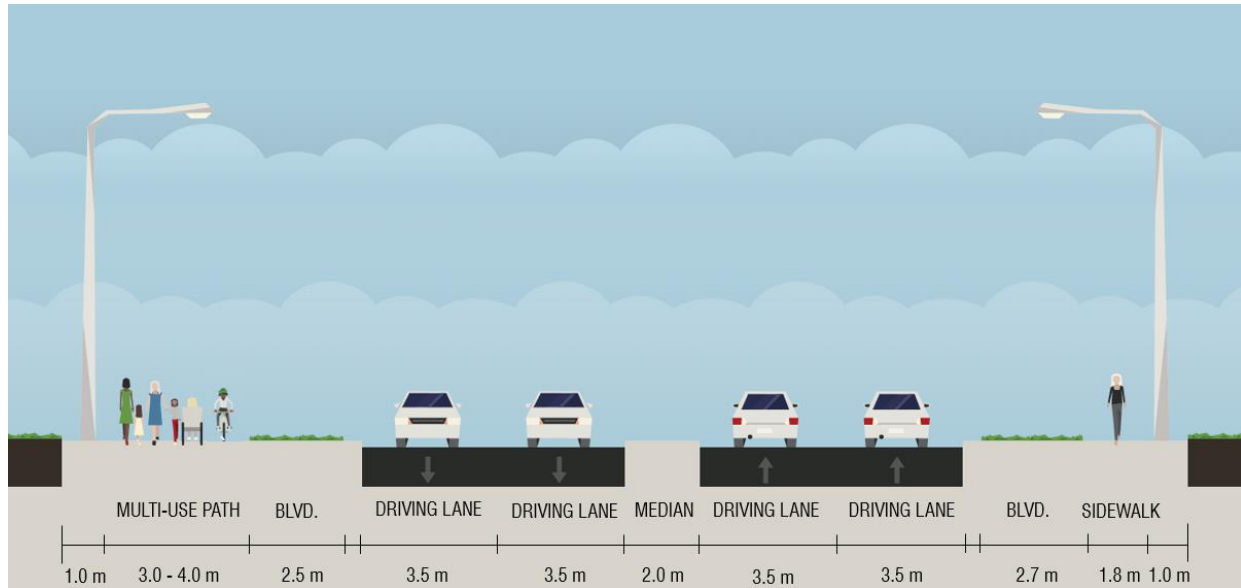


FIGURE ES-2. PREFERRED CROSS SECTION DESIGN

As the road will be widened, there will be changes to the horizontal alignment of the road. The horizontal alignment changes are documented above in the description of the preferred widening option on each segment of the study area roads. In addition to the additional through lanes, further widening is required through certain areas to accommodate auxiliary lanes, such as left and right turn lanes. Transit stops were also coordinated with local and regional transit groups and bus bays have been included where required. Generally, the vertical alignment of the road will largely remain at the same elevation/grade as the existing roadway throughout the study area. Specific locations may require a slight raise in road profile to provide sufficient cover over other roadway features, such as culverts and storm sewers.

As traffic increases in the area due to new commercial and residential developments, safety will be an increasing concern. To improve road safety through parts of the study area with high volumes and multiple accesses, a raised median is recommended to limit left turns. The limitation of left turns helps to reduce the risk of collisions due to turning traffic, especially where there will be high volumes of oncoming traffic in opposing lanes. Medians are primarily recommended near Niagara Square where there are multiple commercial accesses with high volumes of traffic due to the commercial uses in the area. The existing alignment of Montrose Road in an 's' shape also creates safety concerns for sightlines, as it can be difficult to see oncoming traffic around the bends. A median is also proposed in the vicinity of the South Niagara Hospital, at intersections, and along Lyons Creek Road, due to the proximity of the QEW interchange to the southbound left turn lane at the Montrose Road and Lyons Creek Road intersection.

The posted speed limit of the study area roads was also reviewed given the changing context of the area and the proposed improvements. The recommended posted speed limits were projected to the years 2026 and 2041, and reflect a reduction in speed. In some cases, an interim posted speed limit was recommended for 2026 to reflect the changing and anticipated build out of the adjacent lands (i.e. areas may not be fully developed but growth is occurring). The timing for the posted speed changes can be adjusted based on the timing of growth.

Intersections and Accesses

Existing intersections were reviewed for the opportunity to make improvements and new intersections were assessed based on traffic needs or needs of the property owner. A signal warrant analysis was completed as part of the detailed traffic analysis for all unsignalized intersections, which only recommended signalizing the Lyons Creek Road intersection at the QEW FEB off-ramp. However, while some unsignalized intersections do not meet the warrants for signalization in 2041, it is noted that there are excessive delays for the traffic from the “minor” street and there will be an increase in active transportation and transit use. Therefore, it is recommended that provision for signals be provided at some of these intersections and actual traffic volumes should be monitored to facilitate installation of signals, when or if needed; this is identified in the table below as “Potential Future Signals”. Additionally, through discussions with MTO, due to delays noted for the northbound left turn lane at the QEW Toronto-bound Off-ramp, the intersection should be signalized as well.

| Intersection | Proposed Changes |
|------------------------------------|--|
| Niagara Square Drive | Replace existing signals with a three-legged roundabout. A traditional roundabout design could function and operate efficiently. A turbo design was also considered to reduce weaving in or shortly out of the roundabout for access to adjacent properties. The roundabout design will be confirmed in detailed design. |
| Brown Road | Potential Future Signals |
| Oakwood Drive | Potential Future Signals |
| Grassy Brook Road | Potential Future Signals |
| Reixinger Road | New signalized intersection and extension of Reixinger Road west of Montrose Road to allow for a northern connection into the South Niagara Hospital site. This extension also supports a future local road to access the Grand Niagara Secondary Plan area. |
| Hospital access on Montrose Road | New signalized intersection |
| Montrose Road and Lyons Creek Road | Existing traffic signals will be maintained and upgraded to suit the widened roads |
| Hospital access on Biggar Road | New signalized intersection |
| Willodell Road | Left turn lane added on Lyons Creek Road, physical barrier restricting left turns from Willodell Road onto Lyons Creek Road, slight realignment to the west |
| QEW Fort Erie-bound Off-ramp | New signalized intersection warranted by 2026 |
| QEW Toronto-bound Off-ramp | New signalized intersection not warranted but will be included based on excessive delays to the northbound left turn and discussion with MTO |

Existing and potential future private / commercial accesses were also reviewed. The recommended design results in changes to some accesses, including limiting turning movements or relocation of the entrance. Where these impacts occurred, property owners were contacted, advised and consulted with.

In discussions with the City of Niagara Falls, Niagara Health, and the property owner, Reixinger Road will be extended west of Montrose Road as a local road for approximately 125m. The intersection at Montrose Road will be signalized. In the interim, the Reixinger Road extension will serve as an entrance to the northern portion of the South Niagara Hospital. The hospital will have an access road off of the Reixinger Road extension connecting into its internal site circulation roads. Reixinger Road will have a roundabout at the entrance to the South Niagara Hospital to facilitate snow maintenance vehicles turning and maintain entering access to the hospital lands without backing up onto Montrose Road.

Willodell Road is an existing municipal road which is located approximately 180m west of the QEW west ramp terminal. Proposed changes to Willodell Road at Lyons Creek Road include implementing a westbound left turn lane on Lyons Creek Road into Willodell Road, restricting left turns out from Willodell Road, and shifting the intersection by approximately 20m to the west in order to accommodate revised turning radii. The current recommendation was developed in consultation with MTO and the City of Niagara Falls to balance access, safety, and transportation needs.

These changes were recommended due to the proximity of the intersection to the QEW Fort Erie bound (FEB) off-ramp and concerns with the potential for westbound traffic potentially impacting the west ramp terminal traffic operations. The current recommendation (i.e. allowing all movements except for turning left-out from Willodell Road) is acceptable from a traffic operations perspective based on the existing land use conditions, however, it is recognized that this situation could change due to the development of the new South Niagara Hospital and other proposed development north of Lyons Creek Road. A Memorandum of Understanding is in the process of being developed and agreed to between Niagara Region and MTO for commitments relating to future review of the Willodell Road intersection should development or traffic demand change leading the potential impacts to the QEW ramps. City of Niagara Falls Council also provided council resolution supporting a traffic signal at the Lyons Creek Road and Willodell intersection.

Montrose Road Bridge over the Welland River

To accommodate the future widening of Montrose Road to four through lanes, the existing Montrose Road bridge over the Welland River will need to be widened. The proposed widening will incorporate the following elements:

- 4 x 3.5m driving lanes
- 1.5m shoulders in both directions
- 5.5m raised median
- 3.5m Multi-Use Path on the west side of Montrose Road
- 0.5m buffer between the MUP and the parapet wall
- 1.0m buffer between the MUP and the curb at the driving lanes
- 0.39m parapet walls

The bridge widening is restricted to be only on the east side of the existing bridge due to the proposed new Niagara Region sanitary sewer trunk main that is planned to be constructed along the west side of the existing Welland River bridge crossing as well as the presence of existing properties on the west.

The bridge will be widened to the east to create a single structure. The widened portion of the bridge will match the existing bridge as a semi-integral CPCI slab on girder bridge with four spans and three piers in the water.

Drainage, Stormwater, and Culvert Design

As part of the road improvements for the study area, the new roads will be widened and constructed as an urban cross section, meaning that road drainage will be collected via curbs and gutters, directed into catchbasins, where storm sewers will direct water to outlets throughout the study. The storm sewer system was designed based on the City and the Region’s design criteria to collect and convey the 5-year storm and considers the worst climate change scenario for the year 2070 (design service life of the project). The drainage system will follow the existing drainage patterns and outlet to existing watercourses.

While the road widening will result in an increase in impervious area and runoff, it is considered negligible compared to the total subwatershed area and the peak flow rate in the receiving watercourses will not increase from existing conditions. Therefore, no quantity control is recommended.

Due to sensitivities of some of the watercourses in the area, quality control is required. Based on NPCA requirements, areas draining to Warren Creek, Grassy Brook, the tributary of Lyons Creek, and sections of the Welland River, removal of 80% Total Suspended Solids (TSS) is required through quality control measures before the stormwater can be outletted into these watercourses (i.e. “Enhanced” Level I). For all other outlets, water quality treatment of 70% TSS reduction is required (i.e. “Normal” Level II). As such, an Oil Grit Separator (OGS) has been included in the SWM strategy to improve water quality prior to its release into the natural environment. Surface runoff from the road ROW will be captured by catchbasins and directed toward the OGS. Where feasible, flow from the OGS will be directed toward a roadside ditch prior to draining to a watercourse. OGSs were sized to treat a minimum of 90% of the average annual runoff volume and are proposed for areas greater than 0.5ha and where other stormwater quality controls are not possible.

As the road is being widened, the length of the centreline culverts, which convey drainage across the road, also need to be extended to accommodate the widened road cross section. All existing rigid frame box culverts except the tributary of Lyons Creek culvert are in good condition and meet the hydraulic requirements. All frame rigid frame box culverts are to be extended, with the exception of the Lyons Creek Tributary Culvert that will be replaced with twin box culverts. In addition to the rigid frame box culverts, there are three existing pipe culverts that are proposed to be replaced as they are either eroded or do not meet the minimum size requirement.

IMPACTS AND MITIGATION

The impacts associated with implementing the preferred design along with the **key** mitigation measures to address the impacts are summarized at a high level below.

| Category | Potential Impact | Proposed Mitigation Measure |
|----------------|--|---|
| Transportation | | |
| Traffic | Construction of the preferred design could have potential impacts on the transportation environment, particularly impacts to traffic flow and patterns along Montrose Road, Biggar Road, and Lyons Creek Road. | A traffic management plan / construction staging plan will be developed during detailed design to minimize impacts to traffic and access, where possible. Emergency service providers were contacted during this EA study, but should be contacted again prior to and during construction to make |

| Category | Potential Impact | Proposed Mitigation Measure |
|-----------------------------------|---|--|
| | | sure they are aware of the proposed construction staging scheme and the potential traffic disruptions resulting from construction. |
| Navigable Waters | The <i>Canadian Navigable Waters Act</i> (CNWA) applies to all navigable waterways in Canada. The Welland River is considered a navigable waterway and is subject to the provisions of the CNWA. The construction of a new bridge would be considered as Major Works and require approval under Transport Canada's Navigation Protection Program. | An application to obtain authorization for works on the Welland River should be obtained prior to construction. |
| Socio-Economic Environment | | |
| Permanent Property | Due to widening of the road right-of-way, Niagara Region must acquire permanent property from adjacent properties in order to construct the widened road right-of-way. | Where possible, minimize the amount of property required. Where property is required, compensation will be provided to the property owner based on appraisals completed by the Region. At this point, other commitments or requirements will be detailed in an agreement with the Region for other impacts. |
| Temporary Property | During construction there may be temporary impacts to property such as grading and access. | Temporary access for construction will be obtained through a Permission to Enter (PTE) / Construct agreement with the individual property owner. PTEs may also be required for any other reason for access onto lands not owned by the Region. For works in the MTO right-of-way, an MTO Encroachment Permit is required. |
| Access | Reduction of accesses to private/commercial properties. | Where there are permanent changes or impacts to accesses, the property owner should be consulted. |
| Air Quality | During construction, air quality can be temporarily degraded due do dust and/or emissions from construction activities and equipment. Activites include vehicular traffic in open construction areas, dust from storage piles, unloading materials, particularly during strong winds, and the operation of construction equipment. | The following measures are recommended to mitigate the air quality impacts of construction: <ul style="list-style-type: none"> • Keep construction machinery and equipment in good operation condition. • No unnecessary idling of vehicles and limit the speed of vehicular travel through the construction site. • Dust suppressant measures are to be used to reduce dust emissions, when appropriate. |

| Category | Potential Impact | Proposed Mitigation Measure |
|----------------------------|--|---|
| | | <ul style="list-style-type: none"> • Regular cleaning of the construction site, access roads, and construction vehicles to remove construction-caused debris and dust. • All haul equipment should be covered when hauling fine-grained materials. • Stockpiles of fine-grained materials should be covered and stabilized, particularly during dry or windy periods. |
| Noise | <p>There will be temporary noise impacts as a result of construction work, however the magnitude of the impacts will vary greatly throughout the construction period.</p> | <p>The following measures are recommended to mitigate the noise impacts of construction:</p> <ul style="list-style-type: none"> • Limit noise construction activities to daytime hours, where possible. • Where work is required outside of regular daytime work hours, the contractor should try to minimize the noise being generated. For works taking place outside of the hours permitted by the local noise by-law, an exemption should be obtained from the local municipality. • Equipment should be properly maintained and in good operating condition and comply with MECP NPC-115 guidelines. • If complaints regarding construction noise arise, the contractor must investigate and verify that the noise control measures agreed to are in effect. In the presence of persistent noise complaints, alternative noise control measures may be required. |
| Natural Environment | | |
| Vegetation | <p>Vegetation clearing and encroachment of vegetation communities will be required for the new road alignment and improvements. The design has been selected to minimize encroachment of natural features, where possible, or limited to edge habitat only.</p> <p>Potential impacts related to encroachment include: loss of vegetation and habitat; alteration of habitat due to soil compaction; damage to edge trees (e.g., root zone, windthrow); changes in hydrology and moisture regime;</p> | <p>The following recommendations are provided to minimize potential effects to vegetation and vegetation communities:</p> <ul style="list-style-type: none"> • maintain existing drainage pathways and flow regimes during and post-construction; • install surface protection measures to minimize soil compaction; • demarcating the work zones to ensure work remains within the construction limits; • implement an invasive species management plan and follow the Best Management Practices (BMPs) developed by NDMNRF; |

| Category | Potential Impact | Proposed Mitigation Measure |
|----------------------------------|---|---|
| | fugitive dust suppression; salt spray effects; introduction and spread of invasive species; erosion and sedimentation; and accidental spills. | <ul style="list-style-type: none"> • prior to construction, areas with Phragmites should be treated to prevent the spread of seeds; • implement dust control measures for the suppression of fugitive dust; • implement standard BMPs for erosion and sediment control; and, • implement an emergency and response management plan to address the potential for spills. |
| Terrestrial Wildlife and Habitat | Encroachment of natural features is expected to be limited to edge habitat only but may result in permanent and temporary loss of Species at Risk (SAR) habitat (i.e., bats), candidate and confirmed SWH and generalized wildlife habitat. Temporary disruption and avoidance of habitat may also occur during construction due to construction noise, lighting and increased human presence. While most wildlife that occur along highway corridors are likely adapted, to some extent, to anthropogenic disturbances such as traffic noise and artificial light, excess or prolonged disturbances can cause impacts beyond tolerance levels. | <p>The following recommendations are provided to minimize potential effects to wildlife and wildlife habitat:</p> <ul style="list-style-type: none"> • Implement timing restrictions with activities to occur outside of sensitive periods: <ul style="list-style-type: none"> ○ To avoid impacts to breeding birds protected under the Migratory Birds Convention Act, vegetation removal should occur between September 1 and March 31 in any given year. ○ To avoid impacts to bats protected under the Endangered Species Act, removal of potential bat roosting trees is not permitted during the active season (i.e., April 1 to September 30) unless authorized by MECP. • Where vegetation removal is required during the breeding bird window (April 1 to August 31), a nest sweep is required to confirm there are no nests. If nests of a protected species are present, works will not be permitted until the young have fledged and/or approval is provided by MECP for SAR. A setback from the nest (e.g., 30 m) should be determined by a qualified biologist and the area demarcated. • Installation of bat boxes is also recommended to minimize impacts to bats during construction. • Exclusionary measures should be installed at all structural culverts prior to April 1 to prevent bird nesting;. • If Barn Swallow nests are observed at any of the culverts and work has the potential |

| Category | Potential Impact | Proposed Mitigation Measure |
|-----------------------|---|---|
| | | <p>to impact the species or the nest, the activity will need to be registered under O. Reg. 242/08 and a mitigation plan prepared.</p> <ul style="list-style-type: none"> • If turtles or snakes are encountered during construction (including hibernacula), work should be temporarily suspended until the species is out of harm's way. • If necessary, visual inspections and wildlife monitoring will be required where exclusionary measures have been installed and where wildlife activity has been noted. • Wildlife protocols should also be developed to educate workers of potential wildlife occurrences, including SAR, and measures to take in the event of potential encounters. • Where feasible, minimize the extent and duration of construction noise and lighting between April 1 to September 30. |
| Fish and Fish Habitat | <p>To accommodate the widening of Montrose Road to four lanes, the existing bridge / culverts within the corridor will require extensions to allow for the additional lanes and embankment grading. The proposed works which have potential to impact fish and fish habitat include culvert extensions, culvert replacements, channel realignments and bridge works including construction of new in-water piers.</p> | <p>To mitigate the above impacts identified at each watercourse, the following mitigation measures are recommended:</p> <ul style="list-style-type: none"> • Obtain required approvals prior to work commencing. • New channel tie-ins and watercourse realignments should be designed and constructed following natural channel design principles. This is specifically applicable to Warren Creek and the Unnamed Tributary of Lyons Creek. • New culvert extensions should be properly embedded and include the placement of streambed material with the inclusion of a low flow channel to facilitate fish passage. • Ensure the appropriate in-water timing window is adhered to (July 1st – February 28/29th). • Prior to construction of in-water piers for the bridge over the Welland River, the area should be isolated from the watercourse and a fish and mussel salvage should be undertaken within isolated areas. |

| Category | Potential Impact | Proposed Mitigation Measure |
|-----------------------------|---|--|
| | | <ul style="list-style-type: none"> • Schedule work to avoid wet and rainy periods that may increase erosion and sedimentation and run-off. • Ensure that all in-water activities do not interfere with fish passage, constrict the channel width, or reduce flows. Flow shall be maintained downstream at all times when cofferdams are in place. • Contain all in-water works with use of a coffer dam designed and installed according to relevant Contract Specifications. • Retain a qualified environmental professional to ensure applicable permits for relocating fish from within the contained work area (i.e. cofferdams) are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them. • Regular inspection, removal, and disposal of waste materials and sediment. No stockpiles of material within 30 m of the watercourse. • Minimize vegetation removal where possible and proper clearing and grubbing techniques will be utilized. • Develop and implement a riparian planting plan to ensure that cleared areas are restored to pre-construction conditions or better. • Use of properly installed silt fencing or similar erosion control measures to prevent contaminated/sediment laden run-off water from entering either watercourse. • Top soil and seed disturbed banks with native seed mixture and/or cover exposed areas with erosion control measures until seeding can occur. |
| Cultural Environment | | |
| Cultural Heritage | Direct/indirect impacts to some cultural heritage features in the study area, primarily through encroachment to the property and potential vibration impacts during construction. | <ul style="list-style-type: none"> • Design and construction should minimize encroachment as much as possible, particularly to mature trees and the post fence. • Undertake engineering assessments during detailed design to determine |

| Category | Potential Impact | Proposed Mitigation Measure |
|-------------|---|--|
| | | <p>potential vibration impacts to the structure.</p> <ul style="list-style-type: none"> • Post-construction rehabilitation, including sympathetic species planting, and reinstallation of the wood post and beam fence should be considered. This rehabilitation should be discussed with the property owner. • In consultation with the City of Niagara Falls, due to the historic nature of the house and property at 7847 Montrose Road, an HIA should be completed. |
| Archaeology | As per the recommendations of the Stage 1 AA, some of the lands adjacent to the existing roads retain archaeological potential. | <ul style="list-style-type: none"> • No construction can proceed until lands have been cleared of the potential for archaeological resources and as such, a Stage 2 AA should be carried out on all lands that will be impacted by construction. Should findings occur during Stage 2 AA, additional investigations, such as a Stage 3 and 4 AA, may be required. • As the Welland River riverbed will be impacted by the new piers and fill to accommodate for the new bridge, a marine AA should be undertaken. • All other areas as determined in the Stage 1 AA has been cleared of archaeological potential. However, should previously undocumented archaeological resources be discovered, the contractor should cease all alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork. |

DETAILED DESIGN COMMITMENTS

Below is a summary of additional works that are required to be completed during the detailed design phase of the project, prior to construction:

Transportation/Technical Requirements:

- Develop a Traffic Management Plan / Construction Staging Plan to minimize impacts to the traveling public and maintain road safety and vehicular access during construction.
- Confirm the need to raise the road profile in certain areas to accommodate utilities and servicing.
- Confirm and complete street lighting design.

- Prepare a landscaping plan and determine opportunities for streetscaping opportunities. Particularly for the vicinity of the hospital, coordinate with Niagara Health on gateway entrance features and streetscaping.
- Coordinate with utilities on relocation location and the South Niagara Falls Wastewater Treatment Plant alignment and tunnel access shafts.
- Coordinate with transit for need for bus stops and on-road bus stops in the vicinity of the South Niagara Hospital.
- Consult with CPR regarding design and construction at their at-grade crossing.
- Confirm roundabout design at Niagara Square Drive.

Socio-Economic Requirements

- Complete property requirement plans and begin negotiations with affected property owners to purchase property required for the preferred design.

Natural Environment Requirements

- Confirm areas of impacts based on detailed design.
- Wetland Delineation and further discussion with NPCA.
- Consult with regulatory agencies, prepare permit application packages and obtain required permits for environmental impacts.
- Incorporate mitigation measures into construction contract documents.

Cultural Requirements

- Complete Stage 2 Archaeological Assessments (AA) for areas impacted and determined to retain archaeological potential. If required, complete further Stage 3 or 4 AAs.
- Complete a Marine AA for impacts to the Welland River riverbed as a result of the bridge construction.
- For CHR 2, complete baseline vibration monitoring and a Heritage Impact Assessment.

1.0 Introduction

1.1 Study Area

Niagara Region has retained Parsons Inc. to conduct a Class Environmental Assessment (Class EA) Study to examine rehabilitation and improvement needs for Regional Road 98 (Montrose Road) and Regional Road 47 (Lyons Creek Road) / Biggar Road (See Figure 1). This study is being conducted in accordance with the planning and design process for 'Schedule C' projects as outlined in the Municipal Engineers Association "Municipal Class Environmental Assessment," (October 2000, as amended in 2007, 2011 and 2015).

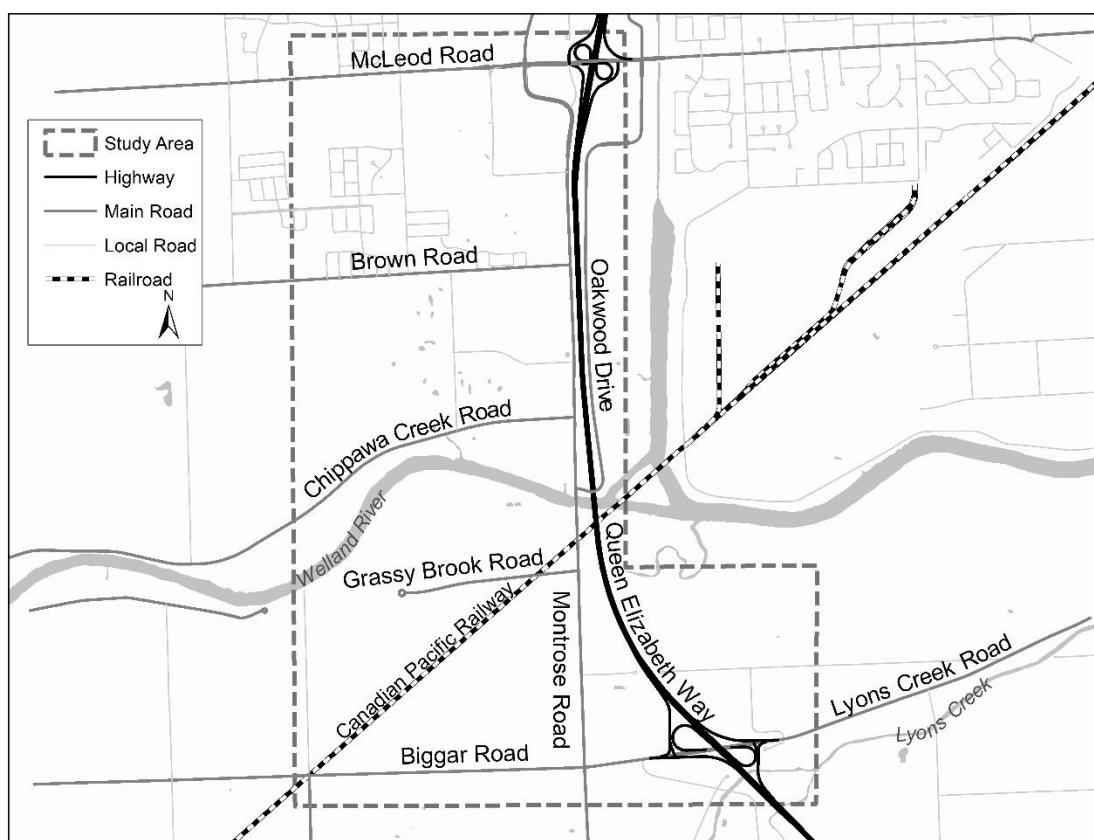


FIGURE 1. STUDY AREA

1.2 Municipal Class Environmental Assessment Process

The Ontario *Environmental Assessment Act* (EAA; 1990) forms the basis and foundation for environmental assessments (EA) undertaken within the province. The EAA identifies two planning and approval processes: Individual EAs and Class EAs.

Class EAs, once approved by the Ministry of Environment, Conservation and Parks (MECP), provide for specific classes of undertakings to follow an alternative planning and decision-making process that is different and less burdensome than that of an individual EA. Providing that the approved process is followed, undertakings conducted under Class EAs have obtained approval under the EAA and can

proceed with implementation, given that all other approvals have been obtained. Class EAs provide a more streamline process since the effects on the environment of the undertakings within that class are generally common or well understood.

The Class EA applies to municipal infrastructure projects, including roads, water and wastewater projects. Under the Municipal Class EA process, municipal road projects are categorized according to their environmental significance and potential effects they may impose on the environment. These categories, described by specific Class EA "schedules", prescribe planning methodologies for each category. At present, there are four schedule classification types including Schedule A, A+, B and C. Generally, the main difference between each of the schedule types is the degree to which each project may adversely affect the existing environment.

The Montrose Road and Lyons Creek Road / Biggar Road Municipal Class EA study has been identified as a Schedule 'C' project undertaking which applies to larger, more complex projects with the potential for significant environmental impacts (natural, social, cultural and economic) and requires multiple opportunities for public input.

An Environmental Study Report (ESR) is required for Schedule 'C' projects and documents the EA process carried out. In order to complete the Schedule 'C' process, a Notice of Completion will be submitted to review agencies, stakeholders, Indigenous Communities, and the public indicating the public review period of at least 30 days for comment and input.

The Municipal Class EA process includes five (5) phases. The combination of the five phases that are required to be completed will depend on the Schedule of the project. Schedule 'C' projects require that all five phases are conducted. The first four phases will be completed as a part of this study; the fifth phase will be initiated following completion of the study. The five phases are summarized as follows:

| | |
|--|---|
| Phase 1: Problem or Opportunity | <ul style="list-style-type: none"> • Identification and description of the problem or opportunity. |
| Phase 2: Alternative Solutions | <ul style="list-style-type: none"> • Identification of alternative solutions to the problem. • Preparation of a physical description of the study area as well as a general inventory of the natural, social and economic environments. • Evaluation of all reasonable alternatives, including the "do nothing" scenario. • Consultation with the public and review agencies. • Selection of the preferred solution. |
| Phase 3: Alternative Design Concepts for the Preferred Solution | <ul style="list-style-type: none"> • Identification of alternative designs for the preferred solution. • Preparation of a detailed inventory of the natural, social and economic environments. • Identification of the potential impacts of the alternative designs. • Evaluation of all alternative designs, including the "do nothing" scenario. • Consultation with the public and review agencies. • Selection of the preferred design. |

| | |
|--|---|
| | <ul style="list-style-type: none"> • Preliminary finalization of preferred design. |
| Phase 4: Environmental Study Report | <ul style="list-style-type: none"> • Completion of the Environmental Study Report (ESR). • Filing of the ESR on the public record for 30 days to allow for review by the public and review agencies. • Respond to requests for a higher level of study during 30-day review period, if received. |
| Phase 5: Implementation | <ul style="list-style-type: none"> • Implementation of preferred design (i.e. , detailed design, construction, etc.). |

1.3 Environmental Study Report

This Environmental Study Report (ESR) has been prepared to document the EA process followed for the Montrose Road and Lyons Creek Road / Biggar Road study as per a Schedule ‘C’ process. The ESR summarizes the inventory of existing conditions, the alternatives considered, the recommended design, the impacts and mitigation measures, and the consultation undertaken. This ESR has been made available for 30-day public review from November 1 to 30, 2021.

2.0 Project Need and Justification

2.1 Existing Planning Policies

2.1.1 PROVINCIAL POLICY STATEMENT, 2020

The *Provincial Policy Statement* (PPS; 2020) sets the policy foundation for regulating the development and use of land, provides direction on land use planning within the province to promote strong communities, a strong economy and a clean and healthy environment. All decisions related to land use planning matters are required to be consistent with the PPS. Provincial plans, such as the Greenbelt Plan, A Place to Grow: Growth Plan for the Greater Golden Horseshoe and the Growth Plan for Northern Ontario, build upon the Provincial Policy Statement's policy foundation.

Policies that are relevant to the study are provided in Policy 1.6.7 Transportation Systems. Specifically, Policy 1.6.7.1 states that transportation systems should be “safe, energy-efficient, facilitate the movement of people and goods, and are appropriate to address projected needs”.

2.1.2 A PLACE TO GROW: GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE, 2019

A Place to Grow: Growth Plan for the Greater Golden Horseshoe (the “Growth Plan”; 2019 amended 2020) is the Ontario government's initiative to plan for growth and development in a way that supports economic prosperity, protects the environment, and helps communities achieve a high quality of life. The *Places to Grow Act, 2005* enables the development of regional growth plans that guide government investments and land use planning policies.

A Place to Grow builds on the Provincial Policy Statement (PPS) to establish a unique land use planning framework for the Greater Golden Horseshoe (GGH) that supports the achievement of complete communities, a thriving economy, a clean and healthy environment, and social equity.

The Growth Plan was the first growth plan to provide a framework for implementing Ontario's vision for building stronger, prosperous communities by better managing growth in this region. It established the long-term framework for where and how the region will grow, while recognizing the realities facing the cities and smaller communities and acknowledging what governments can and cannot influence. It will support the achievement of *complete communities* with access to transit networks, protected employment zones and an increase in the amount and variety of housing available.

According to Schedule 4, Urban Growth Centres, of the Growth Plan, the study area is designated as Built-up Area and Designated Greenfield Area. Under Section 3.2.2, which speaks to policies for transportation systems to support growth, key goals include: connectivity, a balance of choices, particularly promoting transit and active transportation, sustainability, multi-modal access, accommodating agricultural vehicles (if appropriate), and safety.

2.1.3 NIAGARA REGION OFFICIAL PLAN, 2014

Niagara Region's Official Plan (2014) provides a long-range policy and planning document to help shape and manage growth in the Region, including consideration for the natural environment, the economy, resources and agriculture, infrastructure. From a transportation perspective, the Official Plan supports multimodal transportation systems and promotes modes of transport besides single-

occupant vehicle trips, including active transportation, transit and complete streets, public service facilities and a connected and convenient public transit network throughout the Region.

The Niagara Region Official Plan ensures that there is suitable transportation infrastructure to support the Region's growth and economic strategy, making transportation infrastructure planning a priority and guaranteeing that comprehensive active transportation networks are integrated into the transportation systems.

The Official Plan also identifies the structure / land uses throughout the Region. The study area is identified as part of the Urban Area with portions of the study either designated as part of the "Built-Up Area" or "Designated Greenfield Area", which is consistent with the Growth Plan. The Welland River is identified as an environmental conservation area and several potential natural heritage corridors cross or are adjacent to the study area.

2.1.4 NIAGARA REGION TRANSPORTATION MASTER PLAN, 2017

Niagara Region's Transportation Master Plan (TMP), also known as *How We Go*, is a long term strategic planning document that lays out the programs, plans, and improvements required to address transportation needs in the Region from today through to 2041. The TMP looks at various transportation needs, including roads and highways for the movement of people and goods, pedestrians and cycling facilities, and transit. The most recent iteration of the TMP was completed in 2017.

The Region's TMP looked at the anticipated growth expected for the Region over the next 25 years and provides a framework for the planning of the transportation network associated with the development of land use, understanding that the transportations systems will influence where people choose to live and work within the Region.

The Region's TMP identifies Montrose Road, from Chippawa Creek Road to Lyons Creek Road, and Lyons Creek Road, from Montrose Road to Sodom Road, as requiring capacity improvements to address projected growth for the 2032-2041 planning horizon. A Strategic Cycling Network was also developed as part of the TMP, which identifies Montrose Road as an Infill Link on a Regional Road including a multi-use trail on Montrose Road, from McLeod Road to Canadian Drive, and paved shoulders on Montrose Road, from Chippawa Creek Road to Biggar Road. Biggar Road/Lyons Creek Road is identified as existing / future cycling facility as part of the Long Term Network.

2.1.5 CITY OF NIAGARA FALLS OFFICIAL PLAN, 2019

The Official Plan for the City of Niagara Falls (2019) outlines the long term objectives and policies of the City of Niagara Falls with respect to the growth and development of urban lands, the protection of agricultural lands, the conservation of natural heritage areas, and the provision of necessary infrastructure. This Plan reflects the changes in legislation and respects the growth targets of the Growth Plan and the Regional Policy Plan.

The Official Plan identifies the study area as a mix of landuses. The north end of the study area around Niagara Square is designated as Major Commercial. Going south, most of the lands adjacent are designated as Industrial land uses. Several Environmental Protection Areas cross the study area. The south end of the study area includes lands designated as Minor Commercial and Tourist Commercial,

with lands beyond the urban boundary (i.e. south of Biggar Road/Lyons Creek Road) designated as Good General Agriculture. See **Figure 2** for the land use designations in the study area.

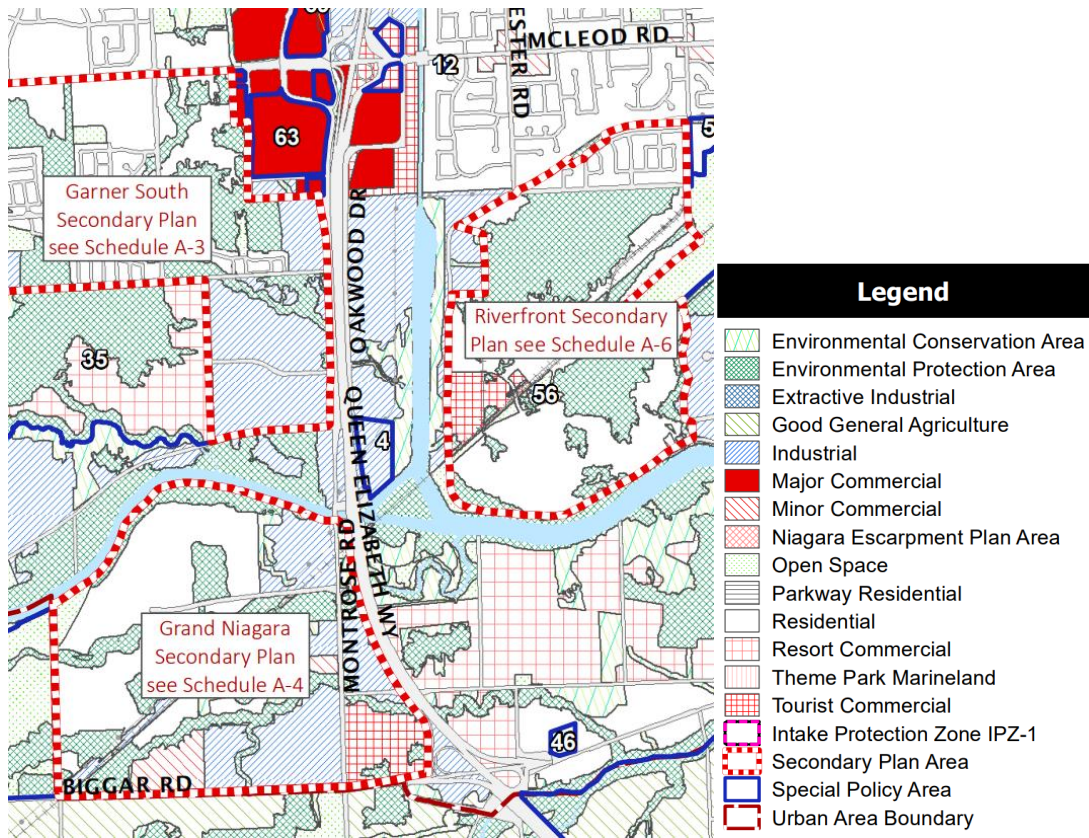


FIGURE 2: CITY OF NIAGARA FALLS OFFICIAL PLAN - LAND USE

2.1.6 GRAND NIAGARA SECONDARY PLAN

Secondary Plans are more detailed land use, transportation and servicing policy plans to support and guide future development for a specific sub-area of a city. The Grand Niagara Secondary Plan provides a detailed land use and policy framework for the lands located north of Biggar Road, south of the Welland River, east of Crowland Avenue, and west of the Queen Elizabeth Way (QEW).

The Grand Niagara Secondary Plan was approved in June 2018 and is now in effect. The subject lands cover a total area of 330 hectares and provides for a variety of land uses including: Low/Medium Density Residential, Employment, Hospital Employment campus, Mixed Use, and Natural Heritage System, as shown in **Figure 3**.

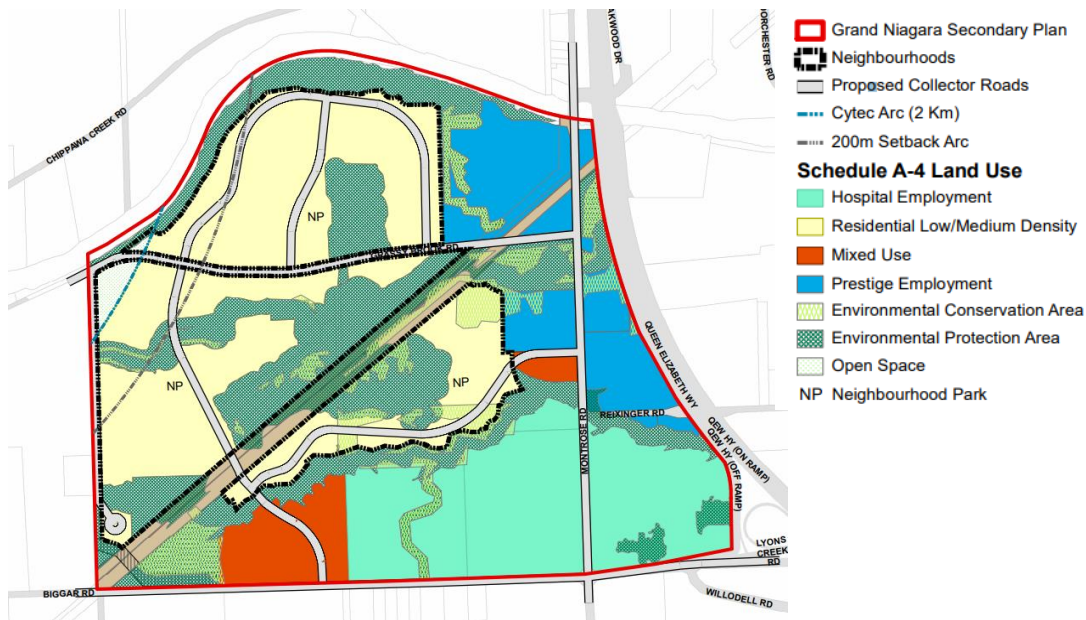


FIGURE 3: GRAND NIAGARA SECONDARY PLAN - LAND USE

2.1.7 GARNER SOUTH SECONDARY PLAN

The Garner South Secondary Plan provides a detailed land use and policy framework for the lands located west of Montrose Road, south of Canadian Drive and north of Chippawa Creek Road. The subject lands cover a total area of 225 hectares and provides for a variety of land uses including: Low/Medium/High Density Residential, Employment, Environmental Protection Area, Neighbourhood Commercial, Open Space, and Mixed, as shown in **Figure 4**.

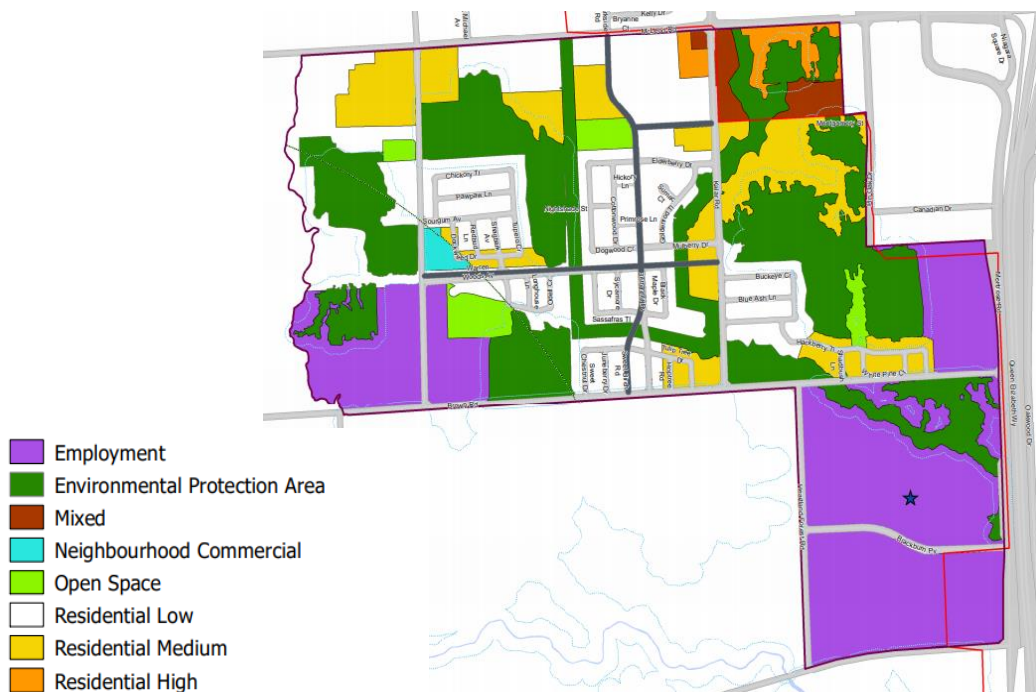


FIGURE 4: GARNER SOUTH SECONDARY PLAN - LAND USE

2.2 Problem / Opportunity Statement

Based on the review of existing planning policies and the traffic analysis as documented in Section 3.2, the following Problem / Opportunity Statement was developed for the EA study:

2.2.1 PROBLEM IDENTIFICATION

Within the study area, Montrose Road and Lyons Creek Road/Biggar Road is located in an area of existing, new and proposed development. As identified in the Region's Transportation Master Plan (2017), this existing and continued development requires road improvements to manage the demands of increased traffic volumes (both vehicular and active transportation). The TMP also identifies this section of Montrose Road and Lyons Creek Road/Biggar Road as an active transportation route, but facilities do not exist to adequately accommodate cyclists or pedestrians.

2.2.2 OPPORTUNITY STATEMENT

Opportunities exist to improve the form and function of Montrose Road and Lyons Creek Road/Biggar Road. These include:

- Create an improved roadway for all modes of transportation (vehicular, active transportation, and transit) based on the Complete Streets approach;
- Improve road safety for all road users (i.e., Vision Zero);
- Enhance the transportation corridor to facilitate regional and local movement of people and goods;
- Address future travel demand associated with population and employment growth; and,
- A long-term vision of street design that supports mixed use development.

3.0 Existing Conditions

3.1 Transportation

3.1.1 ROAD NETWORK

The majority of the corridor, including most of Montrose Road, Lyons Creek Road, and Biggar Road have a rural cross-section, with one lane per direction. The exception is the portion of Montrose Road north of Canadian Drive, adjacent to Niagara Square, which has two lanes per direction and has an urbanized cross-section. **Table 1** below provides a summary of all the roads within the study area.

