



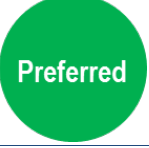
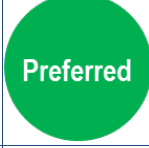




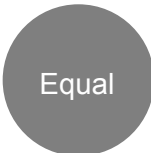
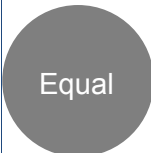
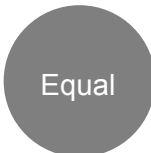
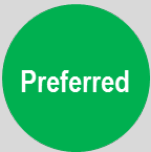
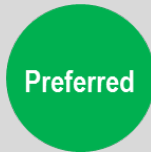
APPENDIX K

Alternative Designs Detailed Evaluation

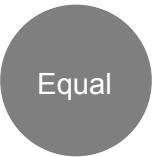
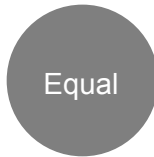
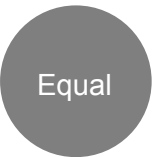
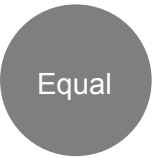
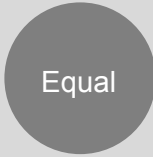
Appendix K: Alternative Designs Detailed Evaluation

Table 1 Casablanca Boulevard/QEW Interchange Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Improved Parclo A4 Interchange	Alternative B - Diverging Diamond Interchange (DDI)
TRANSPORTATION		
Ability to address existing and future traffic operations deficiencies.	 Accommodates future projected traffic demands at the interchange and facilitates an efficient flow of traffic. No meaningful difference between alternatives.	 Accommodates future projected traffic demands at the interchange and facilitates an efficient flow of traffic. No meaningful difference between alternatives.
Ability to address identified access needs/deficiencies.	 Both alternatives accommodate future GO Transit Station access needs.	 Both alternatives accommodate future GO Transit Station access needs.
Ability to address vehicle safety issues.	 This design improves level of safety with fewer conflict points.	 This design improves level of safety with fewer conflict points.
Ability to provide safe access to driveways and properties along the corridor.	NA – no driveways impacted	NA – no driveways impacted

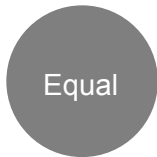




Appendix K: Alternative Designs Detailed Evaluation

Table 1 Casablanca Boulevard/QEW Interchange Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Improved Parclo A4 Interchange	Alternative B - Diverging Diamond Interchange (DDI)
Ability to provide safe, connected, effective, attractive and convenient cycling and pedestrian environment.	 <p>A/T users are provided with a protected, dedicated space, and signalized control for all ramp intersections with the MUP.</p>	 <p>A/T users are provided with a protected, dedicated space. A/T users would need to cross at two unsignalized 90 degree ramp crossings and two signalized road crossings in each direction.</p>
Alignment with the Region's Transportation Master Plan and Strategic Cycling Network	 <p>This alternative meets the policy of providing active transportation connections to complete the cycling network over the QEW bridge to the North Service Road and accommodate a range of users by providing sidewalks and on-road and off-road alternatives for cyclists.</p>	 <p>This alternative provides greater separation of AT users from road users, meeting the policy in the TMP to provide enhanced and safer access for users of "all ages and abilities".</p> <p>On-road users are less accommodated with this alternative, however wayfinding and signage can be provided to guide more experienced users to the appropriate space on the interchange.</p>
Ability to accommodate accessibility requirements along the corridor (e.g. AODA requirements).	 <p>Both alternatives can accommodate improved levels of accessibility over the QEW.</p>	
Transportation Criteria Group Summary		



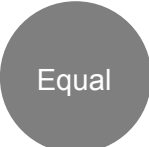
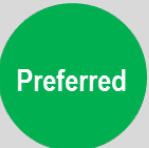

Appendix K: Alternative Designs Detailed Evaluation

Table 1 Casablanca Boulevard/QEW Interchange Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Improved Parclo A4 Interchange	Alternative B - Diverging Diamond Interchange (DDI)
NATURAL ENVIRONMENT		
Vegetation and Wildlife: Potential for disturbance to /impact on function of adjacent terrestrial habitat.	 Removal of grassed areas/possibly some trees within the QEW ROW for realignment of the two off-ramps (cultural meadow and cultural thicket areas). No habitat of significance would be impacted.	 Greater removed area of grassed areas/possibly some trees within the QEW ROW (cultural meadow and cultural thicket areas). No habitat of significance would be impacted.
Aquatic Habitat: Potential for loss and/or degradation of aquatic habitat.	 Neither alternative has the potential to impact aquatic habitat	
Species at Risk: Potential for impact to SAR and/or their habitat.	 Neither alternative has the potential to impact species at risk or their habitat	
Natural Environment Criteria Group Summary	 Equal	

