



BURNSIDE

























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Appendix B













Evaluation of Alternatives













GR19 EA – Evaluation of Alternatives	B1
GR19 EA – Evaluation of Design Alternatives	B2
















Grey Road 19 Improvements-Evaluation of Alternatives (Road Widening)




Criteria for Evaluating Alternatives		1) Do Nothing	2) Widen to four-lane, two-way road with paved shoulders	3) Widen to four-lane, two-way road with paved shoulders and active transportation
A	Natural Environment			
1	Vegetation/Tree Removal	No impact to vegetation	Impact to vegetation within ditch area. Vegetation and some tree clearing required.	Impact to vegetation within ditch area. Vegetation and tree clearing required with wider footprint
	Rating			
2	Terrestrial Habitat (breeding birds, general wildlife, habitat connectivity)	No impact over existing conditions	Vegetation removal may impact breeding birds.Vegetation removal will be subject to timing restriction to avoid direct impact to breeding birds.	Vegetation removal may impact breeding birds.Vegetation removal will be subject to timing restriction to avoid direct impact to breeding birds.
	Rating			
3	Fisheries / Aquatic Habitat	Potential for impact to watercourse and aquatic habitat adjacent to roadway from road runoff and roadside ditches flowing into the watercourse.	Potential for impact to watercourse and aquatic habitat adjacent to roadway from road runoff and roadside ditches flowing into the watercourse. Temporary impact to fish and fish habitat due to construction works through sediment and erosion impacts (indirect). Ditch and culvert replacement works may impact fish and fish habitat (crossing and south side. North ditch feeds watercourse) and are subject to site specific design and conditions.	Potential for impact to watercourse and aquatic habitat adjacent to roadway from road runoff and roadside ditches flowing into the watercourse. Larger paved area to have larger negative water runoff quality impacts. Temporary impact to fish and fish habitat due to construction works through sediment and erosion impacts (indirect). Ditch and culvert replacement works may impact fish and fish habitat (crossing and south side. North ditch feeds watercourse) and are subject to site specific design and conditions.
	Rating			
4	Natural Features (wetland, wooded area)	No impact over existing conditions	Potential for impact to adjacent wetland and woodland areas.	Potential for impact to adjacent wetland and woodland areas.
	Rating			
5	Species at Risk (Bats)	No impact over existing conditions. Vegetation maintenance completed as needed. Culvert maintenance and replacement completed as needed.	Vegetation and tree removal may impact potential habitat of Special Concern birds (south side), SAR bat roosting (south side) habitat, reptile habitat (north side Silver Creek) and Monarch breeding habitat. Vegetation removal will be subject to timing restriction to avoid direct impact to Special Concern species and SAR. No aquatic SAR anticipated.	Vegetation and tree removal may impact potential habitat of Special Concern birds (south side), SAR bat roosting (south side) habitat, reptile habitat (north side Silver Creek) and Monarch breeding habitat. Vegetation removal will be subject to timing restriction to avoid direct impact to Special Concern species and SAR. No aquatic SAR anticipated.
	Rating			
6	Water Resources (groundwater, drainage features, source water protection)	No impact over existing conditions. Ditch and culvert maintenance and replacement completed as needed.	Regrading of ditches required to maintain drainage. Culvert extension anticipated. Possible quantity control measures required with increased impervious area. Culvert maintenance and replacement completed as needed.	Regrading of ditches required to maintain drainage. Possible quantity control measures required with greater increased impervious area. Culvert extension anticipated. Culvert maintenance and replacement completed as needed.
	Rating			
7	Impact on Climate Change (greenhouse gas emissions, carbon sinks, resilience or vulnerability)	Vegetation maintenance is not anticipated to significantly impact the availability of carbon sinks over existing conditions. Without improvements, increased traffic congestion may result in an increase in associated greenhouse gas emissions.	Vegetation clearing associated with a wider footprint is not anticipated to significantly impact the availability of carbon sinks. Increase in traffic over time may result in an increase in associated greenhouse gas emissions over existing conditions. Additional lanes are anticipated to reduce traffic congestion/delay.	Vegetation clearing associated with a wider footprint is not anticipated to significantly impact the availability of carbon sinks. Increase in traffic over time may result in an increase in associated greenhouse gas emissions over existing conditions. Additional lanes are anticipated to reduce traffic congestion/delay.
	Rating			
	Summary Natural Environment			