TABLE 1: SUMMARY OF EXISTING ROADS IN THE STUDY AREA

| Road Name | Regional/Local | Road Type | # of Lanes | Posted Speed (km/h) |
|----------------------|-----------------------|-----------|-------------|--|
| Montrose Road | Regional Road 98 | Arterial | 2-4 | 50 (Niagara Square) 60 (Canadian Dr to Chippawa Creek Rd) 70 (Chippawa Creek Rd to Reixinger Rd) 80 (Reixinger Rd to south of Lyons Creek Rd) |
| Lyons Creek Road | Regional Road 47 | Arterial | 2-4 | 80 |
| Biggar Road | City of Niagara Falls | Arterial | 2 | 80 |
| McLeod Road | Regional Road 49 | Arterial | 4-6 | 50 |
| Niagara Square Drive | City of Niagara Falls | Local | 2 (one way) | - |
| Canadian Drive | City of Niagara Falls | Collector | 2 | - |
| Brown Road | City of Niagara Falls | Arterial | 2 | 60 |
| Blackburn Parkway | City of Niagara Falls | Local | 2 | - |
| Chippawa Creek Road | Regional Road 63 | Arterial | 2 | 50 |
| Oakwood Drive | City of Niagara Falls | Collector | 2 | 60 |
| Grassy Brook Road | City of Niagara Falls | Collector | 2 | 40 |
| Reixinger Road | City of Niagara Falls | Collector | 2 | - |

3.1.2 INTERSECTIONS

There are 14 existing intersections in the study area which are summarized in **Table 2**. There are also private accesses throughout the study area that form ingress/egress points for adjacent properties.

TABLE 2: SUMMARY OF EXISTING INTERSECTIONS IN THE STUDY AREA

| Roadway | Intersecting Street | Type | Intersection Controls |
|---------|---------------------|-------------|-----------------------|
| | McLeod Road | Four legged | Traffic Signal |

| | | | |
|------------------|--------------------------------|--|--|
| Montrose Road | Niagara Square Drive | Four legged, though two legs are one way only onto Montrose Road | Traffic Signal |
| | Canadian Drive | T-intersection | Traffic Signal |
| | Brown Road | T-intersection | Stop Control on Brown Rd only |
| | Blackburn Parkway | T-intersection | Stop Control on Blackburn Pkwy only |
| | Chippawa Creek Road | T-intersection | Stop Control on Chippawa Creek Rd only |
| | Oakwood Drive | T-intersection | Stop Control on Oakwood Dr only |
| | Grassy Brook Road | T-intersection | Stop Control on Grassy Brook only |
| | Reixinger Road | T-intersection | Stop Control on Reixinger Rd only |
| | Lyons Creek Road / Biggar Road | Four legged | Traffic Signal |
| Lyons Creek Road | Willodell Road | T-intersection | Stop Control on Willodell Rd only |
| | QEW Southbound Off Ramp | T-intersection | Stop Control on ramps only |
| | QEW Northbound Off Ramp | T-intersection | Stop Control on ramps only |
| | Dell Road | Four legged | Stop Control on Dell Rd only |

3.1.3 BRIDGE STRUCTURES

The Montrose Road Bridge over the Welland River is a semi-integral, CPCI slab on girder bridge with four (4) spans and three (3) piers in the Welland River. The current width of the existing deck is 11888mm and conveys two lanes of traffic on Montrose, a small curb on both sides, and a TL-4 parapet wall with railings. The bridge deck is drained via deck drains and maintains a navigational opening on the Welland River for small and recreational watercrafts.

3.1.4 TRANSIT

Several Niagara Falls Transit routes (specifically Routes 101, 103, 105, 111, 112, and 113) service the north end of the study area, specifically Niagara Square. Route 113 diverts down Montrose Road to Brown Road in some instances. Otherwise, no other part of the study area is serviced by Niagara Falls Transit.

Two Niagara Region Transit routes service the study area. Specifically, Route 60/65 (Welland) and Route 22 (Fort Erie) runs along Montrose Road in the study area, with a specific stop at 9515 Montrose Road. Route 22 also runs along the portion of Lyons Creek Road in the study area.

There are no formal bus stops or bus bays along the corridor except at Niagara Square and 9515 Montrose Road.

3.1.5 ACTIVE TRANSPORTATION

There are few existing facilities that support active transportation in the study area. None of the study area roads have sidewalks or cycling infrastructure, except a short section of Montrose Road

near Niagara Square which has sidewalks on the west side. Portions of the corridor have a narrow paved shoulder and gravel shoulder, though these are not conducive to walking or cycling. The bridge over the Welland River has a sidewalk on the west side but it is not connected to other existing sidewalks or paths.

3.1.6 RAILROAD CROSSINGS

There is an at-grade Canadian Pacific Rail (CPR) crossing approximately 180m north of Grassy Brook Road. According to information provided by CPR, the track is non-mainline with a speed of 10mph, having up to two trains per day in both directions.

A grade separation warrant calculation was completed for this crossing. Grade separation was not warranted for either 2026 or 2041 projected volumes.

3.2 Detailed Transportation Assessment

A Detailed Transportation Assessment (DTA) was completed to assess existing and future traffic conditions to determine the transportation needs along the corridor and assess traffic demand and operations. This includes determining the existing traffic conditions for the 2019 base year and then projecting growth based on known developments, planned growth from the Official Plan and Secondary Plans, and general population growth, for horizon years 2026 and 2041. The following presents a summary of the DTA findings, however for the actual data and full analysis, refer to **Appendix A**.

3.2.1 ROADWAY CORRIDOR CAPACITY ANALYSIS – EXISTING CONDITIONS

The first step of the DTA included analysing existing roadway corridor capacity and intersection capacity under existing roadway conditions (i.e. no road improvements). The roadway corridors and intersections were assessed based on the volume to capacity (v/c) ratio comparison under both AM and PM peak hour conditions (see **Table 3** and **Table 4**). Road segments that have a v/c ratio that exceeds 0.85 are deemed to be approaching capacity and warrant capacity enhancement and are highlighted in red text in the following tables.

TABLE 3: MONTROSE ROAD – MID-BLOCK CAPACITY ANALYSIS

| Road Segment | | Capacity | Existing (2019) Conditions | | 2026 Conditions (Do Nothing) | | 2041 Conditions (Do Nothing) | |
|-------------------------|-------------------------|----------|----------------------------|------|------------------------------|------|------------------------------|------|
| From | To | | V/C | | V/C | | V/C | |
| | | | NB | SB | NB | SB | NB | SB |
| AM Peak Period | | | | | | | | |
| Mcleod Rd | Niagara Square Entrance | 1700 | 0.16 | 0.13 | 0.32 | 0.31 | 0.47 | 0.44 |
| Niagara Square Entrance | Brown Rd | 850 | 0.39 | 0.27 | 0.76 | 0.63 | 1.05 | 0.89 |
| Brown Rd | Chippawa Creek Rd | 850 | 0.21 | 0.24 | 0.55 | 0.60 | 0.81 | 0.85 |
| Chippawa Creek Rd | Oakwood Dr | 850 | 0.21 | 0.20 | 0.53 | 0.54 | 0.79 | 0.79 |
| Oakwood Dr | Grassy Brook Rd | 850 | 0.31 | 0.24 | 0.70 | 0.63 | 1.04 | 0.95 |

| | | | | | | | | |
|-------------------------|-------------------------|------|------|------|--|------|------|------|
| Grassy Brook Rd | Lyons Creek Rd | 850 | 0.35 | 0.21 | Further divided below to reflect future conditions | | | |
| Grassy Brook Rd | Hospital Entrance | 850 | - | - | 0.74 | 0.46 | 0.90 | 0.60 |
| Hospital Entrance | Lyons Creek Rd | 850 | - | - | 1.32 | 0.59 | 1.54 | 0.71 |
| PM Peak Period | | | | | | | | |
| McLeod Rd | Niagara Square Entrance | 1700 | 0.22 | 0.24 | 0.58 | 0.62 | 0.74 | 0.77 |
| Niagara Square Entrance | Brown Rd | 850 | 0.41 | 0.45 | 0.95 | 0.97 | 1.31 | 1.32 |
| Brown Rd | Chippawa Creek Rd | 850 | 0.34 | 0.28 | 0.78 | 0.81 | 1.11 | 1.15 |
| Chippawa Creek Rd | Oakwood Dr | 850 | 0.28 | 0.38 | 0.76 | 0.84 | 1.08 | 1.18 |
| Oakwood Dr | Grassy Brook Rd | 850 | 0.35 | 0.54 | 0.85 | 1.07 | 1.34 | 1.50 |
| Grassy Brook Rd | Lyons Creek Rd | 850 | 0.29 | 0.55 | Further divided below to reflect future conditions | | | |
| Grassy Brook Rd | Hospital Entrance | 850 | - | - | 0.65 | 0.96 | 0.82 | 1.17 |
| Hospital Entrance | Lyons Creek Rd | 850 | - | - | 0.84 | 1.45 | 0.99 | 1.71 |

TABLE 4: LYONS CREEK ROAD / BIGGAR ROAD – MID-BLOCK ROAD CAPACITY ANALYSIS

| Road Segment | | Capacity | Existing (2019) Conditions | | 2026 Conditions (Do Nothing) | | 2041 Conditions (Do Nothing) | |
|-----------------------|------------------|----------|----------------------------|------|------------------------------|------|------------------------------|------|
| From | To | | V/C | | V/C | | V/C | |
| | | | NB | SB | NB | SB | NB | SB |
| AM Peak Period | | | | | | | | |
| Hospital Entrance | Montrose Rd | 850 | - | - | 0.71 | 0.58 | 0.73 | 0.91 |
| Montrose Rd | Willodell Rd | 850 | 0.69 | 0.58 | 1.14 | 1.58 | 1.35 | 1.87 |
| Willodell Rd | QEW FEB off-ramp | 1700 | 0.35 | 0.31 | 0.57 | 0.81 | 0.68 | 0.96 |
| QEW FEB off-ramp | QEW TB off-ramp | 1700 | 0.41 | 0.15 | 0.59 | 0.36 | 0.70 | 0.40 |
| PM Peak Period | | | | | | | | |
| Hospital Entrance | Montrose Rd | 850 | - | - | 0.69 | 0.73 | 0.92 | 0.94 |
| Montrose Rd | Willodell Rd | 850 | 0.69 | 1.03 | 1.68 | 1.62 | 1.97 | 1.90 |
| Willodell Rd | QEW FEB off-ramp | 1700 | 0.36 | 0.53 | 0.85 | 0.83 | 1.00 | 0.97 |
| QEW FEB off-ramp | QEW TB off-ramp | 1700 | 0.55 | 0.18 | 0.91 | 0.35 | 1.08 | 0.39 |

Under existing conditions, Montrose Road, Lyons Creek Road, and Biggar Road operates within capacity, however, capacity enhancement/road widening will be required under both 2026 and 2041 conditions to accommodate the traffic from the planned developments in addition to general background traffic growth.

3.2.2 INTERSECTION CAPACITY ANALYSIS – EXISTING CONDITIONS

The DTA also assesses how well an intersection operates using the v/c ratio which are associated with Level of Service (LOS) ratings. LOS ranges from A to F, with E and F representing v/c greater than 0.85. The analysis also considers the amount of delay (in seconds) experienced.

3.2.2.1 Signalized Intersections

All signalized intersections except the Montrose Road and Lyons Creek Road / Biggar Road intersection, are operating acceptably under existing conditions. Under existing conditions, the Montrose Road and Lyons Creek Road/Biggar Road intersection is at capacity during AM peak hour and over capacity during PM peak hour, particularly for the westbound and southbound movements. The intersection and all movements are over capacity during both the future (2026) and (2041) conditions. The existing lane configuration is not sufficient to accommodate the future traffic from the hospital and the other planned developments. See **Table 5** for findings.

Montrose Road and McLeod Road intersection is also forecast to exceed capacity under the future (2026) and (2041) conditions during PM peak conditions which is a common experience within developed urban environments.

TABLE 5: SIGNALIZED INTERSECTION CAPACITY ANALYSIS

| Intersection | AM Peak Hour | | | | PM Peak Hour | | | |
|--|--------------|-----------|-----|--------------------------------|--------------|-----------|-----|--|
| | V/C | Delay (s) | LOS | Critical Movements (LOS) | V/C | Delay (s) | LOS | Critical Movements (LOS) |
| Existing 2019 | | | | | | | | |
| Montrose Rd & Lyons Creek Rd / Biggar Rd | 0.97 | 50 | D | WB (E), NB (D) | 1.60 | 274 | F | WB (F), SB (F) |
| Montrose Rd & Niagara Square Dr | 0.66 | 23 | C | - | 0.61 | 12 | B | - |
| Montrose Rd & McLeod Rd | 0.64 | 25 | C | - | 0.86 | 31 | C | WBT (D), NBL (D), NBT (D), NBR (D) |
| 2026 Conditions (Do Nothing) | | | | | | | | |
| Montrose Rd & Lyons Creek Rd / Biggar Rd | 2.61 | 599 | F | EB (F), WB (F), NB (F), SB (F) | 4.69 | 1173 | F | EB (F), WB (F), NB (F), SB (F) |
| Montrose Rd & Canadian Dr | 0.47 | 14 | B | - | 0.71 | 20 | C | - |
| Montrose Rd & Niagara Square Entrance | 0.52 | 19 | B | - | 0.76 | 15 | B | EBL (D) |
| Montrose Rd & Niagara Square Dr | 0.69 | 13 | B | - | 0.86 | 19 | B | WBL (C), NBT (C) |
| Montrose Rd & McLeod Rd | 0.78 | 27 | C | - | 1.10 | 69 | E | EBL (F), EBTR (E), WBL (F), WBT (E), WBR (D), NBL (D), NBT (D), NBR (F), SBL (F) |
| 2041 Conditions (Do Nothing) | | | | | | | | |
| Montrose Rd & Lyons Creek Rd / Biggar Rd | 3.84 | 835 | F | EB (F), WB (F), NB (F), SB (F) | 5.98 | 1582 | F | EB (F), WB (F), NB (F), SB (F) |
| Montrose Rd & Canadian Dr | 0.69 | 23 | C | NBT (C) | 1.17 | 55 | E | EBL (D), EBR (D), NBL (F), NBT (C), SBT (E) |

| | | | | | | | | |
|---------------------------------------|------|----|---|------------------------------|------|-----|---|--|
| Montrose Rd & Niagara Square Entrance | 0.68 | 23 | C | NBT (D) | 0.84 | 21 | C | EBL (F), EBR (E) |
| Montrose Rd & Niagara Square Dr | 0.79 | 15 | B | - | 0.95 | 29 | C | WBL (D), NBT (C) |
| Montrose Rd & McLeod Rd | 0.89 | 37 | D | EBL (D), WBT (D), NBR (E) | 1.49 | 123 | F | EBL (F), EBTR (E), WBL (F), WBT (F), WBR (D), NBT (D), NBR (F), SBL (F) |

3.2.2.2 Unsignalized Intersections

Under existing conditions, all movements at all the intersections are operating well with residual capacity except the SBL (south bound left) movement at QEW FEB off-ramp at Lyons Creek Road during the PM peak hour. See **Table 6** for findings.

Under the 2026 and 2041 conditions, Montrose Road intersections at Grassy Brook Road, Oakwood Drive, Chippawa Creek Road and Brown Road are forecast to experience excessive delays to minor street movements resulting in lengthy queues, in most cases.

QEW FEB off-ramp at Lyons Creek Road is predicted to have both SBR (south bound right) and SBL movements to be constrained under both the future horizon years, while NBL (north bound left) movement is constrained at QEW TB offramp at Lyons Creek Road.

TABLE 6: UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS

| Intersection | Existing Conditions | | 2026 Conditions (Do Nothing) | | 2041 Conditions (Do Nothing) | | | | | |
|---------------------------------------|---------------------|-----|-------------------------------------|-----|------------------------------|-----|-----|---|-----|---|
| | Dir | LOS | Dir | LOS | Dir | LOS | | | | |
| AM Peak Hour | | | | | | | | | | |
| Montrose Rd & Reixinger Rd | WBL | B | WBL | B | WBL | B | | | | |
| | SBL | A | SBL | A | SBL | A | | | | |
| Montrose Rd & Grassy Brook Rd | EBL | A | EBL | F | EBL | F | | | | |
| | NBL | A | NBL | A | NBL | A | | | | |
| Montrose Rd & Oakwood Dr | WBL | B | WBL | C | WBL | F | | | | |
| | SBL | A | SBL | A | SBL | A | | | | |
| Montrose Rd & Chippawa Creek Rd | EBL | B | EBL | C | EBL | F | | | | |
| | NBL | A | NBL | A | NBL | A | | | | |
| Montrose Rd & Brown Rd | EBL | B | EBL | F | EBL | F | | | | |
| | NBL | A | NBL | A | NBL | A | | | | |
| Montrose Rd & Canadian Dr | EBL | B | Intersection analysed as signalized | | | | | | | |
| | NBL | A | | | | | | | | |
| Montrose Rd & Niagara Square Entrance | EBL | B | | | | | | | | |
| | EBR | A | | | | | | | | |
| | NBL | A | | | | | | | | |
| Lyons Creek Rd & Willodell Rd | WBL | A | | | | | WBL | A | WBL | A |
| | NBL | B | | | | | NBL | C | NBL | D |
| Lyons Creek Rd & QEW FEB off-ramp | SBL | C | | | | | SBL | F | SBL | F |
| | SBR | B | | | | | SBR | F | SBR | F |
| | NBL | B | | | | | NBL | E | NBL | F |

| | | | | | | | | | | |
|---------------------------------------|-----|---|-------------------------------------|---|-----|---|-----|---|-----|---|
| Lyons Creek Rd & QEW TB off-ramp | NBR | A | NBR | B | NBR | B | | | | |
| PM Peak Hour | | | | | | | | | | |
| Montrose Rd & Reixinger Rd | WBL | B | WBL | B | WBL | C | | | | |
| | SBL | A | SBL | A | SBL | A | | | | |
| Montrose Rd & Grassy Brook Rd | EBL | B | EBL | F | EBL | F | | | | |
| | NBL | A | NBL | A | NBL | A | | | | |
| Montrose Rd & Oakwood Dr | WBL | C | WBL | F | WBL | F | | | | |
| | SBL | A | SBL | A | SBL | A | | | | |
| Montrose Rd & Chippawa Creek Rd | EBL | B | EBL | E | EBL | F | | | | |
| | NBL | A | NBL | A | NBL | B | | | | |
| Montrose Rd & Brown Rd | EBL | B | EBL | F | EBL | F | | | | |
| | NBL | A | NBL | A | NBL | A | | | | |
| Montrose Rd & Canadian Dr | EBL | B | Intersection analysed as signalized | | | | | | | |
| | NBL | A | | | | | | | | |
| Montrose Rd & Niagara Square Entrance | EBL | C | | | | | | | | |
| | EBR | A | | | | | | | | |
| | NBL | A | | | | | | | | |
| Lyons Creek Rd & Willodell Rd | WBL | A | | | | | WBL | A | WBL | A |
| | NBL | B | | | | | NBL | F | NBL | F |
| Lyons Creek Rd & QEW FEB off-ramp | SBL | F | | | | | SBL | F | SBL | F |
| | SBR | C | | | | | SBR | F | SBR | F |
| Lyons Creek Rd & QEW TB off-ramp | NBL | C | | | | | NBL | F | NBL | F |
| | NBR | B | NBR | B | NBR | C | | | | |

3.2.3 FUTURE ROADWAY TRAFFIC CONDITIONS – WITH IMPROVEMENTS

Based on the traffic analysis for the existing and forecasted traffic volumes and how well the existing road and intersections (i.e. no improvements made) would operate under the forecasted traffic volumes, the DTA determined that additional capacity improvements are required to address the increase in traffic demand associated with the growth of the area. As such traffic assessments were carried out for future 2026 and 2041 horizon years with improvements, in this case widening the study area roads to four lanes (two per direction). By doing so, road capacity would increase to 1,700 vehicles per hour per direction and provide a v/c ratio lower than 0.85 with some residual capacity in most instances. These findings, as shown in **Table 7** and **Table 8**, indicate that widening would accommodate for future increases in traffic demand.

TABLE 7: MONTROSE ROAD - MID-BLOCK CAPACITY ANALYSIS WITH IMPROVEMENTS

| Road Segment | | 2026 Conditions | | | | 2041 Conditions | | | |
|--------------|-------------------------|-----------------------|------|-------------------|------|-----------------|------|-------------------|------|
| From | To | V/C Do Nothing | | V/C With Widening | | V/C Do Nothing | | V/C With Widening | |
| | | NB | SB | NB | SB | NB | SB | NB | SB |
| | | AM Peak Period | | | | | | | |
| Mcleod Rd | Niagara Square Entrance | 0.32 | 0.31 | 0.32 | 0.31 | 0.47 | 0.44 | 0.47 | 0.44 |

| | | | | | | | | | |
|-------------------------|-------------------------|------|------|------|------|------|------|------|------|
| Niagara Square Entrance | Brown Rd | 0.76 | 0.63 | 0.38 | 0.32 | 1.05 | 0.89 | 0.53 | 0.45 |
| Brown Rd | Chippawa Creek Rd | 0.55 | 0.60 | 0.27 | 0.30 | 0.81 | 0.85 | 0.41 | 0.43 |
| Chippawa Creek Rd | Oakwood Dr | 0.53 | 0.54 | 0.26 | 0.27 | 0.79 | 0.79 | 0.40 | 0.40 |
| Oakwood Dr | Grassy Brook Rd | 0.70 | 0.63 | 0.35 | 0.31 | 1.04 | 0.95 | 0.52 | 0.48 |
| Grassy Brook Rd | Hospital Entrance | 0.74 | 0.46 | 0.37 | 0.23 | 0.90 | 0.60 | 0.45 | 0.30 |
| Hospital Entrance | Lyons Creek Rd | 1.32 | 0.59 | 0.66 | 0.29 | 1.54 | 0.71 | 0.77 | 0.36 |
| PM Peak Period | | | | | | | | | |
| Mcleod Rd | Niagara Square Entrance | 0.58 | 0.62 | 0.58 | 0.62 | 0.74 | 0.77 | 0.74 | 0.77 |
| Niagara Square Entrance | Brown Rd | 0.95 | 0.97 | 0.48 | 0.49 | 1.31 | 1.32 | 0.65 | 0.66 |
| Brown Rd | Chippawa Creek Rd | 0.78 | 0.81 | 0.39 | 0.41 | 1.11 | 1.15 | 0.56 | 0.58 |
| Chippawa Creek Rd | Oakwood Dr | 0.76 | 0.84 | 0.38 | 0.42 | 1.08 | 1.18 | 0.54 | 0.59 |
| Oakwood Dr | Grassy Brook Rd | 0.85 | 1.07 | 0.43 | 0.54 | 1.34 | 1.50 | 0.67 | 0.75 |
| Grassy Brook Rd | Hospital Entrance | 0.65 | 0.96 | 0.33 | 0.48 | 0.82 | 1.17 | 0.41 | 0.59 |
| Hospital Entrance | Lyons Creek Rd | 0.84 | 1.45 | 0.42 | 0.73 | 0.99 | 1.71 | 0.50 | 0.86 |

TABLE 8: LYONS CREEK ROAD / BIGGAR ROAD - MID-BLOCK CAPACITY ANALYSIS WITH IMPROVEMENTS

| Road Segment | | 2026 Conditions | | | | 2041 Conditions | | | |
|-----------------------|------------------|-----------------------|------|-------------------|------|-----------------|------|-------------------|------|
| From | To | V/C Do Nothing | | V/C With Widening | | V/C Do Nothing | | V/C With Widening | |
| | | NB | SB | NB | SB | NB | SB | NB | SB |
| | | AM Peak Period | | | | | | | |
| Hospital Entrance | Montrose Rd | 0.71 | 0.58 | 0.35 | 0.29 | 0.73 | 0.91 | 0.38 | 0.45 |
| Montrose Rd | Willodell Rd | 1.14 | 1.58 | 0.57 | 0.79 | 1.35 | 1.87 | 0.68 | 0.93 |
| Willodell Rd | QEW FEB off-ramp | 0.57 | 0.81 | 0.57 | 0.54 | 0.68 | 0.96 | 0.68 | 0.64 |
| QEW FEB off-ramp | QEW TB off-ramp | 0.59 | 0.36 | 0.58 | 0.36 | 0.70 | 0.40 | 0.70 | 0.40 |
| PM Peak Period | | | | | | | | | |
| Hospital Entrance | Montrose Rd | 0.69 | 0.73 | 0.34 | 0.37 | 0.92 | 0.94 | 0.46 | 0.47 |
| Montrose Rd | Willodell Rd | 1.68 | 1.62 | 0.84 | 0.81 | 1.97 | 1.90 | 0.99 | 0.95 |
| Willodell Rd | QEW FEB off-ramp | 0.95 | 0.83 | 0.85 | 0.55 | 1.00 | 0.97 | 1.00 | 0.64 |
| QEW FEB off-ramp | QEW TB off-ramp | 0.91 | 0.35 | 0.91 | 0.35 | 1.08 | 0.39 | 1.08 | 0.39 |

3.2.4 FUTURE INTERSECTION TRAFFIC CONDITIONS - WITH IMPROVEMENTS

Intersections were also reviewed in the DTA to determine how intersections would operate with proposed improvements (widening and future signalization) in place. Findings, as shown in **Table 9**, indicate that most signalized intersections are operating within capacity. Findings for unsignalized intersections, as shown in **Table 10**, indicate that several intersections are anticipated to have excessive delays to minor street traffic under the future 2041 conditions, however these intersections do not meet the warrants for signalization. For more information on the ultimate recommendations for intersections, see Section 7.4.

TABLE 9: SIGNALIZED INTERSECTION CAPACITY ANALYSIS - WITH IMPROVEMENTS

| Intersection | AM Peak Hour | | | | PM Peak Hour | | | |
|--|--------------|-----------|-----|--|--------------|-----------|-----|--|
| | V/C | Delay (s) | LOS | Critical Movements (LOS) | V/C | Delay (s) | LOS | Critical Movements (LOS) |
| 2026 Horizon | | | | | | | | |
| Montrose Rd & Lyons Creek Rd / Biggar Rd | 0.88 | 48 | D | EBL (F), WBL (F), NBL (D), NBT (D), NBR (D), SBL (F) | 0.92 | 67 | E | EBL (D), EBTR (F), WBL (F), WBT (D), WBR (D), NBL (E), NBT (E), NBR (E), SBL (F) |
| Montrose Rd & Niagara Square Dr | 0.69 | 13 | B | - | 0.85 | 19 | B | WBL (C), NBT (B) |
| Montrose Rd & Canadian Dr | 0.26 | 10 | A | - | 0.61 | 16 | B | - |
| Montrose Rd & McLeod Rd | 0.78 | 27 | C | - | 1.10 | 70 | E | EBL (F), EBTR (E), WBL (F), WBT (E), WBR (D), NBL (D), NBT (D), NBR (F), SBL (F) |
| Montrose Rd & Hospital South Access | 0.69 | 19 | B | NBL (C) | 0.80 | 27 | C | NBL (D), SBT (D) |
| Biggar Rd & Hospital East Access | 0.32 | 11 | B | - | 0.45 | 14 | B | - |
| Lyons Creek Rd * QEW FEB Off-Ramp | 0.97 | 11 | B | - | 0.90 | 12 | B | - |
| 2041 Horizon | | | | | | | | |
| Montrose Rd & Lyons Creek Rd / Biggar Rd | 1.10 | 67 | E | EBL (F), EBTR (D), WBL (F), WBT (D), SBL (F) | 1.07 | 82 | F | EBL (D), EBT (F), WBL (F), WBT (D), NBL (E), NBT (E), SBL (F) |
| Montrose Rd & Niagara Square Dr | 0.80 | 16 | B | - | 0.91 | 26 | C | WBL (C), NBT (C) |
| Montrose Rd & Canadian Dr | 0.37 | 12 | B | - | 0.83 | 24 | C | NBL (D), SBT (C) |
| Montrose Rd & McLeod Rd | 0.91 | 24 | C | NBT (D), SBL (E) | 1.15 | 55.5 | E | EBL (E), EBTR (D), WBL (E), WBT (D), NBL (D), NBT (E), SBL (F), SBTR (D) |
| Montrose Rd & Hospital South Access | 0.74 | 25 | C | NBL (C) | 0.89 | 32 | C | WBL (E), NBL (D), SBT (D) |
| Biggar Rd & Hospital East Access | 0.38 | 9 | A | SBL (D) | 0.58 | 16 | B | - |

| | | | | | | | | |
|--------------------------------------|------|----|---|---|------|----|---|---------|
| Lyons Creek Rd & QEW FEB Off-Ramp | 1.12 | 11 | B | - | 1.08 | 16 | B | EBT (C) |
|--------------------------------------|------|----|---|---|------|----|---|---------|

TABLE 10: UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS – WITH IMPROVEMENTS

| Intersection | 2026 Conditions | | 2041 Conditions | |
|----------------------------------|-----------------|-----|-----------------|-----|
| | Dir | LOS | Dir | LOS |
| AM Peak Hour | | | | |
| Montrose Rd & Reixinger Rd | WBL | B | WBL | B |
| | SBL | A | SBL | A |
| Montrose Rd & Grassy Brook Rd | EBL | C | EBL | F |
| | NBL | A | NBL | A |
| Montrose Rd & Oakwood Dr | WBL | C | WBL | E |
| | SBL | A | SBL | B |
| Montrose Rd & Chippawa Creek Rd | EBL | C | EBL | E |
| | NBL | A | NBL | A |
| Montrose Rd & Brown Rd | EBL | E | EBL | F |
| | NBL | A | NBL | A |
| Lyons Creek Rd & Willodell Rd | WBL | B | WBL | B |
| | NBL | B | NBL | C |
| Lyons Creek Rd & QEW TB off-ramp | NBL | E | NBL | F |
| | NBR | B | NBR | B |
| Biggar Rd & Hospital West Access | EBL | A | EBL | A |
| | SBL | A | SBL | B |
| PM Peak Hour | | | | |
| Montrose Rd & Reixinger Rd | WBL | B | WBL | B |
| | SBL | A | SBL | A |
| Montrose Rd & Grassy Brook Rd | EBL | E | EBL | F |
| | NBL | B | EBR | C |
| | - | - | NBL | B |
| Montrose Rd & Oakwood Dr | WBL | F | WBL | F |
| | SBL | A | WBR | B |
| | - | - | SBL | B |
| Montrose Rd & Chippawa Creek Rd | EBL | D | EBL | F |
| | NBL | A | EBR | B |
| | - | - | NBL | B |
| Montrose Rd & Brown Rd | EBL | F | EBL | F |
| | NBL | B | EBR | B |
| | - | - | NBL | B |
| Lyons Creek Rd & Willodell Rd | WBL | B | WBL | C |
| | NBL | D | NBL | F |
| Lyons Creek Rd & QEW TB off-ramp | NBL | F | NBL | F |
| | NBR | B | NBR | C |
| Biggar Rd & Hospital West Access | EBL | A | EBL | A |
| | SBL | C | SBL | D |
| | - | - | SBR | B |

3.2.5 ACCESS MANAGEMENT

As part of the 2017 update to the Niagara Region Transportation Master Plan (TMP), an Access Management policy was created. The goal of Niagara Region's access management policy is to maintain effective traffic flow by minimizing entrances where reasonable. The key objective is to provide a safe access which is consistent with the function and operation of the public road system and access needs of the adjacent land uses. The Geometric Design Guide for Canadian Roads (Transportation Association of Canada – 1999) states that “access management provides a systematic means of balancing the access and mobility requirements of roads. Access management is the process that manages access to land development while simultaneously preserving the flow of traffic on the surrounding public road system in terms of safety, capacity, and speed.”

Niagara Region's policy on Access Management indicates that direct access to/from regional roads should be discouraged or denied except where no alternative exists. Access to a property should be obtained from the local road system where possible. When access must be provided from a regional road, it should be proven to be safe without affecting the capacity of the roadway and balance the needs of all road users. Where possible, existing entranceways should be considered before new entranceways are introduced, and where possible consideration should be given to consolidating entranceways. Sufficient sight distances for vehicles using the access is essential. A Transportation Impact Study that considers the impacts on all roads users may also be required prior to determining the location of an access, the type of access being considered, and the design of said access.

In relation to this EA Study, Niagara Region has applied the access management policy along these roads in order to manage the existing commercial, industrial and residential entrances while considering how future entrances will be controlled.

3.3 Illumination

Most of the study area does not have street lighting. There are some street lights to the west of Montrose Road just north of the Welland River and consistent lighting in the vicinity of Niagara Square.

3.4 Drainage and Stormwater Management

Except for the northern and eastern portion of the study area where the road is urbanized, the majority of the study area drains into roadside ditches which are conveyed towards several culverts that lead to watercourses. A Drainage and Stormwater Management report was prepared to document the analysis of existing drainage conditions, including existing drainage patterns and catchment areas, and the hydrologic and hydraulic assessments undertaken. For the full report, refer to **Appendix B**.

There are eight (8) existing culverts located in the study area which are summarized in **Table 11**.

TABLE 11: EXISTING CULVERTS IN THE STUDY AREA

| No. | Name | Location | Type of Culvert | Span or Diameter (mm) | Rise (mm) | Fisheries | Comments |
|-----|---------------------------------------|---------------|----------------------------------|-----------------------|--------------|-----------|---|
| 1 | Tributary of Warren Creek Culvert | Montrose Road | Non-Rigid Frame Open Footing | 1200 | 1500 | Indirect | Good Condition, Non-structural |
| 2 | Warren Creek Culvert | Montrose Road | Non-Rigid Frame Open Footing | 5500 | 2100 | Direct | Good Condition, Structural |
| 3 | Drainage (north of Chippawa Creek Rd) | Montrose Road | Rigid Frame Box Culvert | 1200 | 1200 | N/A | Good Condition, Non-structural |
| 4 | Drainage (South of Welland River) | Montrose Road | Corrugated Steel Pipe (CSP) | 800 | - | N/A | Recommend for replacement |
| 5 | Grassy Brook Culvert | Montrose Road | Two Cell Box Culverts | 3000 2400 | 2100 1800 | Direct | Good Condition, Structural |
| 6 | Lyons Creek Tributary Culvert | Montrose Road | Reinforced Open Footing Culvert | 4300 | 1200 | Indirect | Previously widened, original section in fair condition, opportunity to upsize |
| 7 | Drainage | Biggar Road | High Density Polyethylene (HDPE) | 600 | | N/A | Replace culvert to minimum size |
| 8 | Drainage (South of Lyons Creek Road) | Montrose Road | HDPE | 450 | | N/A | - |

3.5 Utilities and Servicing

The City of Niagara Falls owns watermains and wastewater sewers throughout the study area. For the majority of Montrose Road and along Lyons Creek Road up to the QEW interchange, the City operates a 300mm PVC watermain. There are no current water services on Biggar Road. The City is currently undertaking a study to provide a secondary watermain (300mm PVC) for the South Niagara Hospital site.

Similarly, the City operates several sanitary sewers throughout Montrose Road and on Lyons Creek Road. There are no sanitary sewers on Biggar Road. Aside from development servicing extensions and related infrastructure upgrades described in the Grand Niagara Secondary Plan, there are no

approved plans for sewer extensions or upgrades within the Study Area. The City is however contemplating the extension of the sanitary sewer along Biggar Road within the extent of future road reconstruction limits.

The Region is currently undertaking a Municipal Class EA for its South Niagara Falls Wastewater Treatment Plant (SNFWWTP) project, which includes a new wastewater treatment plant and wastewater linear infrastructure, to meet the growing needs of the South Niagara Falls area. At this stage in their study, they have selected a wastewater treatment plant site east of the study area, on the east side of the QEW.

The existing dry utilities in the area include:

- Bell
- Cogeco
- Enbridge
- Hydro One
- Niagara Peninsula Energy Inc. (NPEI)
- Niagara Region Broadband Network (NRBN)

3.6 Socio-Economic Environment

3.6.1 PROVINCIAL, REGIONAL AND LOCAL PLANNING POLICIES

An overview of the applicable planning policies are discussed in Section 2.1 above.

3.6.2 EXISTING LAND USE AND ZONING

The existing land use in the study area is a mix of commercial, particularly around Niagara Square, agriculture and farmland, industrial, environmental protection areas, and residential. However, this is a transitional area as shown by the City of Niagara Falls Official Plan, which identifies this area as having a mix of land uses, including Commercial (Major and Minor), Industrial, Environmental Protection Area, Tourist Commercial, and Good General Agriculture. Changes are particularly reflected in the two secondary plans (Garner South and Grand Niagara) which support additional employment and residential development to the area. Land Use and the secondary plans are discussed in Section 2.1.

3.6.3 CURRENT AND FUTURE DEVELOPMENTS

The study area is seeing current growth and development. Changes in zoning from the secondary plans also reflect the planned growth for the area. These developments will further increase travel demand to and from the study area. Current and recent developments include:

- New Costco in Niagara Square
- Residential Subdivision on Brown Road

Known future developments (i.e. site plan has been submitted) include:

- Commercial/Residential developments south of McLeod Road and Montrose Road
- South Niagara Hospital on the northwest quadrant of Montrose Road and Biggar Road
- Development associated with the Grand Niagara Secondary Plan
- Development associated with the Garner South Secondary Plan, including employment lands at Blackburn Parkway

3.7 Natural Environment

The following sections document existing natural environment conditions in the study area. For the full Natural Environment Assessment Report, refer to **Appendix C**.

3.7.1 DESIGNATED AREAS

Designated Areas are defined by resource agencies, municipalities, the provincial and federal government and/or the public, through legislation, policies, or approved management plans, to have special or unique value. Such areas may have a variety of ecological, recreational, and/or aesthetic features and functions that are highly valued. Designated areas identified within the study area include:

- **Niagara Peninsula Conservation Authority (NPCA) Approximate Regulation Lands.** These areas are associated with Provincially Significant Wetlands (PSWs) and watercourses regulated by NPCA.
- **Environmental Protection Areas (EPAs),** identified by both Niagara Region and the City of Niagara Falls. EPAs encompass a variety of environmental features, however, specific features that may be directly impacted include PSWs, NPCA regulated wetlands greater than 2 ha in size, and Significant Habitat of Endangered and Threatened Species.
- **Environmental Conservation Areas (ECAs),** identified by both Niagara Region and the City of Niagara Falls. ECAs encompass a variety of environmental features, however, specific features that may be directly impacted include include significant woodlands, Significant Wildlife Habitat (SWH), significant habitat of species of concern, significant walleylands, critical fish habitat (Type 1) and other fish habitat (Type 2 and 3).
- **Potential Natural Heritage Corridors,** are areas that connect Core Natural Areas and should be maintained or enhanced as they provide ecological functions and linkages for surrounding natural features. Potential natural Heritage Corridors in the study area follow a portion of Warren Creek, the Welland River, CPR, and the area surrounding Biggar Road and Lyons Creek Road, including Lyons Creek North PSW and Lyons Creek PSW.

3.7.2 TERRESTRIAL ENVIRONMENT

3.7.2.1 Ecological Land Classification (ELC)

The vegetation communities in the study area were assessed and described using the Ecological Land Classification and are summarized in **Table 12**. For mapping of the ELC, refer to the Natural Environment Assessment report in **Appendix C**.

TABLE 12: ELC VEGETATION COMMUNITIES

| ELC Code | Community Type | Description |
|---------------------------------|------------------------------|--|
| Constructed Communities | | |
| CGL | Manicured Lawn | This community type includes built-up areas, including residential, rural, commercial and institutional lands, as well as recreational areas such as golf courses. Greenlands such as manicured lawns are also identified within the constructed community type. |
| CGL_1 | Golf Course | |
| CVC | Commercial and Institutional | |
| CVC_1 | Business Sector | |
| CVR | Residential Property | |
| CVS_2 | Hospital (to be constructed) | |
| Agricultural Communities | | |

| ELC Code | Community Type | Description |
|----------------------------------|--|---|
| OAGM1 | Annual Row Crops | This community type includes active agricultural lands used for the production of row crops such as soybean or corn. |
| OAGM2 | Perennial Cover Crop | This community type includes hayfields and fallow lands that are dominated by grasses and herbs. |
| Meadow Communities | | |
| MEFM1 | Dry - Fresh Forb Meadow Ecosite | This community type is dominated by forbs such as Goldenrod or Asters. |
| MEGM3 | Dry - Fresh Graminoid Meadow Ecosite | This community type is dominated by grasses. |
| Hedgerow and Thicket Communities | | |
| HOD | Deciduous Hedgerow | This community includes narrow treed hedgerows with a mix of species, including Bur Oak, White Elm, Eastern Cottonwood, Freeman's Maple, Pin Oak, Norway Maple and Norway Spruce. |
| THDM2 | Dry - Fresh Deciduous Shrub Thicket Ecosite | |
| THDM2-4 | Gray Dogwood Deciduous Shrub Thicket Type | |
| Woodland Communities | | |
| CUW | Cultural Woodland Ecosite | This community was identified from satellite imagery and is located within the limits of the study area not visible from the ROW. |
| FOC | Coniferous Forest Ecosite | This community was identified from satellite imagery and is located along Dell Road near the eastern limits of the study. |
| FOD | Deciduous Forest Ecosite | This community was identified from satellite imagery and is located within the limits of the study area not visible from the ROW. |
| FOD2-4 | Dry - Fresh Oak - Hardwood Deciduous Forest Type | This community type is located adjacent to the Lyons Creek North PSW and is also identified by the Niagara Region as a significant woodland. This community is dominated by Red Oak with White Oak associates. |
| FOD7 | Fresh - Moist Lowland Deciduous Forest Ecosite | This community type is located along Montrose Road and include large patches surrounding the Warren Creek PSW, Lower Grassy Brook PSW, and two communities on the north side of Montrose Road across from where the future Niagara hospital will be located. The woodlands surrounding the Lower Grassy Brook PSW are also identified by the Niagara Region as significant. |
| FOD9 | Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite | This community type is located along Lyons Creek Road and includes three woodland units that are also identified by the Niagara Region as significant. |

| ELC Code | Community Type | Description |
|----------------------------|---|--|
| | | These woodlands are dominated by Red Oak ,with Pin Oak and White Elm associates. |
| Wetland Communities | | |
| MAM | Meadow Marsh Ecosite | This community type was identified based on satellite imagery and is located along Dell Road, off of Lyons Creek Road near the southern limits of the study area. |
| MAM2-2 | Reed-canary Grass Mineral Meadow Marsh Type | Associated with the Lower Grassy Brook PSW. Dominated by Reed-canary Grass. |
| MAMM1-2 | Cattail Graminoid Mineral Meadow Marsh Type | This community type is dominated by Broad-leaved Cattail. This includes one community near the Welland River and two communities near Lyons Creek Road. |
| MAMM1-12 | Common Reed Graminoid Mineral Meadow Marsh Type | This community type is dominated by European Common Reed. There are five communities scattered throughout the study area. |
| MAS | Mineral Shallow Marsh Ecosite | |
| MAS2-1 | Cattail Mineral Shallow Marsh Type | Associated with the Welland River East PSW. Dominated by Broad-leaved Cattail. |
| OAD | Open Aquatic | This community type includes open water ponds. |
| SWD1-3 | Pin Oak Mineral Deciduous Swamp Type | Associated with the Lyons Creek North PSW and Lyons Creek PSW, which is also identified by the Niagara Region as a significant woodland. Dominated by Pin Oak with Silver Maple, Red Maple, Red Oak and Green Ash. This community type is considered provincially rare (S2S3) and globally rare (G2) |
| SWD2-2 | Green Ash Mineral Deciduous Swamp Type | Associated with the Welland River East PSW. Dominated by Green Ash, with Black Walnut, White Elm, Eastern Cottonwood, Sugar Maple, and Red Maple. Red-osier Dogwood, Grey Dogwood and Hawthorn species are also present. |
| SWD3-1 | Red Maple Mineral Deciduous Swamp Type | Associated with the Warren Creek PSW and Lyons Creek PSW. Dominated by Red Maple with Bur Oak, Pin Oak, Swamp White Oak, White Elm, Green Ash and White Willow. A portion of the wetland associated with the Warren Creek PSW also includes a cattail marsh community. |
| SWD3-2 | Silver Maple Mineral Deciduous Swamp Type | Associated with the Lower Grassy Brook PSW and Lyons Creek PSW. Dominated by Silver Maple with White Elm, Green Ash, Shagbark Hickory, and Trembling Aspen. |
| SWD4-2 | White Elm Mineral Deciduous Swamp Type | This community type is located near Rexinger Road on the west side of Montrose Road and north of an unnamed tributary of Lyons Creek. Dominated by White Elm with Reed-canary Grass in the |

| ELC Code | Community Type | Description |
|----------|--------------------------------------|--|
| SWT2-5 | Red-osier Mineral Thicket Swamp Type | groundcover. Several dead standing trees are also present. Associated with the Welland River East PSW. Dominated by Red-osier Dogwood with Grey Dogwood, Silky Dogwood and Willow species. |

3.7.2.2 Significant Wetlands

There are five PSWs within the study area (see **Figure 5**) and a brief summary of each is provided below.

Warren Creek Wetland Complex: The Warren Creek Wetland Complex is located south of Montrose Road between Canadian Drive and east of Brown Road. This wetland complex encompasses approximately 64.84 ha, representing 99% swamp and 1% marsh. The portion of this wetland complex located east of Brown Road extends within the Project limits, specifically the areas surrounding Warren Creek and an unnamed tributary of Warren Creek. The wetland community in the study area is characterized as a Red Maple swamp with a Cattail meadow marsh community along the watercourse.

Welland River East Wetland Complex: The Welland River East Wetland Complex is bisected by Montrose Road and located east of Chippawa Creek Road and associated with the Welland River and tributaries. This wetland complex encompasses approximately 151.17 ha, representing 67% swamp and 33% marsh. The portion of this PSW that extends within the study area are dominated by Green Ash swamps with Cattail shallow marsh communities and Red-osier Dogwood thicket swamps present.

Lower Grassy Brook Wetland Complex: The Lower Grassy Brook Wetland Complex is located south of Montrose Road west and east of Grassy Brook Road. This wetland complex encompasses approximately 21.07 ha, representing 97% swamp and 3% marsh. This PSW is associated with Grassy Brook Creek and includes a Silver Maple swamp community and Reed-canary marsh community within the portion that extends within the study area.