Appendix K: Alternative Designs Detailed Evaluation

Table 1 Casablanca Boulevard/QEW Interchange Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Improved Parclo A4 Interchange	Alternative B - Diverging Diamond Interchange (DDI)
SOCIO ECONOMIC ENVIRONMENT		
Potential for loss of residential/business property.	 <p>Neither alternative has the potential to impact residential/business property</p>	
Potential for disruption to business activity and increased general travel times during construction.	 <p>Some delays to traffic during construction along Casablanca and interchange ramps. Some short-term ramp closures would be required. It is expected that travel along Casablanca Blvd can be largely maintained with minimal delays. Delays would be less than for Alternative 2 as the construction period for this alternative would be shorter. Some impacts to Emergency Management Services (EMS) are anticipated during construction.</p>	 <p>Would require ramp closures for a longer period of time; one loop ramp would likely require closure for a full construction season. Casablanca Boulevard would likely require closure (e.g. one-month period). Traffic delays during construction could negatively impact businesses/travellers in the vicinity of the project (e.g. along the South Service Road) as road users seek alternative routes during construction if delays are significant. May result in increased traffic impacts to adjacent QEW interchanges during closures. Potential for greater impacts to Emergency Management Services (EMS).</p>
Potential for lifestyle disruption effects to residents, such as noise or visual impacts.	 <p>Residences north of QEW at the North Service Road/Casablanca may experience some construction related nuisance effects (noise and/or dust). Effects would be for a shorter duration. Mitigation is available to reduce any effects.</p>	 <p>Residences north of QEW at the North Service Road/Casablanca may experience some construction related nuisance effects (noise and/or dust). Effects would be for a longer duration. Mitigation is available to reduce any effects.</p>





Appendix K: Alternative Designs Detailed Evaluation

Table 1 Casablanca Boulevard/QEW Interchange Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Improved Parclo A4 Interchange	Alternative B - Diverging Diamond Interchange (DDI)
Potential to enhance street corridor character.	 Preferred Potential to improve crossing experience for pedestrians and cyclists.	 Preferred Potential to improve crossing experience for pedestrians and cyclists.
Potential for loss of agricultural land.	 Equal Neither alternative has the potential to impact agricultural land.	
Socio-Economic Criteria Group Summary	 Preferred	 Less Preferred



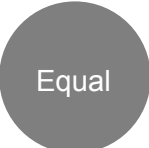
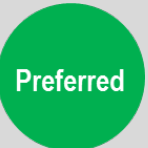

Appendix K: Alternative Designs Detailed Evaluation

Table 1 Casablanca Boulevard/QEW Interchange Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Improved Parclo A4 Interchange	Alternative B - Diverging Diamond Interchange (DDI)
CULTURAL ENVIRONMENT		
Archaeological Resources: Potential for impact to registered archaeological sites and areas of archaeological potential.	Equal	No Impact – affected lands have no archaeological potential.
Built Heritage Resources: Potential to impact registered cultural heritage properties and properties of cultural interest.	Equal	No impact – affected lands do not have any cultural heritage features present.
Cultural Environment Summary Criteria Group	Equal	





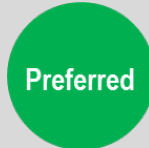

Appendix K: Alternative Designs Detailed Evaluation

Table 1 Casablanca Boulevard/QEW Interchange Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Improved Parclo A4 Interchange	Alternative B - Diverging Diamond Interchange (DDI)
ENGINEERING/ROAD DESIGN		
<p>Services/Utilities: Potential to impact to services or utilities in the corridor (e.g. water, sanitary, electrical, communications).</p> <p>Construction Staging: Potential for impact to traffic operations during construction.</p>	<p> Limited potential for impact to utilities as most of the changes to the interchange relate to ramp works only.</p> <p> Less complex construction. It is expected that the new AT facilities and ramps can be constructed with minimal impact to the flow and operations of traffic through this interchange. Two travel lanes can be kept open/AT travel can be maintained. The estimated construction period is about 4-6 months (one construction season) and so less than Alternative 2. Construction Staging would likely involve the following considerations:</p> <ul style="list-style-type: none"> • Approximately one month (or less) closures of each ramp as tie-ins/finish works are completed • Single lane in each direction along Casablanca during construction (e.g. 4-month period) • May require weekend closures for signal installations etc. 	<p> Less Preferred - This alternative results in the greatest modification to the interchange and therefore has the greatest potential impact on utilities.</p> <p> Less Preferred More complex construction. The construction of a DDI would have the potential for greater impact on the flow of traffic through the interchange and along Casablanca Boulevard. Travel through the interchange would need to be reduced to one lane in each direction for much of the construction period (similar to Alternative 1). It would be difficult to maintain AT travel through the interchange during construction. The estimated construction period is a minimum of 8-12 months (potential for extension of construction over two construction seasons) and so greater than Alternative 1. QEW ramp closures required for a longer period of time resulting in traffic being diverted to other interchanges creating additional congestion and the need for modifications to these other interchanges. Construction Staging would likely involve the following considerations:</p> <ul style="list-style-type: none"> • Minimum of one month closure of each ramp • One of the loop ramps would likely require closure for entire construction season • Casablanca Boulevard would likely require complete closure for at least a one month period



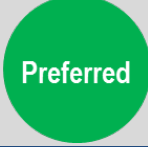
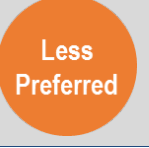
Appendix K: Alternative Designs Detailed Evaluation