	Criteria for Evaluating Alternatives	1) Do Nothing	2) Widen to four-lane, two-way road with paved shoulders	3) Widen to four-lane, two-way road with paved shoulders and active transportation
B	Socio-Cultural Environment			
1	Conformity to Municipal Policies and Development Planning - road network and active transportation connectivity	Does not conform to road network connectivity. Partially conforms to intention of connectivity of active transportation network with existing off-road multi-use trail	Conforms to road network connectivity. Partially conforms to intention of connectivity of active transportation network with existing off-road multi-use trail.	Conforms to road network connectivity. Conforms to intention of connectivity of active transportation network. GR 19 identified as cycling route in TMP. CTMP identifies paved shoulder active transportation.
	Rating			
2	Heritage Resources (archaeological features, built heritage, and cultural heritage landscapes)	No impact over existing conditions	Potential for archaeological resources. Area is partially disturbed. Further Archaeological assessment is required if potential earth works will disturb previously undisturbed areas to the south of the ROW. Potential impact to cultural heritage landscape (farmscape) if road widens to the south.	Potential for archaeological resources. Area is partially disturbed. Further Archaeological assessment is required if potential earth works will disturb previously undisturbed areas to the south of the ROW. Potential impact to cultural heritage landscape (farmscape) if road widens to the south.
	Rating			
3	Local Residents Nuisance Impacts (noise, visual impact)	No impact over existing conditions	Visual impact of tree and vegetation removal. Temporary impact due to construction activities. Potential for increased noise to adjacent residential areas with road widening. Additional study to be completed.	Potential for greater visual impact of tree and vegetation removal. Temporary impact due to construction activities. Potential for increased noise to adjacent residential areas with road widening. Additional study to be completed
	Rating			
4	Municipal services (snow removal, garbage pick up,)	No impact over existing conditions	Temporary impact due to construction activities. Additional lanes and paved shoulder will require additional road maintenance and snow removal.	Temporary impact due to construction activities. Additional lanes and active transportation areas will require additional road maintenance and snow removal.
	Rating			
5	Level of Service (safety of traveled road, travel time, traffic)	Increased travel time with future traffic congestion and delay at intersections. Increased potential for merging conflicts at two-lane roundabouts.	Improved road condition. Reduced travel time with improved traffic flow. Improved safety of turning movements with 2 travel lanes in one direction. Paved shoulder provides a some space along the edge of the road for stopped and emergency vehicles.	Improved road condition. Reduced travel time with improved traffic flow. Improved safety of turning movements with 2 travel lanes in one direction. Paved shoulder provides a designated space along the edge of the road for stopped and emergency vehicles.
	Rating			
6	Active Transportation (connectivity to active transportation network)	Limited to existing multi-use trail on the north side of the ROW. Shared use of the road lanes with vehicles and cyclists.	Limited to existing multi-use trail on the north side of the ROW. Shared use of the road travel lanes with vehicles and cyclists. More vehicle travel lanes may increase difficulty for pedestrians/cyclist to cross the road to connect to multi-use trail.	Connectivity with paved shoulder bike accessible lanes currently on both sides of GR19 to the north of the intersection of GR 19/ GR 119/ Gord Canning Drive. Existing multi-use trail on the north side of the ROW.
	Rating			
7	Active Transportation (pedestrian safety)	Existing off-road multi-use trail provides access and safety for pedestrians. Shared use with different modes of active transportation.	Existing off-road multi-use trail provides access and safety for pedestrians. Shared use of trail with different modes of active transportation.	Existing off-road multi-use trail provides access and safety for pedestrians. Shared use of trail with different modes of active transportation. Paved shoulder provides a designated space along the edge of the road for pedestrians and other road users. Potential for pedestrian conflicts with vehicles with paved shoulder active transportation facilities.
	Rating			