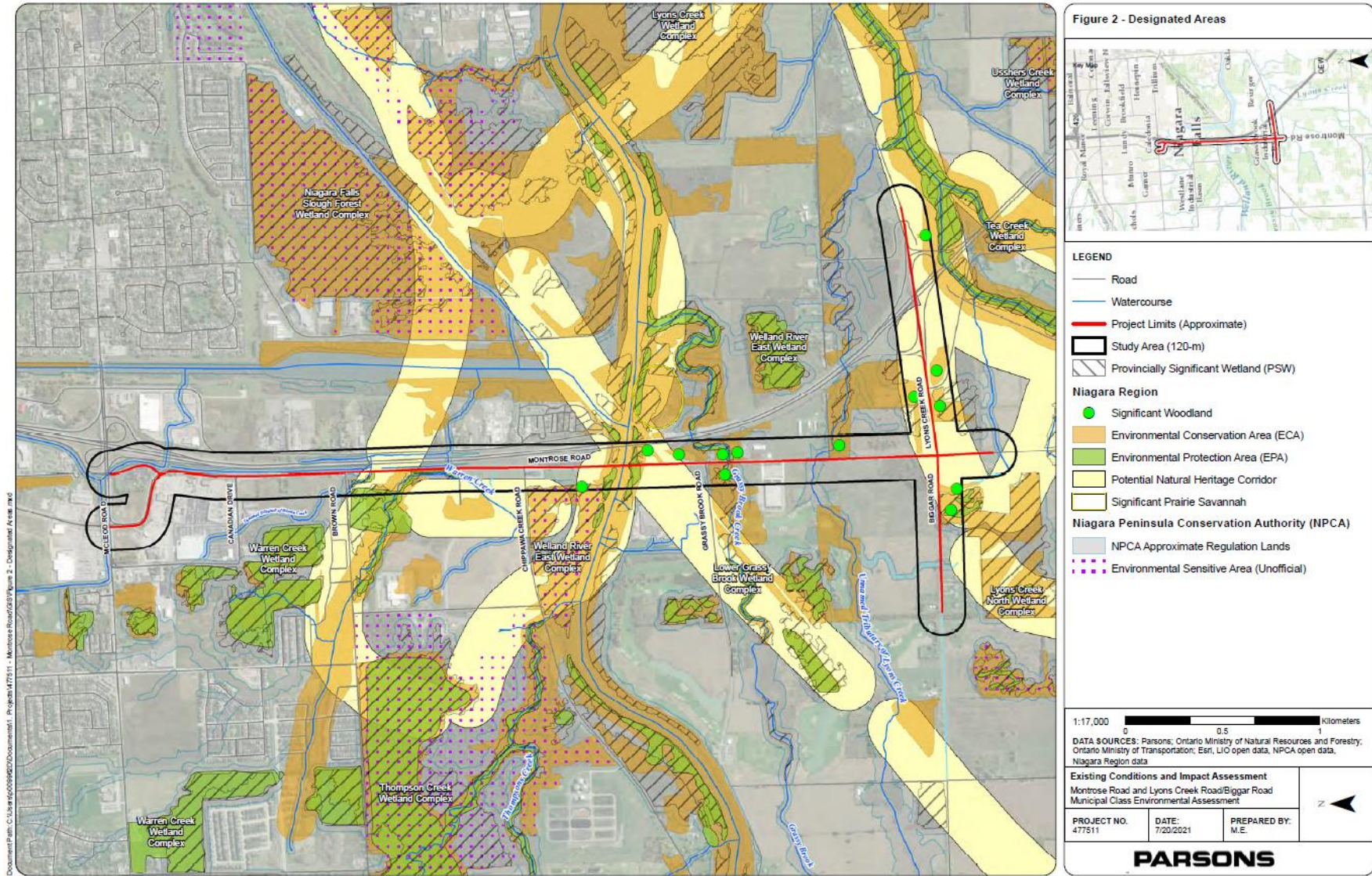
Lyons Creek North Wetland Complex: The Lyons Creek North Wetland Complex is located south of Montrose Road and east of Biggar Road. This wetland complex encompasses approximately 376.13 ha, representing 100% swamp and is associated within an unnamed tributary of Lyons Creek. A portion of the Project limits extend within a provincially rare Pin Oak swamp community.

Lyons Creek Wetland Complex: The Lyons Creek Wetland Complex is bisected by Montrose Road, located east and west of Lyons Creek Road. This wetland complex encompasses approximately 532.24 ha, representing 77% swamp and 23% marsh and includes communities associated with Lyons Creek. A portion of the Project limits extends within a Red Maple swamp community and Silver Maple swamp community on the south side and north side of Lyons Creek Road, respectively. It is noted that the mapped PSW limits on the north side of Lyons Creek Road is active agricultural land and not considered a wetland. A Green Ash swamp is also present at Rexinger Road. This wetland appears to extend further west towards Montrose Road but is not currently mapped within the PSW limits.

3.7.2.3 Significant Woodlands

There are several woodland communities present within the study area, including woodlands identified as significant by the Niagara Region. Significant woodlands are part of the ECA designation. The study area includes 11 woodland units which are generally associated with the PSWs and surrounding woodlands.

FIGURE 5: OVERVIEW OF KEY TERRESTRIAL FEATURES



3.7.2.4 Significant Wildlife Habitat (SWH)

The following sections include a summary of the candidate and confirmed SWH types within 120 m of the Project.

Seasonal Concentration Areas

- **Waterfowl Stopover and Staging Areas (Aquatic)** – The Welland River has the potential to function as a waterfowl stopover and staging area for aquatic habitat. Waterfowl staging was also noted in the wetland evaluation report for the Welland River East PSW, although the specific location was not identified.
- **Shorebird Migratory Stopover Area** – The Welland River has the potential to support this habitat type, although there is likely limited opportunities within the portion that extends within the study area.
- **Bat Maternity Colonies** – All woodlands within the study area have the potential to support habitat for bat maternity colonies. A snag tree survey was completed between Grassy Brook Road and Biggar Road / Lyons Creek Road which identified several potential roosting trees that would meet the criteria for candidate SWH. Incidental acoustic surveys using a handheld active Echo Meter Touch 2 Pro for iOS was completed during the June 2020 amphibian call surveys which identified bats in the woodlands and PSWs in multiple locations in the study area. Eastern Red Bat and Silver-haired Bat were recorded in the woodland south of the CPR. Hoary Bat, Big Brown Bat and Eastern Red Bat were recorded in the Lyons Creek North PSW and Lyons Creek PSW. Silver-haired Bat was also recorded in the Lyons Creek PSW.
- **Turtle Wintering Areas** – The Welland River has the potential to support overwintering habitat for turtles.
- **Reptile Hibernaculum** – Overwintering habitat for snakes may be present in all vegetation communities throughout the study area. This habitat type is difficult to confirm, even with targeted surveys and will therefore be assumed present with mitigation measures provided should hibernaculum be discovered during construction.
- **Deer Winter Congregation Areas** – The NDMNRF identified deer wintering areas within the Warren Creek PSW, Welland River East PSW, Lyons Creek North PSW and Lyons Creek PSW. The Project limits only extend within this habitat type in the Lyons Creek North and Lyons Creek PSWs, along Biggar Road and Lyons Creek Road, respectively.

Rare Vegetation Communities

The following provincially and globally rare vegetation community is present within the study area.

- **Pin Oak Mineral Deciduous Swamp (SWD1-3)** – This community type is considered provincially rare (S2S3) and globally rare (G2). This community type is associated with the Lyons Creek North PSW along Biggar Road.

Specialized Habitat for Wildlife

- **Waterfowl Nesting Area** – All wetland communities >0.5 ha within the study area have the potential to support waterfowl nesting.
- **Turtle Nesting Areas** – Turtle nesting habitat has the potential to occur along the Welland River, Warren Creek, Grassy Brook Creek, and Lyons Creek where sand or gravel substrates are present. There were no turtle nests observed during the field investigations, although targeted surveys were not completed.

- **Amphibian Breeding Habitat (Woodland)** – Amphibian call surveys were completed within the study area and identified SWH in the woodland associated with the Baden-Powel Grassy Brook Park. Other notable woodland and swamp communities with at least two species documented but that didn't meet the criteria for significance are identified as candidate SWH and considered in terms of generalized wildlife habitat.

Habitat for Species of Conservation Concern

- **Marsh Bird Breeding Habitat** – The meadow marsh communities within the study area have the potential to support marsh bird nesting habitat. NDMNRF noted Green Heron in the Welland River East PSW and Lyons Creek North PSW.
- **Terrestrial Crayfish** – The marsh and swamp communities in the study area have the potential to provide habitat for terrestrial crayfish. One terrestrial crayfish burrow of an unknown species was incidentally observed along Warren Creek. To be considered SWH, only one individual or burrow of a listed species is required.
- **Other Rare Species** – SoCC were documented during the field investigations and included bats, Monarch and birds. All of the birds are conservation priority species which are recognized as declining in the Bird Conservation Strategy for Bird Conservation Region (BCR) 13 in Ontario Region: Lower Great Lakes/St. Lawrence Plain.

Animal Movement Corridors

- **Amphibian Movement Corridors** – The natural areas and watercourses surrounding areas identified as amphibian breeding habitat (woodland) are considered as amphibian movement corridors.

3.7.3 FISH AND FISH HABITAT

Of the eight (8) watercourse crossings present within the study area, five (5) were determined to convey watercourses which support fish or provide fish habitat. Detailed aquatic habitat assessments were completed to document existing conditions and identify the presence of fish habitat for these watercourses within the study area. **Table 13** below summarizes the existing fish and fish habitat within the five watercourses and **Figure 6** shows the watercourse locations, however for full details refer to the Natural Environment Assessment Report.

Unnamed Tributary of Warren Creek

The Unnamed Tributary of Warren Creek is an intermittent warmwater watercourse which originates west of the study area and flows east crossing Montrose Road just south of Brown Road. On the east side of the QEW crossing, the watercourse turns south and flows as a roadside ditchline to its confluence with Warren Creek. The channel was dry during the field investigations and heavily overgrown.

Upstream of Montrose Road, the channel meandered within a narrow grassy meadow within a deciduous woodlot. The banks and bed of the channel were vegetated with grasses, vascular plants and cattails. The streambed consisted of saturated muck at near the culvert inlet and a hard dry streambed within the upstream channel. Substrates were comprised primarily of muck and silt. Instream habitat consisted entirely of instream and overhanging vegetation.

The downstream reach was considered a short section of channel approximately 10 m in length between Montrose Road and the QEW. The downstream section consisted of a poorly defined

channel which was dry during field investigations with a dense patch of Common Reed growth immediately downstream of the outlet. The substrates within the channel consisted of saturated muck at the outlet with dry hard muck further downstream. The downstream channel flowed within a disturbed roadside meadow area vegetated with grasses and vascular plants and scattered small deciduous shrubs.

Warren Creek

Warren Creek is a permanent warmwater watercourse which originates in a deciduous woodlot west of Montrose Road associated with the Warren Creek wetland complex. The watercourse exits the woodlot approximately 180 north of the culvert and flows south parallel to Montrose Road as a roadside ditchline to the culvert inlet. The Warren Creek crossing / culvert is located just north of Blackburn Parkway.

Within the upstream reach, the watercourse was channelized and straight. There was deep pooled water with little noticeable flow for approximately 30 m upstream of the inlet which transitioned to a narrow channel with trickle flow further upstream within the ditchline. Substrates within the channel were soft and deep, composed of silt and muck overlying hardpack clay. The channel contained dense submergent consisting of milfoil which was limited to the area immediately upstream of the inlet, further upstream within the ditchline, aquatic vegetation consisted of emergent vegetation, primarily cattails, grasses and sedges. The riparian zone associated with the upstream channel consisted of a disturbed roadside meadow vegetated with grasses, vascular plants and small scattered deciduous trees and shrubs to provide riparian cover. Instream habitat opportunities were provided mainly by instream and overhanging vegetation with small amounts of instream and overhanging woody debris and areas with undercut banks. The slow moving run habitat with dense aquatic vegetation within the upstream reach provides potential habitat, including spawning habitat for Grass Pickerel.

The downstream reach consisted of a short section of channel approximately 8 m in length between the Montrose Road culvert outlet and the QEW centerline culvert inlet. Downstream of the QEW, Warren Creek flowed under Oakwood Drive through another culvert and eventually discharges to the hydro canal channel. The channel downstream of the Montrose Road culvert was considered dry with no observed flow. A large amount of angular cobble was present within the channel which resulted in subsurface flow through the cobble. This angular cobble which had been placed as scour protection appears to function as a seasonal barrier to fish migration during periods of low flow. The channel contained emergent vegetation with a dense patch of cattails immediately downstream of the outlet and vascular plants comprised mainly of mint and purple loosestrife which had overgrown the angular scour protection. Substrates within the channel consisted entirely of cobble and boulder. Instream habitat within the downstream channel was provided by instream vegetation and cover provided by the boulder and cobble substrates.

A fish community survey was conducted using back electrofishing and resulted in the capture of five species considered bait/forage fish including Central Mudminnow, Green Sunfish, Johnny Darter and Yellow Bullhead and 1 piscivorous species: Largemouth Bass. No live mussels, fresh or weathered mussel shells or middens were observed during field investigations.

Welland River

The portion of the Welland River crossing Montrose Road is known as Welland River East, a portion of the river located between the Welland Canals to the west and the Chippawa Channel to the east, a

7 km long stretch of modified and channelized river channel where flows have been reversed to allow the Niagara River to flow towards the Power Canal. The Montrose Road crossing is located approximately 600 m upstream of the Welland River/Power Canal/Chippawa Channel confluence.

The Welland River is a permanent warmwater watercourse and is a wide, slow flowing river within the study area. A flooded cattail marsh area was present along the north bank approximately 70 m upstream of the Montrose Road bridge. A second flooded cattail marsh area was present along the north bank approximately 10 m downstream of the existing bridge location. Shallow clay shelves were present along the nearshore areas of both banks. These dropped off steeply approximately 8-10 m from the banks to a deep central channel. Channel width within the study area was relatively uniform and varied from 70 m near the existing bridge location to approximately 80 m wide upstream and downstream of the existing bridge. The shallow nearshore shelves contained dense submergent and floating vegetation with scattered emergent vegetation along the shorelines. Submergent vegetation consisted of Canada Waterweed, Coontail, Wild Celery, and Narrow-leaved Pondweed, Floating vegetation was comprised primarily of Fragrant White Water Lily and mats of floating algae. Emergent vegetation along the shorelines consisted of aquatic grasses and cattails. The banks of the river upstream and downstream of the bridge were lined with overhanging shrubs and large deciduous trees with thick Wild Grapevine growth providing shade and cover for the nearshore area. Substrates within the shallow nearshore area were soft and deep, approximately 15-30 cm in depth and consisted of silt, muck and detritus overlying hardpack clay. The substrates of the nearshore area under the bridge and immediately upstream and downstream included angular cobble and boulder scour protection.

Due to the substantial fish community information available for the Welland River, a fish community survey was not completed. Fish salvages completed approximately 80 m downstream of Montrose Road by Parsons biologists in 2019 and 2020 as part of the Ministry of Transportation (MTO) QEW/Welland Bridge Replacement project resulted in the capture of 10 bait/forage fish species: Banded Killifish, Pumpkinseed, Common Carp, Green Sunfish, Bluntnose Minnow, Brown Bullhead, Tadpole Madtom, Golden Shiner, Round Goby and Johnny Darter, as well as 2 piscivorous species including Largemouth Bass and Bowfin.

No migratory obstructions to fish passage were noted within the Welland River during field investigations. No live mussels, fresh or weathered mussel shells or middens were observed during field investigations, though several dead Zebra Mussels were noted along the nearshore area.

Grassy Brook Creek

Grassy Brook Creek is a permanent warmwater watercourse which originates west of the study area and flows through a golf course upstream of the Montrose Road crossing just south of Grassy Brook Road. Within the study area the creek flowed within a natural wooded valley corridor, on the east side of Montrose Road the forested area is part of the Lower Grassy Brook Wetland Complex which is connected to the Welland River East Wetland Complex near the confluence with the Welland River.

In the study area, Grassy Brook Creek flows from west to east through a double concrete box culvert under Montrose Road. Upstream of the culvert the watercourse channel meandered through a natural forest area as a defined channel. The deciduous forest area provided a well vegetated riparian zone with grasses and vascular plants for ground cover, deciduous shrubs in the understory and large willows and Manitoba Maples for overhead cover and shade. Channel morphology within the reach was classified as flat with variable depths. Substrates within the upstream section were

dominated by silt overlying clay throughout with some cobble and gravel concentrated at the culvert inlet. In stream aquatic macrophyte growth consisted of submergent and emergent vegetation with dense submergent vegetation comprised of Canada Waterweed and Water-milfoil present for approximately 15 m upstream of the inlet. Emergent vegetation was concentrated along the shallow areas along both banks and consisted of grasses, Awl-fruited Sedge and Soft-stemmed Bulrush. A variety of quality instream habitat was observed throughout the reach which consisted of overhanging and instream vegetation, overhanging and instream woody debris and undercut banks. The presence of warm slow moving water with dense aquatic vegetation within the upstream reach provides potential habitat, including spawning and rearing habitat for Grass Pickerel.

Downstream of Montrose Road, the watercourse flows through a grassland floodplain adjacent to deciduous woodlands. The watercourse contained a slight meander pattern for approximately 100 m and then turned to flow north as a relatively straight channel parallel to the QEW. Channel morphology observed within the downstream reach consisted of a slow moving run of variable depths. Substrates consisted primarily of silt overlying clay streambed with piles of cobble and boulder for approximately 5-8 m downstream of the culvert outlet. In stream aquatic macrophyte growth was dominated by submergent vegetation throughout the channel which consisted of water-milfoil, Canada Waterweed and algae. Emergent vegetation was present along the channel margins and concentrated within the channel near the outlet. Emergent vegetation consisted of aquatic grasses, Arrowhead, Awl-fruited Sedge and Soft-stemmed Bulrush. The riparian zone was well vegetated with tall grasses and vascular plants which overhung the channel throughout the reach. Diverse and quality habitat was observed throughout the reach and consisted of undercut banks with overhanging vegetation, instream woody debris, instream vegetation and cobble piles and overhanging vegetation (grasses and small shrubs) which lined both banks throughout the reach.

A fish community survey was conducted using back electrofishing and resulted in the capture of 5 species considered bait/forage fish including: Central Mudminnow, Green Sunfish, Pumpkinseed, Bluegill and Brown Bullhead and 1 piscivorous species: Bowfin. No migratory barriers to fish movement were noted with the study area and no live mussels, fresh or weathered mussel shells or middens were observed during field investigations.

Unnamed Tributary of Lyons Creek

The Unnamed Tributary of Lyons Creek is an intermittent warmwater watercourse that originates southwest of the study area and flows within a narrow tree line between a golf course and agricultural field towards Montrose Road. The watercourse flows east under Montrose Road, just north of Reixinger Road, through a concrete box culvert and then flows south under Reixinger Road within the study area. Downstream of Reixinger Road, the watercourse flows through primarily forested areas to its confluence with Lyons Creek south of Lyons Creek Road.

The watercourse upstream of Montrose Road consisted of a defined meandering channel through an open grassy meadow area with scattered clumps of small deciduous trees. The channel was dry during the summer investigation with a dry hardpack streambed. The channel contained flowing water during an additional site visit conducted in spring 2021. Substrates consisted of dried mud and silt with some cobble present at the inlet. In stream vegetation within the dry channel consisted of mainly grasses with some sedges and cattails present approximately 40 m upstream of the inlet near the limit of the upstream survey area. In stream habitat in the upstream reach was homogenous and consisted mainly of overhanging and instream vegetation with a small amount of cover provided by cobble at the inlet.

The downstream reach flowed for approximately 75 m through a small deciduous woodlot to the Rexinger Road crossing. The downstream channel was dry and contained dense growth of Common Reed and cattails for approximately 20 m before the channel entered the wooded area. The streambed consisted of dry hardpack muck and silt with some angular cobble present at the culvert outlet. Instream vegetation consisted of grasses, cattails and Common Reed. The riparian zone was well vegetated with grasses and vascular plants overhanging the channel along the banks and large deciduous trees to provide overhead cover and shade for the channel within the woodlot. Instream habitat was homogenous and limited primarily to instream and overhanging vegetation with a small amount of cover provided by the cobble at the outlet.

No fish community sampling was undertaken during the summer investigations as the channel was dry. A fish community sampling undertaken in the spring resulted in no capture, however it is likely that fish access this reach of the watercourse periodically due to its connection to wetland pond areas within the forested areas downstream of Rexinger Road and its connection to Lyon's Creek. The cobble at the inlet and outlet as well as the intermittent nature of the watercourse would be seasonal barriers to fish movement within the system. Due to the intermittent nature of the watercourse, it is unlikely that suitable habitat for SAR mussels is present within the study area.

Lyons Creek

Lyons Creek is a permanent warmwater watercourse which originates southwest of the study area at the Welland Canal and flow is augmented with water from the canal. Prior to canal construction, the Lyons Creek headwaters began at Wainfleet Bog. Lyons Creek now begins at the Welland Canal and flows for 19.5 km to its confluence with the Chippewa Canal. The study area is located in the lower portion of the Lyons Creek watershed.

Upstream of the study area, Lyons Creek is bordered by agricultural fields and a golf course. Downstream of the study area, the creek flows through primarily rural residential and some agricultural areas. The watercourse upstream of the QEW off-ramp to Lyons Creek Road consisted of a gentle meander that flowed through disturbed roadside meadow area and under the QEW. The watercourse had a narrow floodplain area along both banks with a narrow band of deciduous trees along the top of bankfull banks. Channel morphology within the reach was classified as a slow moving flat, water was turbid during the site visit due to recent heavy rains.

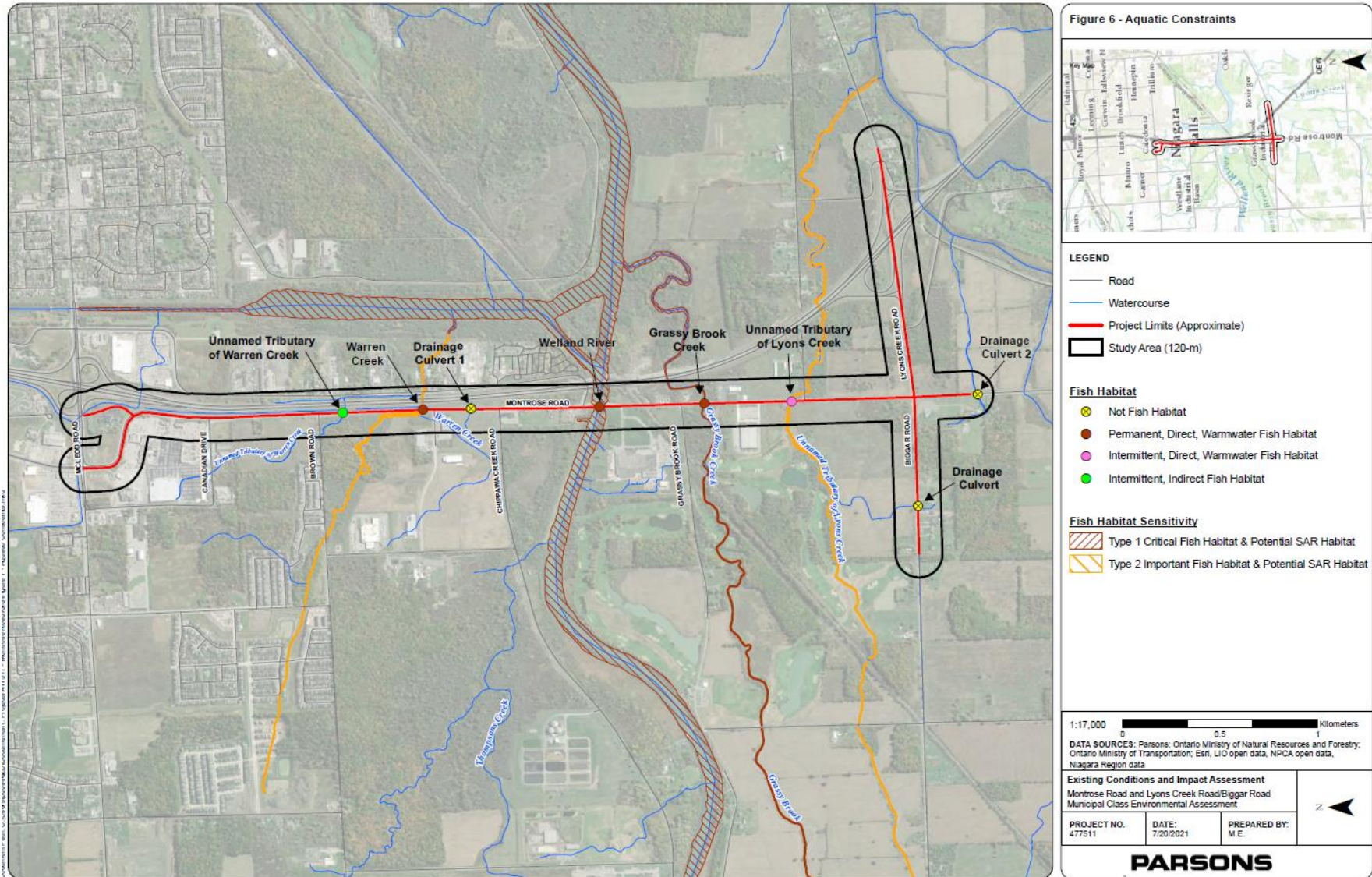
Within the downstream reach, the watercourse flowed as a defined channel with a gentle meander pattern within a wide floodplain area. The floodplain of both banks consisted of cattail marsh which was flooded during the site visit. Large deciduous trees were present along the banks of the bankfull channel at the edge of the cattail marsh areas. A small CSP culvert contributed roadside drainage to the watercourse approximately 10 m downstream of the existing bridge. A large deposit of gravel and sand was present within the floodplain at the outlet of the CSP culvert. Channel morphology within the reach was classified as a slow moving run with noticeable flow. Substrates within the reach were soft and comprised of silt and muck overlying clay. Some angular cobble and boulder were present along the banks and within the channel under the bridge.

Due to the substantial fish community information available during background review for Lyons Creek, a fish community survey was not completed.

TABLE 13: SUMMARY OF FISH AND FISH HABITAT

| Watercourse Name | Flow | Thermal Regime | Fish Habitat | Important / Exceptional / SAR Habitat |
|-----------------------------------|--------------|----------------|--------------|---|
| Unnamed Tributary of Warren Creek | Intermittent | Warmwater | Indirect | <ul style="list-style-type: none"> • None |
| Warren Creek | Permanent | Warmwater | Direct | <ul style="list-style-type: none"> • Bait/forage fish spawning habitat • Warmwater sportfish rearing/nursery habitat • Fish SAR – Grass Pickerel |
| Welland River | Permanent | Warmwater | Direct | <ul style="list-style-type: none"> • Warmwater sportfish habitat • SAR mussel habitat • SAR fish habitat • Fish SAR – Grass Pickerel and Spotted Sucker • Freshwater Mussel SAR – Round Hickorynut and Kidneyshell |
| Grassy Brook Creek | Permanent | Warmwater | Direct | <ul style="list-style-type: none"> • Bait/forage fish spawning habitat • Warmwater sportfish rearing/nursery habitat • Fish SAR – Grass Pickerel • Freshwater Mussel SAR – Round Hickorynut and Kidneyshell |
| Unnamed Tributary of Lyons Creek | Intermittent | Warmwater | Direct | <ul style="list-style-type: none"> • None |
| Lyons Creek | Permanent | Warmwater | Direct | <ul style="list-style-type: none"> • Bait/forage fish spawning habitat • Coolwater and warmwater sportfish rearing/nursery, feeding habitat • SAR fish habitat • Fish SAR – Grass Pickerel |

FIGURE 6: EXISTING FISHERIES WATERCOURSE CROSSINGS



3.7.4 SPECIES AT RISK

A Species at Risk (SAR) screening assessment was completed to determine the potential for SAR to occur within the study area using background information from desktop sources, information from agencies, and field investigations. The summary of potential SAR in the study area is provided in **Table 14**.

TABLE 14: SUMMARY OF POTENTIAL SAR IN THE STUDY AREA

| Common Name Scientific Name | Species at Risk Act (SARA) | Endangered Species Act (ESA) | Legal Protection | Assessment |
|---|------------------------------|------------------------------|------------------|--|
| Mammals | | | | |
| Eastern Small-footed Myotis <i>Myotis leibii</i> | | Endangered (END) | ESA | All woodlands within the study area have the potential to provide habitat for bats. Direct impacts to potential SAR habitat is expected. Implementing timing restrictions to avoid tree removal during the active period (April 1 to September 30) is recommended, along with the installation of bat boxes to mitigate impacts due to construction. |
| Little Brown Myotis <i>Myotis lucifugus</i> | END, Schedule 1 | END | ESA | |
| Northern Myotis <i>Myotis septentrionalis</i> | END, Schedule 1 | END | ESA | |
| Tricolored Bat <i>Perimyotis subflavus</i> | END, Schedule 1 | END | ESA | |
| Birds | | | | |
| Barn Swallow <i>Hirundo rustica</i> | Threatened (THR), Schedule 1 | THR | ESA, SARA, MBCA | The structural culverts and the Welland River bridge have the potential to provide habitat for Barn Swallows. Registration under O. Reg. 242/08 of the ESA may be required if Barn Swallow nests are confirmed and may be impacted by the proposed works. A survey for Barn Swallows is recommended prior to construction. If the proposed culvert and bridge works occur during the breeding bird window (April 1 to August 30), exclusionary measures should be installed on these structures by April 1 to prevent nesting. |
| Bobolink <i>Dolichonyx oryzivorus</i> | THR, Schedule 1 | THR | ESA, SARA, MBCA | This species was documented during breeding bird surveys on June 17, 2020. It is possible this species is nesting in the agricultural field, although not confirmed. The proposed design would encroach edge habitat only. |

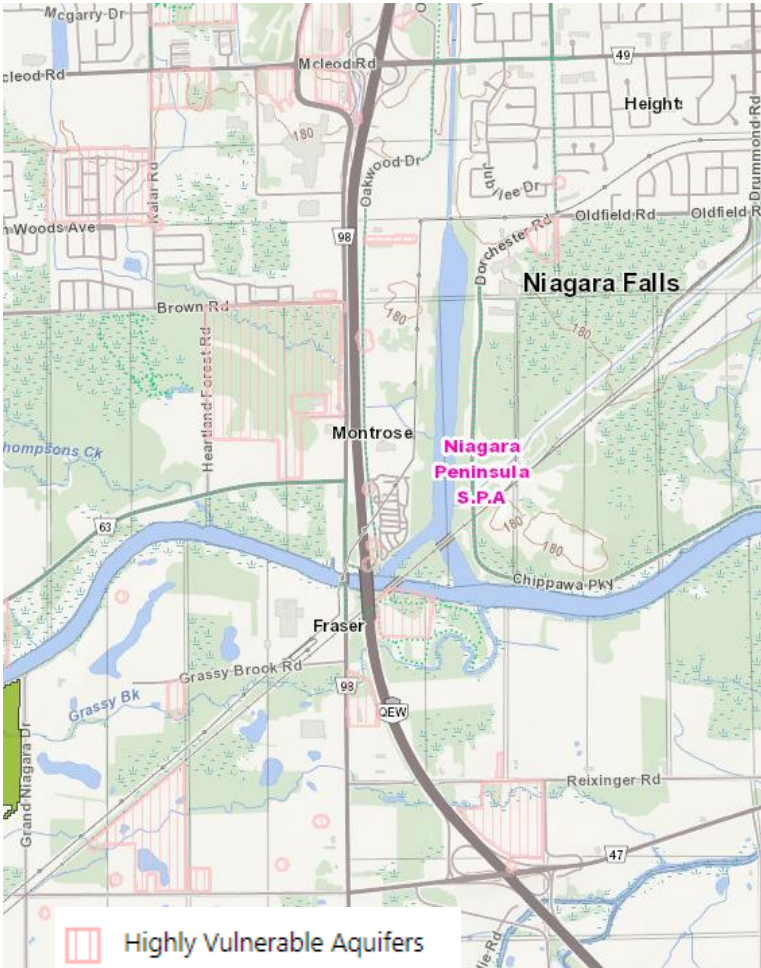
| | | | | |
|---|--------------------|-----------------|--------------------------------|--|
| | | | | It is not expected that a permit will be required. |
| Plants | | | | |
| Deerberry <i>Vaccinium stamineum</i> | THR, Schedule 1 | THR | ESA | There are records of Deerberry in the City of Niagara Falls. There are no records within the study area, however, suitable habitat may be present in the oak woodlands. If direct impacts to open oak wooded areas is required, a targeted survey for this species is recommended. |
| Round-leaved Greenbrier <i>Smilax rotundifolia</i> | THR, Schedule 1 | THR | ESA | There are records of this species in the City of Niagara Falls in Lyons Creek North. This species is found in open wet to moist woodlands, typically red maple and oak communities. The woodlands along Biggar Road / Lyons Creek Road in particular may provide suitable habitat. A targeted survey for this species is recommended where direct impacts to these communities are expected. |
| Mussels | | | | |
| Kidneyshell <i>Ptychobranchnus fasciolaris</i> | END | END | ESA, SARA, Fisheries Act | Kidneyshell are usually found in small to medium rivers in shallow swift moving areas with firmly packed coarse sand and gravel. |
| Round Hickorynut <i>Obovaria subrotunda</i> | END | END | ESA, SARA, Fisheries Act | They prefer medium to large rivers with clay, sand or gravel substrates in areas with moderately swift moving water. They have also been found in shallow areas of lakes with firm sand. In Ontario it has been found in turbid low-gradient rivers with clay/sand or clay/gravel substrates. |
| Eastern Pondmussel <i>Ligumia nasuta</i> | Special Concern | Special Concern | Fisheries Act | Eastern Pondmussel prefers sheltered areas of lakes and in slow-moving areas of rivers and canals with substrates composed of clay, silt/organics and sand/gravel. |
| Fish | | | | |
| Grass Pickerel <i>Esox americanus americanus</i> | Special Concern | Special Concern | Fisheries Act | Grass Pickerel are found in wetlands, slow moving areas of streams and bays of lakes. They prefer shallow, warm, relatively |

| | | | | |
|---|-----------------|-----------------|---------------|--|
| | | | | clear water with dense submergent vegetation. Suitable habitat for Grass Pickerel was observed within Warren Creek, Grassy Brook Creek and the Welland River. |
| Spotted Sucker <i>Minytrema melanops</i> | Special Concern | Special Concern | Fisheries Act | They are found in slow moving areas of streams and typically prefer clear water with low suspended solids. In Canada they have been found in turbid river systems where turbidity is considered moderate to heavy. |

3.7.5 SOURCE WATER PROTECTION

The study area is located in the Niagara Peninsula Source Protection Area. There are several Highly Vulnerable Aquifers overlapping the study area, however there are no Intake Protection Zones, Significant Groundwater Recharge Areas, or Wellhead Protection Areas (see Figure 7).

FIGURE 7: SOURCE WATER PROTECTION FEATURES IN THE STUDY AREA



3.8 Cultural Environment

3.8.1 CULTURAL HERITAGE

A Cultural Heritage Resource Assessment (CHRA) was completed to determine the presence of cultural heritage resources. The results of historical background research and a review of the secondary source material, including historical mapping, revealed a study area with a rural land-use history dating back to the late eighteenth century. A review of federal, provincial and municipal registers and inventories and internal ASI project databases revealed one previously-identified feature of cultural heritage value and two potential cultural heritage resources (CHR) were identified during fieldwork. The three CHR are summarized in **Table 15**.

TABLE 15. SUMMARY OF CULTURAL HERITAGE RESOURCES

| CHR # | Location/Name | Description |
|-------|---|--|
| CHR 1 | Twin Welland River Bridges, QEW over the Welland River. | Provincial Heritage Property, Two adjacent 18 span, riveted steel I-beam girder bridges with concrete piers featuring arched pier caps that carries two lanes of QEW vehicular traffic (on each structure) over the Welland River. Constructed in 1940. |
| CHR 2 | 7847 Montrose Road | Potential CHR (no formal heritage status or recognition), Late nineteenth-century residence featuring hand-hewn beam and dowel construction that was originally built in Welland and relocated in the mid-1930s (personal communication from the owner). |
| CHR 3 | 7473 Reixinger Road | Potential CHR (no formal heritage status or recognition), Late nineteenth-century farmscape with Georgian residence, currently operates as a chicken farm. |

The identified cultural heritage resources are historically and contextually associated with land use patterns in the City of Niagara Falls and more specifically, represent the settlement of small communities along Montrose Road, a nineteenth-century rural roadway, and early twentieth-century transportation infrastructure. For more details and information about the cultural heritage resources, please refer to the CHRA provided in **Appendix D**.

3.8.2 ARCHAEOLOGY

A Stage 1 Archaeology Assessment (AA) was completed to determine archaeological potential in the study area and has been accepted by MHSTCI into the *Ontario Public Register of Archaeological Reports* on July 28, 2021. Various methods were used to inform the determination of archaeological potential, including historical research, background review of past studies, assessment of geographical characteristics, and visual confirmation through site visits. Background reviews noted 65 previously registered archaeological sites are located within one kilometre of the Study Area, though none are located within 50m. Eight previous archaeology reports were also completed within 50m of the study area.

The Stage 1 AA notes that portions of the study area are indicative of archaeological potential due to the presence of well-drained soils, previously identified archaeological sites, proximity to early settlements, water sources: primary, secondary, or past water sources; and early historic transportation routes. As such, the Stage 1 AA concludes that portions of the Study Area exhibit

archaeological potential for the identification of Indigenous and Euro-Canadian archaeological resources. The exact locations that retain potential are documented in the Stage 1 AA in **Appendix E**. Generally, these locations are areas that have not been disturbed, farmer's fields, and natural areas. These areas require either a pedestrian survey or a test pit survey through a Stage 2 AA.

The study area includes a watercourse, the Welland River, and any impacts to the riverbed will require a marine archaeology assessment.

The remainder of the study area does not retain archaeological potential on account of deep and extensive land disturbance, low and wet conditions or having been previously assessed. As such, these lands do not require further archaeological assessment.

4.0 Public Consultation

Public consultation is an important part of the Municipal Class EA process. **Table 16** shows the key points of public consultation undertaken for this EA study. The following sections provide further details about each point of public contact.

TABLE 16: KEY POINTS OF PUBLIC CONSULTATION

| Key Point of Contact | Date | Means of Notification |
|--|---------------------------------|--------------------------------------|
| Notice of Study Commencement and Online PIC #1 | June 10/11 and 17/18, 2020 | Newspaper, Mail, Email, City website |
| Online Public Information Centre #1 | June 24, 2020 | Newspaper, Mail, Email, City website |
| Online Public Information Centre #2 | September 23, 2020 | Newspaper, Mail, Email, City website |
| Online Public Information Centre #3 | April 21, 2021 | Newspaper, Mail, Email, City website |
| Notice of Study Completion | October 28 and November 4, 2021 | Newspaper, Mail, Email, City website |

4.1 Notice of Study Commencement and Online Public Information Centre #1

The Notice of Study Commencement and Online Public Information Centre #1 was published in the *Niagara This Week* on Thursday, June 11 and 18, 2020 and in the *Niagara Falls Review* on Wednesday, June 10 and 17, 2020 (see **Appendix F**). The Notice was also posted on the Region's website, distributed to technical agencies and stakeholders via email, and also mailed to nearby properties within the study area. The purpose of this Notice was to introduce the study, the study area, key contacts, and also details for the first PIC.

The list of technical agencies, interest groups, emergency services, utilities and other stakeholders contacted are summarized in **Table 17**. For consultation with the Indigenous communities, refer to Section 4.4. The notification materials can be found in **Appendix F**.

TABLE 17: SUMMARY OF THE PROJECT CONTACT LIST

| | |
|---|---|
| Federal Agencies | |
| Environment and Climate Change Canada (ECCC) | Canadian Pacific Railway (CPR) |
| Provincial Agencies | |
| Ministry of the Environment, Conservation and Parks (MECP) | Ministry of Agriculture, Food and Rural Affairs |
| Ministry of Heritage, Sport, Tourism, and Culture Industries (MHSTCI) | Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNR) |
| Ministry of Transportation Ontario (MTO) | Infrastructure Ontario (IO) |
| Municipal Agencies | |
| Niagara Peninsula Conservation Authority (NPCA) | City of Niagara Falls |

| | |
|--|--|
| Niagara Health | |
| Local Interest Groups and Stakeholders | |
| District School Board of Niagara | Niagara Region Transportation Steering Committee |
| Niagara Catholic District School Board | City of Niagara Falls, Parks in the City Committee |
| Regional Active Transportation Sub-Committee (formerly Regional Niagara Bicycling Committee) | Niagara Parks Commission |
| Emergency Services | |
| Ontario Provincial Police | Niagara Emergency Medical Services |
| Niagara Ambulance Communications Services | Niagara Regional Police Service |
| Niagara Falls Fire Department | |
| Utilities | |
| Niagara Peninsula Energy | Enbridge Consumer Gas |
| Enbridge Inc. | Bell Canada |
| Hydro One Networks Inc. | Niagara Region Broadband Network |
| Cogeco Cable Solutions | |
| Other Stakeholders | |
| Residents | Local Businesses |
| Property Owners | Developers |

4.2 Public Information Centres

4.2.1 PUBLIC INFORMATION CENTRE #1

The first Online Public Information Centre (PIC) was held on June 24th, 2020. The Notice of PIC #1 was issued along with the Notice of Study Commencement. The PIC was held online through Zoom and was open to the public from 6:00 pm to 7:00 pm. This purpose was to introduce the study to the public, provide an overview of the background and key issues of the study area, and to present and receive input on the Problem / Opportunity Statement. The Project Team presented the PIC display materials, which was then followed by a live question and answer (Q&A) period. Key topics discussed during the Q&A period included: general inquiries, the Environmental Assessment process and consultation, design components, and timing and construction.

No PIC comment forms, or comments related to the PIC were received during the 30-day PIC comment period from June 24th to July 24th, 2020. For full details of the PIC, see **Appendix F** for the PIC #1 Summary Report, which includes the notification materials, the PIC boards, a summary of the Q&A session, and other details about the PIC.

4.2.2 PUBLIC INFORMATION CENTRE #2

The second Online Public Information Centre (PIC) was held on September 23rd, 2020. The PIC was held online through Zoom and was open to the public from 6:00 pm to 8:00 pm. This purpose was to present and receive feedback on Phase 2 of the Class EA, which includes information regarding the existing conditions in the study area and the identification, evaluation, and selection of Alternative Solutions. After the presentation of the PIC display materials, was held a live question and answer

(Q&A) period. Key topics discussed during the Q&A period included: road design, traffic and road safety, servicing, noise pollution, pedestrian safety, timing and construction impacts, and general inquiries.

Three (3) comments related to the PIC were received during the 30-day PIC comment period from September 23rd to October 23rd, 2020. The comments are included and summarized in **Table 18**. For full details of the PIC, see **Appendix F** for the PIC #2 Summary Report, which includes the notification materials, the PIC boards, a summary of the Q&A session, and all comments and responses.

TABLE 18: SUMMARY OF COMMENTS FROM PIC #2

| Topic | Comment Summary | Response |
|-------------------------|---|--|
| Servicing | Water and sanitary services should be extended along Biggar Road and should be considered as part of the Montrose Road and Lyons Creek Road/Biggar Road EA/detailed design assignment to service the hospital and the lands to the west of Montrose Road. | The lands to the west of Montrose Road and north of Biggar Road, including the hospital, are serviced according to the servicing strategy identified in the Grand Niagara Secondary Plan. There are no current plans by the City to extend servicing along Biggar Road for these properties as that has been developed through the secondary planning process. |
| | Niagara Region and their consultant Parsons should meet with the City of Niagara Falls and the stakeholder to discuss servicing on Biggar Road. | The Project Team has ongoing coordination and discussions regarding servicing and buried infrastructure along Biggar Road with the City of Niagara Falls as part of this study for efficiency and reduction of construction impacts in the future. |
| Roadway Design | It appears that the study area is drawn so that it expands south of Biggar Road. However, as the road network is being impacted by developments to the north of Biggar Road (such as those in the Grand Niagara Secondary Plan), the road expansion should primarily expand to the northern part of Biggar Road and not impact the area to the south. | <p>The wider study area encompasses an area larger than the actual road improvement locations for the purpose of considering traffic demand from nearby properties and developments. The portion of the road being widened extends south of Biggar Road on Montrose Road for the purposes of tying into the intersection.</p> <p>The recommended solution includes widening both to the north and south of Biggar Road to balance the property impacts and needs of the future hospital.</p> |
| Traffic and Road Safety | There are safety concerns for residences and users along Biggar Road as the speed limit is too high (80 kph) and the road markings are inadequate. | The Project Team reviewed the speed limits and determined a speed limit reduction should be applied in the vicinity of the hospital. The new design of the widened Biggar Road will also |

| | | |
|---------------------|---|---|
| | | include road markings that are up to Regional standards thereby providing a safer experience for all road users. |
| | What is the planned speed limit on these roads? | At the time of responding, the speed limit had not been determined. See Section 7.3 for the recommended posted speeds. |
| | Biggar Road has been negatively affected by the number of large 3-axle construction vehicles travelling in both directions at significant speeds. | The widening and reconstruction of Biggar Road to Regional safety standards will improve safety along this road for all road users. The posted road speed has also been reassessed in the study area (see Section 7.3). |
| | How will feeder / other local roads be impacted, including those outside the study area? | Local roads may see some increase in traffic from an increase in traffic to the area overall due to growth and development. |
| | Roundabouts are a safe and effective way at ensuring traffic flow and improving road safety. They would be effective at allowing QEW exiting traffic to safely negotiate the Lyons Creek crossings. | Roundabouts were considered as a form of intersection control, including at the QEW on/off ramps on Lyons Creek Road. However due to traffic operations and geometric design constraints, roundabouts were ultimately not selected for the QEW ramps. |
| Noise Pollution | Noise pollution will increase and have impacts on the environment, wildlife and people. What noise studies have been completed to evaluate impacts? What are the acceptable noise levels and abatement process? | The majority of the study area is industrial and agricultural and given this context, some levels of noise are anticipated. |
| Natural Environment | What studies have/will be undertaken for the underground watercourses running close to and across Biggar Road, wetlands, and small rivers, as it relates to road and traffic pollution? | A Natural Environment Assessment Report was completed that looks at existing conditions, assesses impacts, and recommends mitigation measures to minimize impacts, such as road and traffic pollution. |
| | What studies have/will be undertaken for private wells? | No studies are being completed as part of the EA, however at detailed design, if considerable groundwater taking is required, appropriate permits and technical considerations of impacts will be considered as part of the permit requirements. |
| Utilities | Utilities (including natural gas, fibre optic, etc.) and electrical infrastructure should be incorporated into the design now and buried during construction. | Utilities were contacted and coordinated with for relocation or addition of new infrastructure. |

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| Contact List | Request to kept informed and be added to the stakeholder's contact list. | Interested stakeholders can provide their contact information to the Project Team to be added to the stakeholder list. |
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4.2.3 PUBLIC INFORMATION CENTRE #3

The third Online Public Information Centre (PIC) was held on April 21st, 2021. The PIC was held online through Microsoft Teams as a webinar format open to the public from 6:00 pm to 8:20pm. The purpose was to present and receive feedback on Phase 3 of the Class EA, which includes the identification and evaluation of the Alternative Design Concepts, present the Preliminary Preferred Design, and identify the impacts and mitigation measures of the design. A presentation of the PIC displays was followed by a live Q&A session with members from the Project Team. Key topics discussed during the Q&A Period include: restriction of left turns at Willodell Road, road design and alternatives, traffic volumes, property acquisition, and other general inquiries.