Table 1 Casablanca Boulevard/QEW Interchange Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Improved Parclo A4 Interchange	Alternative B - Diverging Diamond Interchange (DDI)
Implementation Timing (approvals, design and construction)	 <p>The improvements could be implemented for the targeted 2021 date to support the GO Transit Station opening.</p>	 <p>The improvements could be implemented for the targeted 2021 date to support the GO Transit Station opening. However, due to the increased complexity there is a greater risk of schedule slippage.</p>
Storm Water Management: Potential for impact on SWM infrastructure and potential for increased run-off and flooding.	 <p>The alternatives would result in minimal change to area of imperviousness and drainage patterns. No significant increase in run-off or flooding potential for either Alternative.</p>	
Engineering/Road Design Summary Criteria Group	 <p>Preferred</p>	 <p>Less Preferred</p>







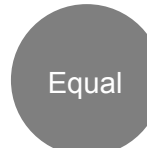
Appendix K: Alternative Designs Detailed Evaluation

Table 1 Casablanca Boulevard/QEW Interchange Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Improved Parclo A4 Interchange	Alternative B - Diverging Diamond Interchange (DDI)
COST		
Relative capital, property and operating cost.	 <p>The estimated cost for this alternative is \$3.0 million. Similar operating costs expected.</p>	 <p>The estimated cost for this alternative is \$6.0 - \$8.0 million. Additional cost to improve other interchanges may be required. Similar operating costs expected.</p>
Ability to recover cost through the Region or Town of Grimsby DC By-law	 <p>The Region's DC Background Study (December 2017) identified approximately \$5.6M for improvements to Casablanca Boulevard between the QEW and Livingston Avenue, some of which may be used to recover the cost of construction to the QEW interchange.</p> <p>The Town of Grimsby DC Background Study (September 2016) allocates approximately \$3M for the QEW ramp improvements.</p> <p>The total cost of the alternative could be recovered through combined development charges.</p>	 <p>The Region's DC Background Study (December 2017) identified approximately \$5.6M for improvements to Casablanca Boulevard between the QEW and Livingston Avenue, some of which may be used to recover the cost of construction to the QEW interchange.</p> <p>The Town of Grimsby DC Background Study (September 2016) allocates approximately \$3M for the QEW ramp improvements.</p> <p>Approximately 50-70% of the cost of the alternative could potentially be recovered through combined development charges.</p>
Cost Summary Criteria Group	 <p>Preferred</p>	 <p>Less Preferred</p>





Appendix K: Alternative Designs Detailed Evaluation

Table 1 Casablanca Boulevard/QEW Interchange Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Improved Parclo A4 Interchange	Alternative B - Diverging Diamond Interchange (DDI)
IMPLEMENTATION - APPROVAL		
MTO Consultation on approval of the preliminary design	 MTO support for the preliminary design to be refined through Detailed Design	 MTO indicated concerns with implementing this alternative, would not be supported to move forward
Overall Evaluation	 Preferred	 Less Preferred

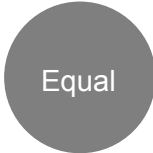
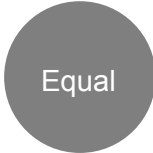
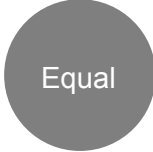

Appendix K: Alternative Designs Detailed Evaluation

Table 2 South Service Road – GO Transit Station Access Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Intersection with Loop Road Access	Alternative B - Intersection with Westbound Left Turn
TRANSPORTATION		
Ability to address existing and future traffic operations deficiencies.	 <p>Allows for better traffic flow as provides additional queue storage for vehicles making a WB left turn into the GO Transit Station. Less chance of delays.</p>	 <p>Requires a left-turn that may not provide adequate queue space and which could spill onto through lanes including onto Casablanca.</p>
Ability to address identified access needs/deficiencies.	 <p>Provides for more efficient access into the GO Transit Station for WB vehicles.</p>	 <p>While improvements accommodate access into the GO Transit Station, some delays are possible.</p>
Ability to address vehicle safety issues.	 <p>This is a non-standard arrangement that asks drivers to move to the right to complete a left hand turn. This may be confusing to first-time or occasional users and may cause sudden lane changes or re-routing. Drivers coming from the south would need to weave across lanes to access the northern access road.</p>	 <p>This is a traditional lane arrangement that drivers understand and are expecting. Drivers coming from the north would need to weave across lanes to access the left turn lane.</p>
Ability to provide safe access to driveways and properties along the corridor.	 <p>Neither alternative has the potential to cause driveway impacts</p>	

Appendix K: Alternative Designs Detailed Evaluation

Table 2 South Service Road – GO Transit Station Access Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Intersection with Loop Road Access	Alternative B - Intersection with Westbound Left Turn
Ability to provide safe, connected, effective, attractive and convenient cycling and pedestrian environment.	Users of a cycle path along SSR would need to cross the access road which would be an uncontrolled crossing. The sidewalk would need to be routed along the north side of the new northern access road which would increase walking distance. Peds/Cyclists would be encouraged to cross at the Casablanca/SSR intersection for access to the GO Transit Station. As the volume of peds/cyclists travelling west along SSR is expected to be minimal.	Preferred – No additional uncontrolled crossings along north side cycle path/sidewalk.
Ability to accommodate accessibility requirements along the corridor (e.g. AODA requirements).	 Improved safety for crossing from the MTO Carpool Lot/GO Bus Loop area south to the GO Transit Station	 No specific accessibility challenges introduced with this design.
Transportation Criteria Group Summary	 Preferred	 Less Preferred