8	Active Transportation (cyclist safety)	Limited to existing multi-use trail on the north side of the ROW. Shared use with different modes of active transportation.	Existing multi-use trail on the north side of the ROW provides shared use with different modes of active transportation. Potential for cyclist conflicts with vehicles with shared use of the road travel lanes.	Existing off-road multi-use trail provides access and safety for cyclists. Paved shoulder provides a designated space along the edge of the road cyclists and other road users. Some potential for cyclist conflicts with stopped and emergency vehicles, other road users. Paved shoulder active transportation provides connectivity to shoulder bike lanes to the north of the Study Area.
	Rating			
9	Land Acquisition Requirements	No property acquisition.	Some property acquisition at integration with roundabouts. Road widening within the existing right-of-way. Property acquisition is not anticipated.	Some property acquisition at integration with roundabouts. Road widening within the existing right-of-way. Potential for property acquisition in select locations is anticipated.
	Rating			
10	Conformity to Agency Policy (NVCA, MNRF, NEP)	No impact over existing conditions	Possible impact to fish and fish habitat through sediment mobilization. DFO review is required. Road improvements within the NVCA regulated limit will require permits. SAR permits not anticipated. Infrastructure permitted in NEP Escarpment Recreation Area.	Possible impact to fish and fish habitat through sediment mobilization. DFO review is required. Road improvements within the NVCA regulated limit will require permits. SAR permits not anticipated. Infrastructure permitted in NEP Escarpment Recreation Area.
	Rating			
	Summary Socio-Cultural Environment			

Criteria for Evaluating Alternatives		1) Do Nothing	2) Widen to four-lane, two-way road with paved shoulders	3) Widen to four-lane, two-way road with paved shoulders and active transportation
c	Financial Factors			
1	Estimated Capital Costs	No impact above existing conditions	Moderate costs for road improvements, grading, vegetation clearing.	High costs for road improvements, utility impacts, grading vegetation clearing.
	Rating			
2	Estimated Operation and Maintenance Cost	Costs for regular maintenance. Gravel shoulders increase maintenance costs.	Moderate costs for regular maintenance. Paved shoulder reduces roadside maintenance.	Higher costs for regular maintenance. Paved shoulder active transportation requires more frequent winter maintenance. Paved shoulder reduces roadside maintenance.
	Rating			
3	Property Acquisition Cost	No impact above existing conditions	Land acquisition not anticipated. Road widening within the existing ROW.	Potential for property acquisition in select locations is anticipated for road widening including paved shoulder for active transportation facility.
	Rating			
	Summary Financial Factors			