Following the PIC, 16 comments related to the PIC were received during the two week comment period from April 21st to May 5th, 2021. The comments are included and summarized in **Table 19**. For full details of the PIC, see **Appendix F** for the PIC #3 Summary Report, which includes the notification materials, the PIC boards, a summary of the Q&A session, and all comments and responses.

TABLE 19: SUMMARY OF COMMENTS FROM PIC #3

| Topic | Comment Summary | Response |
|---|--|---|
| Median and Restrictions to and from Willodell Road from Lyons Creek | Turning left onto Carl Road from Montrose Road is already dangerous, with the traffic volumes estimated in the future seems to become a bigger problem. | The project team reviewed the responses received from PIC #3 and, in coordination with the City of Niagara Falls and MTO, developed an intersection design that allowed left turns into Willodell Road from Lyons Creek Road but did not allow left turns out of Willodell Road. This way the main movement to and from the highway is maintained. The project team met with businesses and stakeholders after to present the new recommended design. |
| | The region should consider leaving the situation as it is now until the "suspected" traffic issues arise. If no issues develop in the future than the Region would save the cost of the median and those who live and work in the area would not be impacted. | |
| | The restriction will cause a lot of traffic down Carl Road and inconvenience residents from getting home as the most common movement is the left turn from Lyons Creek Road into Willodell Road. | |
| | By closing off the left hand turn, you will force more traffic into what is proposed to be an already congested intersection at Lyons Creek Road / Montrose Road. This adds to the intersections volumes and forces a left turn with a greater risk of collision in a greater traffic flow. Once traffic makes it through the intersection of Lyons Creek Rd and Montrose Rd, they will be forced to | |

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| | <p>make a left turn on Carl Road to return to their intended route of Willodell Road, adding another 2.7 km onto their journey (and making 3 turns rather than one, further increasing the risk of collision.)</p> | |
| | <p>What alarms us as a business the most is the fact we will now be required to utilize Carl/McCredie Roads to receive our end of life vehicles which arrive on various sizes of car carriers throughout the week. We can sometimes receive four or five per day. I also believe if we are forced to use these roads we may not be able to turn right from McCredie Road onto Willodell Road. This potentially could cause a safety issue particularly during the winter months when its gets dark much earlier.</p> | |
| | <p>Denying access to Lyons Creek Road is an inconvenience for residents of the area, that should be able to have access to Lyons Creek Road to make both right and left hand turn from Willodell Road in order to access Montrose Road and QEW highway</p> | |
| Utilities | <p>All the electrical should be buried, proper lighting installed and ideally storm sewers should be installed with proper curbs for the entire North frontage on Biggar Rd. It is more cost effective to do this properly now and make sure this is all set up, not just in front of the hospital but all the way down Biggar Road.</p> | <p>The project team is trying to consider all facets of the design that can be accommodated at this time to minimize the need to do things later, which will lead to additional disruption to adjacent properties and traffic, as well as increased costs. The project team coordinated with utility companies and the City of Niagara Falls to coordinate on their utility infrastructure and what needs to be accommodated within the road right-of-way. Whether some utilities will be buried or not will depend on discussions with the utility company.</p> |
| Roundabout | <p>The intersection of Montrose and Biggar/Lyons Creek roads should be a traffic circle.</p> | <p>A roundabout was considered as an option for the Montrose Road / Lyons Creek Road intersection, however due to the anticipated increase in</p> |

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| | | traffic volumes, particularly with vehicles making left turning movements, a roundabout would not operate efficiently due to potential back up of vehicles at certain legs of the roundabout that are waiting to enter |
| PIC / project notification | As the impacts of this project's changes fall beyond the project study area, notices should be extended further than initially stipulated to include all the interested stakeholders. | The project team will increase the consultation area to include residents on Carl Road and McCredie Road. Project team noted the best way to ensure you are added to the project contact list is to fill out a comment form with your contact information and note that you want to be added. |

4.3 Consultation with Technical Agencies and Stakeholders

Consultation with technical agencies and local stakeholders (such as residents, businesses, developers, interest groups) is key to identifying area-specific interests and constraints so that they can be considered in the study. Correspondence with these technical agencies and stakeholders includes written emails, letters, comment forms, etc., meetings, and workshops. Project correspondence throughout the study is summarized in **Table 20**. A Record of Consultation, which includes project correspondence, including meeting minutes where available, are provided in **Appendix F**.

TABLE 20: SUMMARY OF COMMENTS RECEIVED FROM TECHNICAL AGENCIES AND STAKEHOLDERS

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|--|---|---------------|--|
| Federal | | | |
| Fisheries and Oceans Canada (DFO) | DFO confirmed the potential for Spotted Sucker (an aquatic Species at Risk) in the Welland River within the study area. | Nov 2, 2020 | Project team incorporated this information into the Natural Environment Report and impact assessment / mitigation. |
| Canadian Pacific Railway (CPR) | Project team reached out to CPR for information (number of trains, frequency) about the at-grade crossing north of Grassy Brook Road and to see if CPR had additional interests at this crossing. CPR confirmed that train volumes were low (around one train per day). The track is non-mainline with a speed of 10mph. A grade crossing application is required. | Nov 2020 | Project team incorporated the information into the DTA and design. A grade crossing application was completed and provided to CPR, however no response has been received to date. |
| Provincial | | | |
| Ontario Ministry of Transportation (MTO) | Project team reached out to MTO seeking clarification on the encroachment permit process. MTO confirmed that Encroachment Permit(s) will be needed for carrying out field work within the MTO's ROW and provided answers on the permit process. | June 5, 2020 | Project team obtained an MTO Encroachment Permit for fieldwork in the MTO ROW. |
| | Meeting to introduce the EA study. Project team provided an overview of the Municipal Class EA study and discussed the need for ongoing design coordination and review. MTO noted they are also completing structural rehabilitation design for the QEW / Lyons Creek Road bridge. | Aug 13, 2020 | Project team continued to coordinate with MTO and provided traffic analysis and design drawings for MTO's review. Ongoing coordination of the work at the QEW interchange. |
| | MTO provided comments on the draft PIC #2 display boards, which included the need for MTO permits/approval, which extend up to 800m from all MTO property limits, the need to follow the MTO Access Management Guidelines, and to continue to inform MTO of the EA study progress. MTO also asked about the active transportation vision for the area and whether other upcoming projects in the area were mentioned. | Sept 22, 2020 | Project team obtained permits as needed and provided designs for MTO's review. Designs followed MTO guidelines. Active transportation options were reviewed with MTO throughout the study, particularly at the interchange. The project team acknowledged MTO's project at the interchange but did not go into detail as it is not a Regional undertaking. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|----------------------|--|--------------|---|
| | <p>Monthly progress meetings were held with MTO. This first progress meeting was to discuss the draft traffic forecasting memo that was sent to MTO to review. The project team presented the traffic analysis, seeking MTO's feedback on the traffic findings and approach. MTO stated that they don't have any comments on the traffic forecasting memo submitted. Parsons provided preliminary design information, such as reviewing roundabouts and signals, and additional lanes required, at the interchange ramps. MTO noted that senior review of the design is also required, and if a roundabout is being considered, the design will have to be reviewed by MTO's Roundabout Committee.</p> | Nov 2, 2020 | <p>Project team completed a Detailed Transportation Assessment (DTA) for MTO review and approval. Ultimately, a roundabout was not recommended at any of the interchange ramps and was not required to go before MTO's Roundabout Committee. Project coordinated with MTO on the intersection control at the ramps.</p> |
| | <p>Progress meeting was held to discuss the DTA Report, and intersection needs at Niagara Square Drive, Montrose Road/Lyons Creek Road, and the QEW off-ramps at Lyons Creek Road. Also discussed traffic findings, recommended lanes, the Grand Niagara Secondary Plan Traffic Impact Study (TIS), roundabouts, active transportation, and other items important for coordination.</p> <p>MTO noted that meetings with and review by the Roundabout Committee and MTO Executive Committee are required before the next PIC.</p> | Dec 2, 2020 | <p>Project team continued to provide updates to the DTA and designs for MTO review. Lengthy discussions and reviews were undertaken for the traffic findings and recommended intersection configurations. Appropriate reviews by MTO senior staff were completed as part of the EA study.</p> |
| | <p>Progress meeting was held to discuss traffic and design progress. Potential intersection at Niagara Square, Montrose/Lyons Creek intersection, lane requirements, traffic data, active transportation and schedule was discussed.</p> | Jan 13, 2021 | <p>Project team continued to provide updates to the DTA and designs for MTO review.</p> |
| | <p>Meeting was held to provide an update on the DTA and to clarify the requirements of the Roundabout Committee. A timeline was developed to complete the required steps for MTO review and approval.</p> | Feb 1, 2021 | <p>Project team continued to provide updates to the DTA and designs for MTO review. Ultimately, a roundabout was not recommended and MTO Roundabout Committee was not required.</p> |
| | <p>Progress meeting was held to primarily discuss active transportation on the Lyons Creek Road bridge over the QEW and intersection design at the QEW off-ramps.</p> | Feb 10, 2021 | <p>Project team continued to provide updates to the DTA and designs for MTO review.</p> |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|----------------------|--|--------------|--|
| | A meeting was held to review the preliminary design options along Lyons Creek Road, which were sent to MTO for comments. The project team discussed active transportation designs on the Lyons Creek Road bridge over the QEW, Willodell Road, the QEW off-ramp intersection designs, and the DTA. | Feb 24, 2021 | Project team made revisions to the design as per MTO input and continued to provide updates to the DTA and designs for MTO review. |
| | Progress meeting was held to discuss active transportation on the Lyons Creek Road bridge over the QEW and intersection design at the QEW off-ramps. | Mar 10, 2021 | Project team continued to provide updates to the DTA and designs for MTO review. |
| | Progress meeting was held as a pre-Executive Review Meeting to discuss presentation of design materials to senior MTO staff. | Mar 19, 2021 | Project team made revisions to the Executive Review Meeting presentation and designs. |
| | MTO Executive Review Meeting was held for the project team to provide an overview of the design to senior MTO staff. Key MTO concerns include traffic analysis, lack of signals at the east ramp terminal, Willodell Road, and what is being presented at PIC #3. | Mar 23, 2021 | Project team provided responses to traffic questions raised by MTO and continued to revise and update the DTA and designs as per MTO comments. |
| | MTO provided comments from MTO traffic office on the DTA and design. | Apr 7, 2021 | Project team provided responses to inquiries on April 15, 2021. |
| | Progress meeting was held to primarily discuss active transportation on the Lyons Creek Road bridge over the QEW and intersection design at the QEW off-ramps. | Apr 14, 2021 | Project team continued to provide updates to the DTA and designs for MTO review. |
| | MTO presented revised design options to senior management and provided main concerns, which primarily relate to traffic forecasts, intersection design, and active transportation. | Apr 16, 2021 | Project team provided responses to inquiries on April 20, 2021. |
| | MTO provided revised wording for the PIC #3 display boards. | Apr 20, 2021 | Project team updated the PIC #3 display boards as per MTO's request. |
| | Progress meeting was held to discuss the QEW off-ramps designs, MTO comments on the DTA and Active Transportation Memo, and the Willodell Road restriction. | May 12, 2021 | Project team continued to provide updates to the DTA and designs for MTO review. |
| | Meeting for the project team to present the various design alternatives that were assessed to address MTO's concerns | June 3, 2021 | Project team provided all requested data (traffic analysis, designs) for MTO's review of the |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|---|---|---------------|--|
| | about Willodell Road. Project team's preferred option included the restriction of left turns from Willodell Road onto Lyons Creek Road. | | alternatives. Parsons made requested design changes. |
| | Meeting held for the project team to present the revised Willodell Road design. MTO to bring design back to senior staff for review. | June 10, 2021 | Project team provided all requested data and made any requested design changes. |
| | Progress meeting to discuss the revised Willodell Road design, future changes that would warrant revisiting the intersection, and design of the QEW ramps. | June 23, 2021 | Project team revised drawings as required and provided requested information. |
| | MTO Executive Review Meeting where the project team presented the updated designs on Lyons Creek Road itself, at both ramp terminals, and at the Willodell Road intersection. | July 6, 2021 | Project team revised general MTO Executive approval of designs and proceeded to continue design work. |
| | Progress meeting to discuss MTO comments on design and speed limits through this section of Lyons Creek Road. Noted coordination is required with MTO's bridge rehabilitation work. | July 14, 2021 | Project team continued to provide updates to the designs for MTO review. |
| | MTO provided letter documenting discussion on Willodell Road, including future requirements to review and reconsider the Willodell intersection in the event of increased development and traffic concerns. | July 19, 2021 | Niagara Region and MTO is continuing to develop a Memorandum of Understanding regarding commitments relating to this intersection. |
| | Progress meeting to discuss MTO comments on design and speed limits through this section of Lyons Creek Road and QEW ramp works. | Aug 11, 2021 | Project team continued to provide updates to the designs for MTO review. |
| | Progress meeting to discuss MTO comments on design and speed limits through this section of Lyons Creek Road and QEW ramp works. | Sept 8, 2021 | Project team continued to provide updates to the designs for MTO review. |
| Ministry of Northern Development, Mines, Natural Resources and | In response to the Notice of Study Commencement, NDMNRF provided general information and resources to be considered as part of the EA study. | June 16, 2020 | Project team incorporated this information into the EA study, where appropriate. |
| | Per the project team's request, NDMNRF provided available Provincially Significant Wetland Evaluation Reports within the study area including portions of Warren Creek, Welland | Sept 16, 2020 | The PSW information was received and incorporated into the natural environment report and impact assessment / mitigation measures. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
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| Forestry (NDMNRF) | River East, Lower Grassy Brook, Lyons Creek North PSW Complexes. | | |
| Ministry of Environment, Conservation and Parks (MECP) | In response to the Notice of Study Commencement, MECP provided a letter with items to be considered for the EA, including climate change, Species at Risk, permitting, surface water protection, consultation with Indigenous communities, and requesting that a draft ESR be provided for MECP review. | July 8, 2020 | Project team incorporated these items into the EA study, as appropriate. |
| | Project team followed up regarding SAR background information. MECP confirmed that the SAR screening for the project area is acceptable and suggested including SAR bats if tree removals are required. | Oct 26, 2020 | N/A |
| | Meeting with MECP SAR Management Biologist was held to present an overview of the project and the results of the bat habitat assessment. For next steps, MECP requested that an IGF be completed, and additional mapping be provided in order for MECP to make a determination on the need for a permit for potential bat SAR impacts. | Jan 19, 2021 | The project team will complete an IGF and additional mapping and will provide to MECP for review. The project team advised MECP that removal of trees will occur outside of the bat roosting window. |
| | MECP confirmed there is no known occurrences of Jefferson Salamander within 1 kilometre of the site, therefore the habitat regulation would not apply to our study area. | Feb 11, 2021 | No further field investigation for Jefferson Salamander is required, however it will still be noted in reports for the project. |
| Local | | | |
| City of Niagara Falls | Meeting to introduce the EA study. Project team provided an overview of the Municipal Class EA study and discussed the need for ongoing design coordination and review. This meeting was primarily to discuss existing and available traffic data, known planned developments in the area, and the traffic forecasting methodology. | Aug 12, 2020 | Project team coordinated with the City on traffic data needed and continued to coordinate regarding traffic and design. |
| | A progress meeting was held to discuss Niagara Square, the Costco TIS, and two major developments on both sides of Montrose Road near McLeod Road. Other items discussed include the Montrose Business Park and concerns with sightlines at Oakwood Drive. City also shared relevant | Oct 22, 2020 | Project continued to provide progress and updates, and in conjunction with the City, initiated conversations with property owners. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
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| | drawings and studies for developments around Niagara Square. | | |
| | City provided a summary of existing watermain and sanitary sewers as well as any upgrades or needs. | Jan 14, 2021 | Project team incorporated this overview into the design drawings and plans. |
| | The City Economic Development group noted the importance of impacts that the hospital and other developments will have on traffic and requested that developers and the City be kept up to date on the project. | Jan 26, 2021 | Project team continued to discuss with developers and property owners and coordinated with the City. |
| | Meeting for the project team to present the latest recommended design from the City PD Review. The project team ran through the design of the entire study area and the City provided comments and input on design of City-related infrastructure, private accesses, intersections, and Biggar Road, a City-owned road. | Feb 24, 2021 | Project team made revisions to the design as per the City's input and continued to provide updates to the designs for MTO review. |
| | City formally provided comments on the preliminary design. Comments related to road cross section widths, active transportation, suggestions or commitments for the EA document, accesses for private properties, etc. | Mar 12, 2021 | Project team incorporated City comments, as appropriate, and continued to discuss with the City on outstanding issues. |
| | A progress meeting was held to discuss impacts to private properties adjacent to the study area, Willodell Road, design of Biggar Road, and an update on PIC #3. | Apr 7, 2021 | Project team continued to provide progress and updates. |
| | The City advised that they are currently completing the rehabilitation design for the Willodell Road Bridge and Major Donald Dell Bridge, with construction anticipated to take place in 2022. | May 11, 2021 | Noted. |
| | Meeting for the project team to present the various design alternatives for Willodell Road that were assessed. Project team's preferred option included the restriction of left turns from Willodell Road onto Lyons Creek Road. City in support of this alternative. | May 26, 2021 | With City's buy-in, project team presented the options to MTO. |
| | The City of Niagara Falls was consulted regarding the possible extension of Reixinger Road west of Montrose Road, providing access to the Grand Niagara Secondary | June 8, 2021 | Project team proceeded to further the design and incorporate the Reixinger Road extension into the project. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
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| | Plan area and to provide northern access to the hospital. City was on board with the decision and discussed design elements of the extension in the interim (turning circle for snow plows). | | |
| | Coordination call to discuss sanitary and watermain servicing on Biggar Road, with no service extension intended west of Crowland Ave. City will provide watermain design drawings from their consultant. | July 21, 2021 | Project team revised drawings as discussed. Design will proceed assuming no sanitary servicing on Biggar Road. |
| | Meeting with the City to review the outcome of the meeting held between the City and the Grand Niagara Golf Course. The golf course is supportive of the extension via land-swap with the previous Street B lands. Reixinger/Montrose will be signalized, provisions for GNSP services added. A maintenance agreement with the hospital will be required. | Aug 12, 2021 | Project team proceeded to schedule a stakeholder meeting with the Grand Niagara Golf Course and proceeded to initiate design for the extension. |
| | City Council passed a motion in support of a traffic signal with full movement at the Lyons Creek Road and Willodell Road intersection. | Oct 5, 2021 | Project team is continuing to proceed with the proposed design (no left-turn out, no signals) at the intersection as it has been assessed from a traffic perspective and discussed with technical staff and MTO. A traffic signal can be considered as part of future work or developments. City Council's position was documented in the EA documentation. |
| Niagara Health (NH) | In response to the Notice of Study Commencement, Niagara Health expressed interest in participating in the EA study as there is direct coordination required between the road design and the South Niagara Hospital design. | June 09, 2020 | The contacts were added to the project contact list to provide future updates. |
| | Monthly progress meetings were held with NH, and their consultant Stantec. At this first progress meeting, NH presented an illustrative site plan and an overview of their schedule (timing of site plan, RFP, construction). Project teams also discussed servicing, stormwater management, drainage, intersection controls and locations, and transit considerations. | Aug 19, 2020 | Project team and NH continued to coordinate on design and provide updates. |
| | Progress meeting with NH and Stantec was held to discuss proposed property line, transit hub, grading and stormwater | Sept 16, 2020 | Project team and NH continued to coordinate on design and provide updates. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|----------------------|---|--------------|---|
| | management, particularly managing flows from the hospital site to the road right-of-way. Off-site improvements like intersection curb cuts, EMS signal pre-emption, and utilities. | | |
| | As per the project team's request, NH/Stantec provided the Natural Heritage Report completed for the hospital site. | Oct 05, 2020 | Project team reviewed the natural heritage report and incorporated information into the EA study. |
| | Progress meeting was held to primarily discuss stormwater management flow discharge scenarios. Niagara Region's stormwater and drainage staff provided their input on the preferred approach, which is that pre-implementation flows should match flows post-implementation. | Oct 21, 2020 | Project team and NH continued to coordinate on design and provide updates. |
| | Progress meeting was held. NH noted the illustrative site plan was finalized and a preliminary Site Plan Application submission would be issued to the City which would also be provided to the project team. | Nov 18, 2020 | Project team and NH continued to coordinate on design and provide updates. |
| | Meeting with NH and Stantec to review the traffic data and analysis and reach a consensus on an accepted TIS. As NH would like accesses to remain flexible, the project team is implementing minimum distances for the entrances from Montrose Road/Lyons Creek Road to reduce queueing and intersections that are too close in proximity. | Nov 23, 2021 | Project team/NH revised and updated the TIS as per discussion. |
| | Progress meeting was held. NH noted the Site Plan Application (SPA) was being submitted shortly. NH also discussed what information will be required from the project team throughout the hospital design process. Primarily, a review of the SPA package and the detailed design of the road is to be provided as part of the RFP package. NH provided an update on utilities they are coordinating with for site servicing. | Dec 16, 2021 | Project team and NH continued to coordinate on design and provide updates. |
| | NH sent the civil package issued in support of the Site Plan Application for the South Niagara Hospital submission. | Jan 8, 2021 | Project team completed a review of the SPA and provided comments. |
| | Progress meeting was held to discuss schedule and timing updates, drainage, access locations, and utilities. | Jan 20, 2021 | Project team and NH continued to coordinate on design and provide updates. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|----------------------|---|---------------|--|
| | Hospital off-site works integration workshop between NH and various other parties required to support the construction and function of the hospital. Specifically, this includes Niagara Region (and its various sub-consultants undertaking work), the City of Niagara Falls, and utilities. Updates provided by all parties on timing, progress, and work to be done. Workshop allowed a platform to discuss issues between multiple parties. | Jan 28, 2021 | Project team and NH continued to coordinate on design and provide updates. |
| | Progress meeting was held to discuss schedule and timing updates, access locations, and utilities. | Feb 17, 2021 | Project team and NH continued to coordinate on design and provide updates. |
| | Progress meeting was held to discuss schedule and timing updates, access locations, and information that NH will require for its RFP. | Mar 17, 2021 | Project team and NH continued to coordinate on design and provide updates. |
| | Progress meeting was held to discuss schedule and timing updates, access locations, and PIC #3. | Apr 21, 2021 | Project team and NH continued to coordinate on design and provide updates. |
| | Progress meeting was held to discuss access locations and movements, property requirements, and utilities. | May 19, 2021 | Project team and NH continued to coordinate on design and provide updates. |
| | Meeting to discuss the need for daylighting triangles and property impacts. | June 2, 2021 | |
| | Progress meeting was held to discuss the Reixinger Road extension, access, and property requirements. | June 16, 2021 | Project team and NH continued to coordinate on design and provide updates. |
| | Second hospital off-site works integration workshop between NH and various other parties required to support the construction and function of the hospital. Discussion revolved around progress updates for each party and a platform to discuss issues and concerns. | June 17, 2021 | Project team and NH continued to coordinate on design and provide updates. |
| | Progress meeting was held to discuss the design progress, the Reixinger Road extension and need for other accesses, servicing connection point to the site, transit, and construction staging access and coordination during road works. | July 21, 2021 | Project team and NH continued to coordinate on design and provide updates. |
| | Progress meeting was held to discuss key points of coordination required between NH and the Region, | Aug 18, 2021 | Project team and NH continued to coordinate on design and provide updates. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|--|--|---------------|--|
| | particularly regarding the interface between the Region's road ROW and the hospital frontage, updated runoff flows from site and invert depth constraints on Montrose Road. | | |
| | Progress meeting was held to discuss the Notice of Approval conditions and text for the South Niagara Hospital | Sept 15, 2021 | Project team and NH continued to coordinate on design and provide updates. |
| Niagara Peninsula Conservation Authority (NPCA) | Project team contacted NPCA to request information regarding Welland River, Hydraulic Models watercourses crossing between Lyons Creek Rd and McLeod Rd, Watershed masterplan for watercourses crossing Montrose Rd between Lyons Creek Rd and McLeod Rd, and other environmental data. NPCA provide a link to the regulation limits, floodplains, wetlands and other that can be found in the on-line mapping tool 'Watershed Explorer', in addition a sharefile link was shared to allocate all the digital information. | Sept 9, 2020 | Project team created a Sharefile link to allocate digital information. |
| | Project team request clarification regarding NPCA's Type 1 and Type 2 Fish Habitat classifications due to a potential SAR habitat. NPCA provided description of the classification that were assessed for the Region by NDMNRF. | Sept 29, 2020 | Information incorporated into the Natural Environment Report and SWM and Drainage Report and design. |
| | - | Oct 26, 2020 | Project team reviewed the NPCA SWM manual, available background watershed master plans and secondary plans within the project limit and requested feedback from NPCA. No response was received. |
| | NPCA provided comments on the alternatives selected, impacts to wetlands and watercourses. NPCA requested the draft reports for review to be able to provide additional comments. | June 23, 2021 | Project team responded with rationale for the alternative designs chosen and addressed the watercourse and wetland comments. The draft Natural Environment and SWM Report were provided for NPCA review. |
| | NPCA confirmed no further requirements for geotechnical studies. | July 8, 2021 | Noted. |
| Niagara Region – Internal Departments | | | |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
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| Niagara Region, Urban Design and Landscape Architecture (UDLA) | A comment form was submitted by the UDLA expressing interest on preliminary areas of interest like Active transportation, streetscape, place making, views and vistas, strategic infrastructure, opportunities for LID, and other. | June 11, 2020 | Project team engaged the UDLA team in the Active Transportation Workshop and included comments, as appropriate. |
| Niagara Region, Planning and Development | Planning and Development Services submitted a comment form expressing interest in active transportation facilities streetscaping, planning policies, natural heritage features, and archaeology. | July 03, 2020 | Project team reviewed the information provided and incorporated into the study, as required. |
| Niagara Region, Transit Team | Niagara Region Transit staff, representing both the Region's and the City's transit input, provided comments outlining general transit requirements, including stop spacing, AODA compliance, stop locations, and design standards. | Aug 17, 2020 | The recommended plan incorporates transit stop locations that were determined in coordination with/have been reviewed by the transit team. |
| | A meeting was held to discuss bus stop locations, maximum walking distances, the preference for near side bus stops, and transit at the hospital. | Oct 14, 2020 | Parsons will reviewed the Bus Design Guidelines and incorporated discussion into the recommended plan. |
| | The project team provided a bus stop location plan and Transit staff provided comments / recommended adjustments on the stop locations. | Feb 05, 2021 | Project team revised the recommended plan accordingly. |
| | The project team provided the recommended plans as presented at PIC #3 for Transit staff to review. Follow up comments were provided for specific stop locations at Niagara Square Drive, Grassy Brook Road, 9515 Montrose Road, and the Montrose Road / Lyons Creek Road intersection. | May 26, 2021 | Project team provided responses to the questions and more context on latest project updates. |
| | Online meeting to provide a quick summary of bus stops and bus bays incorporated in the design. Discussed bus stops at the Reixinger Road extension and provisions for on-road bus stops to service the hospital site. | July 29, 2021 | Bus stop will be moved from 9515 Montrose Road to Reixinger Road and provisional on-road bus stops will be included in the EA, though will be revisited at the time of implementation. |
| Niagara Region Public Health | Regional Public Health staff provided comments regarding design elements to be considered in the EA study, particularly opportunities to expand cycling and walking trails and connectivity and recommended a multi-use path | June 24, 2020 | Project team engaged the Public Health team in the Active Transportation Workshop and included comments, as appropriate. The recommended design for active transportation was supported by this team. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|--|--|---------------|---|
| | on the west. Also expressed concerns about the Welland River crossing for active transportation. | | |
| South Niagara Falls Wastewater Treatment Plant (SNFWWTP) | An initial meeting was held with the Region and its consultant, GM Blue Plan, for the SNFWWTP project. Project overviews were presented and discussions related to coordination of design efforts and possible sewer locations based on the Montrose Road widening alignment. | Nov 9, 2020 | Project team continued to share information with SNFWWTP project team. Ongoing coordination on design and progress. |
| | Progress meeting was held to discuss tunneling shaft and sewer locations and available property, particularly at Reixinger Road and Grassy Brook Road. | Feb 17, 2021 | Project team continued to share information with SNFWWTP project team. Ongoing coordination on design and progress. |
| | Coordination call with GM Blue Plan reviewed property requirements for shaft compound construction. Location of trunk sewer and sewer profile are being refined. Detailed design by GM Blueplan to begin in 2022 and construction in 2024. | June 16, 2021 | Project team will continue to coordinate with utility relocation. Ongoing coordination on design and progress. |
| Utilities | | | |
| Cogeco Connexion | No concerns with the project and would like to continue be included in future notification. | June 8, 2020 | Contact added to mailing list. |
| Niagara Peninsula Energy Inc. (NPEI) | No concerns with the project and would like to continue be included in future notification. | June 12, 2020 | Contact added to mailing list. |
| Hydro One Networks Inc. (HONI) | Hydro One has existing high voltage Transmission facilities within the study area, HONI requested to stay informed as more information becomes available, and provided comments regarding the infrastructure along the project and the same time stated that the Region is responsible for all costs to relocate Hydro One plant, so the intent should be to avoid any Hydro One relocation. | July 27, 2020 | Confirm utility impacts and communicate them to HONI when known. |
| | Meeting with Hydro One. They advised that the Hydro One towers at the Welland River Bridge and Montrose Road are programmed for removal. Hydro One provided information on property ownership of their lands. | Feb 11, 2021 | The Region assigned a Properties Representative to handle property acquisition where required. Project team continue to coordinate with Hydro One on relocations. |
| Bell | Meeting was held to review the design roll plans to identify utility conflicts. Bell will acquire PTEs and work with NPCA to | June 17, 2021 | Project team to share test-pit report from T2UE and incorporate utilities into conflict matrix. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|--------------------------------|---|---------------|--|
| | perform relocations. Planview will perform a full locate on bridge structure for Bell conduits. | | |
| Utilities Workshop 1 | Utilities inside study area were introduced to the project and given high-level project timeline. Existing utility relocation projects on Montrose at the CPR and Welland River were reviewed. | Feb 3, 2021 | Project team to work with utilities in order to identify conflict points as the preliminary designs become available. |
| Utilities Workshop 2 | Preliminary design roll-plans were shared with utilities via ShareFile on May 21. Roll-plans were reviewed and conflict points identified during workshop. | June 22, 2021 | Utility plans will be overlaid with design to identify conflict points requiring relocation when drawings become available. |
| Other | | | |
| Active Transportation Workshop | Workshop with various active transportation stakeholder groups to present the proposed active transportation strategy on Montrose Road, Lyons Creek Road, and Biggar Road. The general approach is a multi-use path on the west side of Montrose Road and the north side of Biggar Road and Lyons Creek Road. | Jan 25, 2021 | This was carried forward to the recommended design, except the Lyons Creek Road bridge over the QEW, which through discussions with MTO, will not include active transportation at this time. |
| EMS | Roundabout and traffic signal options at Niagara Square/Montrose and Lyons Creek/QEW ramp terminals were reviewed with EMS. EMS expressed a preference for multi-lane roundabouts over signalization as long as there is sufficient room for vehicles to pull over inside the roundabout. The Region has a policy to install signal pre-emption on all signals as they are constructed or replaced. | Mar 2, 2021 | EMS comments will be incorporated into the evaluation of intersections. |
| Public Stakeholders | | | |
| Property Owner (E.S. Fox Ltd) | Sent a letter with concerns about safety and the increase in traffic on Montrose Road. The letter provided suggestions for improvements, including a turning lane on Montrose Road, widening, turning lanes, active transportation, and signals / roundabout considerations. | June 17, 2020 | The project team met with E.S. Fox to present the recommended design and discuss their concerns. A turning lane will be implemented on Montrose Road and the future Grassy Brook Road is anticipated to be signalized in the future. |
| | Follow up to the June 17, 2020 letter to advise that traffic volumes have increased and the turn to/from Montrose Road is increasingly difficult to do safely. | Dec 18, 2020 | The project team met with E.S. Fox to present the recommended design and discuss their concerns. A turning lane will be implemented on Montrose Road |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|---|---|------------------|---|
| | | | and the future Grassy Brook Road is anticipated to be signalized in the future. |
| | Meeting with E.S. Fox to present the recommended design and discuss concerns regarding access and safety for several of their properties. Generally, E.S. Fox was satisfied with the design and recommendations. | Mar 12, 2021 | The project team incorporated some changes to the design following the meeting. |
| Property Owner (Cuviello Construction) <i>Note key points of contact are noted though project team has had many phone calls and conversations with project team members</i> | Spoke with project managers and provided development plans for the property. Property owner has a keen interest in the project and has some concerns with accesses to their property, particularly the potential land locking of the parcel just west of the QEW. | June 19/23, 2020 | Project team added contact to project contact list and met with them throughout the project. |
| | Meeting where the property owner provided background on the use of the properties and project team presented the recommended design and improvements adjacent to the properties. Main concern relates to access for the parcel just west of the QEW onto Lyons Creek Road. Property owner is requesting full moves access (signals preferred) to the eastern property, however there are concerns with signal spacing, signal warrant, and proximity to the QEW west ramp terminal. | Apr 8, 2021 | Project team conducted traffic analysis of several options for accesses on Lyons Creek Road between Montrose Road and the west ramp terminal. A signal is not warranted and may inhibit traffic operations through this stretch. Through discussions with MTO, a signal would not be supported by MTO due to potential for backups to the ramp terminal. |
| | Reiterated concerns with the recommended design that does not include a signalized access to their property just west of the QEW. | Apr 11, 2021 | At this time, a signalized intersection is not proposed on Lyons Creek Road between Montrose Road and the QEW as it is not warranted based on traffic analysis and due to the proximity of the QEW and existing signals. When a site plan has been developed for these properties, a new intersection or access can be put forth for review at that time. |
| | Meeting to present the revised Willodell Road intersection design, potential future impacts to this intersection, and discuss access to their property and next possible steps. Property owner did not support the revised design and reiterated the concerns with the lack of a full moves access. | July 27, 2021 | Project team clarified that the EA is not recommending a signalized intersection to the property. Further discussion on access to the property will be undertaken at the site plan review stage. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|---------------------------------|--|-----------------|--|
| | On-site meeting with the property owner to review the property and access to the site. | August 12, 2021 | Project team reiterated that when a site plan is put forward for the properties, a new intersection or access can be put forth for review at that time. |
| Member of the Public | Asked if Lyons Creek Road will be closed for the study. | June 19, 2020 | During the preliminary design, it is hard to provide actual dates for any construction staging closures, however a PIC will be held prior to construction to advise of staging and closure impacts. |
| Property Owner | Concerned about maintenance of the roadside ditches and access to their property. | July 2, 2020 | A portion of their frontage will see the roadway being urbanized and drainage conveyed through gutters rather than roadside ditches. No accesses are being impacted. |
| Member of the Public | Provided written concerns about impacts to the Dell Cemetery, a historic cemetery off Dell Road, east of the QEW. Stakeholder provided a brief history of the site. | July 14, 2020 | Project team advised the stakeholder that impacts are primarily localized to areas adjacent to the study area roads so impacts to the Dell Cemetery are not anticipated. The recommended design does not impact the cemetery. |
| Member of the Public | Provided written concerns about safety concerns on Biggar Road with increasing traffic, speed, passing vehicles, and lack of shoulders and proper lighting. Suggested a light be installed at Morris Road to slow vehicles down. | Aug 14, 2020 | This EA study addresses some of the concerns about Biggar Road, however the study construction limits only extend just past the west limits of the hospital so will not address concerns at Morris Road and Biggar Road. |
| Member of the Public | Provided written comments about an opportunity to improve the cross walk between Chapel Heights and Niagara Square, including new paint and crossing signal times. Also indicated that upgrades to the Montrose Road and Lyons Creek Road/Biggar Road intersection are needed and inquired about additional turning lanes. | Aug 14, 2020 | A signalized cross walk is recommended at Niagara Square Drive to facilitate pedestrians crossing from Chapel Heights to Niagara Square. Exact timing and design will be determined in detailed design. The Montrose Road and Lyons Creek Road/Biggar Road intersection will be significantly upgraded to accommodate the increase in traffic and includes auxiliary left and right turning lanes. |
| Property Owner (Chapel Heights) | Meeting was held with Chapel Heights (CH) representatives to discuss concerns with flooding and drainage issues on the CH property as a result of surrounding construction. The interest in sidewalks improvements to accommodate the | Aug 24, 2020 | City of NF to put in a request to review drainage system. The Project Team noted that the Transportation Master Plan identifies Montrose Road as an active transportation corridor so the |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|----------------------|---|---------------------|---|
| | <p>increasing pedestrian traffic and they noted they have future plans to develop the north part of the property into another resident building.</p> | | <p>study will look at how bike lanes, sidewalks, multi-use paths, etc. can be accommodated. The Region noted that the EA study will look at combining driveway accesses and reducing conflict points, which presents safety concerns to both drivers and other road users (e.g. pedestrian crossing multiple accesses).</p> |
| | <p>Meeting was held to present preliminary design options along Montrose Road in the vicinity of the property, including options for roundabouts and a continuous median. CH expressed concerns regarding safety for its seniors residents, unfamiliarity with roundabouts, accessibility for EMS vehicles, pedestrian crossing that doesn't have a dedicated signal timing, property taking and impacts to its accesses.</p> | <p>Mar 11, 2021</p> | <p>The project team presented information on how roundabouts support safer traffic movements. The recommended design includes a pedestrian crossing with flashers that can be activated with a push button to accommodate pedestrian crossings. The Region is also initiating a roundabout education campaign. Property taking is minimal in a current unused corner of the site and there will be no impacts to property accesses.</p> |
| | <p>Letter describing concerns with roundabouts in close proximity to the retirement home, particularly confusing for drivers and seniors. This would also require property acquisition and removal of the left turn entry into the property, which would require EMS vehicles to navigate the roundabout to enter the site.</p> | <p>Mar 17, 2021</p> | <p>Property acquisition is minimal in a current unused corner of the site. EMS providers were consulted and the roundabout who did not indicate concerns with site access and supported use of roundabouts.</p> |
| | <p>Response to meeting minutes indicating the preference for traffic signals over a roundabout at Niagara Square Drive, particularly with concern over the pedestrian crossing which will not be coordinated with traffic signal timing.</p> | <p>Apr 8, 2021</p> | <p>The roundabout is used to facilitate access to both sides of Montrose Road in the presence of a continuous median. The pedestrian crossing will be designed with a flashing beacon, initiated by a push button, as per design standards.</p> |
| | <p>Meeting to present the revised recommended design which includes only the roundabout at Niagara Square Drive only. The second roundabout was not pursued due to operational concerns with proximity to the McLeod Road intersection. Key concerns for CH is the pedestrian crossing and access for EMS vehicles.</p> | <p>Apr 16, 2021</p> | <p>A pedestrian crossing with flashing beacons activated by a push button that provides dedicated crossing time for pedestrians. EMS noted vehicle delays would be negligible with the roundabout.</p> |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|--|--|---------------|---|
| Property Owner (Terrio) | Meeting was held to present preliminary design options along Montrose Road in the vicinity of the property, including options for roundabouts and a continuous median. One potential option included incorporating a roundabout with a leg of the roundabout being a direct access to the property. Property owners expressed concerns regarding traffic safety in a roundabout, access to their property, and grade of the road. | Mar 11, 2021 | The project team presented information on how roundabouts support safer traffic movements. Project team also noted the constraints of this section of Montrose Road, which includes two curves that present safety / visibility challenges with entrances and left turns. |
| | Meeting to present the revised recommended design which includes only the roundabout at Niagara Square Drive only. The second roundabout was not pursued due to operational concerns with proximity to the McLeod Road intersection. The roundabout at Niagara Square Drive would still facilitate cars going southbound to access their property. Also noted there is a bus stop in front of their property. | Apr 19, 2021 | Project team is not showing any accesses as part of the design, as this will be determined through site plan approval. |
| Resident | Asked about the construction plan for the hospital, how works on Biggar Road will impact their property, if utilities will be installed, and what construction impacts are anticipated. | Sept 18, 2020 | Construction staging for the hospital will be completed separate from the roadway. The roadway works will have temporary impacts to their access though a traffic management plan will be prepared to minimize impacts to traffic and access throughout the study area. |
| Resident | Noted the importance of the lands north of Biggar Road within the urban boundary as major development potential to service the hospital. As such, the construction of this Montrose Road EA study is an opportunity to incorporate utilities on Biggar Road, not only to the hospital but along the rest of the Biggar Road frontage within the urban boundary. This should be undertaken as part of this study now so that the road does not need to be redone in the future. | Sept 22, 2020 | Current plans including extension of utilities to provide services to the hospital and do not include the remainder of properties fronting Biggar Road within the urban boundary. This property is captured in the Grand Niagara Secondary Plan which has proposed its own internal servicing strategy. |
| Property Owner (Niagara Square /Bayfield Advisors) | Meeting to introduce the study and discuss Bayfield's development plans and the option to consolidate access through the stretch of Montrose Road near Niagara Square to improve traffic flow through the corridor. | Oct 29, 2020 | Project team will share DTA with Bayfield once reviewed and approved by the Region. |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|-------------------------------------|--|--------------|---|
| | <p>Meeting was held to present preliminary design options along Montrose Road in the vicinity of the property, including options for roundabouts and a continuous median. The roundabout at Niagara Square Drive could incorporate a leg into the mall as a point of direct access, however, this was noted as being more intrusive and require reconfiguration of the internal site, loss of development potential and parking spots. A roundabout to the west of Niagara Square Drive could also accommodate access to Niagara Square.</p> | Mar 12, 2021 | <p>Project team conducted further analysis of the roundabout options and other ways to support access and safety in the area.</p> |
| | <p>Meeting to present the revised recommended design which includes only the roundabout at Niagara Square Drive only. Bayfield concerned primarily with loss of property and development potential, the loss of left turns onto Montrose Road and whether other existing roads can accommodate this traffic, and safety of the roundabout related to weaving,</p> | Apr 16, 2021 | <p>Project team reviewed accesses to Niagara Square and revisited the design of the roundabout to fix the issue with weaving.</p> |
| | <p>Formal letter outlining concerns with regard to the preferred design shown at PIC #3, which reiterates the concerns from the April 16 meeting, particularly regarding future growth and development opportunities of the site, redirection of traffic reducing access to businesses, and reduction of access to the site overall.</p> | May 5, 2021 | <p>Project team reviewed roundabout weaving and access impacts to the property. Different roundabout configurations can be reviewed during detailed design to reduce weaving, but a turbo configuration has been reviewed which would address the weaving concern. A signalized intersection at their main entrance is not supported due to the proximity to the Canadian Drive signals and a median will be implemented at the main entrance to limit left turns. An additional right-out exit is supported along the first bend of Montrose Road.</p> |
| Resident | <p>Provided a suggestion to redesign the entrance to Niagara Square.</p> | Jan 10, 2021 | <p>Project team reviewed accesses and egresses along Montrose Road in the vicinity of Niagara Square and have developed a preliminary design to address access to the various properties in the area.</p> |
| Venture Niagara – Community Futures | <p>Requested additional information on the project for cycling tourism in the Region.</p> | Feb 23, 2021 | <p>Project team provided a link to the project website and advised them to attend PIC #3.</p> |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|--|---|---------------|--|
| Development Corporation | | | |
| Property Owner (Arpad Hungarian Hall) | Meeting to discuss impacts to accesses and property acquisition due to road widening and intersection improvements. Property owners provided information about the use of the property, access needs, and site constraints. | Apr 8, 2021 | Project team advised property owners of next steps and provided public notices as updates. Added new property owner contact information. |
| Property Owner (Willodell Golf Course) | Meeting was held to present the recommended design on Lyons Creek Road, which included a proposed median at Willodell Road at Lyons Creek Road that would limit left turns to Willodell Road. Project team explained the rationale and discussions that led to the recommendation, such as safety, weaving and back ups, and some of the alternatives that were reviewed. The golf course was concerned of the significant detour that their patrons and residents in the area would be required to take to reach the golf course / their homes from the highway. | Apr 19, 2021 | Following PIC #3, the project team reviewed options for the Willodell Road / Lyons Creek Road intersection and through discussions with the City and MTO, developed a design that included a left turn lane from Lyons Creek Road to Willodell Road, however left turns out from Willodell Road would be restricted. |
| | Email inquiring about the proposed intersection design at Willodell Road with the median. Suggested delaying the implementation of the median and had several questions regarding design and traffic information. | Apr 21, 2021 | The median option was reconsidered and the preferred design now includes the left turn into Willodell Road but restricts the left turn out. |
| Willodell Golf Course and LKQ Auto | Meeting to present the revised Willodell Road intersection design. Both businesses were pleased that the main traffic movement between QEW and Willodell Road could be maintained. The intersection design accommodates for larger vehicles used by LKQ Auto. | July 28, 2021 | Project team advised property owners of the next steps of the EA. |
| Resident | Written comments expressing concern over a proposed median at Willodell Road at Lyons Creek Road that would limit left turns to Willodell Road. Noted there are no current traffic concerns at this intersection and there are two through lanes which would allow through traffic to continue unimpeded. This restriction would result in significant detour for residents who use Willodell Road. | Apr 20, 2021 | Project team noted that under current conditions, the intersection works with no concerns, however with a future increase in traffic, this will result in challenges to the operations of the intersection. Following PIC #3, the project team reviewed options for the Willodell Road / Lyons Creek Road intersection and through discussions with the City and MTO, developed a design that included a left turn lane from Lyons Creek Road to Willodell Road, |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|---|---|---------------|---|
| | | | however left turns out from Willodell Road would be restricted. |
| Resident | Written comments expressing concern over a proposed median at Willodell Road at Lyons Creek Road that would limit left turns to Willodell Road. Primarily concerned with the relocation of the left turn traffic to the Lyons Creek Road intersection going down Montrose Road and turning left onto Carl Road, especially for the heavier vehicles going to and from LKQ Auto. Suggested that a dedicated left turn lane can be added. | Apr 20, 2021 | Project team acknowledged the concern with rerouting the left turns and other potential issues of the new route. Following PIC #3, the project team reviewed options for the Willodell Road / Lyons Creek Road intersection and through discussions with the City and MTO, developed a design that included a left turn lane from Lyons Creek Road to Willodell Road, however left turns out from Willodell Road would be restricted. |
| | Written comments following the Willodell Stakeholder Meeting. Concerned that restricting left-out traffic onto Lyons Creek Road will result in risks by redirecting traffic to Carl Road onto Montrose Road and cars still choosing to turn left at Willodell Road. | Aug 1, 2021 | The left-out traffic represents a small volume of traffic being redirected to Carl Road/Montrose Road. The conditions here are unchanged. Lyons Creek Road traffic will increase greatly with the future development of the Grand Niagara area and will not be a road with lesser volumes of traffic in the future. |
| Property Owner | Meeting with the property owner to discuss impacts to their property and access and the proposed improvements to Montrose Road in front of their property. | May 27, 2021 | Project team provided a summary of the impacts and the Region will contact the property owner in future phases of the project to discuss property impacts. |
| Resident | Noted an increase in vehicular traffic, cyclists and pedestrians since the opening of the Costco and concerned about safety. Inquired about plans for a bike lane or sidewalk. | May 27, 2021 | Project team noted that a multi-use path is recommended along the west side of Montrose Road that can accommodate active transportation uses and provides safety from vehicular traffic. Future studies may extend it further down Montrose Road past Lyons Creek Road. |
| Stakeholder Meeting for Willodell Road | Following PIC #3, the project team reviewed options for the Willodell Road / Lyons Creek Road intersection and through discussions with the City and MTO, developed a design that included a left turn lane from Lyons Creek Road to Willodell Road, however left turns out from Willodell Road would be restricted. The project team met again with residents in the | July 29, 2021 | Project team to progress with design allowing left in and right in/out of Willodell Road as this allows for most of the traffic to continue as is under existing conditions with restrictions impacting a small portion of movements at the intersection. The |

| Agency / Stakeholder | Issue/Comment | Date | Project Team's Response |
|--------------------------------|---|--------------|--|
| | area to present the revised design. Residents raised concern that the proposed design would continue to direct excessive traffic along Carl Road and that the EA should be extended to include streets south of Lyons Creek Road. | | Notice distribution area will be increased to include areas south of Lyons Creek Road. |
| Property Owner (Grand Niagara) | Meeting to discuss the Reixinger Road extension through their property. Project team presented a preliminary design of the roadway. Generally, no concerns with the proposed work and design. | Aug 17, 2021 | Project team to progress with the design. |

4.4 Indigenous Consultation

Consultation with Indigenous communities is an important component of the EA process. At the beginning of the EA study, the project team, with support from MECP, prepared a list of Indigenous communities (see **Table 21**) that may have an interest in the project.