Appendix K: Alternative Designs Detailed Evaluation

Table 2 South Service Road – GO Transit Station Access Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Intersection with Loop Road Access	Alternative B - Intersection with Westbound Left Turn
NATURAL ENVIRONMENT		
Vegetation and Wildlife: Potential for disturbance to /impact on function of adjacent terrestrial habitat.	 Equal	Neither alternative has the potential to impact vegetation/wildlife
Aquatic Habitat: Potential for loss and/or degradation of aquatic habitat.	 Equal	Neither alternative has the potential to impact aquatic habitat
Species at Risk: Potential for impact to SAR and/or their habitat.	 Equal	Neither alternative has the potential to impact species at risk or their habitat
Natural Environment Criteria Group Summary	 Equal	

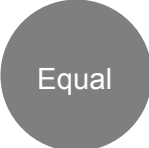
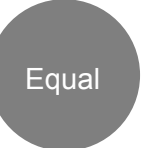

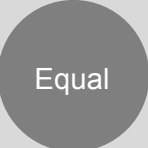
Appendix K: Alternative Designs Detailed Evaluation

Table 2 South Service Road – GO Transit Station Access Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Intersection with Loop Road Access	Alternative B - Intersection with Westbound Left Turn
SOCIO ECONOMIC ENVIRONMENT		
Potential for loss of residential/business property.	Equal	Neither alternative would impact residential/business property.
Potential for disruption to business activity during construction.	Equal	Both alternatives have similar potential for traffic delays during construction. This could impact local business activity.
Potential for lifestyle disruption effects to residents, such as noise or visual impacts.	Equal	Neither alternative would cause lifestyle disruption effects.
Potential enhance street corridor character.	Equal	An improved street character is possible with both alternatives.
Potential for loss of agricultural land.	Equal	Neither alternative would cause impacts to agricultural land.






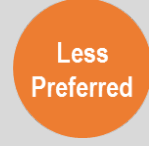
Appendix K: Alternative Designs Detailed Evaluation

Table 2 South Service Road – GO Transit Station Access Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Intersection with Loop Road Access	Alternative B - Intersection with Westbound Left Turn
Socio-Economic Criteria Group Summary	Equal	
CULTURAL ENVIRONMENT		
Archaeological Resources: Potential for impact to registered archaeological sites and areas of archaeological potential.	Equal	The subject lands are previously disturbed, no potential for impacts to archaeological resources
Built Heritage Resources: Potential to impact registered cultural heritage properties and properties of cultural interest.	Equal	Neither alternative would cause impacts to built heritage resources.
Cultural Environment Criteria Group Summary	Equal	



Appendix K: Alternative Designs Detailed Evaluation

Table 2 South Service Road – GO Transit Station Access Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Intersection with Loop Road Access	Alternative B - Intersection with Westbound Left Turn
ENGINEERING/ROAD DESIGN		
Services/Utilities: Potential to impact to services or utilities in the corridor (e.g. water, sanitary, electrical, communications).	 Equal	Both alternatives have similar potential for impact on utilities.
Construction Staging: Potential for impact to traffic operations during construction.	 Equal	Both alternatives have similar construction staging requirements.
Storm Water Management: Potential for impact on SWM infrastructure and potential for increased run-off and flooding.	 Equal	Both alternatives have similar SWM requirements. The additional road surface area of Alternative B is not considered to be significant.
Engineering/Road Design Criteria Group Summary	 Equal	





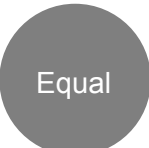
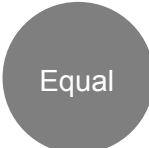
Appendix K: Alternative Designs Detailed Evaluation

Table 2 South Service Road – GO Transit Station Access Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A – Intersection with Loop Road Access	Alternative B - Intersection with Westbound Left Turn
COST		
Relative capital, property and operating cost.	 Some additional costs will be required to re-construct the north side bus loop road. Similar operating costs expected.	 Less costly. Similar operating costs expected
IMPLEMENTATION - APPROVAL		
MTO Consultation on approval of the preliminary design	 MTO support for the preliminary design to be refined through Detailed Design	 MTO indicated concerns with limited vehicle storage and potential queuing impacts on the QEW Interchange.
Overall Evaluation Summary	 Preferred	 Less Preferred

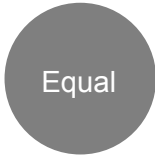


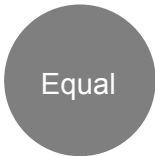


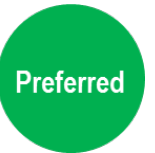

Appendix K: Alternative Designs Detailed Evaluation

Table 3 Casablanca Boulevard Widening and Drainage Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A - Urbanized Cross-Section	Alternative B - Maintain Rural Cross-Section
TRANSPORTATION		
Ability to address future roadway capacity deficiencies.	Evaluation criterion not applicable to decision regarding the selection of an urban vs. rural cross-section	
Ability to address identified access needs/deficiencies.	Evaluation criterion not applicable to decision regarding the selection of an urban vs. rural cross-section	
Ability to address existing and future traffic operations deficiencies.	Evaluation criterion not applicable to decision regarding the selection of an urban vs. rural cross-section	
Ability to address vehicle safety issues.	Evaluation criterion not applicable to decision regarding the selection of an urban vs. rural cross-section	
Ability to provide safe access to driveways and properties along the corridor.	Evaluation criterion not applicable to decision regarding the selection of an urban vs. rural cross-section	
Ability to provide safe, connected, effective, attractive and convenient cycling and pedestrian environment.	 Provides greater flexibility for provision of an active transportation facility along the road corridor.	 The presence of a ditch along the west side of the roadway provides less flexibility in the design of A/T facilities.

