





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 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.

Legend

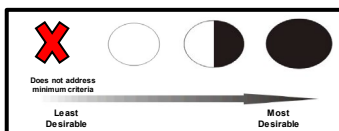
			
Does not address minimum criteria			
Least Desirable	→		Most Desirable

Final Recommendation:	Multi-Use Path
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Alternative Design Concepts - Montrose Road Section 1 (McLeod Road to Canadian Drive)

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 signalled 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.

Legend



Final Recommendation:	Roundabout at Niagara Square Drive with a median
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Alternative Design Concepts - Montrose Road Section 2 (Canadian Drive to Chippawa Creek 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	●	●	●		
Safety	●	●	●		
Active Transportation	●	●	●		
Transit	●	●	●		
Utilities	○	○	●		
SUMMARY	●	●	●		
NATURAL ENVIRONMENT					
Vegetation	○	●	○		
Aquatic	○	○	○		
Wetlands	○	●	○		
Species at Risk (SAR)	○	●	○		
SUMMARY	○	●	○		
CULTURAL ENVIRONMENT					
Archaeology	○	○	○		
Cultural Heritage	○	●	○		
SUMMARY	○	●	○		
SOCIO - ECONOMIC ENVIRONMENT					
Access	●	●	●		
Property	×	×	○		
Construction Disruptions	●	×	●		
SUMMARY	○	×	○		
COST					
Capital Costs	○	○	○		
Maintenance Costs	○	○	○		
SUMMARY	○	○	○		
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.		

Legend

Does not address minimum criteria

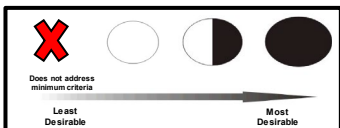
Least Desirable → Most Desirable

Final Recommendation:	Widen to the west only
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Alternative Design Concepts - Montrose Road Section 3 (Chippawa Creek Road to Grassy Brook Road), Bridge and Approaches

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	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.	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.	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.	Not preferred - Widening to the west will significantly encroach on properties and buildings on the northwest quadrant of the bridge.	Not preferred - Widening to the west will significantly encroach on properties and buildings on the northwest quadrant of the bridge.

Legend



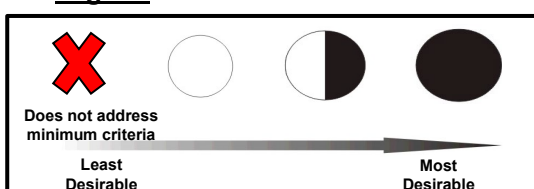
Final Recommendation:

Widen existing bridge to the east or Twin with a new bridge to the east. To be reviewed further in later stages.

Alternative Design Concepts - Montrose Road Section 4 (Chippawa Creek Road to Lyons Creek 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 mussels at Grassy Brook may be impacted by culvert extension.	○ Impacts to potential SAR bat habitat through removal of trees. Potential SAR mussels at Grassy Brook may be impacted by culvert extension.	○ Impacts to potential SAR bat habitat through removal of trees. Potential SAR mussels 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.

Legend



Final Recommendation:	Widen along the centreline
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Alternative Design Concepts - 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.

Legend

Does not address minimum criteria
 Least Desirable
 Moderate
 Most Desirable

Final Recommendation:	Widen along the centreline
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Alternative Design Concepts - 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.

Legend

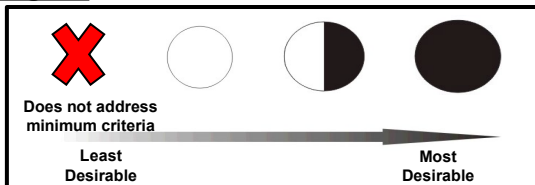
Does not address minimum criteria

Least Desirable → Most Desirable

Final Recommendation:	Widen along the centreline
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Alternative Design Concepts - Montrose Road / Lyons Creek Road Intersection Controls				
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.	

Legend



Final Recommendation:	Traffic Signals
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Alternative Design Concepts - Lyons Creek Road Bridge over QEW Bridge Cross Section

EVALUATION CRITERIA	1. Uni-directional Facilities (with barrier wall on the QEW bridge)	2. Multi-Use Path on North Side (with barrier wall on the QEW bridge)	3. Repeat 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 lane 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.	● 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 fewer crossing points as activity can be kept on one side. However, the MUP and buffers do not meet design standards.	○ 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 design standards can be met.	○ Better for traffic operations as the structure fully separates vehicular traffic from AT traffic.	○ No change to existing traffic operations and widths at the bridge.
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. Having facilities on both sides increases the crossing points at ramp terminals. Facility is also formally signed for bikes, so 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.	○ 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.	○ 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.	○ Safest option uses are active separated from the driving lanes on the bridge and standard widths are 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 the lack of separation/barriers.	○ Alternative not recommended 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 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 are 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 are 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 are significant costs with bridge replacement. 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 use across the bridge under the current context. The area can be monitored and as development progresses, the need for a facility can be reviewed.

Legend

Does not address minimum criteria

Least Desirable

Most Desirable

Final Recommendation:

DO NOTHING

Alternative Design Concepts - Lyons Creek Road and QEW ramp terminal intersection controls

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	○ No additional property required.	○ 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.	○ 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.	○ More property and construction impacts.
COST		
Capital Costs	● Moderate costs that involve installation of signal infrastructure and some construction / realignment of lanes.	○ Significant costs as the area of impact is larger and more significant changes to the intersection. Property costs also considered.
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 - 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.	Not preferred - Roundabouts in this location cannot accommodate future traffic demand, and will operate poorly and result in significant queuing, especially in the west leg, which will impede EMS vehicle access. Some additional property is required and there will be more construction impacts.

Legend

Does not address minimum criteria

Least Desirable Most Desirable

Final Recommendation:

Traffic Signals