TABLE 21: INDIGENOUS COMMUNITIES CONSULTED WITH

| Indigenous Communities | |
|--|--|
| Chippewas of the Thames First Nation | Alderville First Nation |
| Six Nations of the Grand River | Haudenosaunee Development Institute |
| Mississaugas of Scugog Island First Nation | Haudenosaunee Confederacy Chiefs Council |
| Mississaugas of the Credit First Nation | Metis Nation of Ontario |

All study notices were sent to the Indigenous communities listed above (electronically and hard copy). Efforts were also made to follow up with groups that had not provided any response. A consultation log summarizing the project team’s liaison with Indigenous communities during the study is included in **Table 22**.

TABLE 22: SUMMARY OF INDIGENOUS CONSULTATION

| Indigenous Community | Date | Comment / Purpose | Response |
|---|--------------------|---|--|
| Mississaugas of the Credit First Nation (MCFN) | June/July 2020 | MCFN expressed interest in participating in environmental and archaeological studies, as well as reviewing draft reports associated with each. | A Field Liaison Representative (FLR) was invited to participate in all remaining environmental and archaeological fieldwork. Reports were provided for MCFN to review. |
| | September 10, 2020 | MCFN requested an update on outstanding studies and field visits. | Project team provided a summary of studies completed and whether FLRs were on site or not. |
| | February 1, 2021 | MCFN reviewed the Stage 1 AA and had no further concerns. Noted the need for Stage 2 AA in the future and MCFN would like FLRs to participate when fieldwork is undertaken. | MCFN was invited to participate in the Stage 2 AA. |
| Six Nations of the Grand River (SNGR) | July 20, 2020 | Project team sent a follow up email to the Notice of Study Commencement to see if there were any comments or input. | - |

| | | | |
|---|----------------|---|---|
| | July 14, 2021 | Meeting with SNGR to discuss details of the Stage 2 AA, including monitors and recommendations of the Stage 1 AA. | Project team provided the Stage 1 AA for information and continued to work on the agreement for monitors. |
| Haudenosaunee Confederacy Chiefs Council/Haudenosaunee Development Institute (HDI) | July 20, 2020 | Project team sent a follow up email to the Notice of Study Commencement to see if there were any comments or input. | - |
| | July 5, 2021 | HDI confirmed interest in participating in the Stage 2 AA. | Project team provided the Stage 1 AA for information and continued to work on the agreement for monitors. |
| Metis Nation of Ontario | July 20, 2020 | Project team sent a follow up email to the Notice of Study Commencement to see if there were any comments or input. | - |
| Mississaugas of Scugog Island First Nation | July 20, 2020 | Project team sent a follow up email to the Notice of Study Commencement to see if there were any comments or input. | - |
| Chippewa of the Thames First Nation | July 20, 2020 | Project team called the chief and left a voicemail regarding the Notice of Study Commencement to see if there were any comments or input. | - |
| | April 21, 2021 | No concerns with the project information presented at this time. | - |
| Alderville First Nation | July 21, 2020 | No further comments as the study area is significant distance away from Alderville's treaty areas. | - |

4.5 Notice of Study Completion

Upon completion of the study, this Environmental Study Report (ESR) was compiled which documents the work undertaken through Phases 1 to 4 of the Municipal Class EA process. A Notice of Study Completion is then issued, which details the recommendations of the study and the beginning of the 30-day public review period of the ESR. The Notice also includes the provision and instructions to request for a high level of study and outlines the process on how to provide comments.

The Notice of Study Completion was published in the *Niagara This Week* on Thursday, October 28, and November 4, 2021 (see **Appendix F**) notifying that the ESR is available for 30-day public review period from November 1 to 30, 2021. The Notice was also posted on the Region's website and mailed to nearby properties within the study area on the week of October 25, 2021. Due to an unexpected delay, the review period was revised from November 8 to December 7, 2021 and the Notice was updated and distributed via the website and email.

5.0 Alternative Solutions

5.1 Alternative Solutions

Alternative Solutions are high-level, planning options to address the Problem / Opportunity Statement and include a "Do Nothing" scenario. The Class EA process requires that all reasonable and feasible solutions be identified, described and evaluated against the environmental factors relevant to the study, such as the natural, social, cultural and economic environments. A number of potential solutions were developed for the Problem / Opportunity Statement (see Section 2.2) and are described in **Table 23**.

TABLE 23: ALTERNATIVE SOLUTIONS

| Alternative Solutions | | Description |
|-----------------------|---|--|
| 1 | Do Nothing | The existing transportation system is not changed (this alternative will form a baseline for comparison of alternative solutions). |
| 2 | Limit Development | Restrict development of surrounding lands now and in the future. |
| 3 | Improve Alternative Routes | Undertake improvements (Including capacity improvements) to other corridors parallel to Montrose Road. |
| 4 | Local Roadway/Intersection Improvements | Modify roadway and intersections locally to improve operations (e.g. traffic signal and timing, adding through and turn lanes) |
| 5 | Additional Lanes (Capacity Increase) | Increase traffic capacity on Montrose Road through widening and addition of through traffic lanes |
| 6 | Accommodate Other Travel Modes | Improve facilities for other modes of travel such as walking, cycling and transit |

5.2 Evaluation Criteria

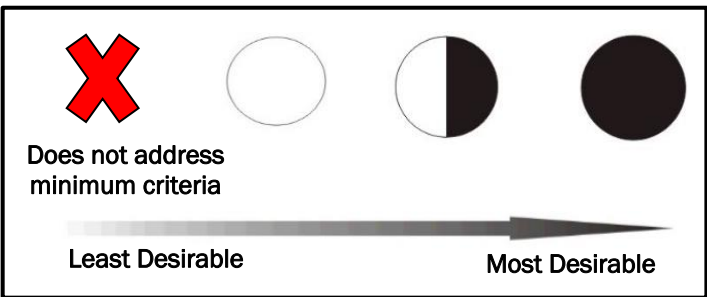
Evaluation criteria are developed to represent the broad definition of the environment as applicable to the study. Generally, the environment is broken down into various factors as outlined in **Table 24**.

TABLE 24: EVALUATION CRITERIA

| Environmental Factors | Evaluation Criteria | Description |
|----------------------------|-----------------------|---|
| Technical / Transportation | Traffic Demand | Does the Alternative Solution address anticipated traffic demand needs now and in the future? |
| | Safety | Does the Alternative Solution address safety concerns along the corridor? |
| | Active Transportation | Does the Alternative Solution accommodate active transportation users along the corridor? |
| | Transit | Does the Alternative Solution address transit needs now and in the future? |

| | | |
|----------------------------|---------------------------------------|--|
| | Network Redundancy | Does the Alternative Solution support access and redundancy in the transportation network for EMS vehicles to/from the hospital? |
| Natural Environment | Terrestrial | What impacts will the Alternative Solution have on the terrestrial environment? |
| | Aquatic | What impacts will the Alternative Solution have on the aquatic environment? |
| Cultural Environment | Archaeology | What impacts will the Alternative Solution have on archaeological resources? |
| | Cultural Heritage | What impacts will the Alternative Solution have on cultural heritage resources? |
| Socio-Economic Environment | Local and Regional Planning Documents | Does the Alternative Solution align with local and regional planning documents (e.g. Official Plan, Transportation Master Plan)? |
| | Supports Local Growth and Development | Does the Alternative Solution support the planned growth and development in this area? |
| | Access | What impacts will the Alternative Solution have on access? |
| | Property | What impacts will the Alternative Solution have on property? |
| Costs | Capital Costs | What are the anticipated capital costs of the Alternative Solution? |
| | Maintenance Costs | What are the anticipated maintenance costs of the Alternative Solution? |

The Alternative Solutions identified in Section 5.1 were evaluated against the criteria developed in Section 5.2. The detailed evaluation table of Alternative Solutions is provided in the following Section and use the following symbology to represent how desirable the alternative is when evaluated against the criteria. These symbols are used to visually represent the qualitative analysis and is not meant as a quantitative assessment tool:



5.3 Evaluation of Alternative Solutions

The Alternative Solutions identified in Section 5.1 were evaluated against the criteria developed in Section 5.2. The evaluation is completed in detail in **Table 25**.

TABLE 25: EVALUATION OF ALTERNATIVE SOLUTIONS

| Evaluation Criteria | Alternative Solutions | | | | | | | | | | | |
|---|-----------------------|--|----------------------|---|-------------------------------|---|--|--|---|--|-----------------------------------|--|
| | 1. Do Nothing | | 2. Limit Development | | 3. Improve Alternative Routes | | 4. Roadway / Intersection Improvements | | 5. Additional Lanes (Capacity Increase) | | 6. Accommodate Other Travel Modes | |
| TRANSPORTATION & ENGINEERING | | | | | | | | | | | | |
| Traffic Demand | ✘ | Does not address traffic demand and growth | ○ | Reduces some traffic demand but current planned growth will still be greater than current road capacity | ◐ | Addresses some traffic demand and growth in the City but not for the study area | ◐ | Partially addresses traffic demand and growth | ● | Addresses traffic demand and growth | ○ | Slightly addresses some traffic demand by providing better opportunities for other modes of travel. |
| Safety | ✘ | No improvements for safety | ✘ | No improvements for safety | ✘ | No improvements for safety in the study area | ● | Improves safety in the study area | ● | Improves safety in the study area | ● | Improves safety in the study area, particularly for other pedestrians and cyclists |
| Active Transportation | ○ | Does not improve or support active transportation use | ✘ | Does not improve or support active transportation use | ✘ | Does not improve or support active transportation use in the study area | ◐ | Somewhat improves and supports active transportation | ◐ | Somewhat improves and supports active transportation | ● | Improves and supports active transportation |
| Transit | ○ | Does not improve or support transit use | ○ | Does not improve or support transit use | ○ | Does not improve or support transit use in the study area | ◐ | Somewhat provides opportunity to support transit but does not improve operation due to traffic | ● | Supports increased transit use and operations by improving traffic and adding lanes for use | ◐ | Compatible with increased transit use, makes transit more accessible |
| Network Redundancy | ○ | No improvements to network redundancy, potential to inhibit movement to the hospital due to traffic queues | ○ | No improvements to network redundancy | ○ | No improvements to network redundancy in the study area | ◐ | Partially improves network redundancy | ● | Improves network redundancy and access to the hospital | ○ | No improvements to network redundancy |
| SUMMARY | ✘ | Does not address transportation needs of the corridor. | ✘ | Does not address transportation needs of the corridor. | ✘ | Does not address transportation needs of the corridor. | ◐ | Addresses several transportation needs, such as traffic demand, safety, access, in the corridor, but alone would not address anticipated growth. | ● | Addresses several transportation needs, such as traffic demand, safety, access, in the corridor. | ◐ | Partially addresses transportation needs, such as active transportation use, but alone would not address anticipated growth. |

| Evaluation Criteria | Alternative Solutions | | | | | | | | | | | |
|---------------------------------------|-----------------------|--|----------------------|--|-------------------------------|--|--|--|---|--|-----------------------------------|--|
| | 1. Do Nothing | | 2. Limit Development | | 3. Improve Alternative Routes | | 4. Roadway / Intersection Improvements | | 5. Additional Lanes (Capacity Increase) | | 6. Accommodate Other Travel Modes | |
| NATURAL ENVIRONMENT | | | | | | | | | | | | |
| Terrestrial | ● | No impacts to the terrestrial environment | ● | No impacts to the terrestrial environment | ● | No impacts to the terrestrial environment | ◐ | Potential for some impacts to adjacent areas | ◐ | Potential for some impacts to adjacent areas | ◐ | Potential for some impacts to adjacent areas |
| Aquatic | ● | No impacts to the aquatic environment | ● | No impacts to the aquatic environment | ● | No impacts to the aquatic environment | ◐ | Potential for some impacts to adjacent watercourses | ◐ | Potential for some impacts to adjacent watercourses | ◐ | Potential for some impacts to adjacent watercourses |
| SUMMARY | ● | No impacts to the natural environment as no work is being undertaken. | ● | No impacts to the natural environment as no work is being undertaken. | ● | No impacts to the natural environment as no work is being undertaken. | ◐ | Potential for some impacts to the adjacent natural environment. Impacts to be mitigated by mitigation measures or avoided where possible. | ◐ | Potential for some impacts to the adjacent natural environment. Impacts to be mitigated by mitigation measures or avoided where possible. | ◐ | Potential for some impacts to the adjacent natural environment. Impacts to be mitigated by mitigation measures or avoided where possible. |
| CULTURAL ENVIRONMENT | | | | | | | | | | | | |
| Archaeology | ● | No impacts to archaeological resources | ● | No impacts to archaeological resources | ● | No impacts to archaeological resources | ◐ | Potential for some impacts to adjacent archaeological resources. Additional studies may be required. | ◐ | Potential for some impacts to adjacent archaeological resources. Additional studies may be required. | ◐ | Potential for some impacts to adjacent archaeological resources. Additional studies may be required. |
| Cultural Heritage | ● | No impacts to cultural heritage resources | ● | No impacts to cultural heritage resources | ● | No impacts to cultural heritage resources | ◐ | Potential for some impacts to adjacent cultural heritage resources. Additional studies may be required. | ◐ | Potential for some impacts to adjacent cultural heritage resources. Additional studies may be required. | ◐ | Potential for some impacts to adjacent cultural heritage resources. Additional studies may be required. |
| SUMMARY | ● | No impacts to the cultural environment as no work is being undertaken. | ● | No impacts to the cultural environment as no work is being undertaken. | ● | No impacts to the cultural environment as no work is being undertaken. | ◐ | Potential for some impacts to the adjacent cultural environment. Impacts to be mitigated by mitigation measures or avoided where possible. | ◐ | Potential for some impacts to the adjacent cultural environment. Impacts to be mitigated by mitigation measures or avoided where possible. | ◐ | Potential for some impacts to the adjacent cultural environment. Impacts to be mitigated by mitigation measures or avoided where possible. |
| SOCIO - ECONOMIC ENVIRONMENT | | | | | | | | | | | | |
| Local and Regional Planning Documents | ✘ | Is not supported by the Transportation Master Plan (TMP) or the Official Plan (OP) | ✘ | Is not supported by the TMP or the OP | ◐ | Other routes are recommended for improvement by the TMP | ● | Supported by the TMP / OP by addressing safety and operations | ● | Supported by the TMP / OP by widening and addressing growth | ● | Supported by the TMP / OP by addressing recommendations of the active transportation plan |
| Supports Local Growth and Development | ○ | Does not support local growth and development. | ○ | Does not support local growth and development. | ○ | Does not support local growth and development in the study area. | ● | Supports local growth and development | ● | Supports local growth and development | ◐ | Somewhat supports local growth and development |

| Evaluation Criteria | Alternative Solutions | | | | | | | | | | | |
|-----------------------|---|---|---|---|--|---|--|--|--|--|---|---|
| | 1. Do Nothing | | 2. Limit Development | | 3. Improve Alternative Routes | | 4. Roadway / Intersection Improvements | | 5. Additional Lanes (Capacity Increase) | | 6. Accommodate Other Travel Modes | |
| Access | ● | Does not impact existing access but does not offer any access improvements. | ● | Does not impact existing access but does not offer any access improvements. | ● | Does not impact existing access but does not offer any access improvements. | ● | Opportunities to improve and revise access, as needed | ● | Opportunities to improve and revise access, as needed | ● | Does not impact existing access but does not offer any access improvements. |
| Property | ● | No property impacts as there is no work being undertaken. | ● | No property impacts as there is no work being undertaken. | ● | No property impacts as there is no work being undertaken in the study area. | ○ | Some potential property impacts adjacent to areas of improvement. | ○ | Potential for greater property impacts adjacent to areas of improvement. | ● | Some potential property impacts adjacent to areas of improvement. |
| SUMMARY | ✗ | Does not support the planning vision in the study area. | ✗ | Does not support the planning vision in the study area. | ● | Minimal impacts but does not support the planning vision and growth in the study area. | ● | Supports the planning vision for this area, though there may be some property impacts. | ● | Supports the planning vision for this area, though there may be some property impacts. | ● | Supports the planning vision for this area, but does not fully support growth / no access improvements. |
| COST | | | | | | | | | | | | |
| Capital Costs | ● | No capital costs. | ● | No capital costs. | ● | No capital costs related to this study. | ○ | Moderate capital costs. | ○ | Significant capital costs. | ● | Moderate capital costs. |
| Maintenance Costs | ● | Some increase in maintenance costs due to increased wear and tear from increased traffic. | ● | Some increase in maintenance costs due to increased wear and tear from increased traffic. | ● | Some increase in maintenance costs due to increased wear and tear from increased traffic. | ○ | Some increase in maintenance costs to maintain improvements. | ○ | Some increase in maintenance costs to maintain additional lanes. | ● | Some increase in maintenance costs to maintain improvements. |
| SUMMARY | ● | No cost impacts. | ● | No cost impacts. | ● | No cost impacts. | ○ | Moderate costs. | ○ | Significant costs. | ● | Moderate costs. |
| RECOMMENDATION | This alternative is not recommended as traffic demand and growth is not accommodated and it does not support local and regional plans. While there are minimal natural and cultural impacts, Doing Nothing does not support or address the issues identified in the Problem / Opportunity Statement. | | This alternative is not recommended as traffic demand and growth is not accommodated and it does not support local and regional plans. While limiting development would somewhat reduce demand, limiting development does not support or address the issues identified in the Problem / Opportunity Statement. | | This alternative is not recommended as traffic demand and growth in the study area is not accommodated. While there are minimal natural and cultural impacts to the study area, improving other roads does not support or address the issues identified in the Problem / Opportunity Statement. | | This alternative is recommended in conjunction with other alternatives. Localized improvements to roadways and intersections alone would partially address safety and operations but would not be able to fully address the Problem / Opportunity Statement, particularly the increase in traffic demand. | | This alternative is recommended in conjunction with other alternatives. Widening the roadway alone would address traffic demand and growth but would not be able to fully address the Problem / Opportunity Statement, such as intersection improvements and active transportation. | | This alternative is recommended in conjunction with other alternatives. Accommodating active transportation uses alone would address improvements to AT but would not be able to fully address the Problem / Opportunity Statement, particularly the increase in traffic demand. | |

5.4 Selection of Alternative Solutions

Based on the evaluation, Alternatives 1, 2, 3 are not recommended as they do not accommodate the anticipated traffic demand, are not supported by local and regional plans, and do not address the Problem / Opportunity Statement.

Based on the evaluation, the preferred Alternative Solutions are a combination of Alternatives 4, 5, and 6 as they best address projected traffic growth and planned developments in the study area and include improvements for intersections, other travel modes, and access:

- Alternative 4: Local Roadway/Intersection improvements
- Alternative 5: Additional lanes (capacity increase)
- Alternative 6: Accommodation of other travel modes

These are the preferred Alternative Solutions which were brought forward to Phase 3 of the Municipal Class EA and for which Alternative Design Concepts were developed for.

6.0 Alternative Design Concepts

The alternative design concepts are options to implement the recommended alternative solutions from Phase 2 of the Municipal Class EA (MCEA). Phase 3 of the MCEA process requires that those alternative design concepts are developed and that all reasonable and feasible solutions shall be identified and described. The alternative design concepts are then evaluated against the environmental factors relevant to the study, such as the natural, socio-cultural, transportation and economic environments. The following section identifies the various alternative designs that were considered as part of the EA study, including alternatives for road cross sections, widening, and intersections.

6.1 Road Right-of-Way Cross Sections

The road right-of-way (ROW) for all roads in the study area would accommodate an urbanized cross section (i.e., curb and gutter) with two lanes per direction, and a median barrier or turning lane, as appropriate. Two alternatives were considered for how Active Transportation (AT) can be accommodated:

- Separated Multi-Use Path (MUP) on the west/north
- On-street bike lanes on both sides

| No. | Alternative Design Concepts | Description |
|-----|--|---|
| 1 | Separated Multi-Use Path (MUP) on the west/north | A 3.0 to 4.0m MUP that accommodates different forms of active transportation on the west side of Montrose Road/north side of Biggar Road/Lyons Creek Road. The MUP forms part of the boulevard and is fully separate from the travel lanes. |
| 2 | On-street bike lanes on both sides | A 1.5m on-street bike lane on each side of the ROW separated from the travel lanes with a painted buffer only. Sidewalks will be provided on both sides of the road, where appropriate either now or in the future. |

6.2. Montrose Road

For the purpose of the evaluation of the alternative design concepts, Montrose Road was divided into four sections:

- Section 1: McLeod Road to Canadian Drive
- Section 2: Canadian Drive to Chippawa Creek Road
- Section 3: Chippawa Creek Road to Grassy Brook Road
- Section 4: Grassy Brook Road to Lyons Creek Road/Biggar Road

Generally, the alternatives considered widening along the centreline, to the east, or to the west.

6.2.1 SECTION 1: MCLEOD ROAD TO CANADIAN DRIVE

This section of Montrose Road has already been widened to a four lane configuration in support of Niagara Square. As such, roadway widening options were not assessed in this section. However, opportunities to improve access and safety were reviewed in order to:

- Minimize left turns to reduce potential for collisions
- Facilitate safe and efficient traffic flow in/out of the various existing and planned developments
- Addition of active transportation facilities and bus bays

The following concepts were considered:

| No. | Alternative Design Concepts | Description |
|-----|--|--|
| 1 | Do Nothing | Leave as is, no changes are made |
| 2 | Keep Existing Traffic Signals with a Continuous Median | No changes to the existing intersection controls and locations, however improvements can be made to existing signals. Implement a continuous median through Section 1, limiting left turns. |
| 3 | Implement Roundabout at the first “bend” south of McLeod Road with a Continuous Median | Implement a roundabout at the first “bend” south of McLeod Road to facilitate access for drivers to the other side of the median. Implement a continuous median through Section 1, limiting left turns. |
| 4 | Implement Roundabout at Niagara Square Drive with Continuous Median | Replace the existing traffic signals at Niagara Square Drive with a roundabout to facilitate access for drivers to the other side of the median. Implement a continuous median through Section 1, limiting left turns. |

6.2.2 SECTION 2: CANADIAN DRIVE TO CHIPPAWA CREEK ROAD

On Montrose Road, from Canadian Drive to Chippawa Creek Road, the following three widening alternatives were considered:

| No. | Alternative Design Concepts | Description |
|-----|-----------------------------|---|
| 1 | Widen along Centreline | Widen and add lanes along the centreline (i.e. expand to both sides). |
| 2 | Widen to the East | Widen and add lanes to the east only. |
| 3 | Widen to the West | Widen and add lanes to the west only. |

6.2.3 SECTION 3: CHIPPAWA CREEK ROAD TO GRASSY BROOK ROAD

This section of Montrose Road includes the crossing over the Welland River. As the bridge and roadway designs will be dependent on each other (i.e. if you widen the bridge to the west, the approaches will also be located to the west), both the bridge and roadway alternatives are considered together under this section. The following widening alternatives were considered:

| No. | Alternative Design Concepts | Description |
|-----|-----------------------------|--|
| 1 | Widen along Centreline | Widen Montrose Road and the bridge on both sides. |
| 2 | Widen to the East | Widen Montrose Road and the bridge to the east only. |
| 3 | Widen to the West | Widen Montrose Road and the bridge to the west only. |

6.2.4 SECTION 4: GRASSY BROOK ROAD TO LYONS CREEK ROAD / BIGGAR ROAD

On Montrose Road, from Grassy Brook Road to Lyons Creek Road / Biggar Road, the following three widening alternatives were considered:

| No. | Alternative Design Concepts | Description |
|-----|-----------------------------|---|
| 1 | Widen along Centreline | Widen and add lanes along the centreline (i.e. expand to both sides). |
| 2 | Widen to the East | Widen and add lanes to the east only. |
| 3 | Widen to the West | Widen and add lanes to the west only. |

6.3 Biggar Road

For the section of Biggar Road, from Montrose Road westerly 0.85km, the following three widening alternatives were considered:

| No. | Alternative Design Concepts | Description |
|-----|-----------------------------|---|
| 1 | Widen along Centreline | Widen and add lanes along the centreline (i.e. expand to both sides). |
| 2 | Widen to the North | Widen and add lanes to the north only. |
| 3 | Widen to the South | Widen and add lanes to the south only. |

6.4 Lyons Creek Road

For the section of Lyons Creek Road, from Montrose Road easterly to the QEW west ramp terminal, the following three widening alternatives were considered:

| No. | Alternative Design Concepts | Description |
|-----|-----------------------------|---|
| 1 | Widen along Centreline | Widen and add lanes along the centreline (i.e. expand to both sides). |
| 2 | Widen to the North | Widen and add lanes to the north only. |
| 3 | Widen to the South | Widen and add lanes to the south only. |

6.5 Montrose Road and Lyons Creek Road/Biggar Road – Intersection Controls

This study presents an opportunity to reconsider and re-evaluate the appropriate intersection control (i.e. stop sign, traffic signals, roundabouts) at key intersections through the study area. Depending on the context, different intersection controls can improve safety, traffic operations, efficiency, etc. This intersection is currently signalized, however, this EA study reviewed the opportunity to replace the intersection with a roundabout. The intersection control alternatives considered for this intersection are either traffic signals or a roundabout.

6.6 Lyons Creek Road / QEW Underpass Bridge

The existing Lyons Creek Road bridge over the QEW (owned by MTO) has a bridge deck with a constrained width that cannot accommodate auxiliary right-of-way features for active transportation (sidewalk, Multi-Use Paths, bike lanes). As widening of the bridge is not technically feasible due to the bridge type, short and long term options were considered on how to incorporate active transportation features in this section of Lyons Creek Road. The short term options considered the reconfiguration of lanes and features within the existing bridge deck width. The long term options considered the construction of a new underpass structure. The alternative designs considered include:

| No. | Alternative Design Concepts | Description |
|-----|--|--|
| 1 | Uni-directional Facilities with Barrier Walls | Bike lanes on each side of the bridge, with a small buffer and barrier wall separating the bike lane from traffic. Substandard buffers for travel lanes. |
| 2 | MUP on the North Side with a Barrier Wall | Include a 3.0m MUP on the north side only with a small buffer and barrier wall separating the bike lane from traffic. Substandard buffers for travel lanes. |
| 3 | Repaint the Bridge Deck and Use the Buffer as a Bike Lane | Remove the median island and repaint the Bridge Deck to accommodate wider buffers that can also be used as bike lanes. Substandard buffers and median. |
| 4 | Extend Curb for a Sidewalk and Widen Travel Lane for Shared Cars and Bikes | Extend curbs for use as a sidewalk on both sides and widen curbside travel lane as a shared lane that can be used by both vehicles and bikes. Substandard buffers and median. |
| 5 | Future Bridge Replacement by MTO with MUP on the North Side | At such time that MTO determines a need to replace the bridge, the new bridge deck can be built to accommodate a 4.0m MUP on the north side with all lane, buffer, and median widths meeting design standards. |
| 6 | Future Bridge Replacement by MTO with AT path on both sides | At such time that MTO determines a need to replace the bridge, the new bridge deck can be built to accommodate a 3.0m AT path on both sides with all lane, buffer, and median widths meeting design standards. |
| 7 | New Separate MUP Structure to the North of the Existing Bridge | Construct a new separate structure north of the existing bridge that can accommodate a 4.0m MUP. Existing bridge will not be impacted. |
| 8 | Do Nothing | The existing bridge will be left as is. |

6.7 Lyons Creek Road / QEW Ramps – Intersection Control

In consultation with MTO, both traffic signals and roundabouts were considered as intersection control options for the intersections of the on and off ramps at the Lyons Creek Road interchange. This includes the Fort Erie-Bound Ramp off-ramp terminal (also referred to as the west ramp terminal) and the Toronto-bound off-ramp terminal (also referred to as the east ramp terminal).

6.8 Willodell Road Intersection

Due to the proximity of the Willodell Road intersection to the west ramp terminal of the QEW at Lyons Creek Road resulting in potential queuing and safety concerns, different intersection options were considered. At PIC #3, the project team presented an option that would restrict Willodell Road to right turns in and right turns out only (i.e. no left turns in and out) through the implementation of a median. Community feedback received from PIC #3 led the project team to explore more alternatives to address the issue at this intersection. The full set of options considered include:

| No. | Alternative Design Concepts | Description |
|-----|---|--|
| 1 | Do Nothing | Intersection remains as is with no median allowing full moves access in and out of Willodell Road. |
| 2 | Implement Continuous Median, no U-turns at Montrose Road | A median restricts access to right-in right-out only at Willodell Road. Cars wanting to turn left onto Willodell Road would need to turn left on Montrose Road to Carl Road. |
| 3 | Implement Continuous Median, U-turns accommodated during left turn phase at Montrose Road | A median restricts access to right-in right-out only at Willodell Road. Cars wanting to turn left onto Willodell Road would need to turn make a U-turn at Montrose Road to drive eastbound. |
| 4 | Allow left-in, right-in right-out at Willodell Road using signage only | Left-in is allowed from Lyons Creek Road onto Willodell Road, however left turns out are not allowed. Only signs would be implemented to indicate the left turn. |
| 5 | Allow left-in, right-in right-out at Willodell Road using channelization | Left-in is allowed from Lyons Creek Road onto Willodell Road, however left turns out are not allowed. Only signs would be implemented to indicate the left turn. A new left turn channel will be implemented on Lyons Creek Road to store cars waiting to turn left. |
| 6 | Implement new mid-block signalized intersection further west of existing intersection | A new signalized intersection that requires realigning Willodell further west of the existing would allow for full moves access. |
| 7 | Realign Willodell Road east to the QEW off-ramp | Realign Willodell Road to the east to line up with the QEW off-ramp signalized intersection, allowing full moves access. |
| 8 | Implement Continuous Median, build new east-west local road connection Montrose Road to McCredie Road from about 350-400m south of Lyons Creek Road | A median restricts access to right-in right-out only at Willodell Road. Cars wanting to turn left onto Willodell Road would need to turn make a left turn at Montrose Road. Build a new east-west local road for drivers to access Willodell Road without using Carl Road. |
| 9 | Median U-turn traffic signal on Montrose Road about 350m south of Lyons Creek Road | A U-turn traffic signal that would facilitate U-turns making them safer and easier to maneuver in traffic. |
| 10 | New public road allowance to allow drivers to circle back | Construct new public road allowance on private land in the northeast quadrant of Montrose Road / Lyons Creek Road for drivers to circle back |

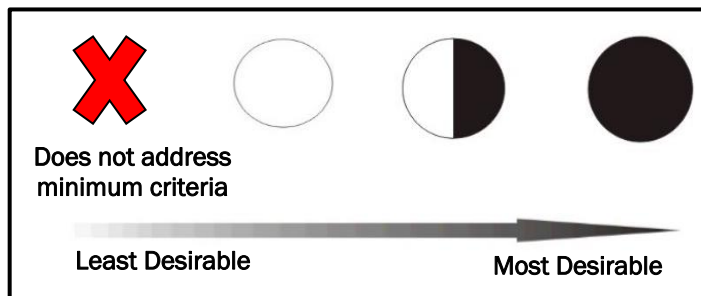
6.9 Evaluation Criteria

Evaluation criteria are developed to represent the broad definition of the environment as applicable to the study. Similar criteria as described in Section 5.2 were used to evaluate the alternative design concepts. However, as the design concepts provide a higher level of detail than the alternative solutions, the following criteria were added where appropriate:

- Traffic Operations, particularly for evaluating the efficiency and movement of traffic with the different intersection control alternatives
- Utilities, particularly for widening concepts that could require the relocation of utility infrastructure
- Constructability, to determine the ease of which the alternative can be constructed, or whether there would be significant complexities or risks
- Wetlands, Groundwater, and Species At Risk, to assess at a more detailed level the impacts to the sensitive natural features
- Construction Disruptions, to assess the anticipated magnitude of disruptions that construction would cause

6.10 Evaluation of Alternative Design Concepts

The Alternative Design Concepts identified above in Section 6.0 were evaluated against the criteria developed in Section 6.8. The detailed evaluation tables for all alternative design concepts are provided in the following Sections and use the following symbology to represent how desirable the alternative is when evaluated against the criteria. These symbols are used to visually represent the qualitative analysis and is not meant as a quantitative assessment tool:



6.10.1 RIGHT-OF-WAY CROSS SECTIONS

The evaluation of the Alternative Design Concepts identified in Section 6.1 for the right-of-way cross section is detailed in Table 26.

TABLE 26. EVALUATION OF ALTERNATIVE DESIGN CONCEPTS RIGHT-OF-WAY CROSS SECTIONS

| Alternative Design Concepts - Right of Way Cross Section | | | | |
|--|-------------------|---|-------------------------|---|
| EVALUATION CRITERIA | 1. Multi-Use Path | | 2. On-Street Bike Lanes | |
| TRANSPORTATION & ENGINEERING | | | | |
| Traffic Demand and Operations | ● | The ROW includes four lanes which will meet the traffic demands and growth in the area. | ● | The ROW includes four lanes which will meet the traffic demands and growth in the area. Some more consideration required at intersections for the bike lanes. |

| | | | | |
|---|---|--|---|--|
| Safety | ● | Safest for all road users as cars are physically separated from cyclists. Having the MUP on one side reduces the need for cyclists to cross to the other side of the road. | ○ | Less safe. While all users have their own space, cyclists are not physically separated from cars. Cyclists also need to cross to the other side of the road when travelling in the other direction. |
| Active Transportation | ● | Supports active transportation users by providing a facility and a physical separated buffer from cars. | ● | Supports active transportation users by providing a facility for key uses (cycling and walking) and buffers between each. |
| SUMMARY | ● | More supportive and safer for pedestrians and cyclists. | ○ | Supports active transportation but is less safe for cyclists. |
| NATURAL ENVIRONMENT | | | | |
| SUMMARY | ● | No differentiation between ROW options, both occupy the same ROW width. See other options for natural environment impacts. | ● | No differentiation between ROW options, both occupy the same ROW width. See other options for natural environment impacts. |
| CULTURAL ENVIRONMENT | | | | |
| SUMMARY | ● | No differentiation between ROW options, both occupy the same ROW width. See other options for cultural environment impacts. | ● | No differentiation between ROW options, both occupy the same ROW width. See other options for cultural environment impacts. |
| SOCIO - ECONOMIC ENVIRONMENT | | | | |
| Access | ● | Creates some conflict points at accesses. | ● | Creates some conflict points at accesses. |
| Property | ● | No differentiation between ROW options, both occupy the same ROW width. See other options for property impacts. | ● | No differentiation between ROW options, both occupy the same ROW width. See other options for property impacts. |
| Compatibility with Land Uses | ● | A MUP is preferred as it will be located on the west/north side of the road, providing access and an AT facility where most of the future development will occur, including future subdivisions and the hospital. | ○ | Less preferred as most of the development on the west, requiring cyclists to cross the road. |
| SUMMARY | ● | Preferred as this provides the AT facility where most developments will occur. | ○ | Less preferred as most developments are on the west. |
| COST | | | | |
| Capital Costs | ○ | Significant construction costs to widen the road. | ○ | Significant construction costs to widen the road. |
| Maintenance Costs | ○ | Moderate increase in maintenance costs. | ○ | Moderate increase in maintenance costs. |
| SUMMARY | ○ | Moderate to significant costs. | ○ | Moderate to significant costs. |
| Conclusions | | Preferred - The MUP offers a wide enough platform to accommodate pedestrians and cyclists and is physically separated from cars. The MUP will also be constructed on the west/north side of the road, closer to where most future developments will be located. Thus, this options provides safer options and access. | | Not preferred - While this alternative does support active transportation, it is less safe as the only separation between cyclists and cars is a painted buffer. Also, the cyclists need to cross the road to access the opposite direction, which is also less safe. |
| Final Recommendation: Multi-Use Path | | | | |

6.10.2 MONTROSE ROAD

6.10.2.1 Section 1: McLeod Road to Canadian Drive

The evaluation of the Alternative Designs Concepts identified in Section 6.2.1 for Section 1 of Montrose Road is detailed in Table 27.

TABLE 27. EVALUATION OF ALTERNATIVE DESIGN CONCEPTS SECTION 1 OF MONTROSE ROAD

| EVALUATION CRITERIA | 1. Do Nothing (Median with openings) | | 2. Keep Traffic Signals at Niagara Square Drive (with Median) | | 3. New Roundabout about 200m south of McLeod Road (with Median) | | 4. Replace signal with a roundabout at Niagara Square Drive (with Median) | |
|---|--------------------------------------|--|---|---|---|---|---|--|
| TRANSPORTATION & ENGINEERING | | | | | | | | |
| Traffic Demand | ● | As traffic increases, this would not accommodate the volume of left turns in and out of properties with existing entrances. | ● | Existing four lanes will meet the traffic demands and growth in the area. | ○ | Significant traffic volumes of vehicles turning right on McLeod Road cannot be accommodated at this roundabout. | ● | Existing four lanes will meet the traffic demands and growth in the area. |
| Traffic Operations | ○ | As traffic increases, left turns become more challenging, which can lead to back ups on Montrose Road and also on the internal circulation of private lands. This results to poor operations requirement improvements. | ● | Eliminating left turns improves operations on Montrose Road, but restricts access to adjacent properties and does not offer the operational flexibility of roundabouts. | ✗ | Due to significant traffic on northbound Montrose Road waiting to turn right at McLeod Road, there would be queuing into the roundabout resulting in poor operations. | ● | Eliminating left turns improves operations on Montrose Road, and the roundabout provides the ability to make U-turns to access entrances on the other side of the median. |
| Safety | ● | As traffic increases, left turns across two lanes of traffic will become more difficult to make and less safe with a higher possibility for dangerous collisions. | ● | Improves safety as it reduces the left turns across two lanes of high traffic, reducing the likelihood of more dangerous collisions. | ● | Improves safety as it reduces the left turns across two lanes of high traffic, reducing the likelihood of more dangerous collisions. | ● | Improves safety as it reduces the left turns across two lanes of high traffic, reducing the likelihood of more dangerous collisions. |
| Active Transportation | ● | The existing traffic signal provides a signalised crossing, however there is no existing painted crosswalk. | ● | There is no existing painted crosswalk. If the existing signal is upgraded, an improved crosswalk can be implemented. | ● | A roundabout does not have a controlled pedestrian crossing (PXO), however a PXO can be implemented with flashers to provide a dedicated crossing time for pedestrians. | ● | A roundabout does not have a controlled pedestrian crossing (PXO), however a PXO can be implemented with flashers to provide a dedicated crossing time for pedestrians. |
| SUMMARY | ● | Traffic conditions will worsen over time and the operations and safety of the road will worsen as well. Left turns into the many accesses will become more dangerous and difficult to make. | ● | Good option from a transportation perspective as it reduces left turns and incorporates a pedestrian crossing. | ✗ | While a roundabout would facilitate safer movements to the other side of the road, a roundabout in this location would not operate well. | ● | Good option from a transportation perspective as it facilitates safer movements to the other side of the road and maintains the operations of the road. |
| NATURAL ENVIRONMENT | | | | | | | | |
| Terrestrial (Vegetation, Wetlands, SAR) | ● | No impacts to vegetation. | ● | None to minimal impacts to vegetation. | ● | Minimal impacts to vegetation. | ● | Minimal impacts to vegetation. |
| Aquatic (Fish, Fish Habitat, SAR) | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. |
| SUMMARY | ● | No impacts to the natural environment. | ● | Minimal vegetation impacts as there are minimal natural environmental features in the vicinity. | ● | Minimal vegetation impacts as there are minimal natural environmental features in the vicinity. | ● | Minimal vegetation impacts as there are minimal natural environmental features in the vicinity. |
| CULTURAL ENVIRONMENT | | | | | | | | |
| Archaeology | ● | No impacts to archaeological resources. | ● | No impacts to archaeological resources. | ● | Some archaeological impacts, a portion adjacent to the roadway require further archaeological assessment. | ● | No impacts to archaeological resources. |
| Cultural Heritage | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. |
| SUMMARY | ● | No impacts to the cultural environment. | ● | No impacts to the cultural environment. | ● | Additional archaeological assessment required for a small portion near the roadway. | ● | No impacts to the cultural environment. |
| SOCIO - ECONOMIC ENVIRONMENT | | | | | | | | |
| Access | ○ | Doing Nothing will result in no improvements to access. Access in and out of adjacent properties will become more difficult overtime. | ○ | Does not allow or facilitate cars accessing the other side of the road. While drivers can make a U-turn at the signals, this is less safe and is not well facilitated at this location. Right-in/right-out access can be accommodated for Niagara Square in the first bend. | ● | Allows for improved access to surrounding properties overall. Roundabouts allow for vehicles to more easily access the east/west sides of the road. | ● | Allows for improved access to surrounding properties overall. No full movement access for each property but roundabouts allow for vehicles to easily access the east/west sides of the road. Right-in/right-out access can be accommodated for Niagara Square in the first bend and left turns to McLeod can be made through the roundabout. |

| | | | | | | | | |
|--|---|--|--|---|---|--|---|--|
| Property | ● | No property impacts. | ● | Minimal impacts to property to reconfigure / improve the signalized intersection. | ● | Roundabouts will require additional property to implement and has the largest footprint of the alternatives. | ● | Roundabouts will require additional property to implement and has the largest footprint of the alternatives. |
| SUMMARY | ○ | Doing Nothing over time will not address the access and safety needs through the corridor as the situation will worsen overtime with more traffic. | ○ | Significant concerns from an access perspective as the signal will not help vehicles access the other side of the road. | ● | While there are more property impacts associated with a roundabout, a roundabout offers a safe and efficient way to access the other side of the road. | ● | While there are more property impacts associated with a roundabout, a roundabout offers a safe and efficient way to access the other side of the road. |
| COST | | | | | | | | |
| Capital Costs | ● | No additional capital / construction costs. | ● | Minimal to moderate costs to upgrade the intersection. | ● | Moderate costs as the area of impact is larger and more significant changes to the intersection. Property costs also considered. | ● | Moderate costs as the area of impact is larger and more significant changes to the intersection. Property costs also considered. |
| Maintenance Costs | ● | No additional maintenance costs. | ● | Minimal additional maintenance costs. | ● | Low maintenance cost after initial implementation. | ● | Low maintenance cost after initial implementation. |
| SUMMARY | ● | No additional costs. | ● | Minimal additional costs. | ● | Moderate cost. | ● | Moderate cost. |
| Conclusions | Not preferred - Doing nothing is not a safe option in the long term as traffic continues to increase. Left turns in and out of adjacent properties will become more dangerous and difficult to make. | | Not preferred - While a signal and median would improve the safety of the corridor overall, it does not offer any improvements to access. | | Not preferred - While a roundabout and median would improve the safety and access of the corridor overall, it was ruled out as it would not work operationally due to queues backing up into the roundabout. | | Preferred - A roundabout and median would improve the safety and access of the corridor overall by allowing drivers to easily circulate through the roundabout to change travel direction. | |
| Final Recommendation: Roundabout at Niagara Square Drive with a continuous median to facilitate safe access to properties on the other side of the median without the need for left turns. Option includes a 4.0m Multi-Use Path on west and a sidewalk on the east (except for the portion along the QEW). | | | | | | | | |

6.10.2.2 Section 2: Canadian Drive to Chippawa Creek Road

The evaluation of the Alternative Designs Concepts identified in Section 6.2.2 for Section 2 of Montrose Road is detailed in Table 28.