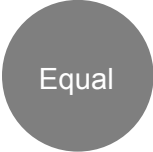
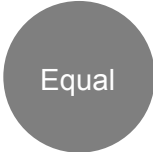


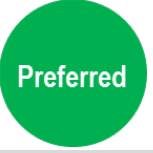

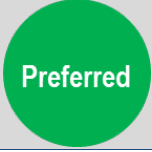
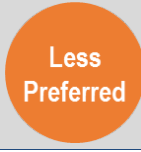
Appendix K: Alternative Designs Detailed Evaluation

Table 3 Casablanca Boulevard Widening and Drainage Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A - Urbanized Cross-Section	Alternative B - Maintain Rural Cross-Section
Ability to accommodate accessibility requirements along the corridor (e.g. AODA requirements).	Evaluation criterion not applicable to decision regarding the selection of an urban vs. rural cross-section	
Transportation Criteria Group Summary		
NATURAL ENVIRONMENT		
Vegetation and Wildlife: Potential for removal of terrestrial vegetation and wildlife habitat including street trees.	 Preferred Some need for removal of trees and vegetation along the ROW.	 Less Preferred Greater potential for removal of trees and vegetation along and adjacent to the ROW.
Vegetation and Wildlife: Potential for disturbance to /impact on function of adjacent terrestrial habitat.	 Equal Similar potential for disturbance to adjacent habitat which is not considered to be significant.	
Aquatic Habitat: Potential for loss and/or degradation of aquatic habitat.	 Equal While Alternative A would result in the burying of the road side ditch along Casablanca Boulevard, it was determined that this drainage feature is used for flow conveyance and does not provide suitable fish habitat. As such, it is not anticipated that the proposed road widening activities and proposed enclosure of the drainage feature would cause serious harm to fish or fish habitat as per Section 35 of the Fisheries Act.	



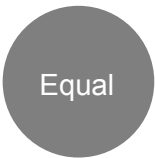




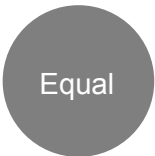
Appendix K: Alternative Designs Detailed Evaluation

Table 3 Casablanca Boulevard Widening and Drainage Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A - Urbanized Cross-Section	Alternative B - Maintain Rural Cross-Section
Species at Risk: Potential for impact to SAR and/or their habitat.	 <p>The corridor has limited potential to support SAR species. The alternatives were considered to have similar potential for impact on SAR species.</p>	
Natural Environment Group Summary		
SOCIO ECONOMIC ENVIRONMENT		
Compatibility with Provincial Policy Statement sections 1.6.7 and 1.6.8 (Transportation Systems and Transportation Infrastructure Corridors).	 <p>Both alternatives are compatible with provincial policies.</p>	
Compatibility with Region and Municipality Planning policies (official plans, secondary plans and transportation plans).	 <p>Compatible with complete street guidelines</p>	 <p>Less compatible with complete street guidelines</p>
Potential for loss of residential property.	 <p>No residential property required</p>	 <p>Residential property required along the west side of the corridor (approx. +/- 6 m)</p>




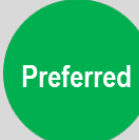


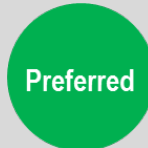

Appendix K: Alternative Designs Detailed Evaluation

Table 3 Casablanca Boulevard Widening and Drainage Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A - Urbanized Cross-Section	Alternative B - Maintain Rural Cross-Section
Potential for disruption to business activity during construction.	 Equal The alternatives have similar potential for traffic disruption which could impact travel through the area and access to local area businesses.	
Potential for lifestyle disruption effects to residents, such as noise or visual impacts.	 Equal The alternatives have similar potential for lifestyle disruption effects to residents.	
Potential enhance street corridor character.	 Preferred Removes ditch and provides greater opportunity for streetscapes improvements.	 Less Preferred Lower potential for streetscape improvements with ditch in place.
Potential for loss of agricultural land.	 Preferred No removal of agricultural land	 Less Preferred Greater potential for removal of agricultural land located on the west side of the corridor.
Socio-Economic Criteria Group Summary	 Preferred	 Less Preferred
CULTURAL ENVIRONMENT		

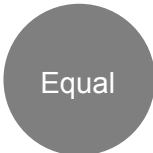
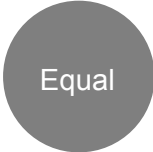

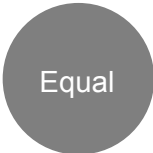
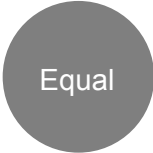
Appendix K: Alternative Designs Detailed Evaluation

Table 3 Casablanca Boulevard Widening and Drainage Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A - Urbanized Cross-Section	Alternative B - Maintain Rural Cross-Section
Archaeological Resources: Potential for impact to registered archaeological sites and areas of archaeological potential.	 Minimal potential for impact of lands with archaeological potential.	 Greater potential for impact on lands with archaeological potential.
Built Heritage Resources: Potential to impact registered cultural heritage properties and properties of cultural interest.	 Neither alternative has the potential to impact to built heritage features.	
Cultural Environment Criteria Group Summary	 Preferred	 Less Preferred
ENGINEERING/ROAD DESIGN		
Services/Utilities: Potential to impact to services or utilities in the corridor (e.g. water, sanitary, electrical, communications).	 Road lowering/storm sewer has greater potential to affect existing below grade utilities	 A new side ditch would have some potential to affect existing below grade utilities.
Construction Staging: Potential for impact to traffic operations during construction.	 Both alternatives have similar potential for impact on traffic operations during construction.	