	Criteria for Evaluating Alternatives	1) Do Nothing	2) Widen to four-lane, two-way road with paved shoulders	3) Widen to four-lane, two-way road with paved shoulders and active transportation
D	Technical Factors			
1	Addresses future traffic control and operation requirements (capacity, level of service, delay, queues, coordinated intersection with roundabouts)	A 2-lane road cross section does not operate well with existing two-lane round-about at GR 119 and GR 19 intersection. The operations of the future 2-lane roundabout at Crosswinds Blvd. does not rely on widening of GR 19 to a four-lane cross section. Stop control intersections will experience egress delay in the medium to long term horizon.	4 lane cross section will coordinate to operate well with 2 lane roundabouts. 4 lanes needed to maintain acceptable capacity in the future with additional through lanes and reduce delays on approaches to intersections and address delays at stop controlled intersections. 4 lanes will serve volume of turning movements.	4 lane cross section will coordinate to operate well with 2 lane roundabouts. 4 lanes needed to maintain acceptable capacity in the future with additional through lanes and reduce delays on approaches to intersections and address delays at stop controlled intersections. 4 lanes will serve volume of turning movements.
	Rating			
2	Addresses operational safety (sight distance, road side safety)	Adequate sight distances maintained. Increased potential for merging conflicts at two-lane round abouts. Potential for cyclist/pedestrian conflicts with vehicles with on road sharing of travel lanes.	Maintains adequate sight distances. 4 lanes reduces potential for merging conflict with 2 lane roundabouts. Maintains two-way access to properties. Paved shoulder reduces roadside maintenance, provides some space for road side safety. Potential for cyclist/pedestrian conflicts with vehicles with on road sharing of travel lanes.	Maintains adequate sight distances. 4 lanes reduces potential for merging conflict with 2 lane roundabouts. Maintains two-way access to properties. Paved shoulder reduces roadside maintenance, provides space for vehicles for road side safety. Reduced potential for cyclist/pedestrian conflicts with vehicles with designated space along the edge of the road.
	Rating			
3	Design constraints- impact to ditches	Maintains existing ditch slopes and utility locations.	Would require grading of ditch slopes.	Would require steeper grading of ditch slopes.
	Rating			
4	Design constraints- impact to road side utilities	Maintains existing utility locations.	Minor impact to existing utility locations.	Requires moving of existing utility locations.
	Rating			
	Summary Technical Factors			

	Criteria for Evaluating Alternatives	1) Do Nothing	2) Widen to four-lane, two-way road with paved shoulders	3) Widen to four-lane, two-way road with paved shoulders and active transportation
E	Problem Statement			
1	Addresses Problem Statement	No	Yes	Yes
	Rating			
	Summary Problem Statement	Not Preferred	Preferred	Preferred

Criteria for Evaluating Alternatives	1) Do Nothing	2) Widen to four-lane, two-way road with paved shoulders	3) Widen to four-lane, two-way road with paved shoulders and active transportation
Overall Summary	Not Preferred	Most Preferred	Least Preferred

Order of Preference

Most Preferred 






















More Preferred 










Somewhat Preferred 







Less Preferred 







Least Preferred 

Grey Road 19 Improvements-Evaluation of Design Solutions (Road Widening)

Criteria for Evaluating Alternatives		1) Widen on north side with paved shoulders	2) Widen on south side with paved shoulders	3) Widen the Road both sides
A Natural Environment				
1	Vegetation/Tree Removal	Tree clearing required	Tree clearing required	Tree clearing required
	Rating			
2	Terrestrial Habitat (breeding birds, general wildlife, habitat connectivity)	Vegetation removal may impact breeding birds and reptiles. Vegetation removal will be subject to timing restriction to avoid direct impact to breeding birds and reptiles.	Vegetation removal may impact breeding birds and reptiles. Vegetation removal will be subject to timing restriction to avoid direct impact to breeding birds and reptiles.	Vegetation removal may impact breeding birds and reptiles. Vegetation removal will be subject to timing restriction to avoid direct impact to breeding birds.
	Rating			
3	Fisheries / Aquatic Habitat	Potential for impact to Silver Creek watercourse and aquatic habitat due to culvert replacement activities and grading that may impact fish and fish habitat and are subject to site specific design and conditions. Impact to Silver Creek may be minimized with modification to road embankments and ditches. Potential impact to fish and fish habitat through sediment mobilization (indirect).	Impact to Silver Creek watercourse due to grading and channel realignment. Culvert replacement activities may impact fish and fish habitat and are subject to site specific design and conditions. Potential impact to fish and fish habitat through sediment mobilization (indirect).	Impact to Silver Creek watercourse due to grading and channel realignment. Culvert replacement activities may impact fish and fish habitat and are subject to site specific design and conditions. Potential impact to fish and fish habitat through sediment mobilization (indirect).
	Rating			
4	Natural Features (wetland, wooded area)	Potential for encroachment into wetland features and indirect impact to adjacent wetland features due to siltation during construction activities.	Potential for impact to wetland and wooded area due to tree removal, siltation during construction activities.	Potential for impact to wetland and wooded area due to tree removal, siltation during construction activities.
	Rating			
5	Species at Risk (Bats)	Vegetation removal is not anticipated to impact SAR bats.	Improvements will require vegetation and tree removal which may impact potential SAR bat habitat. Vegetation removal will be subject to timing restriction to avoid direct impact to SAR.	Improvements will require vegetation and tree removal which may impact SAR bat habitat. Vegetation removal will be subject to timing restriction to avoid direct impact to SAR.
	Rating			
6	Water Resources (groundwater, drainage features, source water protection)	Regrading of ditches required to maintain drainage. Culvert extension anticipated. Culvert maintenance and replacement completed as needed. Possible quantity control measures required with increased impervious area.	Regrading of ditches required to maintain drainage. Culvert extension anticipated. Culvert maintenance and replacement completed as needed. Possible quantity control measures required with increased impervious area.	Regrading of ditches required to maintain drainage. Culvert extension anticipated. Culvert maintenance and replacement completed as needed. Possible quantity control measures required with increased impervious area.
	Rating			
	Summary Natural Environment			