TABLE 28. EVALUATION OF ALTERNATIVE DESIGN CONCEPTS SECTION2 OF MONTROSE ROAD

| EVALUATION CRITERIA | 1. Widen Montrose Road along Centreline | | 2. Widen Montrose Road to the East | | 3. Widen Montrose Road to the West | |
|---|---|--|------------------------------------|---|------------------------------------|--|
| TRANSPORTATION & ENGINEERING | | | | | | |
| Traffic Demand | ● | Widening will meet the traffic demands and growth in the area. | ● | Widening will meet the traffic demands and growth in the area. | ● | Widening will meet the traffic demands and growth in the area. |
| Safety | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. |
| Active Transportation | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. |
| Transit | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. |
| Utilities | ● | Aerial hydro lines are located east of the roadway and would need to be relocated. | ● | Aerial hydro lines are located east of the roadway and would need to be relocated. | ● | No utility relocation of hydro lines required on the west. |
| SUMMARY | ● | Meets the technical and transportation needs of the study area. | ● | Meets the technical and transportation needs of the study area. | ● | Meets the technical and transportation needs of the study area. |
| NATURAL ENVIRONMENT | | | | | | |
| Vegetation | ● | Moderate impacts, especially to the woodland near Brown Road. | ● | Least impacts, minimal vegetation to the east. | ● | Most impacts, especially to the woodland near Brown Road. |
| Aquatic | ○ | Widening of the road requires extension of two culverts at two fisheries watercourses: Warren Creek and a tributary of Warren Creek. Widening will require realignment of Warren Creek running parallel to the road on the west. | ● | Widening of the road requires extension of two culverts, impacting two fisheries watercourses: Warren Creek and a tributary of Warren Creek. Widening to the east will have the least impacts to fisheries overall. | ○ | Widening of the road requires extension of two culverts at two fisheries watercourses: Warren Creek and a tributary of Warren Creek. Widening will require realignment of Warren Creek running parallel to the road on the west. |

| | | | | | | |
|---|---|--|---|--|---|---|
| Wetlands | ● | Some impacts to the Warren Creek Wetland Complex located north of Blackburn Parkway. | ● | No impacts to wetlands. | ● | Moderate impacts to the Warren Creek Wetland Complex located north of Blackburn Parkway. |
| Species at Risk (SAR) | ● | Impacts to potential SAR bat habitat through removal of trees. | ● | No SAR impacts. | ● | Most impacts to potential SAR bat habitat through removal of trees. |
| SUMMARY | ● | Moderate impacts to the natural environment, including impacts to woodlands and wetlands on the west and realignment of Warren Creek running parallel to the road. | ● | Least impacts relative to the other alternatives. Least environmental features on the east side of Montrose Road. | ● | The most encroachment on the natural environmental features on the west side, including woodlands and wetlands and the realignment of Warren Creek. |
| CULTURAL ENVIRONMENT | | | | | | |
| Archaeology | ● | Some archaeological impacts as areas on both sides of the road require further archaeological assessment. | ● | Least archaeological impacts to the east as most of the area is disturbed or previously assessed. | ● | Some archaeological impacts as more areas to the west of the road require further archaeological assessment. |
| Cultural Heritage | ● | Some impacts to the frontage of a cultural heritage resource property. | ● | No impacts to cultural heritage resources. | ● | Most impacts to the frontage of a cultural heritage resource property. |
| SUMMARY | ● | Some impacts to a cultural heritage resource and need for additional archaeological assessment. | ● | Some additional archaeological assessment required. | ● | Some impacts to a cultural heritage resource and need for additional archaeological assessment. |
| SOCIO-ECONOMIC ENVIRONMENT | | | | | | |
| Access | ● | Minor impacts to private driveways. | ● | No impacts to access. | ● | Minor impacts to private driveways. |
| Property | ✘ | Limited room for widening on the east due to proximity to the QEW. Widening along the centreline would still encroach into the QEW right-of-way, impacting ditches and potentially driving lanes and will require additional infrastructure such as retaining walls. | ✘ | Limited room for widening on the east due to proximity to the QEW. Significant encroachment into the QEW right-of-way, impacting ditches and potentially driving lanes and will require additional infrastructure such as retaining walls. | ● | Some property taking required. Property taking will involve property frontage and will not impact any buildings. |
| Construction Disruptions | ● | Minimal disruptions to access and traffic. Other impacts will be minimized through construction best management practices. | ✘ | Significant disruptions due to encroachment to the QEW lanes. | ● | Minimal disruptions to access and traffic. Other impacts will be minimized through construction best management practices. |
| SUMMARY | ● | Some impacts to property and accesses. | ✘ | Not a feasible option due to proximity to and encroachment on the QEW. | ● | Some impacts to property and accesses. |
| COST | | | | | | |
| Capital Costs | ● | Significant construction costs to widen the road. | ● | Significant construction costs to widen the road. | ● | Significant construction costs to widen the road. |
| Maintenance Costs | ● | Moderate increase in maintenance costs. | ● | Moderate increase in maintenance costs. | ● | Moderate increase in maintenance costs. |
| SUMMARY | ● | Moderate to significant costs. | ● | Moderate to significant costs. | ● | Moderate to significant costs. |
| Conclusions | | Not preferred - Technically it is not feasible to widen along the centreline as that would encroach into the QEW ROW including the highway ditch and potentially impact the travel lanes. | | Not preferred - Technically it is not feasible to widen exclusively to the east as that would encroach into the QEW ROW including the highway ditch and potentially impact the travel lanes. | | Preferred - While this option would have impacts on the west, including natural environmental impacts to the woodland edge, wetlands, and Warren Creek, it is the only technically feasible option due to the constraint of the QEW. |
| Final Recommendation: Widen to the west only as widening to the east is constrained by the proximity of the QEW. | | | | | | |

6.10.2.3 Section 3: Chippawa Creek Road to Grassy Brook Road

The evaluation of the Alternative Designs Concepts identified in Section 6.2.3 for Section 3 of Montrose Road is detailed in Table 29.

TABLE 29. EVALUATION OF ALTERNATIVE DESIGN CONCEPTS SECTION 3 OF MONTROSE ROAD

| EVALUATION CRITERIA | 1. Widen Existing Welland River Bridge along the centreline | 2. Widen Existing Welland River Bridge to the East | 4. Twinning with a New Bridge to the East | 3. Widen Existing Welland River Bridge to the West | 5. Twinning with a New Bridge to the West |
|---|--|--|--|--|--|
| TRANSPORTATION & ENGINEERING | | | | | |
| Traffic Demand | ● Widening will meet the traffic demands and growth in the area. | ● Widening will meet the traffic demands and growth in the area. | ● Widening will meet the traffic demands and growth in the area. | ● Widening will meet the traffic demands and growth in the area. | ● Widening will meet the traffic demands and growth in the area. |

| | | | | | | | | | | |
|-----------------------------------|---|--|---|---|---|--|---|---|---|---|
| Safety | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. |
| Active Transportation | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. |
| Transit | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. |
| Utilities | ◐ | Hydro utilities are located on the east and require relocation. Telecommunications cable duct located on the east though likely not impacted. Constrained on the west side due to the future wastewater sewer. | ◐ | Hydro utilities are located on the east and require relocation. Telecommunications cable duct located on the east will likely be impacted. | ◐ | Hydro utilities are located on the east and require relocation. Telecommunications cable duct located on the east will likely be impacted. | ○ | Constrained on the west side due to the future wastewater sewer. | ○ | Constrained on the west side due to the future wastewater sewer. |
| Constructability | ● | No issues with this method of construction. | ● | No issues with this method of construction. | ● | No issues with this method of construction. | ● | No issues with this method of construction. | ● | No issues with this method of construction. |
| Future Use | ● | Widening the existing bridge allows for one bridge deck which allows for flexibility in the future use of the road (e.g. repainting lines, construction staging, future bridge work). | ● | Widening the existing bridge allows for one bridge deck which allows for flexibility in the future use of the road (e.g. repainting lines, construction staging, future bridge work). | ◐ | Having two separate structures limits the future use of the road platform to the deck widths. | ● | Widening the existing bridge allows for one bridge deck which allows for flexibility in the future use of the road (e.g. repainting lines, construction staging, future bridge work). | ◐ | Having two separate structures limits the future use of the road platform to the deck widths. |
| SUMMARY | ● | Meets the technical, structural, and transportation needs. | ● | Meets the technical, structural, and transportation needs. | ● | Meets the technical, structural, and transportation needs. | ◐ | Meets the technical, structural, and transportation needs, however significant conflict with the proposed wastewater sewer on the west side. | ◐ | Meets the technical, structural, and transportation needs, however significant conflict with the proposed wastewater sewer on the west side. |
| NATURAL ENVIRONMENT | | | | | | | | | | |
| Vegetation | ◐ | Some impacts to vegetation on both sides of the road. | ○ | Most impacts, particularly to the woodland on the east of Montrose Rd for the roadway portion | ○ | Most impacts, particularly to the woodland on the east of Montrose Rd for the roadway portion | ● | Minimal impacts to vegetation to the west | ● | Minimal impacts to vegetation to the west |
| Aquatic | ◐ | Similar impacts across all options. Additional piers would need to be erected in the Welland River. | ◐ | Similar impacts across all options. Additional piers would need to be erected in the Welland River. | ◐ | Similar impacts across all options. Additional piers would need to be erected in the Welland River. | ◐ | Similar impacts across all options. Additional piers would need to be erected in the Welland River. | ◐ | Similar impacts across all options. Additional piers would need to be erected in the Welland River. |
| Wetlands | ◐ | Some impacts to the Welland River East Wetland Complex on both sides of the bridge. | ◐ | Most impacts to the Welland River East Wetland Complex on the east side of the bridge. | ◐ | Most impacts to the Welland River East Wetland Complex on the east side of the bridge. | ● | Least impacts to the Welland River East Wetland Complex only on the southwest quadrant of the bridge. | ● | Least impacts to the Welland River East Wetland Complex only on the southwest quadrant of the bridge. |
| Species at Risk | ◐ | Some impacts to SAR bat habitat through removal of trees and potential impacts to SAR mussels in the Welland River. | ○ | Significant impacts to SAR bat habitat through removal of trees and potential impacts to SAR mussels in the Welland River. Though impacts can be mitigated through compensation. | ○ | Significant impacts to SAR bat habitat through removal of trees and potential impacts to SAR mussels in the Welland River. Though impacts can be mitigated through compensation. | ● | Minimal impacts to SAR bat habitat through removal of trees and potential impacts to SAR mussels in the Welland River. | ● | Minimal impacts to SAR bat habitat through removal of trees and potential impacts to SAR mussels in the Welland River. |
| SUMMARY | ◐ | Moderate natural environmental impacts on both sides of the road. | ◐ | More significant natural environmental features on the east side of the road, however impacts can be mitigated and compensated. | ◐ | More significant natural environmental features on the east side of the road, however impacts can be mitigated and compensated. | ● | Least natural environmental impacts on the west side of the road, as there are fewer features on the west. | ● | Least natural environmental impacts on the west side of the road, as there are fewer features on the west. |
| CULTURAL ENVIRONMENT | | | | | | | | | | |
| Archaeology | ◐ | Some archaeological impacts as areas on both sides of the road require further archaeological assessment. | ◐ | Some archaeological impacts as areas on the east require further archaeological assessment. | ◐ | Some archaeological impacts as areas on the east require further archaeological assessment. | ◐ | Some archaeological impacts as areas on the west require further archaeological assessment. | ◐ | Some archaeological impacts as areas on the west require further archaeological assessment. |
| Cultural Heritage | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. |
| SUMMARY | ◐ | Some additional archaeological assessment required. | ◐ | Some additional archaeological assessment required. | ◐ | Some additional archaeological assessment required. | ◐ | Some additional archaeological assessment required. | ◐ | Some additional archaeological assessment required. |
| SOCIO-ECONOMIC ENVIRONMENT | | | | | | | | | | |
| Access | ◐ | Moderate impacts to accesses in close proximity to the bridge and particularly to the northwest of the bridge. | ◐ | Fewer access impacts overall, however impacts the house at Grassy Brook Road. | ◐ | Fewer access impacts overall, however impacts the house at Grassy Brook Road. | × | Significant impacts to accesses and the properties itself to the northwest of the bridge as the road will need to be significantly widened to the west. | × | Significant impacts to accesses and the properties itself to the northwest of the bridge as the road will need to be significantly widened to the west. |

| | | | | | | | | | | |
|--|---|---|---|---|--|---|---|--|---|--|
| Property | ○ | Some property taking required, particularly to multiple properties to the northwest of the bridge with the potential to impact buildings. | ● | Less private property taking, however impacts to the house at Grassy Brook Road. | ● | Less private property taking, however impacts to the house at Grassy Brook Road. | × | Significant impacts to the properties to the northwest of the bridge, including impacts to buildings, as the road will need to be significantly widened to the west. | × | Significant impacts to the properties to the northwest of the bridge, including impacts to buildings, as the road will need to be significantly widened to the west. |
| Construction Disruptions | ● | Some disruptions to access and traffic. Other impacts will be minimized through construction best management practices. | ● | Some disruptions to access and traffic. Other impacts will be minimized through construction best management practices. | ● | Some disruptions to access and traffic. Other impacts will be minimized through construction best management practices. | × | Significant disruption to the properties to the northwest of the bridge. | × | Significant disruption to the properties to the northwest of the bridge. |
| SUMMARY | ● | Work along the centreline will result in property and access impacts to several properties. | ● | Restricting work only to the east will have the least property and access impacts overall. | ● | Restricting work only to the east will have the least property and access impacts overall. | × | Restricting work only to the west will have significant impacts to multiple properties and homes. | × | Restricting work only to the west will have significant impacts to multiple properties and homes. |
| COST | | | | | | | | | | |
| Capital Costs | ● | Significant capital costs for bridge construction and property taking. | ● | Significant capital costs for bridge construction. | ● | Significant capital costs for bridge construction. | ● | Significant capital costs for bridge construction and property taking. | ● | Significant capital costs for bridge construction and property taking. |
| Maintenance Costs | ● | Moderate increase in maintenance costs. | ● | Moderate increase in maintenance costs. | ● | Moderate increase in maintenance costs. | ● | Moderate increase in maintenance costs. | ● | Moderate increase in maintenance costs. |
| SUMMARY | ● | Significant costs. | ● | Significant costs. | ● | Significant costs. | ● | Significant costs. | ● | Significant costs. |
| Conclusions | <p>Not preferred - While the centreline is a neutral option overall, there will still be considerable impacts to the properties on the northwest quadrant of the bridge.</p> | | <p>Preferred - This alternative has significant environmental impacts, however these impacts can be minimized through mitigation measures or compensation. This alternative reduces significant property and building impacts located northwest of the bridge.</p> | | <p>Preferred - This alternative has significant environmental impacts, however these impacts can be minimized through mitigation measures or compensation. This alternative reduces significant property and building impacts located northwest of the bridge. While twinning has some disadvantages compared to widening, twinning is a feasible option as well.</p> | | <p>Not preferred - Widening to the west will significantly encroach on properties and buildings on the northwest quadrant of the bridge.</p> | | <p>Not preferred - Widening to the west will significantly encroach on properties and buildings on the northwest quadrant of the bridge.</p> | |
| <p>Final Recommendation: Widen existing bridge to the east or Twin with a new bridge to the east to minimize impacts to existing properties and buildings along the west and to accommodate existing and planned utilities. The above evaluation was presented at PIC #3. Since that time upon further review, the option to widen the bridge was selected as this would allow a continuous platform as opposed to twinning which would leave a gap. See Section 7.7 for further details.</p> | | | | | | | | | | |

6.10.2.4 Section 4: Grassy Brook Road To Lyons Creek Road / Biggar Road

The evaluation of the Alternative Designs Concepts identified in Section 6.2.4 for Section 4 of Montrose Road is detailed in Table 30.

TABLE 30. EVALUATION OF ALTERNATIVE DESIGN CONCEPTS SECTION 4 OF MONTROSE ROAD

| EVALUATION CRITERIA | 1. Widen Montrose Road along centreline | | 2. Widen Montrose Road to the East | | 3. Widen Montrose Road to the West | |
|---|---|--|------------------------------------|--|------------------------------------|--|
| TRANSPORTATION & ENGINEERING | | | | | | |
| Traffic Demand | ● | Widening will meet the traffic demands and growth in the area. | ● | Widening will meet the traffic demands and growth in the area. | ● | Widening will meet the traffic demands and growth in the area. |
| Safety | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. |
| Active Transportation | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. |
| Transit | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. |
| Utilities | ● | Aerial hydro lines are located west of the roadway and would need to be relocated. | ● | No utility relocation of hydro lines required on the west. | ● | Aerial hydro lines are located west of the roadway and would need to be relocated. |
| SUMMARY | ● | Meets the technical and transportation needs of the study area. | ● | Meets the technical and transportation needs of the study area. | ● | Meets the technical and transportation needs of the study area. |

| NATURAL ENVIRONMENT | | | | | | |
|--|---|--|---|--|---|---|
| Vegetation | ● | Some impacts to the woodland near Grassy Brook and patches of trees adjacent to the road. | ● | Most impacts overall to the woodland near Grassy Brook and the tributary of Lyons Creek at Reixinger Road. | ● | Some impacts to the woodland near Grassy Brook and patches of trees adjacent to the road. |
| Aquatic | ● | Widening of the road requires culvert works, impacting two fisheries watercourses: Grassy Brook and a tributary of Lyons Creek. | ○ | Widening of the road requires culvert works, impacting two fisheries watercourses: Grassy Brook and a tributary of Lyons Creek. This may also impact the creek and culvert on Reixinger Road where it turns south. | ● | Widening of the road requires culvert works, impacting two fisheries watercourses: Grassy Brook and a tributary of Lyons Creek. |
| Wetlands | ● | Some impacts to the Lower Grassy Brook Wetland Complex on both sides of the road. | ● | Some impacts to the Lower Grassy Brook Wetland Complex, though slightly less on the east side. | ● | Most impacts to the Lower Grassy Brook Wetland Complex. |
| Species at Risk | ● | Impacts to potential SAR bat habitat through removal of trees. Potential SAR mussells at Grassy Brook may be impacted by culvert extension. | ● | Impacts to potential SAR bat habitat through removal of trees. Potential SAR mussells at Grassy Brook may be impacted by culvert extension. | ● | Impacts to potential SAR bat habitat through removal of trees. Potential SAR mussells at Grassy Brook may be impacted by culvert extension. |
| SUMMARY | ● | Moderate impacts to the natural environment. | ○ | Most impacts to the natural environment. | ● | Moderate impacts to the natural environment. |
| CULTURAL ENVIRONMENT | | | | | | |
| Archaeology | ● | Some archaeological impacts as areas on both sides of the road require further archaeological assessment. | ● | Some archaeological impacts as areas on both sides of the road require further archaeological assessment. | ● | Some archaeological impacts as areas on both sides of the road require further archaeological assessment. |
| Cultural Heritage | ● | Some impacts to the frontage of a cultural heritage resource property. | ● | Some impacts to the frontage of a cultural heritage resource property. | ● | No impacts to cultural heritage resources. |
| SUMMARY | ● | Some impacts to a cultural heritage resource and need for additional archaeological assessment. | ● | Some impacts to a cultural heritage resource and need for additional archaeological assessment. | ● | Some additional archaeological assessment required. |
| SOCIO - ECONOMIC ENVIRONMENT | | | | | | |
| Access | ● | Minor impacts to private driveways. | ● | Minor impacts to private driveways. | ● | Minor impacts to private driveways. |
| Property | ● | Some property taking required. Property taking will primarily involve property frontage but due to the transition from Section 3 to 4, one building may be impacted. Minimizing property needs from the hospital is preferred. | ● | Some property taking required. Property taking will primarily involve property frontage but due to the transition from Section 3 to 4, one building may be impacted. Minimizing property needs from the hospital is preferred. | ○ | Some property taking required. Property taking will involve property frontage and will not impact any buildings. Significant impact on one parking lot and the hospital property. |
| Construction Disruptions | ● | Minimal disruptions to access and traffic. Other impacts will be minimized through construction best management practices. | ● | Minimal disruptions to access and traffic. Other impacts will be minimized through construction best management practices. | ● | Minimal disruptions to access and traffic. Other impacts will be minimized through construction best management practices. |
| SUMMARY | ● | Minimal access and construction impacts, however one building may be impacted. | ● | Minimal access and construction impacts, however one building may be impacted. | ● | Minimal access and construction impacts, but reduces available property for hospital site. |
| COST | | | | | | |
| Capital Costs | ● | Significant construction costs to widen the road. | ● | Significant construction costs to widen the road. | ● | Significant construction costs to widen the road. |
| Maintenance Costs | ● | Moderate increase in maintenance costs. | ● | Moderate increase in maintenance costs. | ● | Moderate increase in maintenance costs. |
| SUMMARY | ● | Moderate to significant costs. | ● | Moderate to significant costs. | ● | Moderate to significant costs. |
| Conclusions | | Preferred - This option balances impacts to natural features and property requirements on both sides of the road. | | Not preferred - This option has the most impacts on the natural environment and one cultural heritage feature. | | Not preferred - This option reduces some impacts on the east side, however would significantly reduce the property of the hospital. |
| Final Recommendation: Widen along the centreline as there are no key constraints and considering equitable property taking. | | | | | | |

6.10.3 BIGGAR ROAD

The evaluation of the Alternative Designs Concepts identified in Section 6.3 is detailed in Table 31.

TABLE 31. EVALUATION OF ALTERNATIVE DESIGN CONCEPTS FOR BIGGAR ROAD

| EVALUATION CRITERIA | 1. Widen Biggar Road along centreline | 2. Widen Biggar Road to the North | 3. Widen Biggar Road to the South |
|---------------------|---------------------------------------|-----------------------------------|-----------------------------------|
|---------------------|---------------------------------------|-----------------------------------|-----------------------------------|

| TRANSPORTATION & ENGINEERING | | | | | | |
|------------------------------|---|--|---|---|---|--|
| Traffic Demand | ● | Widening will meet the traffic demands and growth in the area. | ● | Widening will meet the traffic demands and growth in the area. | ● | Widening will meet the traffic demands and growth in the area. |
| Safety | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. |
| Active Transportation | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. |
| Transit | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. |
| Utilities | ○ | Aerial hydro lines are located north of the roadway and would need to be relocated. | ○ | Aerial hydro lines are located north of the roadway and would need to be relocated. | ● | No utility relocation of hydro lines required on the south. |
| Hospital Compatibility | ● | Widening the road supports increased traffic demand to the hospital. The hospital has accounted for some property required for widening along the centreline. | ○ | Widening the road supports increased traffic demand to the hospital. Widening to the north would require significant property taking which would impact available area for the hospital site. | ● | Widening the road supports increased traffic demand to the hospital. No property would be required from the hospital site. |
| SUMMARY | ● | Meets the technical and transportation needs of the study area and minimizes the property needs of the hospital. | ○ | Meets the technical and transportation needs of the study area but significantly encroaches into the hospital site. | ● | Meets the technical and transportation needs of the study area and minimizes the property needs of the hospital. |
| NATURAL ENVIRONMENT | | | | | | |
| Vegetation | ○ | Some impacts to the woodland and trees mostly south of Biggar Road. | ● | Least impacts overall, some trees north of Biggar Road. | ○ | Most impacts to the woodland and trees south of Biggar Road. |
| Aquatic | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. |
| Wetlands | ○ | Some impacts to the Lyons Creek North Wetland Complex. | ● | No impacts to wetlands. | ○ | Most impacts to the Lyons Creek North Wetland Complex. |
| Species at Risk | ○ | Impacts to potential SAR bat habitat through removal of trees. | ● | None to minimal Impacts to potential SAR bat habitat through removal of trees. | ○ | Impacts to potential SAR bat habitat through removal of trees. |
| SUMMARY | ○ | Some impacts to the woodland and wetland edges adjacent to the road. | ● | Least impacts overall to the natural environment. | ○ | Most impacts and encroachment to the woodland and wetland. |
| CULTURAL ENVIRONMENT | | | | | | |
| Archaeology | ○ | Some archaeological impacts as areas on both sides of the road require further archaeological assessment. | ● | Fewer archaeological impacts compared to other alternatives as fewer areas to the north require further archaeological assessment. | ○ | Some archaeological impacts as many areas on the south side of the road require further archaeological assessment. |
| Cultural Heritage | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. |
| SUMMARY | ○ | Need for additional archaeological assessment. | ● | Least impacts overall, some additional archaeological assessment required. | ○ | Need for additional archaeological assessment. |
| SOCIO - ECONOMIC ENVIRONMENT | | | | | | |
| Access | ○ | Moderate impacts. Several residences on the south with direct access to Biggar Road would be impacted. | ● | Minimal impacts to accesses. | ○ | Moderate impacts. Several residences on the south with direct access to Biggar Road would be impacted. |
| Property | ○ | Some property taking required. Property taking will involve property frontage and will not impact any buildings. | ○ | Some property taking required. Property taking will involve property frontage and will not impact any buildings. Would result in significant encroachment into the hospital site. | ○ | Some property taking required. Property taking will involve property frontage and will not impact any buildings. |
| Construction Disruptions | ○ | Some disruptions to access and traffic, particularly tying the existing driveways into the new road. Other impacts will be minimized through construction best management practices. | ● | Least disruptions to access and traffic, particularly for the driveways to the south. Other impacts will be minimized through construction best management practices. | ○ | Some disruptions to access and traffic, particularly tying the existing driveways into the new road. Other impacts will be minimized through construction best management practices. |
| SUMMARY | ○ | Some impacts to access and property requirements. | ○ | Least impacts to access and private property but significant impact to the hospital site. | ○ | Some impacts to access and property requirements. |
| COST | | | | | | |
| Capital Costs | ○ | Significant construction costs to widen the road. | ○ | Significant construction costs to widen the road. | ○ | Significant construction costs to widen the road. |
| Maintenance Costs | ○ | Moderate increase in maintenance costs. | ○ | Moderate increase in maintenance costs. | ○ | Moderate increase in maintenance costs. |
| SUMMARY | ○ | Moderate to significant costs. | ○ | Moderate to significant costs. | ○ | Moderate to significant costs. |

| | | | |
|--|--|--|---|
| Conclusions | Preferred - This option balances impacts between several factors including natural features, property impacts, and the hospital site. | Not preferred - This option has the least impacts to natural features and properties on the south, however would significant encroach onto and limit the hospital site. | Not preferred - This option provides the most space for the hospital but has the most significant impacts to the natural features and properties on the south. |
| Final Recommendation: Widen along the centreline. | | | |

6.10.4 LYONS CREEK ROAD

The evaluation of the Alternative Designs Concepts identified in Section 6.4 is detailed in Table 32.

TABLE 32. EVALUATION OF ALTERNATIVE DESIGN CONCEPTS FOR LYONS CREEK ROAD

| EVALUATION CRITERIA | 1. Widen Lyons Creek Road along centreline | | 2. Widen Lyons Creek Road to the North | | 3. Widen Lyons Creek Road to the South | |
|--|--|---|--|--|--|--|
| TRANSPORTATION & ENGINEERING | | | | | | |
| Traffic Demand | ● | Widening will meet the traffic demands and growth in the area. | ● | Widening will meet the traffic demands and growth in the area. | ● | Widening will meet the traffic demands and growth in the area. |
| Safety | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. | ● | Safety improvements are accommodated through the widening. |
| Active Transportation | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. | ● | Active transportation facilities are improved and included in the widened roadway. |
| Transit | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. | ● | Transit facilities are included in the widened roadway. |
| Utilities | ● | No utility relocation of hydro lines required. | ● | No utility relocation of hydro lines required. | ● | No utility relocation of hydro lines required. |
| Interchange Compatibility / MTO approval | ● | Least impact to the interchange as the same centreline can be maintained. | ◐ | Potential impacts to the geometrics of the interchange ramps being shifted to the north and not meeting required design standards. | ◐ | Potential impacts to the geometrics of the interchange ramps being shifted to the south and not meeting required design standards. |
| SUMMARY | ● | Meets the technical and transportation needs of the study area and minimizes impacts to the interchange. | ◐ | Meets the technical and transportation needs of the study area however there are potential significant impacts to the interchange. | ◐ | Meets the technical and transportation needs of the study area however there are potential significant impacts to the interchange. |
| NATURAL ENVIRONMENT | | | | | | |
| Vegetation | ◐ | Some impacts to the woodland and trees both north and south of Lyons Creek Road. | ◐ | Some impacts to the woodland and trees north of Lyons Creek Road. | ◐ | Some impacts to the woodland and trees south of Lyons Creek Road. |
| Aquatic | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. |
| Wetlands | ◐ | Some impacts to the Lyons Creek Wetland Complex both north and south of the road. | ◐ | Some impacts to the Lyons Creek Wetland Complex north of the road. | ◐ | Some impacts to the Lyons Creek Wetland Complex south of the road. |
| Species at Risk | ◐ | Impacts to potential SAR bat habitat through removal of trees. | ◐ | Impacts to potential SAR bat habitat through removal of trees. | ◐ | Impacts to potential SAR bat habitat through removal of trees. |
| SUMMARY | ◐ | Moderate environmental impacts to woodlands and wetlands. | ◐ | Moderate environmental impacts to woodlands and wetlands. | ◐ | Moderate environmental impacts to woodlands and wetlands. |
| CULTURAL ENVIRONMENT | | | | | | |
| Archaeology | ◐ | Some archaeological impacts as areas on both sides of the road require further archaeological assessment. | ◐ | Some archaeological impacts as areas on the north require further archaeological assessment. | ◐ | Some archaeological impacts as areas on the south require further archaeological assessment. |
| Cultural Heritage | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. |
| SUMMARY | ◐ | Need for additional archaeological assessment. | ◐ | Need for additional archaeological assessment. | ◐ | Need for additional archaeological assessment. |
| SOCIO - ECONOMIC ENVIRONMENT | | | | | | |
| Access | ● | Minimal impacts to accesses. | ● | Minimal impacts to accesses. | ● | Minimal impacts to accesses. |

| | | | | | | |
|--|---|--|---|---|---|---|
| Property | ● | Some property taking required. Property taking will involve property frontage and will not impact any buildings. | ● | Some property taking required. Property taking will involve property frontage and will not impact any buildings. | ● | Some property taking required. Property taking will involve property frontage and will not impact any buildings. |
| Construction Disruptions | ● | Some disruptions to access and traffic. Other impacts will be minimized through construction best management practices. | ● | Some disruptions to access and traffic. Other impacts will be minimized through construction best management practices. | ● | Some disruptions to access and traffic. Other impacts will be minimized through construction best management practices. |
| SUMMARY | ● | Some property required to accommodate the widened road. | ● | Some property required to accommodate the widened road. | ● | Some property required to accommodate the widened road. |
| COST | | | | | | |
| Capital Costs | ● | Significant construction costs to widen the road. | ● | Significant construction costs to widen the road. | ● | Significant construction costs to widen the road. |
| Maintenance Costs | ● | Moderate increase in maintenance costs. | ● | Moderate increase in maintenance costs. | ● | Moderate increase in maintenance costs. |
| SUMMARY | ● | Moderate to significant costs. | ● | Moderate to significant costs. | ● | Moderate to significant costs. |
| Conclusions | | Preferred - This option balances impacts between property and natural features, and will have the least impacts to the interchange and the bridge over the QEW. | | Not preferred - This option is similar to the other options in terms of impacts, except there is a potential for impacts to the interchange. | | Not preferred - This option is similar to the other options in terms of impacts, except there is a potential for impacts to the interchange. |
| Final Recommendation: Widen along the centreline. | | | | | | |

6.10.5 MONTROSE ROAD AND LYONS CREEK ROAD/BIGGAR ROAD – INTERSECTION CONTROLS

The evaluation of the Alternative Designs Concepts identified in Section 6.5 is detailed in Table 33.

TABLE 33. EVALUATION OF ALTERNATIVE DESIGN CONCEPTS AT THE MONTROSE ROAD / LYONS CREEK ROAD / BIGGAR ROAD INTERCHANGE

| EVALUATION CRITERIA | 1. Traffic Signals | | 2. Roundabouts | |
|---|--------------------|--|----------------|---|
| TRANSPORTATION & ENGINEERING | | | | |
| Traffic Demand | ● | A signalized intersection can better accommodate the anticipated traffic volumes and demand. | ● | Roundabout cannot accommodate anticipated traffic demand, particularly in the conflicting left turning movements. |
| Traffic Operations | ● | Traffic signals can better manage the conflicting left turn movements through the intersection improving traffic flow in all directions. | ● | There is a high number of conflicting left turns through this intersection, which reduces the operations and the ability for the roundabout to efficiently move traffic through the intersection resulting in backups and long queues to get into the roundabout. |
| Safety | ● | Somewhat less safe than roundabouts as vehicles are exposed to higher potential for broadside or head-on collisions. | ● | While roundabouts are generally safer, the high volume of traffic will impact the safe operations of a roundabout. |
| Active Transportation | ● | A traffic signal accommodates dedicated crossing phases for pedestrians and cyclists, which are controlled by signals. | ● | Roundabouts can also accommodate pedestrian crossings, and flashing beacons can be incorporated to stop vehicular traffic. |
| EMS Compatibility | ● | Signals are equipped with pre-emptive signal compatibility which supports access for emergency vehicles. | ● | Roundabouts are free flowing which can quickly clear the way for emergency vehicles. |
| SUMMARY | ● | Due to the significant volumes anticipated, a traffic signal will operate better and safer. | ● | Roundabout will not efficiently move cars through the intersection due to the volume of conflicting left turn movements. |
| NATURAL ENVIRONMENT | | | | |
| Terrestrial (Vegetation, Wetlands, SAR) | ● | Some impacts to vegetation due to additional lanes. | ● | Some impacts to vegetation due to a larger footprint. |
| Aquatic (Fish, Fish Habitat, SAR) | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. |
| SUMMARY | ● | Some terrestrial impacts. | ● | Some terrestrial impacts. |
| CULTURAL ENVIRONMENT | | | | |
| Archaeology | ● | Some areas require additional archaeological assessment as a larger area is needed at the intersection, though less than a roundabout | ● | Some areas require additional archaeological assessment as a larger area is needed at the intersection |
| Cultural Heritage | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. |

| | | | | |
|--|--|--|--|---|
| SUMMARY | ● | Need for additional archaeological assessment. | ● | Need for additional archaeological assessment. |
| SOCIO - ECONOMIC ENVIRONMENT | | | | |
| Access | ● | Due to the median, some impacts to accesses. | ● | Due to the median, some impacts to accesses. |
| Property | ● | Property impacts as the intersection will be larger to accommodate lanes. | ● | Property impacts as the intersection will be larger for the roundabout footprint. |
| SUMMARY | ● | Some impacts to access and property. | ● | Some impacts to access and property. |
| COST | | | | |
| Capital Costs | ● | Moderate construction costs to implement the signalized intersection and the additional lanes. | ● | Moderate construction costs to implement the roundabout. |
| Maintenance Costs | ● | Higher maintenance costs associated with infrastructure for the signals. | ● | Low maintenance cost after initial implementation. |
| SUMMARY | ● | Moderate to significant costs. | ● | Moderate costs. |
| Conclusions | Preferred - Signals better accommodate anticipated future traffic volumes and turning movements at the intersection. | | Not preferred - Roundabouts would not be a good option here due to the high volume of traffic, particularly left turning traffic, which would result in long queues to enter the roundabout. | |
| Final Recommendation: Traffic Signals as a roundabout would not function well due to traffic volumes and movements. | | | | |

6.10.6 LYONS CREEK ROAD / QEW BRIDGE

The evaluation of the Alternative Designs Concepts identified in Section 6.6 is detailed in Table 34.

TABLE 34. EVALUATION OF ALTERNATIVE DESIGN CONCEPTS LYONS CREEK ROAD BRIDGE OVER QEW BRIDGE CROSS SECTION

| EVALUATION CRITERIA | 1. Uni-directional Facilities (with barrier walls on the QEW bridge) | 2. Multi-Use Path on North Side (with barrier wall on the QEW bridge) | 3. Repaint the Bridge Deck and use the buffer as an on-road bike lane | 4. Extend curb for use as a sidewalk and the curbside travel lane is a shared line for vehicles and bikes | 5a. Include MUP on the North Side in Future MTO Bridge Replacement (Long Term) | 5b. Include Uni-directional facilities on both sides in Future MTO Bridge Replacement (Long Term) | 6. New separated AT Structure North of the Existing Bridge | 7. Do Nothing |
|---|--|---|---|---|--|--|--|---|
| TRANSPORTATION & ENGINEERING | | | | | | | | |
| Traffic Demand | ● | No change to vehicular lanes, two lanes per direction is sufficient. | ● | No change to vehicular lanes, two lanes per direction is sufficient. | ● | No change to vehicular lanes, two lanes per direction is sufficient. | ● | No change to vehicular lanes, two lanes per direction is sufficient. |
| Interchange / Traffic Operations | ● | Less preferred for traffic operations due to the substandard buffers and multiple conflict points. Lack of buffer width may be an issue for snow storage. | ● | Less preferred for traffic operations due to the substandard buffers and multiple conflict points. Lack of buffer width may be an issue for snow storage. | ● | Better for traffic operations as design standards can be met. | ● | Better for traffic operations as the structure fully separates vehicular traffic from AT traffic. |
| AT / Safety | ● | Cars and cyclists are separated by a barrier wall providing better comfort for cyclists, though the buffers are substandard. Having facilities on both sides of the road increases the conflict points at ramp terminals and more points of exposure to traffic. Facility is also formally signed for bikes, thus is not conducive for pedestrians. | ● | A MUP provides comfort for active transportation users through the presence of a physical barrier and fewer crossing points as activity can be kept on one side. However, the MUP and buffers do not meet design standards. | ○ | Least safe / comfort as cars will be travelling at high speeds through this section and the lack of barrier and substandard design increases the potential for incidents to occur. Having facilities on both sides of the road increases the crossing points at ramp terminals. Facility is also formally signed for bikes, thus is not conducive for pedestrians. | ○ | Least safe / comfort as cars will be travelling at high speeds through this section and the lack of barrier and substandard design increases the potential for incidents to occur. Having facilities on both sides of the road increases the crossing points at ramp terminals. |
| | ● | | ○ | Least safe / comfort as cars will be travelling at high speeds through this section and the lack of barrier and substandard design increases the potential for incidents to occur. Having facilities on both sides of the road increases the crossing points at ramp terminals. | ● | Better for traffic operations as design standards can be met. | ● | Safer option as there is a barrier and sufficient widths for the MUP and buffers, however, there will be no facilities in the interim, though existing cyclist and pedestrian traffic is anticipated to be low. |
| | ● | | ○ | Least safe / comfort as cars will be travelling at high speeds through this section and the lack of barrier and substandard design increases the potential for incidents to occur. Having facilities on both sides of the road increases the crossing points at ramp terminals. | ● | Better for traffic operations as design standards can be met. | ● | Safer option as there is a barrier and sufficient widths for the MUP and buffers, however, there will be no facilities in the interim, though existing cyclist and pedestrian traffic is anticipated to be low. |
| | ● | | ○ | Least safe / comfort as cars will be travelling at high speeds through this section and the lack of barrier and substandard design increases the potential for incidents to occur. Having facilities on both sides of the road increases the crossing points at ramp terminals. | ● | Better for traffic operations as design standards can be met. | ● | Safest option as the active transportation uses are fully separated from the driving lanes on the bridge and standard widths are met. |
| | ● | | ○ | Least safe / comfort as cars will be travelling at high speeds through this section and the lack of barrier and substandard design increases the potential for incidents to occur. Having facilities on both sides of the road increases the crossing points at ramp terminals. | ● | Better for traffic operations as design standards can be met. | ● | No formal active transportation facility across the bridge which does not accommodate active transportation use. However, existing cyclist and pedestrian traffic is anticipated to be low. |

| | | | | | | | | | | | | | | | | |
|---|---|--|---|--|---|--|---|--|---|---|---|---|---|--|---|--|
| Connectivity | ● | Good connection to the existing paved shoulders (which is an AT route) at the east end of the study area, but does not match proposed northside MUP at the hospital. | ● | Good connection to the proposed northside MUP at the hospital but not the existing paved shoulders (which is an AT route) at the east end of the study area. | ● | Good connection to the existing paved shoulders (which is an AT route) at the east end of the study area, but does not match proposed northside MUP at the hospital. | ● | Good connection to the existing paved shoulders (which is an AT route) at the east end of the study area, but does not match proposed northside MUP at the hospital. | ● | Could likely provide better connectivity in the future when there is sufficient room on the bridge deck and future routes are established, though no facilities in the interim. | ● | Could likely provide better connectivity in the future when there is sufficient room on the bridge deck and future routes are established, though no facilities in the interim. | ● | Good connection to the proposed northside MUP at the hospital but not the existing paved shoulders (which is an AT route) at the east end of the study area. | ● | No formal connection provided between both sides of the bridge, however it is not anticipated that this connection is required at this time. |
| Transit | ● | Lanes wide enough to accommodate transit, though a facility on both sides of the road may block lanes where buses need to stop. | ● | Lanes wide enough to accommodate transit, and a facility on one side of the road reduce overlap of bus and AT areas. | ● | Lanes wide enough to accommodate transit, though a facility on both sides of the road may block lanes where buses need to stop. | ● | Lanes wide enough to accommodate transit, though a facility on both sides of the road may block lanes where buses need to stop. | ● | Lanes wide enough to accommodate transit, and a facility on one side of the road reduce overlap of bus and AT areas. | ● | Lanes wide enough to accommodate transit, and a facility on one side of the road reduce overlap of bus and AT areas. | ● | Lanes wide enough to accommodate transit, and a facility on one side of the road reduce overlap of bus and AT areas. | ● | No impacts to transit. |
| Constructability / Impacts to the Interchange | ● | Minor constructability issues. Requires some reconfiguration of the existing bridge deck / ROW. | ● | Minor constructability issues. Requires some reconfiguration of the existing bridge deck / ROW. | ● | Minor constructability issues. Requires some reconfiguration of the existing bridge deck / ROW. | ● | Minor constructability issues. Requires some reconfiguration of the existing bridge deck / ROW. | ● | No major issues as replacement can involve a wider bridge deck to accommodate AT. | ● | No major issues as replacement can involve a wider bridge deck to accommodate AT. | ● | Additional work to be done on the approaches and embankments, with potential need for retaining walls to reduce impacts to existing ramps. | ● | No constructability issues. |
| SUMMARY | ● | Less preferred as there are more conflict points and sub-standard buffers. | ● | MUP is on the north side to match existing conditions west of the interchange, though buffers are sub-standard. | ○ | Alternative not recommended due to safety concerns due to the lack of separation/barriers. | ○ | Alternative not recommended due to safety concerns due to the lack of separation/barriers. | ● | A good long-term solution in order to meet design standards, however does not offer any short-term solutions. | ● | A good long-term solution in order to meet design standards, however does not offer any short-term solutions. | ● | While this option best accommodates active transportation, it may impact the existing interchange configuration. | ● | While no formal active transportation facility is provided, this can work as an interim solution until development warrants providing an active transportation connection. |
| NATURAL ENVIRONMENT | | | | | | | | | | | | | | | | |
| Terrestrial (Vegetation, Wetlands, SAR) | ● | No impacts to vegetation. | ● | No impacts to vegetation. | ● | No impacts to vegetation. | ● | No impacts to vegetation. | ● | Minor to moderate impacts to vegetation to construct a new bridge. | ● | Minor to moderate impacts to vegetation to construct a new bridge. | ● | Minor impacts to vegetation to construct the new crossing. | ● | No impacts to vegetation. |
| Aquatic (Fish, Fish Habitat, SAR) | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. |
| SUMMARY | ● | No impacts to the natural environment. | ● | No impacts to the natural environment. | ● | No impacts to the natural environment. | ● | No impacts to the natural environment. | ● | Minimal impacts to the natural environment. | ● | Minimal impacts to the natural environment. | ● | Minimal impacts to the natural environment. | ● | No impacts to the natural environment. |
| CULTURAL ENVIRONMENT | | | | | | | | | | | | | | | | |
| Archaeology | ● | No additional archaeological assessment required as works contained to existing bridge deck. | ● | No additional archaeological assessment required as works contained to existing bridge deck. | ● | No additional archaeological assessment required as works contained to existing bridge deck. | ● | No additional archaeological assessment required as works contained to existing bridge deck. | ● | Further archaeological assessment may be required depending on impacts of bridge widening to ramps. | ● | Further archaeological assessment may be required depending on impacts of bridge widening to ramps. | ● | Likely none to minimal further archaeological assessment required as work can be contained in disturbed areas. | ● | No additional archaeological assessment required. |
| Cultural Heritage | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. |
| SUMMARY | ● | No impacts to the cultural environment. | ● | No impacts to the cultural environment. | ● | No impacts to the cultural environment. | ● | No impacts to the cultural environment. | ● | Likely none to minimal impacts to the cultural environment. | ● | Likely none to minimal impacts to the cultural environment. | ● | Likely none to minimal impacts to the cultural environment. | ● | No impacts to the cultural environment. |
| SOCIO - ECONOMIC ENVIRONMENT | | | | | | | | | | | | | | | | |
| Access | ● | Some access impacts beyond the bridge where the active transportation facility crosses local / access roads. | ● | Some access impacts beyond the bridge where the active transportation facility crosses local / access roads. | ● | Some access impacts beyond the bridge where the active transportation facility crosses local / access roads. | ● | Some access impacts beyond the bridge where the active transportation facility crosses local / access roads. | ● | Some access impacts where the active transportation facility crosses local / access roads. Depending on embankment impacts to ramps, there may be impacts local roads. | ● | Some access impacts where the active transportation facility crosses local / access roads. Depending on embankment impacts to ramps, there may be impacts local roads. | ● | Some access impacts where the active transportation facility crosses local / access roads. | ● | No impacts to access. |
| Property | ● | No additional property required. | ● | No additional property required. | ● | No additional property required. | ● | No additional property required. | ● | Potential property required to accommodate wider bridge as the impacts to the embankment may impact ramp locations. | ● | Potential property required to accommodate wider bridge as the impacts to the embankment may impact ramp locations. | ● | No additional property required. | ● | No additional property required. |
| Construction Impacts | ● | Some disruptions to traffic during reconfiguration of the bridge deck and ramps. | ● | Some disruptions to traffic during reconfiguration of the bridge deck and ramps. | ● | Some disruptions to traffic during reconfiguration of the bridge deck and ramps. | ● | Some disruptions to traffic during reconfiguration of the bridge deck and ramps. | ● | Significant disruptions related to overall bridge replacement, however addition of AT infrastructure minimal impacts to staging overall. | ● | Significant disruptions related to overall bridge replacement, however addition of AT infrastructure minimal impacts to staging overall. | ○ | Minimal disruptions on Lyons Creek Road, but closures or other work required on QEW for new bridge work. | ● | No construction impacts. |

| | | | | | | | | | | | | | | | | |
|---|---|--|---|--|---|--|---|--|--|---|--|---|--|---|--|--|
| SUMMARY | ● | Minimal impacts overall, and some construction disruptions. | ● | Minimal impacts overall, and some construction disruptions. | ● | Minimal impacts overall, and some construction disruptions. | ● | Minimal impacts overall, and some construction disruptions. | ○ | Replacement could result in significant impacts to property and access. | ○ | Replacement could result in significant impacts to property and access. | ○ | Minimal impacts to adjacent lands but will result in traffic impacts and closures on the QEW. | ● | No impacts. |
| COST | | | | | | | | | | | | | | | | |
| Capital Costs | ● | Low to moderate costs to reconfigure the bridge deck and approaches. | ● | Low to moderate costs to reconfigure the bridge deck and approaches. | ● | Low to moderate costs to reconfigure the bridge deck and approaches. | ● | Low to moderate costs to reconfigure the bridge deck and approaches. | ○ | Significant costs to replace the bridge. | ○ | Significant costs to replace the bridge. | ○ | Significant costs for the construction of a new AT bridge. | ● | No additional costs as there is no work. |
| Maintenance Costs | ○ | Some increase to maintenance costs. | ○ | Some increase to maintenance costs. | ○ | Some increase to maintenance costs. | ○ | Some increase to maintenance costs. | ○ | Moderate increase to maintenance costs. | ○ | Moderate increase to maintenance costs. | ○ | Significant increase in maintenance costs. | ● | No additional maintenance costs. |
| SUMMARY | ○ | Moderate costs. | ○ | Moderate costs. | ○ | Moderate costs. | ○ | Moderate costs. | ○ | Significant Costs. | ○ | Significant Costs. | ○ | Significant costs. | ● | No additional costs. |
| Conclusions | Not preferred - While active transportation is accommodated, it does not meet MTO design standards (i.e. lanes, buffers, median are not wide enough). | | Not preferred - While active transportation is accommodated, it does not meet MTO design standards (i.e. lanes, buffers, median are not wide enough). | | Not preferred - While active transportation is accommodated, it does not meet MTO design standards (i.e. lanes, buffers, median are not wide enough) and is unsafe under these high speed conditions due to a lack of buffer or separation. | | Not preferred - While active transportation is accommodated, it does not meet MTO design standards (i.e. lanes, buffers, median are not wide enough) and is unsafe under these high speed conditions due to a lack of buffer or separation. | | Not preferred at this time - While this option would best accommodate active transportation and meet design standards, there is significant costs with bridge replacement. This option can be revisited at a later time as development in the area progresses. | | Not preferred at this time - While this option would best accommodate active transportation and meet design standards, there is significant costs with bridge replacement. This option can be revisited at a later time as development in the area progresses. | | Not preferred at this time - While this option would best accommodate active transportation and meet design standards, there is significant costs with construction of a new bridge. This option can be revisited at a later time as development in the area progresses. | | Preferred - While no formal active transportation facility is provided, this alternative can work as an interim solution as it is not anticipated there will be much active transportation need across the bridge under the current context. The area can be monitored and as development progresses, the need for a facility can be reviewed. | |
| Final Recommendation: Do Nothing | | | | | | | | | | | | | | | | |

6.10.7 QEW RAMPS / LYONS CREEK ROAD

The evaluation of the Alternative Designs Concepts identified in Section 6.7 is detailed in Table 35.