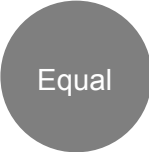




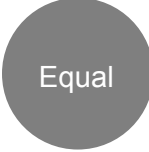
Appendix K: Alternative Designs Detailed Evaluation

Table 3 Casablanca Boulevard Widening and Drainage Alternative Designs Evaluation		
Criteria Groups/Criteria	Alternative A - Urbanized Cross-Section	Alternative B - Maintain Rural Cross-Section
Storm Water Management: Potential for impact on SWM infrastructure and potential for increased run-off and flooding.	 Greater potential need for additional auxilliary SWM facilities.	 A ditch would provide a higher level of stormwater management (e.g. temporary storage and quality control)
Engineering/Road Design Criteria Group Summary		
COST		
Relative capital, property and operating cost.	 Higher relative cost	 Lower relative cost
Overall Evaluation Summary		

Appendix K: Alternative Designs Detailed Evaluation

Table 4 Stormwater Management Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative B – New Conveyance, End of Pipe Control and Use of Vine Road Drain	Alternative C – New Conveyance and End of Pipe Control	Alternative D - New Conveyance, Super-Pipes and new Storm Sewer Outlet
TRANSPORTATION			
		No impact to the transportation system. All alternatives can accommodate the planned roadway improvements.	
NATURAL ENVIRONMENT			
Vegetation and Wildlife: Potential for removal of terrestrial vegetation and wildlife habitat including street trees.		Both alternatives have potential for some vegetation removal associated with the required new storm sewer that would be between the SWM facility/GO Transit Station south parking area and Casablanca Boulevard.	 Property and land impacts would be limited to smaller nodes along the corridor
Vegetation and Wildlife: Potential for disturbance to /impact on function of adjacent terrestrial habitat.		Once installed, the new storm sewers would not have ongoing disturbance to any adjacent habitat areas.	
Aquatic Habitat: Potential for loss and/or degradation of aquatic habitat.		All alternatives would result in the burying of the road side ditch along Casablanca Boulevard This drainage feature is used for flow conveyance and does not provide suitable fish habitat. As such, it is not anticipated that the proposed road widening activities and proposed enclosure of the drainage feature would cause serious harm to fish or fish habitat as per Section 35 of the Fisheries Act.	

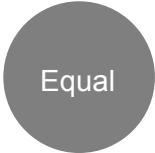





Appendix K: Alternative Designs Detailed Evaluation

Table 4 Stormwater Management Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative B – New Conveyance, End of Pipe Control and Use of Vine Road Drain	Alternative C – New Conveyance and End of Pipe Control	Alternative D - New Conveyance, Super-Pipes and new Storm Sewer Outlet
Species at Risk: Potential for impact to SAR and/or their habitat.	 The Focused Study Area has limited potential to support SAR species. The alternatives were considered to have similar potential for impact on SAR species.		
Natural Environment Criteria Group Summary			
SOCIO ECONOMIC ENVIRONMENT			
Potential for loss/impact of residential property.	 While no residential property is required, there is potential for flooding of residential property located along the Vine Road drain.	 No residential property is required and avoids/ mitigates the risk of potential flooding of residential property.	
Potential for disruption to business activity during construction.	 All alternatives have minimal potential for disruption to businesses		










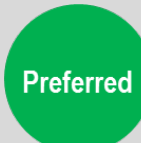
Appendix K: Alternative Designs Detailed Evaluation

Table 4 Stormwater Management Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative B – New Conveyance, End of Pipe Control and Use of Vine Road Drain	Alternative C – New Conveyance and End of Pipe Control	Alternative D - New Conveyance, Super-Pipes and new Storm Sewer Outlet
Potential for lifestyle disruption effects to residents, such as noise or visual impacts.	Equal	Neither alternative would have long-term disruption effects.	
Potential enhance street corridor character.	Equal	Neither alternative has the potential to enhance street character.	
Potential for loss of agricultural land.	Equal	Both alternatives result in similar impact on agricultural land (same land that is intended for a future Regional transit facility and potential south parking area for the GO Transit station).	
Socio-Economic Environment Criteria Group Summary		Equal	Preferred
CULTURAL ENVIRONMENT			
Archaeological Resources: Potential for impact to registered archaeological sites and areas of archaeological potential.	Equal	Both alternatives have similar potential for impact to archaeological resources. The proposed SWM facility/parking area is located in an area that has archaeological potential and subject to Stage 2 investigations.	