	Criteria for Evaluating Alternatives	1) Widen on north side with paved shoulders	2) Widen on south side with paved shoulders	3) Widen the Road on both sides
B	Socio-Cultural Environment			
1	Heritage Resources (archaeological features, built heritage, and cultural heritage landscapes, memorial)	No archaeological or cultural heritage resources present on the north side of the ROW.	Further archaeological assessment did not identify archaeological resources on the south side. Potential impact to cultural heritage landscape (remnant agricultural landscape) on the south side of the ROW.	Further archaeological assessment did not identify archaeological resources. Potential impact to cultural heritage landscape (remnant agricultural landscape) on the south side of the ROW.
	Rating			
2	Local Residents Nuisance Impacts (noise, traffic, visual impact, noise)	Some visual impact of tree and vegetation removal. Improved road condition and traffic flow. No significant change in noise levels. Temporary impact due to construction activities.	Some visual impact of tree and vegetation removal. Improved road condition and traffic flow. No significant change in noise levels. Temporary impact due to construction activities.	Some visual impact of tree and vegetation removal. Improved road condition and traffic flow. No significant change in noise levels. Temporary impact due to construction activities.
	Rating			
	Summary Socio-Cultural Environment			





	Criteria for Evaluating Alternatives	1) Widen on north side with paved shoulders	2) Widen on south side with paved shoulders	3) Widen the Road both sides
c	Financial Factors			
1	Estimated Capital Costs	Moderate costs for road improvements, vegetation clearing.	Moderate costs for road improvements, vegetation clearing.	Moderate costs for road improvements, vegetation clearing.
	Rating			
	Summary Financial Factors			

	Criteria for Evaluating Alternatives	1) Widen on north side with paved shoulders	2) Widen on south side with paved shoulders	3) Widen the Road both sides
D	Technical Factors			
1	Design constraints (topography)	Available ROW is wider on the north side.	Available ROW is wider on the north side.	Available ROW is wider on the north side.
	Rating			
	Summary Technical Factors			

	Criteria for Evaluating Alternatives	1) Widen on north side with paved shoulders	2) Widen on south side with paved shoulders	3) Widen the Road
E	Problem Statement			
1	Addresses Problem Statement	Yes	Yes	Yes
	Summary Problem Statement	Preferred	Preferred	Preferred

Criteria for Evaluating Alternatives	1) Widen on north side with paved shoulders	2) Widen on south side with paved shoulders	Widen the Road
Overall Summary	Most Preferred	Least Preferred	Less Preferred

ORDER OF PREFERENCE

- Most Preferred 
- More Preferred 
- Somewhat Preferred 
- Less Preferred 
- Least Preferred 