TABLE 35. EVALUATION OF ALTERNATIVE DESIGN CONCEPTS THE INTERSECTION AT LYONS CREEK ROAD/ QEW RAMPS

| EVALUATION CRITERIA | 1. Traffic Signals | | 2. Roundabouts | |
|---|--------------------|---|----------------|--|
| TRANSPORTATION & ENGINEERING | | | | |
| Traffic Demand | ● | Future traffic demand can be accommodated. | ○ | Roundabout is overcapacity in the 2041 traffic scenario. |
| Traffic Operations | ● | No major traffic operations concerns. | ○ | Operationally, the traffic demand from the west leg and the off ramp will result in delays and queues for those entering the roundabout from the west leg, resulting in poor operations and significant queues. |
| Safety | ○ | Somewhat less safe than roundabouts as vehicles are exposed to higher potential for broadside or head-on collisions. | ○ | While roundabouts are generally safer, the high volume of traffic will impact the safe operations of a roundabout. |
| Active Transportation | ● | Signals are safer for active transportation users, such as cyclists and pedestrians, as there are dedicated crossing times at the signal. | ○ | AT crossings are also at uncontrolled locations and with the significant volume of traffic coming off the QEW directly into the roundabout, it would be unsafe for pedestrians or cyclists if they were crossing the leg of the roundabout. |
| Constructability | ● | No major issues with construction of this option at the existing location. | ○ | No major issues with construction of this option. However, a roundabout design that removed the west to south movement and utilized a dedicated west to south ramp (to accommodate traffic operations) was assessed to determine if that movement could remain separate, however it is not feasible. |
| EMS Compatibility | ● | Signals are equipped with pre-emptive signal compatibility which supports access for emergency vehicles. | ○ | Roundabouts are free flowing which can quickly clear the way for emergency vehicles. However, if there is significant queuing in the roundabout, this will reduce the effectiveness for emergency vehicles. |
| SUMMARY | ● | Preferred from a transportation and engineering perspective as a signalized intersection can support the future traffic demand and operate well. A signalized intersection also supports active transportation uses and EMS vehicles. | ○ | A roundabout will operate poorly under future traffic demand and cause delays and queues in certain legs. |
| NATURAL ENVIRONMENT | | | | |
| Terrestrial (Vegetation, Wetlands, SAR) | ● | Minor impacts to vegetation. | ● | Minor impacts to vegetation. |
| Aquatic (Fish, Fish Habitat, SAR) | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. |

| | | | | |
|--|---|--|--|---|
| SUMMARY | ● | Minimal impacts to the natural environment. | ● | Minimal impacts to the natural environment. |
| CULTURAL ENVIRONMENT | | | | |
| Archaeology | ● | None to minimal additional archaeological assessment required. | ● | None to minimal additional archaeological assessment required. |
| Cultural Heritage | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. |
| SUMMARY | ● | Minimal impacts to the cultural environment. | ● | Minimal impacts to the cultural environment. |
| SOCIO - ECONOMIC ENVIRONMENT | | | | |
| Access | ● | Requires restriction of the left in/out at Willodell Road due to proximity to the ramp terminal and weaving of vehicles. | ● | Requires restriction of the left in/out at Willodell Road due to proximity to roundabout and back up of vehicles waiting to make a left turn. |
| Property | ① | No additional property required. | ① | Some additional property required to accommodate larger area of roundabout |
| Construction Impacts | ● | Minor disruptions to the ramps and to Lyons Creek Road to reconfigure lane alignments and install electrical facilities. Minor closures anticipated. | ① | Longer disruptions to ramps and Lyons Creek Road during construction. Ramps may be temporarily closed for longer periods of time or temporary ramps need to be constructed. |
| SUMMARY | ● | Fewer impacts to surrounding area. | ① | More property and construction impacts. |
| COST | | | | |
| Capital Costs | ● | Moderate costs that involve installation of signal infrastructure and some construction / realignment of lanes. | ① | Significant costs as the area of impact is larger and more significant changes to the intersection. Property costs also considered. |
| Maintenance Costs | ① | Higher maintenance costs associated with infrastructure for the signals. | ● | Low maintenance cost after initial implementation. |
| SUMMARY | ① | Moderate to significant costs. | ① | Moderate costs. |
| Conclusions | <p>Preferred - Traffic signals are preferred for the intersection control at the QEW interchange. Traffic signals are able to accommodate future traffic demand while still operating well and support active transportation and EMS vehicles to and from the hospital. There are minimal other impacts to the surrounding area.</p> | | <p>Not preferred - Roundabouts in this location cannot accommodate future traffic demand, and will operate poorly and result in significant queueing, especially in the west leg, which will impede EMS vehicle access. Some additional property is required and there will be more construction impacts.</p> | |
| Final Recommendation: Traffic Signals as a roundabout would not function well due to traffic volumes and movements. | | | | |

6.10.8 WILLODELL ROAD INTERSECTION

The evaluation of the Alternative Designs Concepts identified in Section 6.8 is detailed in Table 36.

TABLE 36: EVALUATION OF ALTERNATIVE DESIGN CONCEPTS FOR THE WILLODELL ROAD INTERSECTION

| EVALUATION CRITERIA | 1. Do Nothing | 2. Continuous Median, No U-Turns at Montrose Road | 3. Continuous Median, U-Turns allowed at Montrose Road | 4. Left-In, Right-In, Right-Out using signage only | 5. Left-In, Right-In, Right-Out using channelizations | 6. New Mid-Block Signalized Intersection Further West | 7. Realign Willodell Road to the QEW Off-Ramp | 8. New East-West Local Road | 9. U-turn signal | 10. New Public Road Allowance |
|---|--|--|---|---|---|---|---|--|--|--|
| TRANSPORTATION & ENGINEERING | | | | | | | | | | |
| Traffic Demand / Operations | ○ As traffic increases on Lyons Creek Road, left turns at Willodell Road will be more difficult leading to queues and back ups. | ○ No more operational concerns at Willodell Road, however all traffic will be required to make a left turn on Montrose Road and Carl Road, creating operational issues elsewhere. | ○ No more operational concerns at Willodell Road, however all traffic will be required to make a U-turn on Montrose Road, creating operational issues for the left-turn queue. | ● The left-out movement is eliminated however queueing can occur on Lyons Creek Road for the left-in. Only small volume of left-out traffic requires detour. | ● The left-out movement is eliminated and any queueing for left-in is accommodated in the channelization. Only small volume of left-out traffic requires detour. | ● Full movements allowed however a signal may impair traffic flow on Lyons Creek Road. Exact signal delays are hard to determine at this time as development to the property on the north has not been determined. | ● Full movements allowed however the reconfigured intersection may impair traffic flow on Lyons Creek Road and the operations of the west ramp terminal. | ○ No more operational concerns at Willodell Road, however all traffic will be required to make a left turn on Montrose Road and this new road, creating operational issues elsewhere. | ○ No more operational concerns at Willodell Road, however all traffic will be required to make a left turn on Montrose Road, creating operational issues elsewhere. | ○ No more operational concerns at Willodell Road, however traffic will detour through the new public road allowance, creating operational issues elsewhere. |

| EVALUATION CRITERIA | 1. Do Nothing | | 2. Continuous Median, No U-Turns at Montrose Road | | 3. Continuous Median, U-Turns allowed at Montrose Road | | 4. Left-In, Right-In, Right-Out using signage only | | 5. Left-In, Right-In, Right-Out using channelizations | | 6. New Mid-Block Signalized Intersection Further West | | 7. Realign Willodell Road to the QEW Off-Ramp | | 8. New East-West Local Road | | 9. U-turn signal | | 10. New Public Road Allowance | | |
|---|---------------|--|---|--|--|--|--|---|---|--|---|---|---|---|-----------------------------|---|------------------|--|-------------------------------|---|--|
| Impacts to the QEW / Lyons Creek Road Interchange | ○ | Potential queuing and backups into the west ramp terminal. | ● | No left turns allowed at Willodell Road, so there will be no queuing into the west ramp terminal. | ● | No left turns allowed at Willodell Road, so there will be no queuing into the west ramp terminal. | ○ | Left-in at Willodell Road potential to result in queuing into the west ramp terminal. | ● | Left-in at Willodell Road will be in a left turn lane, reducing potential for queuing into west ramp terminal. | ● | A signal may result in delays to the west ramp terminal though exact delays are hard to determine at this time as development to the property on the north has not been determined. | ✘ | Reconfiguration of the west ramp terminal will impact the operations of the signal. Will not be geometrically possible given the location of the on-ramp. | ● | No left turns allowed at Willodell Road, so there will be no queuing into the west ramp terminal. | ● | No left turns allowed at Willodell Road, so there will be no queuing into the west ramp terminal. | ● | No left turns allowed at Willodell Road, so there will be no queuing into the west ramp terminal. | |
| Road Safety | ○ | As traffic increases on Lyons Creek Road, left turns will be increasingly difficult to make safely. There may also be safety concerns related to weaving traffic and queues into the west ramp terminal. | ○ | Safety concerns of left turns on Lyons Creek Road is eliminated, however, safety concerns are introduced where traffic is detoured, i.e. left turn onto Carl Road from Montrose Road and on local roads. | ○ | Safety concerns of left turns on Lyons Creek Road is eliminated, however, safety concerns are introduced where traffic is detoured, i.e. left turn onto Carl Road from Montrose Road and on local roads. | ○ | As traffic increases on Lyons Creek Road, left turns will be increasingly difficult to make safely, so this option eliminates one left turn movement. However, drivers may not obey signage. There may also be safety concerns related to weaving traffic and queues into the west ramp terminal. | ● | As traffic increases on Lyons Creek Road, left turns will be increasingly difficult to make safely, so this option eliminates one left turn movement through physical barriers. The left turn channel allows for cars to wait safely and will reduce backups to the interchange. There may also be safety concerns related to weaving traffic. | ● | Safer option as all movements will have a dedicated timing at the signal, however a signal may result in backups to the west ramp terminal. | ● | Safer option as all movements will have a dedicated timing at the signal. | ● | Safety concerns of left turns on Lyons Creek Road is eliminated and a new route for detoured traffic is constructed that is safer than existing local roads, though a left turn from Montrose Road is still required. | ○ | Safety concerns of left turns on Lyons Creek Road is eliminated, however, safety concerns are introduced where traffic is detoured, i.e. on Montrose Road. | ○ | Safety concerns of left turns on Lyons Creek Road is eliminated, however, safety concerns are introduced where traffic is detoured, i.e. into the new public road allowance | |
| Access to the Willodell Road Area | ● | Full moves access is maintained at Willodell Road. | ○ | Access is considerably limited and significant detour is required. | ○ | Access is considerably limited and some detour is required. | ● | Only left-out is not allowed and main access to and from the highway is maintained. | ● | Only left-out is not allowed and main access to and from the highway is maintained. | ● | Full moves access is maintained at Willodell Road. | ● | Full moves access is maintained at Willodell Road. | ○ | Access is considerably limited and significant detour is required. | ○ | Access is considerably limited and significant detour is required. | ○ | Access is considerably limited and significant detour is required. | |
| SUMMARY | ○ | Doing Nothing will result in unsafe conditions and potential impacts to the west ramp terminal. as traffic increases | ○ | While this addresses safety at Willodell Road, creates unsafe and operational conditions elsewhere on Montrose Road/Carl Road. | ○ | While this addresses safety at Willodell Road, creates unsafe and operational conditions elsewhere on Montrose Road. | ● | Partial access to the Willodell area is maintained however safety and operational conditions on Lyons Creek Road remains. | ● | Partial access to the Willodell area is maintained to and from the highway. Safety and operational concerns mostly addressed. | ● | Full moves access to the Willodell area is maintained however the queues and impacts to the west ramp terminal are unknown. | ✘ | This option is not feasible as the realigned Willodell Road would not be able to cross the QEW on-ramp. | ○ | While this addresses safety at Willodell Road, creates unsafe and operational conditions elsewhere on Montrose Road/Carl Road. | ○ | While this addresses safety at Willodell Road, creates unsafe and operational conditions elsewhere on Montrose Road. | ○ | While this addresses safety at Willodell Road, creates unsafe and operational conditions elsewhere. | |
| NATURAL ENVIRONMENT | | | | | | | | | | | | | | | | | | | | | |
| Terrestrial (Vegetation, Wetlands, SAR) | ● | No impacts to vegetation. | ● | No impacts to vegetation. | ● | No impacts to vegetation. | ● | No impacts to vegetation. | ● | Moderate impacts to vegetation/PSW to construct a new turn lane and reconfigure the intersection. | ○ | Significant impacts as the alignment cuts through significant woodland and a PSW. | ● | Moderate impacts to vegetation to construct a new connection to the ramp terminal. | ● | Moderate impacts to vegetation to construct a new public right-of-way. | ● | Potential for some vegetation impacts to construct turn around area. | ● | Moderate impacts to vegetation/PSW to construct a new road allowance. | |
| Aquatic (Fish, Fish Habitat, SAR) | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | ● | Work in proximity to Lyons Creek, will have to review for impacts. | ● | No impacts to aquatic resources. | ● | No impacts to aquatic resources. | |
| SUMMARY | ● | No impacts to the natural environment. | ● | No impacts to the natural environment. | ● | No impacts to the natural environment. | ● | No impacts to the natural environment. | ● | Moderate impacts to terrestrial resources. | ○ | Significant impacts to terrestrial resources. | ● | Moderate impacts to terrestrial resources. | ● | Moderate impacts to terrestrial resources. | ● | Potential for impacts to terrestrial resources. | ● | Moderate impacts to terrestrial resources. | |
| CULTURAL ENVIRONMENT | | | | | | | | | | | | | | | | | | | | | |
| Archaeology | ● | No additional AA required. | ● | No additional AA required. | ● | No additional AA required. | ● | No additional AA required. | ● | Some further AA required for reconfiguration of the Willodell Rd intersection. | ○ | Significant AA required for the new road alignment. | ● | Some further AA required for new connection to the ramp terminal | ○ | Significant AA required for the new road alignment. | ● | Some further AA required for the turn around area. | ○ | Significant AA required for the new road allowance. | |
| Cultural Heritage | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | ● | Not assessed in this EA, to be assessed through additional studies. | ● | No impacts to cultural heritage resources. | ● | No impacts to cultural heritage resources. | |
| SUMMARY | ● | No impacts to the cultural environment. | ● | No impacts to the cultural environment. | ● | No impacts to the cultural environment. | ● | No impacts to the cultural environment. | ● | Need for further AA. | ○ | Need for further AA for a large area. | ● | Need for further AA. | ○ | Need for further AA for a larger area and need to assess for | ● | Need for further AA. | ○ | Need for further AA for a large area. | |

| EVALUATION CRITERIA | 1. Do Nothing | | 2. Continuous Median, No U-Turns at Montrose Road | | 3. Continuous Median, U-Turns allowed at Montrose Road | | 4. Left-In, Right-In, Right-Out using signage only | | 5. Left-In, Right-In, Right-Out using channelizations | | 6. New Mid-Block Signalized Intersection Further West | | 7. Realign Willodell Road to the QEW Off-Ramp | | 8. New East-West Local Road | | 9. U-turn signal | | 10. New Public Road Allowance | | |
|---|--|----------------------------------|---|--|---|--|---|--|--|--|--|---|--|---|--|--|---|---|--|--|--|
| | | | | | | | | | | | | | | | | cultural heritage resources. | | | | | |
| SOCIO - ECONOMIC ENVIRONMENT | | | | | | | | | | | | | | | | | | | | | |
| Property | ● | No additional property required. | ● | No additional property required. | ● | No additional property required. | ● | No additional property required. | ◐ | Some property is required to reconfigure the intersection. | ○ | Significant property required for the new realigned road and bisects existing property. | ○ | Significant property required for the new realigned road and bisects existing property. | ○ | Significant property required for the new road right-of-way. | ◐ | Some property is required for the new turn around area. | ○ | Significant property required for the new road right-of-way. | |
| COST | | | | | | | | | | | | | | | | | | | | | |
| Capital Costs | ● | No capital cots. | ● | Low capital costs. | ● | Low capital costs. | ● | Low capital costs. | ◐ | Moderate capital costs. | ○ | Significant capital costs. | ○ | Significant capital costs. | ○ | Significant capital costs. | ◐ | Moderate capital costs. | ○ | Significant capital costs. | |
| Maintenance Costs | ● | No change to maintenance costs. | ● | None to minimal change to maintenance costs. | ● | None to minimal change to maintenance costs. | ● | None to minimal change to maintenance costs. | ● | Minimal change to maintenance costs. | ◐ | Moderate increase to maintenance costs. | ◐ | Moderate increase to maintenance costs. | ◐ | Moderate increase to maintenance costs. | ◐ | Moderate increase to maintenance costs. | ◐ | Moderate increase to maintenance costs. | |
| SUMMARY | ● | No costs. | ● | Minimal costs. | ● | Minimal costs. | ● | Minimal costs. | ◐ | Moderate costs. | ○ | Significant costs. | ○ | Significant costs. | ○ | Significant costs. | ◐ | Moderate costs. | ○ | Significant costs. | |
| Conclusions | Not preferred – While it has the least impacts overall, it does not address any of transportation concerns (safety, operations) associated with the future use of the intersection. | | Not preferred – While this option addresses transportation concerns at the Willodell Road intersection, it results in safety and operational concerns elsewhere. | | Not preferred – While this option addresses transportation concerns at the Willodell Road intersection, it results in safety and operational concerns elsewhere. | | Not preferred - While it maintains the key movements at the Willodell Road intersection, signage along may not be effective in managing traffic and can still result in delays and queues to the west ramp terminal. | | Preferred – This option maintains the key movements at the Willodell Road intersection, is physically configured so as to limit left-out, and includes a left turn lane to minimize potential impacts to the west ramp terminal. Some environmental and property impacts associated with this option. | | Not preferred at this time - While this option allows for full moves access, a signalized intersection would need to be reviewed in the future along with anticipated development to determine impacts to the west ramp terminal. Significant environmental and property impacts. | | Not preferred - While this option maintains full moves access, it is not feasible as it would directly impact the QEW on-ramp and it cannot be realigned geometrically. | | Not preferred – While this option addresses transportation concerns at the Willodell Road intersection, it results in safety and operational concerns elsewhere. Also significant environmental and property impacts associated with this option. | | Not preferred – While this option addresses transportation concerns at the Willodell Road intersection, it results in safety and operational concerns elsewhere. | | Not preferred – While this option addresses transportation concerns at the Willodell Road intersection, it results in safety and operational concerns elsewhere and is a detour that is not likely to be used. Also significant environmental and property impacts associated with this option. | | |
| Final Recommendation: Left-in, Right-In, Right-Out using channelizations | | | | | | | | | | | | | | | | | | | | | |

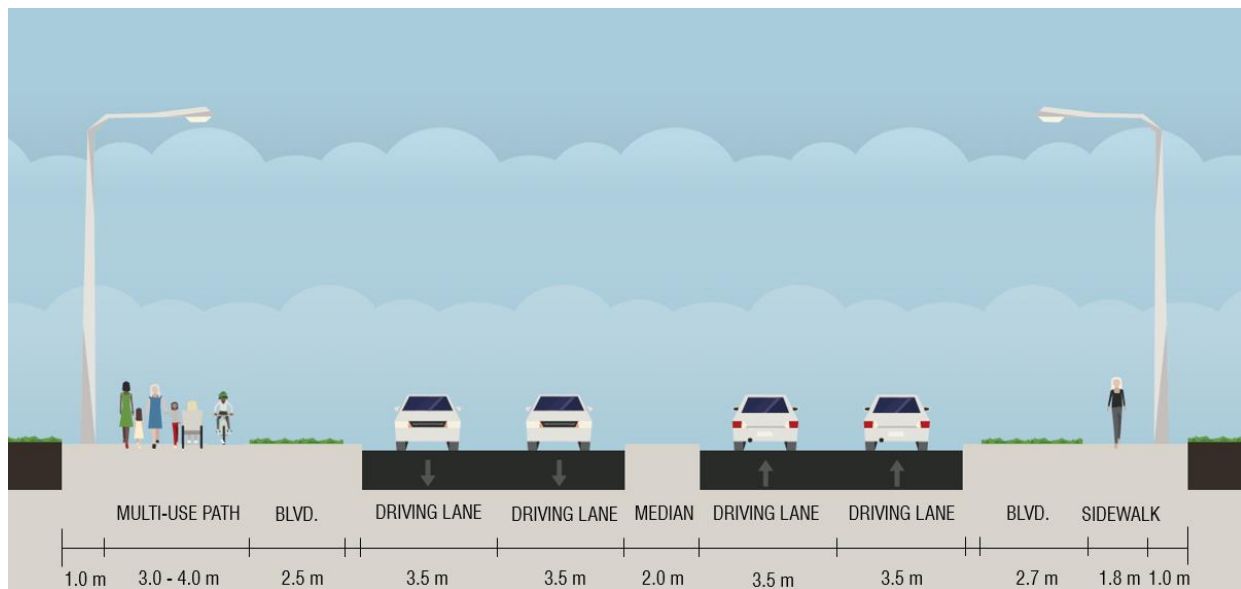
7.0 Description of the Preferred Design

The following sections describe the key features of the preferred preliminary design. For the preliminary design, refer to **Appendix G**.

7.1 Typical Cross Sections and Complete Streets

The road right-of-way (ROW) is nominally 30m throughout the study area, except at certain locations where up to 37m of road ROW width is required to accommodate additional turning lanes. The typical cross section for Montrose Road/Lyons Creek Road/Biggar Road is shown in **Figure 8** and includes:

- 4 x 3.5m driving lanes
- 2.0m median OR 4.0m centre left turning lane (where appropriate)
- 3.0m – 4.0m Multi-Use Path on the west side of Montrose Road and north side of Lyons Creek Road/Biggar Road
- 1.8m sidewalk on the east side of Montrose Road, in select locations, or protected for future construction as appropriate.



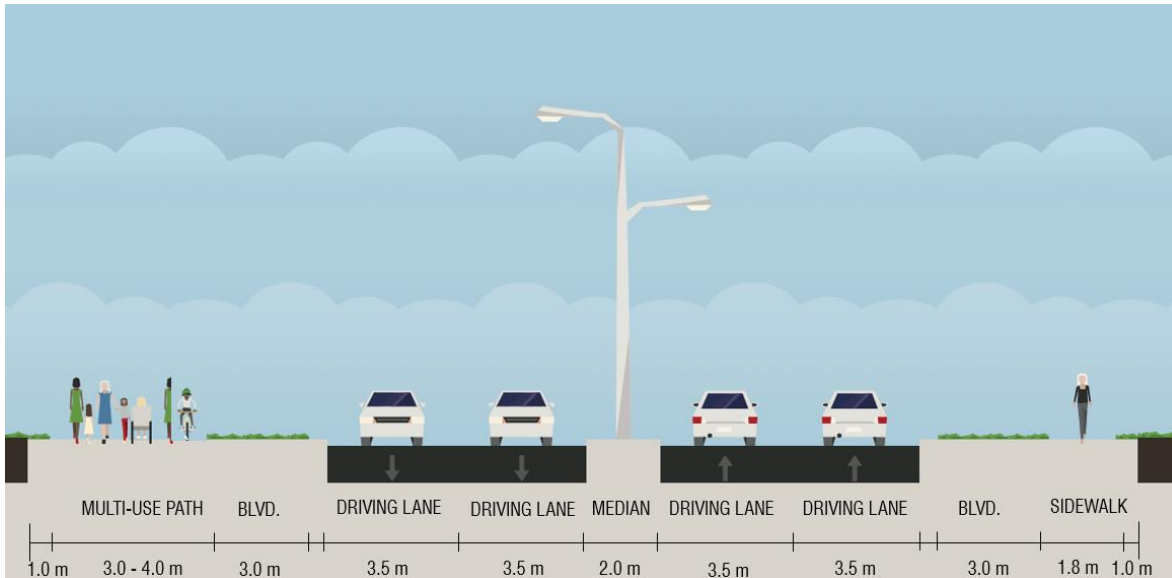


FIGURE 8: TYPICAL RIGHT-OF-WAY CROSS SECTION

Niagara Region has adopted a vision to develop “Complete Corridors” (also called Complete Streets) which integrates land use planning, transportation planning, and urban design. The purpose of Complete Corridors is to design a public ROW that supports all modes of travel (cars, transit, pedestrians, cyclists, etc.) which also helps people of all ages and abilities travel within the Region. While roads generally serve transportation functions, the Complete Corridor concept also supports placemaking through design. This corridor best resembles the ‘Urban General – Wide’ typology. Complete Streets principles are incorporated into the road cross section through selection of appropriate roadway and boulevard elements based on the context of the study area. Given that not many properties front directly onto the roads in the study area, certain elements are not appropriate for this context. A key consideration in determining a ROW that also conforms with the Complete Corridors concept is the location of most developments (primarily to the west of the study area in this case), and safety and use of the study area roads (generally high traffic, high speed along the study roads). Given this context, it was most appropriate to provide a multi-use path on the west side of Montrose Road to provide a safer environment for active transportation uses. Other elements that were considered was the implementation of a raised median island for safety and a boulevard for added buffer and plantings. Section 7.11 also provides more details on streetscaping to meet Complete Streets principles.

7.2 Horizontal / Vertical Road Alignment

As the road will be widened, there will be changes to the horizontal alignment of the road. On Montrose Road, from Canadian Drive to Chippawa Creek Road, widening will primarily occur to the west of the existing roadway. On Montrose Road from Chippawa Creek Road to Grassy Brook Road, widening will primarily occur to the east of the existing roadway. On all other remaining road sections being widened, widening will occur generally equally from the centreline, i.e., on both sides of the road. Refer to Section 6.0 on the detailed determination on where widening will occur. In addition to the additional through lanes, further widening is required through certain areas to accommodate auxiliary lanes, such as left and right turn lanes.

Generally, the vertical alignment of the road will largely remain at the same elevation/grade as the existing roadway throughout the study area. Specific locations may require a slight raise in road profile to provide sufficient cover over other roadway features, such as culverts and storm sewers. The exact raise in road profile will be confirmed during detailed design.

7.3 Road Safety and Speed

As traffic increases in the area due to new commercial and residential developments, safety will be an increasing concern. To improve road safety through parts of the study area with high volumes and multiple accesses, a raised median is recommended to limit left turns. The limitation of left turns helps to reduce the risk of collisions due to turning traffic, especially where there will be high volumes of oncoming traffic in opposing lanes. Medians are primarily recommended near Niagara Square where there are multiple commercial accesses with high volumes of traffic due to the commercial uses in the area. The existing alignment of Montrose Road in an ‘s’ shape also creates safety concerns for sightlines, as it can be difficult to see oncoming traffic around the bends. A median is also proposed in the vicinity of the South Niagara Hospital, at intersections, and along Lyons Creek Road, due to the proximity of the QEW interchange to the southbound left turn lane at the Montrose Road and Lyons Creek Road intersection.

The posted speed limit of the study area roads was also reviewed given the changing context of the area and the proposed improvements. The recommended posted speed limits were projected to the years 2026 and 2041 (**Table 37**), as those are the same horizon years considered under the traffic assessment. In some cases, an interim posted speed limit was recommended for 2026 to reflect the changing and anticipated build out of the adjacent lands (i.e. areas may not be fully developed but growth is occurring). The timing for the posted speed changes can be adjusted based on the timing of growth.

TABLE 37: RECOMMENDED POSTED SPEED LIMIT CHANGES

| | Existing Posted Speed | 2026 Posted Speed | 2041 Posted Speed |
|--|-----------------------|-------------------|-------------------|
| Montrose Road | | | |
| McLeod Rd – Canadian Dr | 50 | 50 | 50 |
| Canadian Dr – Chippawa Creek Road | 60 | 60 | 60 |
| Chippawa Creek Rd – Reixinger Road | 70 | 70 | 60 |
| Reixinger Road – Lyons Creek Road | 80 | 70 | 60 |
| South of Lyons Creek Road | 80 | 80 | 80 |
| Biggar Road / Lyons Creek Road | | | |
| Crowland Road – West Hospital Entrance | 80 | 80 | 80 |
| West Hospital Entrance – Dell Road | 80 | 60 | 60 |
| East of Dell Road | 80 | 70 | 70 |

7.4 Intersections and Accesses

Through the EA study, existing intersections were reviewed for the opportunity to make improvements and new intersections were assessed based on traffic needs or needs of the property owner. A signal warrant analysis was completed as part of the DTA for all unsignalized intersections, which only recommended signalizing the Lyons Creek Road intersection at the QEW FEB off-ramp. However, while some unsignalized intersections do not meet the warrants for signalization in 2041, it is noted that there are excessive delays for the traffic from the “minor” street and there will be an increase in active transportation and transit use. Therefore, it is recommended that provision for signals be provided at some of these intersections and actual traffic volumes should be monitored to facilitate installation of signals, when or if needed; this is identified in **Table 38** as “Potential Future Signals”. Additionally, through discussions with MTO, due do delays noted for the northbound left turn lane at the QEW Toronto-bound Off-ramp, the intersection should be signalized as well. A summary of the proposed intersection improvements are included in **Table 38**.

TABLE 38: SUMMARY OF PROPOSED NEW INTERSECTIONS AND INTERSECTION IMPROVEMENTS

| Intersection | Proposed Changes |
|------------------------------------|---|
| Niagara Square Drive | Replace existing signals with a three-legged roundabout. A traditional roundabout design could function and operate efficiently. A turbo design was also considered to reduce weaving in or shortly out of the roundabout for access to adjacent properties. The roundabout design will be confirmed in detailed design. (see Figure 9) |
| Brown Road | Potential Future Signals |
| Oakwood Drive | Potential Future Signals |
| Grassy Brook Road | Potential Future Signals |
| Reixinger Road | New signalized intersection and extension of Reixinger Road west of Montrose Road to allow for a northern connection into the South Niagara Hospital site. This extension also supports a future local road to access the Grand Niagara Secondary Plan area. |
| Hospital access on Montrose Road | New signalized intersection |
| Montrose Road and Lyons Creek Road | Existing traffic signals will be maintained and upgraded to suit the widened roads (see Figure 10). |
| Hospital access on Biggar Road | New signalized intersection |
| Willodell Road | Left turn lane added on Lyons Creek Road, physical barrier restricting left turns from Willodell Road onto Lyons Creek Road, slight realignment to the west |
| QEW Fort Erie-bound Off-ramp | New signalized intersection warranted by 2026 (see Figure 11) |
| QEW Toronto-bound Off-ramp | New signalized intersection not warranted but will be included based on excessive delays to the northbound left turn and discussion with MTO (see Figure 11) |

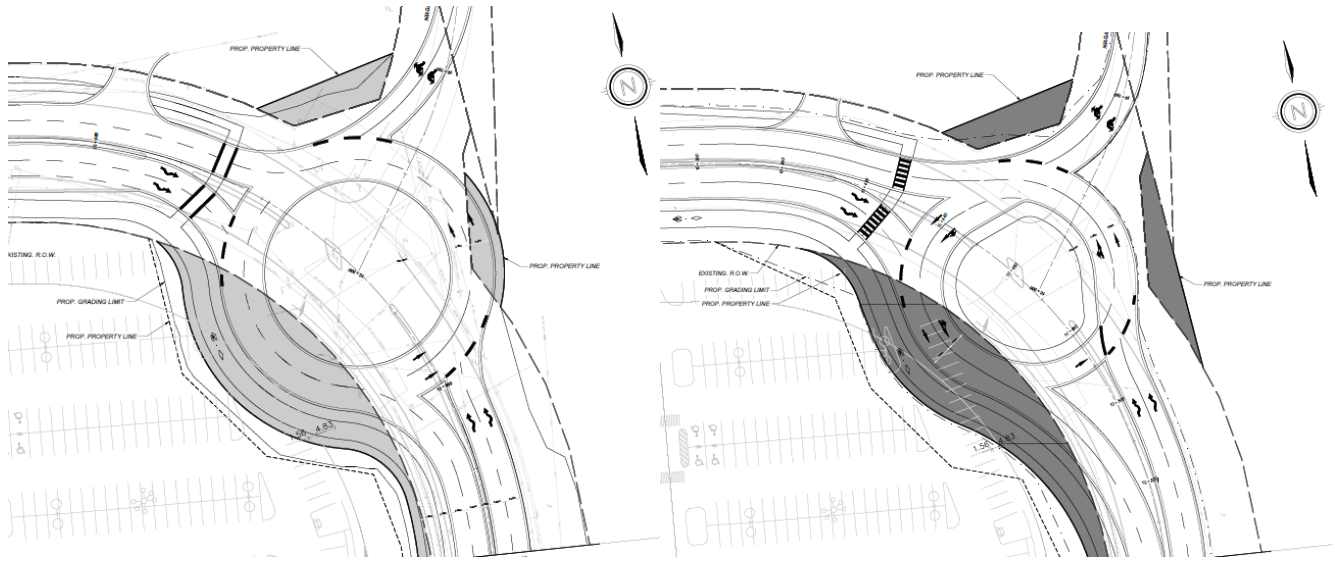


FIGURE 9: PROPOSED ROUNDABOUT AT NIAGARA SQUARE DRIVE (TRADITIONAL - LEFT, TURBO - RIGHT)

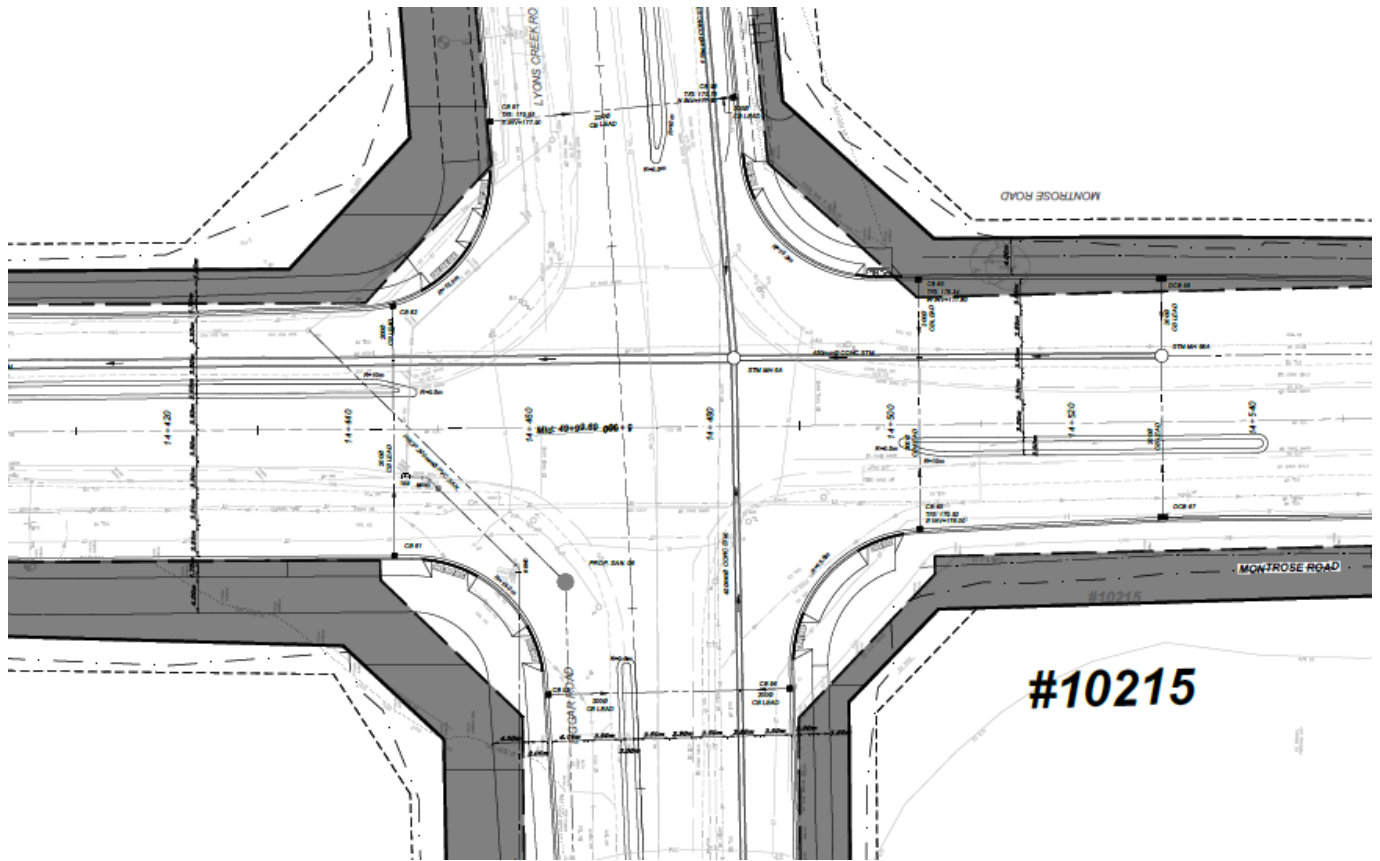


FIGURE 10: WIDENED AND IMPROVED MONTROSE ROAD / LYONS CREEK ROAD INTERSECTION

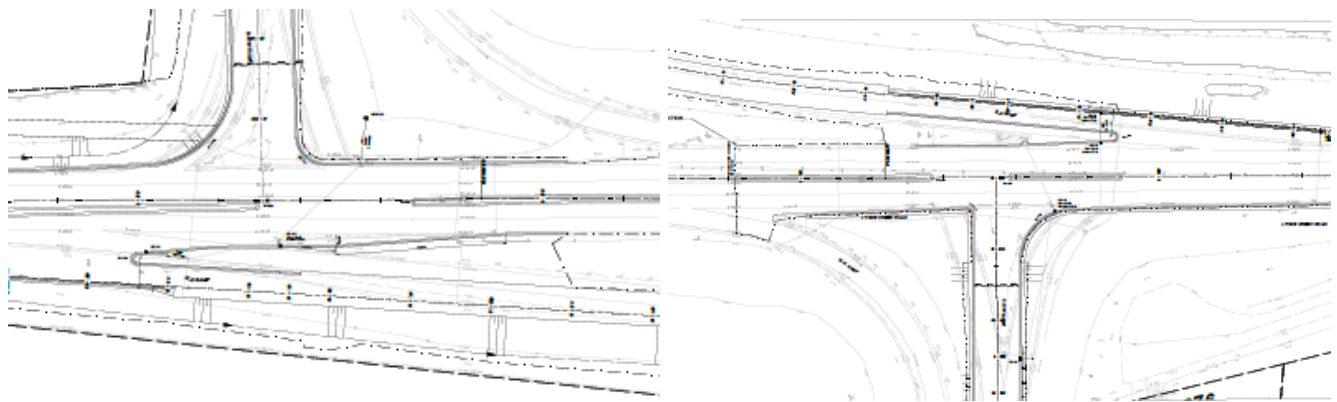


FIGURE 11: QEW RAMP TERMINAL INTERSECTIONS

Existing and potential future private / commercial accesses were also reviewed. The recommended design results in changes to some accesses, including limiting turning movements or relocation of the entrance. Where these impacts occurred, property owners were contacted, advised and consulted with. On the study area design roll plans, some accesses are shown in dashed lines and represent accesses that will be confirmed through detailed design at a later date or through the site plan approval process.

7.4.1 ACCESS MANAGEMENT

In line with the Region's access management policy, a 2.0m raised median island has been recommended effectively ensuring that left turn movements are not facilitated where safety and access concerns have been identified. Left turns will only be allowed at controlled public road intersections. A raised median is recommended along Montrose Road from McLeod Road to Chippawa Creek Road, and from north of Reixinger Road to Lyons Creek Road/Biggar Road. On Montrose Road between Chippawa Creek Road and Reixinger Road, a continuous two-way left turn lane is being recommended in order to maintain the access levels to individual lots that do not have alternate left turn access. A raised median is also recommended along Lyons Creek Road and along the frontage of the hospital site on Biggar Road. Niagara Region will review future site plan applications and related accesses in accordance with the current standards.

7.4.2 REIXINGER ROAD EXTENSION

In discussions with the City of Niagara Falls, Niagara Health, and the property owner, Reixinger Road will be extended west of Montrose Road as a local road for approximately 125m. The intersection will be signalized.

In the interim, the Reixinger Road extension will serve as an entrance to the northern portion of the South Niagara Hospital. The hospital will have an access road off of the Reixinger Road extension connecting into its internal site circulation roads. Reixinger Road will have a roundabout at the entrance to the South Niagara Hospital to facilitate snow maintenance vehicles turning and to maintain entering access to the hospital lands without backing up onto Montrose Road. The design is shown in **Figure 12**.

In the long term, the Reixinger Road extension aligns with the goals of the Grand Niagara Secondary Plan and will effectively become what is "Street B" in the plan. Reixinger Road will be further extended west in the future when the road layout of the Grand Niagara Secondary Plan is developed.

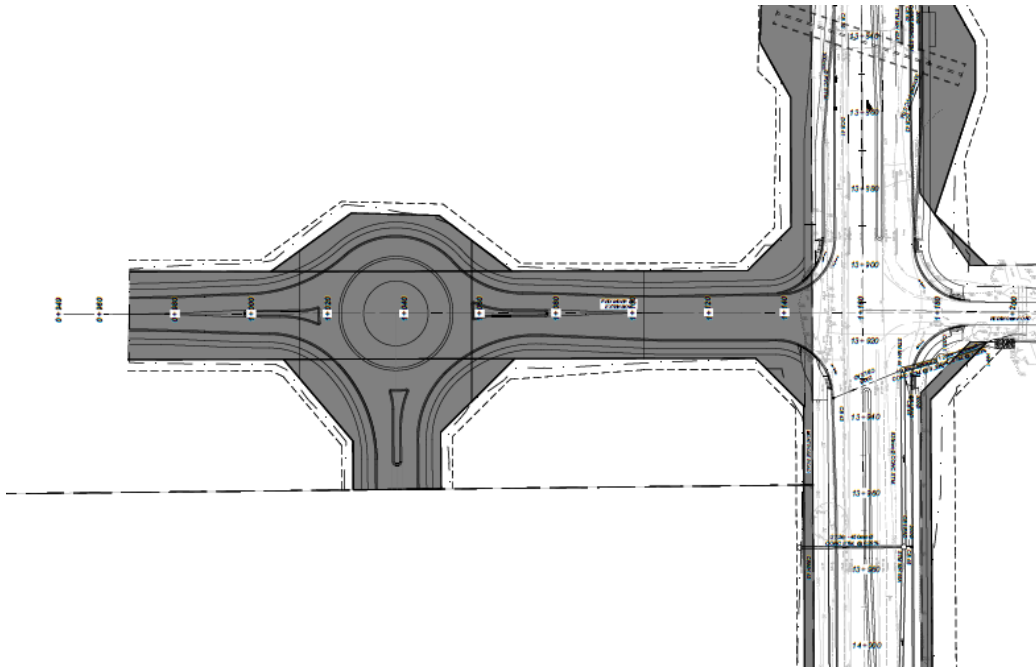


FIGURE 12: PROPOSED DESIGN OF THE REIXINGER ROAD EXTENSION

7.4.3 WILLODELL ROAD INTERSECTION

Willodell Road is an existing municipal road which is located approximately 180m west of the QEW west ramp terminal. Proposed changes to Willodell Road at Lyons Creek Road include implementing a westbound left turn lane on Lyons Creek Road into Willodell Road, restricting left turns out from Willodell Road, and shifting the intersection by approximately 20m to the west in order to accommodate revised turning radii. A previous recommendation included implementing a median on Lyons Creek Road that would restrict the Willodell Road intersection to a right-in right-out only configuration. However, through considerable feedback from the public and in consultation with MTO and the City of Niagara Falls, the current recommendation (**Figure 13**) was developed to balance access, safety, and transportation needs.