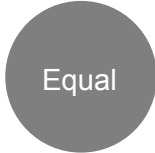









Appendix K: Alternative Designs Detailed Evaluation

Table 4 Stormwater Management Alternative Designs Evaluation				
Criteria Groups/Criteria	Alternative B – New Conveyance, End of Pipe Control and Use of Vine Road Drain	Alternative C – New Conveyance and End of Pipe Control	Alternative D - New Conveyance, Super-Pipes and new Storm Sewer Outlet	
Built Heritage Resources: Potential to impact registered cultural heritage properties and properties of cultural interest.	 Equal	None of the alternatives have the potential to impact built heritage resources.		
Cultural Environment Criteria Group Summary	 Equal			
ENGINEERING/ROAD DESIGN				
Services/Utilities: Potential to impact to services or utilities in the corridor (e.g. water, sanitary, electrical, communications).	 Preferred	Potential for conflict with utilities limited to Casablanca Boulevard corridor south of Livingston Ave.	 Less Preferred	Additional potential for conflict with utilities along Casablanca Blvd north of Livingston Ave. and along the South Service Road.
Construction Staging: Potential for impact to traffic operations during construction.	 Preferred	Less conflict and need for coordination with the planned roadway improvements.	 Less Preferred	The continuation of a storm pipe along Casablanca Blvd north of Livingston Avenue results in need to coordinate with road works along this section including a possible future grade separated crossing of the rail tracks.










Appendix K: Alternative Designs Detailed Evaluation

Table 4 Stormwater Management Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative B – New Conveyance, End of Pipe Control and Use of Vine Road Drain	Alternative C – New Conveyance and End of Pipe Control	Alternative D - New Conveyance, Super-Pipes and new Storm Sewer Outlet
Storm Water Management: Potential for impact on SWM infrastructure and potential for increased run-off and flooding.	 Provides less quantity control with potential for flooding to residential properties along the Vine Road drainage channel.	 Provides greater level of quantity control and avoids flooding potential to residential properties.	
Engineering/Road Design Criteria Group Summary			
COST			
Relative capital, property and operating cost.	 Lower cost with lower new storm sewer length	 High cost due to greater storm sewer length	
Overall Evaluation Summary			

Appendix K: Alternative Designs Detailed Evaluation

Table 5 CN Rail Crossing Treatment Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative A – Improved At-Grade Crossing	Alternative B – Underpass Grade Separated Crossing	Alternative C – Overpass Grade Separated Crossing
TRANSPORTATION			
Ability to provide required access to GO Transit Station and other commercial properties.	 None of the alternatives impact the GO Transit Station access. Access can be accommodated under all the alternatives.		
Ability to address existing and future traffic operations deficiencies.	 Delays to traffic movement through the corridor.	 Improved flow of traffic through the corridor.	 Improved flow of traffic through the corridor.
Ability to address vehicle safety issues.	 Higher potential for vehicle/train conflicts.	 Potential for vehicle/train conflicts eliminated.	 Avoids potential vehicle/train conflicts, however the steep approach grade to the South Service Road could result in some safety issues.
Ability to provide safe access to residential driveways and properties along the corridor.	 Limited/no impact to existing driveways	 Requires relocation and consolidation of 3 residential entrances on the east side of Casablanca Boulevard	 Maintaining access to Casablanca Boulevard for 3 residences on the east side of Casablanca not possible due to significant roadway and driveway grade change that would result.













Appendix K: Alternative Designs Detailed Evaluation

Table 5 CN Rail Crossing Treatment Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative A – Improved At-Grade Crossing	Alternative B – Underpass Grade Separated Crossing	Alternative C – Overpass Grade Separated Crossing
Ability to provide safe, connected, effective, attractive and convenient cycling and pedestrian environment.	 <p>No change in grade to roadway. No impact on cyclists/pedestrians.</p>	 <p>Changes in roadway grades. A tunnel environment for pedestrian and cyclists is generally less preferred due to perceived security issues, which can be mitigated through design.</p>	 <p>Would require steep sidewalk/bike path grades which could be challenging for some users.</p>
Ability to accommodate accessibility requirements along the corridor (e.g. AODA requirements).	 <p>Can meet AODA standard.</p>	 <p>Can meet AODA standard.</p>	 <p>Not likely to meet AODA requirements due to required steep grades.</p>
Transportation Criteria Group Summary			

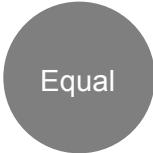
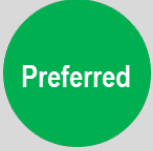
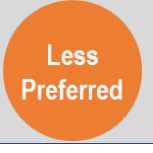
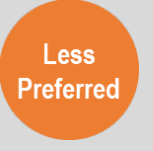
Appendix K: Alternative Designs Detailed Evaluation

Table 5 CN Rail Crossing Treatment Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative A – Improved At-Grade Crossing	Alternative B – Underpass Grade Separated Crossing	Alternative C – Overpass Grade Separated Crossing
NATURAL ENVIRONMENT			
Vegetation and Wildlife: Potential for removal of terrestrial vegetation and wildlife habitat including street trees.	Equal Limited natural habitat along the corridor. With the planned widening of the roadway, a similar amount of roadside vegetation likely to be impacted.		
Vegetation and Wildlife: Potential for disturbance to /impact on function of adjacent terrestrial habitat.	Equal N/A - no significant habitat adjacent to the roadway		
Aquatic Habitat: Potential for loss and/or degradation of aquatic habitat.	Equal No potential to impact aquatic habitat	Equal Extension of a culvert, aquatic habitat impacts minimal.	Equal Extension of a culvert, aquatic habitat impacts minimal.
Species at Risk: Potential for impact to SAR and/or their habitat.	Equal None of the alternatives have the potential to impact SAR or their habitat.		
Natural Environment Criteria Group Summary	Equal		