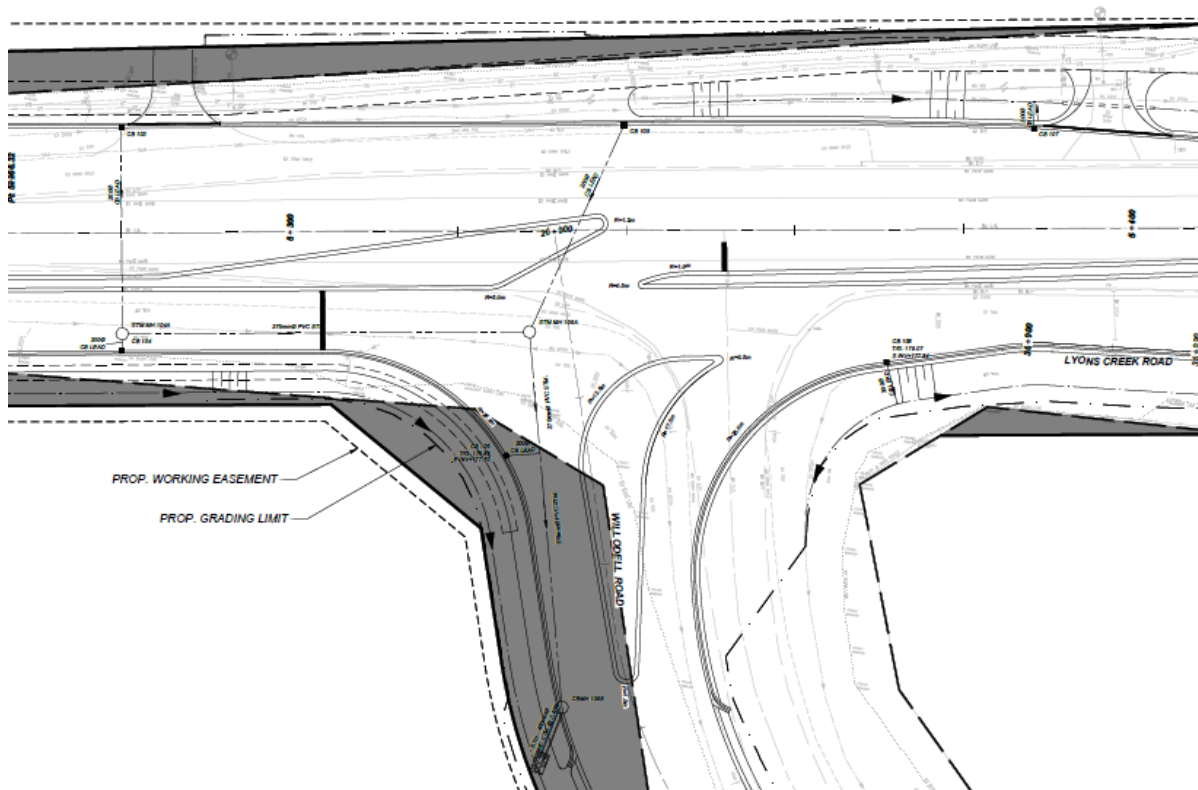


FIGURE 13: WILLODELL ROAD INTERSECTION DESIGN

These changes were recommended due to the proximity of the intersection to the QEW Fort Erie bound (FEB) off-ramp and concerns with the potential for westbound traffic potentially impacting the west ramp terminal traffic operations. A sensitivity analysis was undertaken to determine the westbound traffic demand and when the queue in the westbound turning lane will potentially start interfering with the QEW FEB Off-ramp at Lyons Creek Road. Based on the analysis, it was determined that a maximum left turning vehicle queue length would be 21m in the 2041 PM peak hour (which was the worst case scenario for the turning movements at this intersection). As such, a dedicated turn lane with a storage length of 75m for westbound left turning traffic is sufficient to accommodate queuing traffic. The left turn movement from Willodell Road will be restricted to reduce additional conflicting movements and improve safety and reduce queues. A left turn from Willodell Road would require drivers to traverse two eastbound lanes of Lyons Creek Road and the left turn lane from Lyons Creek Road. Given the anticipated high traffic volumes in both directions and the higher operating speeds in this area, this movement is considered to be difficult for drivers to manage safely. It should be noted that should the left turns from Lyons Creek Road to Willodell Road experience significant delays, the option to install one-directional (eastbound) traffic signals to allow for protected left turns into Willodell Road may be implemented by Niagara Region. These traffic signals would not impact westbound through traffic on Lyons Creek Road.

The current recommendation (i.e. allowing all movements except for turning left-out from Willodell Road) is acceptable from a traffic operations perspective based on the existing land use conditions, which include the lands south of Lyons Creek Road being generally outside of the City of Niagara Falls urban boundary, and that no future development is currently envisioned for these lands that would increase traffic using the left turning lane. The City also indicated that there are no plans to

revise the proposed land uses and the Official Plan in this area in the foreseeable future. The recommended intersection design accommodates for the majority of the traffic movements, particularly to and from the QEW, however any traffic that would be traveling northbound on Willodell Road and intending to turn left on Lyons Creek Road would have to detour using Carl Road and Montrose Road. However, it is anticipated that very few vehicles (less than 10 vehicles per hour during the 2041 peak hour) would be making the left-out from Willodell Road so only a small number of vehicles are being detoured.

However, it is recognized that this situation could change due to the development of the new South Niagara Hospital and other proposed development north of Lyons Creek Road, including the following scenarios:

- a development proposal consistent with the *Planning Act* is filed for the lands immediately north of Lyons Creek Road between the QEW and Montrose Road; or,
- a determination by the City of Niagara Falls that the Official Plan is to be amended to revise the proposed land use in the area south of Lyons Creek Road, east of Montrose Road and west of the QEW.

Development under the *Planning Act* of sufficient size to require a traffic study, or other applicable process such as a Secondary Plan or Municipal Class EA, will require analysis of the impact of the proposed development or changes to the land use and review impacts to the Lyons Creek Road and Willodell Road intersection and the extent of those impacts on the traffic operations of Lyons Creek Road at the QEW interchange ramp terminals. Should that analysis identify safety and operational concerns at the QEW interchange ramp terminals resulting from the proposed land use changes, the City of Niagara Falls and Niagara Region will recommend optional solutions to the Willodell Road intersection in cooperation with the triggering application and the MTO in order to address the operational concerns. A Memorandum of Understanding is in the process of being developed and agreed to with MTO.

City of Niagara Falls Council also provided council resolution supporting a traffic signal at the Lyons Creek Road and Willodell intersection. However, as the existing recommended design for the Willodell Road intersection addresses transportation and traffic requirements, and has been accepted by MTO, the EA recommendation is not changed. Future signals at the intersection can be explored through other means, such as through site plan review or a separate study.

7.5 Active Transportation

Active transportation will be accommodated throughout the study area through a 3.0m to 4.0m wide two-way Multi-Use Path (MUP) on the west side of Montrose Road and the north side of Biggar Road and Lyons Creek Road. The MUP is best suited to the west side of Montrose Road as it provides access to existing and future residential and commercial developments and the QEW generally parallels Montrose Road along the east side cutting off any access to lands along the east perimeter of the right-of-way. Coordination with Niagara Health regarding the MUP and sidewalk in front of the hospital should continue in order to determine what coordination and interfacing is required.

The MUP along the hospital frontage along both Montrose Road and Biggar Road should be designed to a 4.0m width to accommodate a higher level of both pedestrian and bicycle traffic. In addition, from McLeod Road to Canadian Drive along Montrose Road, the MUP should be designed to a 4.0m width due to potential for growth of bicycle and pedestrian traffic. Along the remainder of Montrose

Road and along Lyons Creek Road, a minimum 3.0m wide MUP should be installed as the volumes of pedestrian and bicycle traffic would be expected to be lower. During detailed design, the width of the MUP within this latter section should be reviewed to determine if a Desired Width of 3.5m, based on OTM Book 18, can be accommodated.

OTM Book 18 recommends that the desired buffer width between the back of the curb and the MUP be between 1.5m and 2.5m for a two-way MUP on a roadway with a posted speed limit of ≤ 60 km/h. This dimension is recommended for the entire study area and the ROW width has been developed to accommodate a buffer width between 1.5m and 1.75m. While the section of Montrose Road from Grassy Brook Road to Biggar Road will be initially posted at 70km/h, the posted speed on this roadway section is to be reduced to 60km/h once significant development begins to occur in this area therefore consideration of placing the MUP outside the Clear Zone is not being recommended here.

As the MUP is being planned as a two-way combined facility that will accommodate both bicycles and pedestrians, it is important to provide user guidance and reminders of the need to share the facility and allow for oncoming traffic. It is recommended that a yellow centreline be applied throughout the MUP in order to provide this guidance. As the MUP vertical alignment is generally quite flat throughout the study corridors, a dashed yellow line would be sufficient along with other markings as recommended in OTM Book 18 such as white bicycle symbols, pedestrian symbols and white directional arrows.

A 1.8m sidewalk is proposed on the east side of Montrose Road between Baden Powell Park and Lyons Creek Road, as it would provide connection to the existing recreational park space and future developments. As this portion of the road will be constructed in advance of future developments, sidewalks will only be implemented where there are future transit stops in order to facilitate safe pedestrian movements to a controlled crossing. Future continuous sidewalks to support development will be implemented through the development approval process.

At the roundabout proposed at Niagara Square Drive / Montrose Road, a dedicated Level 2 pedestrian crossover with flashing beacons, which can be activated by pushing a button, is to be implemented to the west of the roundabout. This crossing will support access to Niagara Square for any pedestrians coming from the Chapel Heights seniors' residence or from the north / east of the study area. The design of the pedestrian crossover, including pavement markings, signage, and lights, should follow design standards from the Ontario Traffic Manual (OTM) Book 15 and Book 18.

7.6 Transit

The opportunity to widen and improve the roads in the study area is also an opportunity to incorporate transit infrastructure, primarily bus bays, bus stops, and sidewalks to access the stops. Bus stop locations were determined in consultation with Niagara Region and City of Niagara Falls Transit groups. New bus stops are proposed at the following locations in both the northbound and southbound directions, unless otherwise indicated, and will be confirmed with the needs of local and regional transit systems during detailed design:

- Blackburn Parkway
- Reixinger Road
- New signalized intersection of hospital off Montrose Road (northbound only)

- Montrose Road / Lyons Creek Road (southbound in the right turn lane)
- Service to South Niagara Hospital (either via an on-site transit hub on the hospital lands or directly on Montrose Road)

No transit stops are proposed on Biggar Road or on Lyons Creek Road.

At Blackburn Parkway, traffic signals will not be required to provide intersection control. As a result, in order to accommodate pedestrians crossing from the bus stop on the east side of Montrose Road, a Level 2 Pedestrian Crossover should be installed to provide a controlled pedestrian crossing in this area.

7.7 Montrose Bridge over the Welland River

To accommodate the future widening of Montrose Road to four through lanes, the existing Montrose Road bridge over the Welland River will need to be widened. The proposed widening will incorporate the following elements:

- 4 x 3.5m driving lanes
- 1.5m shoulders in both directions
- 5.5m raised median
- 3.5m Multi-Use Path on the west side of Montrose Road
- 0.5m buffer between the MUP and the parapet wall
- 1.0m buffer between the MUP and the curb at the driving lanes
- 0.39m parapet walls

The bridge horizontal alignment requires that the bridge match the proposed Montrose Road layout at the Oakwood Drive intersection which is characterized by the widening being all to the east of the existing road and includes the proposed 3.0m left turn lane and 2.0m raised median island. These latter two elements cause the need for a 5.5m wide raised median on the bridge itself.

The bridge widening is also restricted to be only on the east side of the existing bridge due to the proposed new Niagara Region sanitary sewer trunk main that is planned to be constructed along the west side of the existing Welland River bridge crossing.

Consideration was given to whether to widen the existing bridge to accommodate all lanes or to build a second separate bridge for the northbound lanes. It was determined that the existing bridge would require widening in order to accommodate the MUP. Given the additional shoulder requirements for two separate structures, the cost of a single structure is not significantly higher and a single structure provides flexibility for traffic staging in future years when the widened bridge will require rehabilitation. Therefore, the bridge will be widened to the east to create a single structure. The widened portion of the bridge will match the existing bridge as a semi-integral CPCI slab on girder bridge with four spans and 3 piers in the water.

7.8 Drainage and Stormwater Management (SWM)

As part of the road improvements for the study area, the new roads will be widened and constructed as an urban cross section, meaning that road drainage will be collected via curbs and gutters, directed into catchbasins, where storm sewers will direct water to outlets throughout the study.

The storm sewer system was designed based on the City and the Region’s design criteria to collect and convey the 5-year storm and considers the worst climate change scenario for the year 2070 (design service life of the project). The drainage system will follow the existing drainage patterns and outlet to existing watercourses.

A Drainage and Stormwater Management Report was prepared and is included in **Appendix B**. For a full description of the drainage assessment and SWM strategy, refer to the report, however a brief summary is provided below.

7.8.1 STORMWATER MANAGEMENT STRATEGY

As part of the Drainage and Stormwater Management report, a SWM strategy was developed to address any water quantity and quality concerns. While the road widening will result in an increase in impervious area and runoff, it is considered negligible compared to the total subwatershed area and the peak flow rate in the receiving watercourses will not increase from existing conditions. Therefore, no quantity control is recommended.

Due to sensitivities of some of the watercourses in the area, quality control is required. NPCA has determined quality control limits based on the sensitivities of the watercourses and wetlands in the area. For areas draining to Warren Creek, Grassy Brook, the tributary of Lyons Creek, and sections of the Welland River, removal of 80% Total Suspended Solids (TSS) is required through quality control measures before the stormwater can be outletted into these watercourses (i.e. “Enhanced” Level I). For all other outlets, water quality treatment of 70% TSS reduction is required (i.e. “Normal” Level II). As such, an Oil Grit Separator (OGS) has been included in the SWM strategy to improve water quality prior to its release into the natural environment. Surface runoff from the road ROW will be captured by catchbasins and directed toward the OGS. Where feasible, flow from the OGS will be directed toward a roadside ditch prior to draining to a watercourse. OGSs were sized to treat a minimum of 90% of the average annual runoff volume and are proposed for areas greater than 0.5ha and where other stormwater quality controls are not possible. See **Table 39** for a summary of the proposed quality controls.

TABLE 39: PROPOSED STORMWATER QUALITY CONTROLS

| Outlet Location | Area (ha) | Proposed Quality Control | Required TSS Removal (%) | Provided TSS Removal (%) |
|------------------|-----------|--------------------------|--------------------------|--------------------------|
| Biggar Road | 0.585 | OGS | 70 | 79 |
| Biggar Road | 0.71 | OGS | 70 | 77 |
| Lyons Creek Road | 0.66 | Enhanced Swale | 70 | - |
| Montrose Road | 0.59 | OGS | 80 | 84 |
| Montrose Road | 0.45 | OGS | 80 | 80 |
| Montrose Road | 0.8 | OGS | 80 | 82 |
| Montrose Road | 3.65 | OGS | 80 | 82 |

7.8.2 CULVERT DESIGN

As the road is being widened, the length of the centreline culverts, which convey drainage across the road, also need to be extended to accommodate the widened road cross section. All existing rigid frame box culverts except the tributary of Lyons Creek culvert are in good condition and meet the hydraulic requirements.

Based on this recommendation, this undertaking provided an opportunity to replace the tributary of Lyons Creek culvert with twin 3000 x 1500 mm box culverts. This improves its structural condition and service life, and provides an opportunity to increase the size of the culvert to improve hydraulic capacity. In reviewing the watercourse channel, the design also recommends skewing the culvert to improve the tie-in angles at the downstream end of the culvert (i.e. changing the angle from a 90-degree turn to a smoother transition) though the culvert will remain in roughly the same location. The new twin cell culvert will be constructed in two longitudinal halves. Construction of these two halves of the culvert will be undertaken concurrent with the traffic staging for the roadway construction and will require a temporary water bypass system to manage flows during construction. The culvert should also be designed with a low flow channel to address fish passage concerns as the watercourse is identified as an important fish habitat by NPCA.

In addition to the rigid frame box culverts, there are three existing pipe culverts that are proposed to be replaced as they are either eroded or do not meet the minimum size requirement.

Table 40 provides a summary of the design recommendations at each culvert. For fisheries impacts related to works at the culverts, refer to Section 8.3.

TABLE 40: SUMMARY OF CULVERT RECOMMENDATIONS

| N o. | Name | Type | Span x Rise (mm) | Proposed Length (m) | Embedment (mm) | Proposed Action |
|------|---------------------------------------|------------------------------------|----------------------------|---------------------|----------------|---|
| 1 | Tributary of Warren Creek Culvert | Open Footing Rigid Frame Box (RGB) | 1200 x 1500 | 44.6 | - | Extension |
| 2 | Warren Creek Culvert | Open Footing RGB | 5500 x 2100 | 43.6 | - | Extension |
| 3 | Drainage (north of Chippawa Creek Rd) | Open Footing RGB | 1200 x 1200 | 42.8 | - | Extension |
| 4 | Drainage (South of Welland River) | CSP/HDPE | 800 | 39.9 | - | Replacement |
| 5 | Grassy Brook Culvert | Box Culvert | 3000 x 2100 2400 x 1800 | 41.4 | 300 | Extension |
| 6 | Lyons Creek Tributary Culvert | Box Culvert | 3000 x 1500 3000 x 1500 | 45.1 | 300 | Culvert Replacement with twin box culverts |
| 7 | Drainage (on Biggar Road) | CSP/HDPE | 800 | 35.0 | 200 | Replacement and upsize, embed to avoid cover issues |
| 8 | Drainage (South of Lyons Creek Road) | HDPE | 450 | 23.0 | 350 | Replacement and upsize, embed to |

| | | | | | | |
|--|--|--|--|--|--|--------------------|
| | | | | | | avoid cover issues |
|--|--|--|--|--|--|--------------------|

7.9 Utilities and other Municipal Services

Utilities were consulted with during the study to coordinate providing utility connections to the hospital and to communicate relocation needs and design.

In addition to the existing dry utilities identified in Section 3.4, Rogers and Telus will also be installing their plants within the study area to service the South Niagara Hospital site. Utility relocation is required for all existing utilities.

The project team consulted with the City in designing the new watermain on Montrose Road and Biggar Road.

The project team also worked with Niagara Region to coordinate on the South Niagara Falls Wastewater Treatment Plant (SNFWWTP) project as a sanitary sewer is proposed, originating from east of the QEW, westerly along Reixinger Road, and then running north on Montrose Road on the west side. Coordination included discussing proposed shaft locations, identifying the road right-of-way, and project timing.

7.10 Illumination

Street lighting is required throughout the study area and can be implemented in the median or along both sides of the road. Lighting should be designed according to the Region and City’s street lighting standards. Street light design and spacing will be explored further during detailed design.

7.11 Streetscaping

Landscaping and vegetation planting opportunities exist in the boulevards and in the centre of the roundabout. A landscape plan will be prepared in detailed design that incorporates landscaping and streetscaping elements, which gives consideration to the public realm, safety, and aesthetics for all users of the roadway, including pedestrians and cyclists. Landscaping should also consider the Region’s Complete Streets Design Guidelines, which includes guidelines on relevant elements of this study, such as the Planting Zone, Edge Zone, Multi-use Path, Low Impact Development (LID), Transit Facilities, and Lighting.

Ongoing conversations are required with Niagara Health to develop the northwest quadrant of the Montrose Road and Lyons Creek Road / Biggar Road intersection as that is a gateway into the South Niagara Hospital. Special considerations for this corner include visual and aesthetic features and plantings.

7.12 Construction Staging

There will be three general phases of construction staging that vary depending on whether the widening is occurring on both sides of the road or all to one side only.

Where widening is occurring on either side of the existing road centreline, construction must occur on both sides of the road and the existing lanes must also be reconstructed. In this instance, traffic will generally be maintained on the existing lanes during the first phase and the road bed will be widened to one side of the existing road. Upon completion of that widening, the two live traffic lanes will be switched over to the newly constructed roadbed.

The second phase involves redirecting live traffic to the new lanes constructed in the first phase so that two lanes of traffic (one per direction) can be maintained. In this second phase, the road bed will be widened on the opposite side of the existing road centreline and any additional reconstruction work on the existing lanes will also be undertaken.

Where widening will occur on only one side of the existing road, construction of the widened road bed will occur only on one side of the road and the existing lanes must also be reconstructed. In this instance, traffic will generally be maintained on the existing lanes during the first phase and the full road bed widening will be constructed on the one side of the existing road. Upon completion of that road bed widening and paving, the two live traffic lanes will be switched over to the newly constructed roadbed.

The second phase involves redirecting live traffic to the new lanes constructed in the first phase so that two lanes of traffic (one per direction) can be maintained. In this second phase, the existing road will be reconstructed.

Throughout these two phases there will be sub-phases that allow for the construction of underground infrastructure such as sewers and culverts. This construction will be undertaken within the context of the two general stages noted above, regardless of the widening scenario.

The third and final construction phase will be to complete the median island construction, lighting and surface course paving. This is accomplished utilizing the entire new road bed to move the two live lanes of traffic using construction delineation barrels to direct traffic appropriately.

Existing entrances and crossing road intersections will all be maintained during construction so that road users may access these entry/exit points from the roadway. Where entrances may be impacted significantly (temporarily closed), the property owners will be notified in advance of the timelines for the construction so that arrangements can be made by the owners. In these instances, efforts will be made to stage works to minimize access impacts, if at all possible and construction is expedited so that the inconvenience is minimized.

The exact traffic staging will be designed in the detailed design phase of the project.

7.13 Preliminary Cost Estimate

A preliminary high-level construction cost estimate was developed for the study area and has been split into the following sections:

| <u>Section:</u> | <u>Cost Estimate</u> |
|---|----------------------|
| Montrose Road (McLeod Road to Grassy Brook Road) | \$28.1M |
| Montrose Road (Grassy Brook Road to south of Biggar Road) | \$13.7M |
| Lyons Creek Road and QEW Ramps | \$6.0M |
| Biggar Road | \$6.0M |

8.0 Impacts and Mitigation Measures

8.1 Transportation Environment

Construction of the preferred design could have potential impacts on the transportation environment, particularly impacts to traffic flow and patterns along Montrose Road, Biggar Road, and Lyons Creek Road. A traffic management plan / construction staging plan will be developed during detailed design to minimize impacts to traffic and access, where possible. Where there are permanent changes or impacts to accesses, the property owner should be consulted.

Emergency service providers were contacted during this EA study, but should be contacted again prior to and during construction to make sure they are aware of the proposed construction staging scheme and the potential traffic disruptions resulting from construction.

The *Canadian Navigable Waters Act* (CNWA) applies to all navigable waterways in Canada. Although no watercourses in the study area are on the Schedule of Navigable Waters, the Welland River is considered a navigable waterway and is subject to the provisions of the CNWA. The construction of a new bridge over the Welland River would be considered as Major Works and require approval under Transport Canada's Navigation Protection Program. An application to obtain authorization for works on the Welland River should be obtained prior to construction.

There is one CPR crossing within the study area, just south of the Welland River on Montrose Road. The road widening design will have impacts to the crossing and further discussions with CPR should be carried out during detailed design.

8.2 Socio-Economic Environment

8.2.1 PROPERTY REQUIREMENTS

Due to widening of the road right-of-way, Niagara Region must acquire permanent property from adjacent properties in order to construct the widened road right-of-way, which includes travel lanes, boulevards, sidewalks and the multi-use path, street lighting poles, and other utilities. Where possible, efforts were made to minimize the amount of property required. The property required is shown in the design drawings in **Appendix G**.

Where property is required, compensation will be provided to the property owner based on appraisals completed by the Region. At this point, other commitments or requirements will be detailed in an agreement with the Region for other impacts.

In order to construct the road, there will also be temporary property impacts to grade the new constructed road back into the existing grade of the property. The lands required for grading will not be acquired by the Region, but temporary access for construction to complete the grading will be obtained through a Permission to Enter (PTE) / Construct agreement with the individual property owner.

PTEs may also be required for any other reason for access onto lands not owned by the Region. For works in the MTO right-of-way, an MTO Encroachment Permit is required.

8.2.2 ACCESS

Due to the need for medians associated with safety, access management and intersections, there are some permanent impacts to access for individual properties. All properties will still have access in and out to their property but may not have full movement access (i.e. access from all directions).

During construction, access may be restricted or limited temporarily while the roadway is being built. Efforts will be made to maintain access and to reduce the length of time accesses are being impacted. The contractor will be required to advise residents and businesses when access to their property will be impacted in advance.

8.2.3 AIR QUALITY

During construction, air quality can be temporarily degraded due to dust and/or emissions from construction activities and equipment. Activities include vehicular traffic in open construction areas, dust from storage piles, unloading materials, particularly during strong winds, and the operation of construction equipment. The following measures are recommended to mitigate the air quality impacts of construction:

- Keep construction machinery and equipment in good operation condition.
- No unnecessary idling of vehicles and limit the speed of vehicular travel through the construction site.
- Dust suppressant measures are to be used to reduce dust emissions, when appropriate.
- Regular cleaning of the construction site, access roads, and construction vehicles to remove construction-caused debris and dust.
- All haul equipment should be covered when hauling fine-grained materials.
- Stockpiles of fine-grained materials should be covered and stabilized, particularly during dry or windy periods.

8.2.4 NOISE IMPACT

There will be temporary noise impacts as a result of construction work, however the magnitude of the impacts will vary greatly throughout the construction period. The following measures are recommended to mitigate the noise impacts of construction:

- Limit noise construction activities to daytime hours, where possible.
- Where work is required outside of regular daytime work hours, the contractor should try to minimize the noise being generated. For works taking place outside of the hours permitted by the local noise by-law, an exemption should be obtained from the local municipality.
- Equipment should be properly maintained and in good operating condition and comply with MECP NPC-115 guidelines.
- If complaints regarding construction noise arise, the contractor must investigate and verify that the noise control measures agreed to are in effect. In the presence of persistent noise complaints, alternative noise control measures may be required.

8.3 Natural Environment

8.3.1 VEGETATION

Vegetation clearing and encroachment of vegetation communities, including the PSWs and significant woodlands will be required for the new road alignment, intersection improvements and drainage improvements. The design has been selected to minimize encroachment of natural features, where possible, or limited to edge habitat only.

Potential impacts related to encroachment include: loss of vegetation and habitat; alteration of habitat due to soil compaction; damage to edge trees (e.g., root zone, windthrow); changes in hydrology and moisture regime; fugitive dust suppression; salt spray effects; introduction and spread of invasive species; erosion and sedimentation; and accidental spills.

The following recommendations are provided to minimize potential effects to vegetation and vegetation communities:

- maintain existing drainage pathways and flow regimes during and post-construction;
- install surface protection measures to minimize soil compaction;
- demarcating the work zones to ensure work remains within the construction limits;
- implement an invasive species management plan and follow the Best Management Practices (BMPs) developed by NDMNRF, Ontario Invasive Plant Council (OIPC) and the Clean Equipment Protocol for Industry (Halloran et al., 2013);
- prior to construction, areas with Phragmites should be treated to prevent the spread of seeds;
- implement dust control measures for the suppression of fugitive dust;
- implement standard BMPs for erosion and sediment control; and,
- implement an emergency and response management plan to address the potential for spills.

8.3.2 TERRESTRIAL WILDLIFE AND WILDLIFE HABITAT

Encroachment of natural features is expected to be limited to edge habitat only but may result in permanent and temporary loss of SAR habitat (i.e., bats), candidate and confirmed SWH and generalized wildlife habitat. Temporary disruption and avoidance of habitat may also occur during construction due to construction noise, lighting and increased human presence. While most wildlife that occur along highway corridors are likely adapted, to some extent, to anthropogenic disturbances such as traffic noise and artificial light, excess or prolonged disturbances can cause impacts beyond tolerance levels.

The following recommendations are provided to minimize potential effects to wildlife and wildlife habitat:

- Implement timing restrictions with activities to occur outside of sensitive periods:
 - To avoid impacts to breeding birds protected under the *Migratory Birds Convention Act*, vegetation removal should occur between September 1 and March 31 in any given year.
 - To avoid impacts to bats protected under the *Endangered Species Act*, removal of potential bat roosting trees is not permitted during the active season (i.e., April 1 to September 30) unless authorized by MECP.
- Where vegetation removal is required during the breeding bird window (April 1 to August 31), a nest sweep is required to confirm there are no nests. If nests of a species protected under the MBCA, SARA or ESA (i.e., SAR) are present, works will not be permitted until the young have fledged and/or approval is provided by MECP for SAR. A setback from the nest (e.g., 30 m) should be determined by a qualified biologist and the area demarcated to ensure work does not occur within the setback limits

- Installation of bat boxes is also recommended to minimize impacts to bats during construction, specifically in areas where bat habitat was identified;
- Exclusionary measures should be installed at all structural culverts prior to April 1 to prevent bird nesting;
- If Barn Swallow nests are observed at any of the culverts and work has the potential to impact the species or the nest, the activity will need to be registered under O. Reg. 242/08 and a mitigation plan prepared.
- If turtles or snakes are encountered during construction (including hibernacula), work should be temporarily suspended until the species is out of harm's way. If a hibernacula site is discovered, all work must cease and a Qualified Biologist should be contacted to discuss mitigation options.
- If necessary, visual inspections and wildlife monitoring will be required where exclusionary measures have been installed and where wildlife activity has been noted.
- Wildlife protocols should also be developed to educate workers of potential wildlife occurrences, including SAR, and measures to take in the event of potential encounters. Preventative measures to minimize encounters, injury and incidental take should also be provided;
- Where feasible, minimize the extent and duration of construction noise and lighting between April 1 to September 30.

8.3.3 FISH AND FISH HABITAT

To accommodate the widening of Montrose Road to four lanes, the existing bridge / culverts within the corridor will require extensions to allow for the additional lanes and embankment grading. The proposed works which have potential to impact fish and fish habitat include culvert extensions, culvert replacements, channel realignments and bridge works including construction of new in-water piers. Generally, wherever possible, construction activities associated with in-water works should be conducted in dry conditions in order to minimize impacts to aquatic resources and fish habitat. These works should be completed within the permitted in-water timing window from July 1st – February 28/29th as provided by NDMNRF to avoid the critical spawning, rearing and migration periods for fish.

Proposed works are not anticipated to result in the death of fish if mitigation measures are implemented, however there is potential that some construction activities may result in the Harmful Alteration, Disruption or Destruction (HADD) of fish habitat. Project works deemed to likely result in a HADD of fish habitat may require submission to DFO for further project review under the Fisheries Protection Provisions of the *Fisheries Act*. The following describes impacts and mitigation measures at each fisheries watercourse crossing.

Unnamed Tributary of Warren Creek

The proposed road widening will result in culvert extension to the east and west of the existing culvert for the Unnamed Tributary of Warren Creek with an increased culvert length from 26.8 m to 43.8 m and will result in direct impacts to the watercourse through the increase in culvert footprint area and the permanent alteration of fish habitat from open stream habitat to closed habitat. However, the watercourse has been identified as indirect fish habitat and it is anticipated that the proposed works should have negligible effect on the habitat and the contributions to fish habitat downstream provided appropriate environmental protection and sediment/erosion controls are implemented, continually monitored, and used effectively during construction.

Warren Creek

The proposed road widening will result in a 20 m extension to the west of the existing Warren Creek non-rigid frame open foot culvert. The culvert extension will result in the permanent alteration of direct fish habitat which supports a warmwater bait/forage fish community including Grass Pickerel and contributes to potential SAR mussel habitat downstream. The Warren Creek channel west of Montrose Road will be realigned further west to accommodate widening and embankment works. These works will result in the destruction of fish habitat due to the removal of the existing channel and the creation of new fish habitat at the new realigned channel location. It is recommended that the new channel be designed and constructed following natural channel design principles including low flow channel and natural substrates and incorporate fish habitat features. The proposed culvert extension work and channel realignment work will impact slow moving areas of the watercourse with submergent vegetation which provides suitable spawning and nursery/rearing habitat for Grass Pickerel. The proposed culvert extension and channel realignment works have the potential to result in a HADD of fish habitat and may be subject to approval under the federal *Fisheries Act*.

Welland River

The proposed new bridge over the Welland River will include new in-water piers and require infilling of the Welland River for the new bridge embankments. The construction of in-water piers will result in the permanent destruction of fish habitat within the Welland River which supports a diverse warmwater fish assemblage including potential SAR mussel habitat due to the footprint area associated with the new piers. The pier construction work may negatively impact SAR mussel habitat as well as areas which provide suitable spawning, nursery/rearing habitat for Grass Pickerel. The proposed new bridge works have the potential to result in a HADD of fish habitat and may be subject to approval under the federal *Fisheries Act*.

Grassy Brook Creek

The proposed road widening will result in an extension to the east and west of the existing Grassy Brook Creek two cell concrete box. The culvert extensions will result in the permanent alteration of direct fish habitat which supports a warmwater bait/forage fish community including Grass Pickerel and has potential to provide SAR mussel habitat. These works will result in the permanent alteration of fish habitat from open stream habitat to closed habitat. The habitat within Grassy Brook Creek impacted by the culvert extensions includes slow moving run areas with submergent vegetation which provides suitable spawning, nursery/rearing habitat for Grass Pickerel. The proposed culvert extension works have the potential to result in a HADD of fish habitat and may be subject to approval under the federal *Fisheries Act*.

Unnamed Tributary of Lyons Creek

Due to the condition of the culvert and the opportunity to upsize for drainage capacity, the culvert for the Unnamed Tributary of Lyons Creek was recommended to be replaced offline with two new culverts. The culverts were skewed to follow more natural channel flow rather than requiring the channel to turn at 90 degrees at the outlets. The replacement and extension to the east and west at a new location consists of a reinforced open foot culvert and result in an increase in culvert length from 15.3 m to 45.2 m. These works will result in the destruction of fish habitat due to the removal of the existing culvert and the creation of new fish habitat at the new culvert location adjacent to the existing. The increased culvert length will result in an overall net change in habitat from open stream habitat to closed stream habitat. The proposed culvert replacement/extension work and new

channel tie-in work have the potential to result in a HADD of fish habitat and may subject to approval under the federal *Fisheries Act*.

Lyons Creek

No works are proposed for Lyons Creek. Road works associated with the QEW off-ramp to Lyons Creek Road may occur within 30 m of Lyons Creek. It is anticipated that these works can be fully mitigated through the implementation of appropriate ESC measures and measures to protect fish and fish habitat.

A summary of the proposed activities at fisheries watercourses is provided in **Table 41**.

TABLE 41: SUMMARY OF PROPOSED ACTIVITIES AT FISHERIES WATERCOURSES

| Watercourse | Proposed Design and Works | Anticipated Approvals |
|-----------------------------------|---|---|
| Unnamed Tributary of Warren Creek | Culvert Extension | DFO Request for Review |
| Warren Creek | Culvert Extension Watercourse Realignment | DFO Request for Review |
| Welland River | New Bridge | DFO Request for Review, ESA |
| Grassy Brook Creek | Culvert Extension | DFO Request for Review, ESA |
| Unnamed Tributary of Lyons Creek | Offline Culvert Relocation Watercourse Realignment | DFO Request for Review |
| Lyons Creek | No direct impacts, though works at the Toronto-bound off ramp may occur within 30m of the watercourse | N/A, protection through ESC measures and BMPs |

To mitigate the above impacts identified at each watercourse, the following mitigation measures are recommended:

- Obtain required approvals) prior to work commencing.
- New channel tie-ins and watercourse realignments should be designed and constructed following natural channel design principles, including low flow channel, natural substrates, and incorporates fish habitat features. This is specifically applicable to Warren Creek and the Unnamed Tributary of Lyons Creek.
- New culvert extensions should be properly embedded and include the placement of streambed material with the inclusion of a low flow channel to facilitate fish passage through the culvert.
- Ensure the appropriate in-water timing window is adhered to (July 1st – February 28/29th).
- Prior to construction of in-water piers for the bridge over the Welland River, the area should be isolated from the watercourse and a fish and mussel salvage should be undertaken within isolated areas.
- Schedule work to avoid wet and rainy periods that may increase erosion and sedimentation and to avoid the input of contaminated run-off from entering the watercourse.
- Ensure that all in-water activities do not interfere with fish passage, constrict the channel width, or reduce flows. At no time can the channel be constricted fully during construction. Flow shall be maintained downstream at all times when cofferdams are in place, in order to maintain fish passage and habitats downstream.

- Contain all in-water works with use of a coffer dam designed and installed according to relevant Contract Specifications.
- Minimize duration of in-water work and conduct instream work during periods of low flow to further reduce the risk to fish and their habitat and to allow work in water to be contained.
- Retain a qualified environmental professional to ensure applicable permits for relocating fish from within the contained work area (i.e. cofferdams) are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site.
- Regular inspection, removal, and disposal of waste materials and sediment. No stockpiles of material within 30 m of the watercourse.
- Restore channel, watercourse banks, bed substrate and instream cover to pre-existing or better condition and seed to establish vegetative cover.
- Minimize vegetation removal where possible and proper clearing and grubbing techniques will be utilized. All retained vegetation will be delineated and protected.
- Develop and implement a riparian planting plan to ensure that cleared areas are restored to pre-construction conditions or better through planting of native trees and vegetation.
- Use of properly installed silt fencing or similar erosion control measures to prevent contaminated/sediment laden run-off water from entering either watercourse.
- Install silt fence around disturbed area.
- Top soil and seed disturbed banks with native seed mixture and/or cover exposed areas with erosion control measures until seeding can occur.

8.4 Cultural Environment

8.4.1 CULTURAL HERITAGE

A review of built heritage features was completed and documented in Section 3.7. **Table 42** below summarizes the potential or anticipated impacts of the recommended design on each cultural heritage resource.

| Feature ID | Potential/Anticipated Impact | Mitigation Strategy |
|--|--|--|
| CHR 1 – Twin Welland River Bridges, QEW over the Welland River | No negative or direct impacts to CHR 1 anticipated. If construction will take place within 50m of the bridge, impacts of vibration should be investigated. | <ul style="list-style-type: none"> • Construction and staging on Oakwood Drive should be planned to avoid impacts to CHR 1. • If works are within 50m of the structure, undertake investigations to determined potential vibration impacts. |
| CHR 2 – 7847 Montrose Road (Potential CHR) | Minor direct impacts to CHR 2 are anticipated, which include encroachment on the property and the potential removal of a twentieth-century post fence and established trees associated with the property. There are no direct impacts to the residence building. Due to the proximity of work (within 50m), the impacts of vibrations should be investigated and | <ul style="list-style-type: none"> • During detailed design, design should minimize encroachment as much as possible to the property, particularly to mature trees and the post fence. • During construction, works should limit impacts as much as possible. • Tree protection zones should be implemented to protect mature trees that can be retained. |

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| | mitigation measures should be implemented prior to construction. | <ul style="list-style-type: none"> • Undertake engineering assessments during detailed design to determine potential vibration impacts to the structure. • Post-construction rehabilitation, including sympathetic species planting, and reinstallation of the wood post and beam fence should be considered. This rehabilitation should be discussed with the property owner. • A Heritage Impact Assessment (HIA) was not recommended as part of the CHRA as neither the structure nor any apparent features of significant cultural heritage value are anticipated to be impacted. However, in consultation with the City of Niagara Falls, due to the historic nature of the house and property, which has been around for many years, an HIA should be completed. |
| CHR 3 – 7473 Reixinger Road (Potential CHR) | Minor direct impacts to CHR 3 are anticipated, which include encroachment on the property and removal of a small portion of agricultural lands. There are no direct impacts to the buildings on the property or any landscape features of potential cultural heritage value. | <ul style="list-style-type: none"> • During detailed design, design should minimize encroachment as much as possible to the property, particularly to active agricultural lands. • During construction, works should limit impacts as much as possible. • Post-construction rehabilitation, including sympathetic species planting, should be considered. • An HIA is not recommended as neither the structure nor any apparent features of significant cultural heritage value are anticipated to be impacted. |

8.4.2 ARCHAEOLOGY

As per the recommendations of the Stage 1 AA, some of the lands adjacent to the existing roads retain archaeological potential. No construction can proceed until lands have been cleared of the potential for archaeological resources and as such, a Stage 2 AA should be carried out on all lands that will be impacted by construction. Should findings occur during Stage 2 AA, additional investigations, such as a Stage 3 and 4 AA, may be required.

As the Welland River riverbed will be impacted by the new piers and fill to accommodate for the new bridge, a marine AA should be undertaken.

All other areas as determined in the Stage 1 AA has been cleared of archaeological potential. However, should previously undocumented archaeological resources be discovered, the contractor should cease all alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork.

9.0 Additional Work, Permits, and Monitoring

9.1 Detailed Design Commitments

Section 8.0 documents the impacts and mitigation measures associated with the proposed design. Below is a summary of additional works that are required to be completed during the detailed design phase of the project, prior to construction:

Transportation/Technical Requirements:

- Develop a Traffic Management Plan / Construction Staging Plan to minimize impacts to the traveling public and maintain road safety and vehicular access during construction.
- Confirm the need to raise the road profile in certain areas to accommodate utilities and servicing.
- Confirm and complete street lighting design.
- Prepare a landscaping plan and determine opportunities for streetscaping opportunities. Particularly for the vicinity of the hospital, coordinate with Niagara Health on gateway entrance features and streetscaping.
- Coordinate with utilities on relocation location and the South Niagara Falls Wastewater Treatment Plant alignment and tunnel access shafts.
- Coordinate with transit for need for bus stops and for on-road bus stops in the vicinity of the South Niagara Hospital.
- Consult with CPR regarding design and construction at their at-grade crossing.
- Confirm roundabout design at Niagara Square Drive.

Socio-Economic Requirements

- Complete property requirement plans and begin negotiations with affected property owners to purchase property required for the preferred design.

Natural Environment Requirements

- Confirm areas of impacts based on detailed design.
- Wetland Delineation and further discussion with NPCA.
- Consult with regulatory agencies, prepare permit application packages and obtain required permits for environmental impacts.
- Incorporate mitigation measures into construction contract documents.

Cultural Requirements

- Complete Stage 2 Archaeological Assessments (AA) for areas impacted and determined to retain archaeological potential. If required, complete further Stage 3 or 4 AAs.
- Complete a Marine AA for impacts to the Welland River riverbed as a result of the bridge construction.
- For CHR 2, complete baseline vibration monitoring and a Heritage Impact Assessment.

9.2 Permits and Approvals

The permits and approvals in Table 43 have been identified as being or potentially being required.

TABLE 43: PERMITS AND APPROVALS SUMMARY

| Regulatory Agency | Legislation | Permit/Approval | Description |
|---|---|---|---|
| Federal | | | |
| Transport Canada | <i>Canadian Navigable Waters Act (CNWA)</i> | Authorization for Major Works under the Navigation Protection Program | The widening of the Montrose Road bridge over the Welland River and new piers has impacts to navigation on the Welland River. |
| Fisheries and Oceans Canada (DFO) | <i>Fisheries Act</i> | Request for Review, Letter of Advice or Fisheries Act Authorization | A DFO Request for Review is required for the new Montrose Road bridge over the Welland River, and the culvert extensions and replacement |
| Environment and Climate Change Canada (ECCC) | <i>Species at Risk Act</i> | SARA-compliant permit / authorization (in conjunction with DFO permit) | If the Project is determined likely to cause death of SAR and/or a HADD of SAR fish habitat, this permit will be required in conjunction with the DFO permit. |
| Provincial | | | |
| Ministry of the Environment, Conservation and Parks | <i>Ontario Environmental Assessment Act (EAA)</i> | Schedule 'C' Municipal Class EA | Satisfactory completion of EA requirements is a prerequisite for obtaining most other approvals. |
| | <i>Endangered Species Act (ESA)</i> | Information Gathering Form (IGF), Letter of Advice, 17(2)(c) permit, Overall Benefit Permit | For impacts to potential SAR, including bat and mussel SAR, an IGF should be completed and submitted to MECP to determine what further steps and permits are required. |
| | <i>Endangered Species Act, O. Reg. 242/08</i> | Notice of Activity Registration | If inactive Barn Swallow nests are to be removed. May require the installation of kiosks and monitoring. |
| | <i>Ontario Water Resources Act</i> | Permit to Take Water (PTTW) / Environmental Activity and Sector Registry (EASR) | PTTW required if >400,000 L/d of surface or groundwater taken, an EASR will be registered as a prescribed activity if the amount of water exceeds 50,000 L/d and is <400,000 L/d. |
| | <i>Environmental Protection Act</i> | Environmental Compliance Approval | Required prior to construction to ensure that the proposed works comply with MECP guidelines for the design of sanitary sewage |

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| | | | systems, storm sewer systems and/or water systems |
| Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) | | License to Collect Fish | Required during construction where there is mussel salvage (if required) of fish relocation from isolated work zones. |
| Ontario Ministry of Transportation (MTO) | | Encroachment Permit | For any works occurring in the MTO corridor. |
| Local | | | |
| Niagara Peninsula Conservation Authority (NPCA) | <i>Conservation Authorities Act, O. Reg. 155/06</i> | Development and Interference with Wetlands and Alterations to Shorelines and Watercourses | A permit is required for works within the NPCA regulated area associated with adjacent PSWs, and woodland areas, stormwater management, and drainage. |
| Regional Municipality of Niagara | Regional Tree and Forest Conservation By-Law 30-2008 | Tree Removal Exemption | For tree removal or injury of any tree located within a woodland. |
| City of Niagara Falls | Noise By-law | Exemption | Required to allow construction works outside of permitted days/hours. |
| | Tree By-law | Exemption | Required for tree removal or planting on municipal property within the City of Niagara Falls. |
| Other | | | |
| Canadian Pacific Rail | | Crossing Permit | To notify CPR on the impacts to the at-grade crossing north of Grassy Brook Road. |

9.3 Monitoring

Following completion of this EA study, traffic conditions should continue to be monitored to determine whether provisional signal locations for unsignalized intersections are required and when they should be implemented.

During construction, standard best management practices and construction monitoring should be undertaken to ensure that construction is occurring according to the design and that mitigation measures are implemented correctly and are functioning as intended. Through the permitting process, additional measures may be required.

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