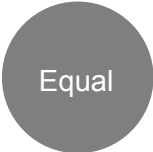
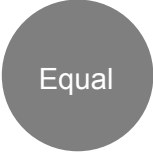
Appendix K: Alternative Designs Detailed Evaluation

Table 5 CN Rail Crossing Treatment Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative A – Improved At-Grade Crossing	Alternative B – Underpass Grade Separated Crossing	Alternative C – Overpass Grade Separated Crossing
SOCIO ECONOMIC ENVIRONMENT			
Potential for loss of residential/business property.	 Minimal property impacts.	 Some frontage impacts to residential properties and commercial properties along the South Service Road.	 Would require acquisition of 3 residences plus some commercial property along the South Service Road. Removal of GO Transit Station parking spaces & access modifications may be required.
Potential for disruption to business activity during construction.	 Minimal traffic disruption during construction.	 More significant disruption to traffic during construction and for a longer time period.	 More significant disruption to traffic during construction and for a longer time period.
Potential for lifestyle disruption effects to residents, such as noise or visual impacts.	 No significant change over existing conditions	 Would result in visual change of the street character for a few residents.	 Significant change in views from several residential properties on the east side of Casablanca.
Potential enhance street corridor character.	 Generally supportive of street character improvements associated with planned lane widening.	 Grade separation is less supportive of street character enhancements.	 Grade separation is less supportive of street character enhancements.

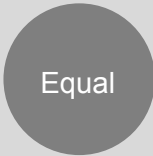
Appendix K: Alternative Designs Detailed Evaluation

Table 5 CN Rail Crossing Treatment Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative A – Improved At-Grade Crossing	Alternative B – Underpass Grade Separated Crossing	Alternative C – Overpass Grade Separated Crossing
Potential for loss of agricultural land.	 None of the alternatives have the potential to impact agricultural land.		
Socio-Economic Criteria Group Summary			

CULTURAL ENVIRONMENT

Archaeological Resources: Potential for impact to registered archaeological sites and areas of archaeological potential.		Lands are previously disturbed; none of the alternatives have the potential to impact archaeological resources.	
Built Heritage Resources: Potential to impact registered cultural heritage properties and properties of cultural interest.		No built heritage features in the vicinity of the Rail corridor; none of the alternatives have the potential to impact built heritage resources.	










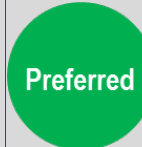
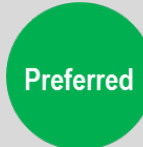

Appendix K: Alternative Designs Detailed Evaluation

Table 5 CN Rail Crossing Treatment Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative A – Improved At-Grade Crossing	Alternative B – Underpass Grade Separated Crossing	Alternative C – Overpass Grade Separated Crossing
Cultural Environment Criteria Group Summary			

ENGINEERING/ROAD DESIGN

Services/Utilities: Potential to impact to services or utilities in the corridor (e.g. water, sanitary, electrical, communications).	Preferred- minimal potential for impact on utilities	Less Preferred – Greater potential for impact to existing utilities.	Less Preferred – Greater potential for impact to existing utilities.
Construction Staging: Potential for impact to traffic operations during construction.	Preferred - construction would be relatively straightforward. All alternatives require coordination with Metrolinx.	Less Preferred - complex construction staging likely requiring road closure. Detour route would be required. All alternatives require coordination with Metrolinx.	Less Preferred - complex construction staging likely requiring road closure. Detour route would be required. All alternatives require coordination with Metrolinx.
Storm Water Management: Potential for impact on SWM infrastructure and potential for increased run-off and flooding.	Preferred - requires minimal reworking of local drainage system. Changes would be required for the road widening/additional lanes.	Less Preferred - requires reworking of local drainage system including new SWM facilities. - would require a pumping station for the subway.	Less Preferred - requires reworking of local drainage system including new SWM facilities

Appendix K: Alternative Designs Detailed Evaluation

Table 5 CN Rail Crossing Treatment Alternative Designs Evaluation			
Criteria Groups/Criteria	Alternative A – Improved At-Grade Crossing	Alternative B – Underpass Grade Separated Crossing	Alternative C – Overpass Grade Separated Crossing
Engineering/Road Design Criteria Group Summary	 Preferred	 Less Preferred	 Less Preferred
COST			
Relative capital, property and operating cost.	 Preferred Less costly than the grade separated alternatives	 Less Preferred High capital cost for underpass and ongoing costs for operation and maintenance of pump facility.	 Less Preferred High capital cost for overpass.
IMPLEMENTATION - APPROVAL			
CN, Metrolinx, and MTO Consultation on approval of the detailed design	 Preferred MTO and Metrolinx support as a short-medium term alternative, with mitigation and monitoring. CN consultation to be conducted as part of Detailed Design.	 Preferred MTO and Metrolinx support as the long-term alternative. CN consultation to be conducted as part of Detailed Design.	 Less Preferred MTO and Metrolinx concerns about implementation and safety challenges.
Overall Evaluation Summary	 Preferred Short- to Medium-Term	 Preferred Long Term	 Less Preferred

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