

Schedule 'C' Municipal Class Environmental Assessment for Merritt Road (Regional Road 37) and Rice Road (Regional Road 54) in the Town of Pelham, the City of Thorold and the City of Welland

APPENDIX

O

Alternative Solutions

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Evaluation of Alternative Solutions

Schedule 'C' Municipal Class Environmental Assessment for
Regional Road 37 (Merritt Road) and Regional Road 54 (Rice Road) in the
Town of Pelham, City of Thorold, and City of Welland, Ontario

Prepared for:

Niagara Region

01 June 2021



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Schedule 'C' Municipal Class Environmental Assessment for
Regional Road 37 (Merritt Road) and Regional Road 54 (Rice Road) in the
Town of Pelham, City of Thorold, and City of Welland, Ontario

Prepared for:

Niagara Region

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1.0 Introduction

The Regional Municipality of Niagara (Niagara Region) has retained Wood Environment & Infrastructure (Wood) to undertake a Schedule 'C' Municipal Class Environmental Assessment (MCEA) Study for improvements to Regional Road 37 (Merritt Road) and Regional Road 54 (Rice Road), in the Town of Pelham, City of Thorold, and City of Welland, Ontario. The Study Area includes the following four road segments (Figure 1-1):

- Segment 1 – Merritt Road between Rice Road and Cataract Road
- Segment 2 – Merritt Road between Cataract Road and Merrittville Highway / Niagara Street
- Segment 3 – Merritt Road between Merrittville Highway / Niagara Street and Highway 406
- Segment 4 – Rice Road between Merritt Road and Quaker Road

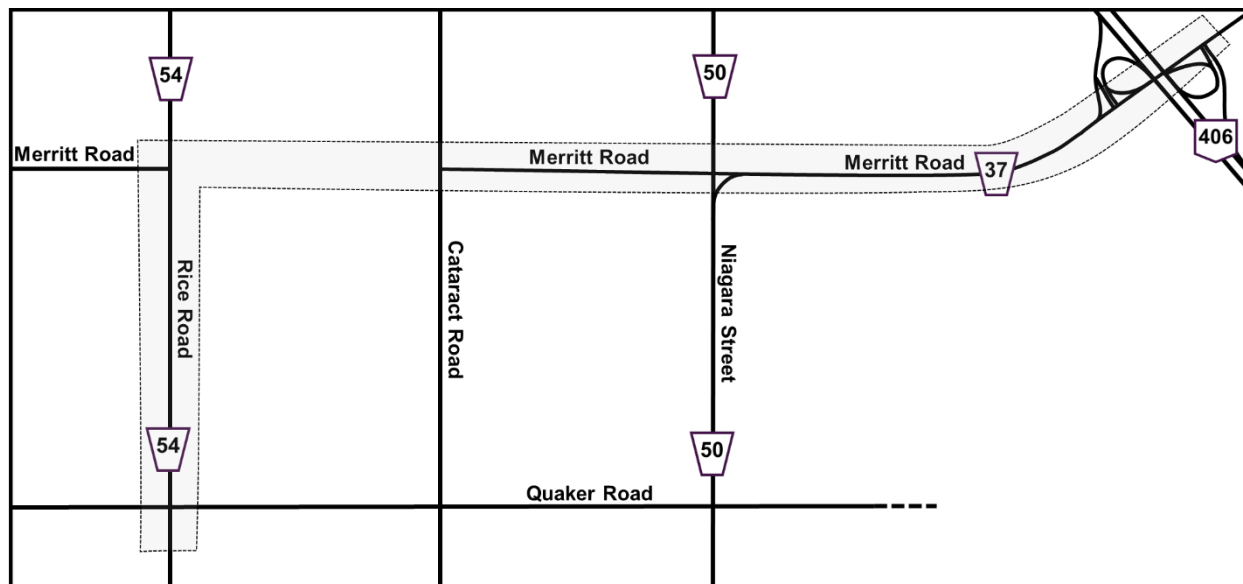


Figure 1-1: Study Area

The Study is being carried out in accordance with the requirements of Phases 1 to 4 outlined in Municipal Class Environmental Assessment document (Municipal Engineers Association, October 2000, as amended in 2007, 2011 & 2015).

This document was prepared to document Municipal Class EA Phases 1 and 2 for this project. Specifically, this document outlines the problem and opportunity statement and the evaluation of alternative solutions process to identify a preferred solution that addresses the problem and opportunity statement.

2.0 Problem and Opportunity Statement

This study is building on the recommendations of the Niagara Region's Transportation Master Plan (TMP) (2017), which included the following (IBI Group et al., 2017):

- Extension of Merritt Road between Regional Road 54 (Rice Road) and Cataract Road;
- Capacity improvements of Merritt Road from Cataract Road to Highway 406; and,
- Capacity improvements to Regional Road 54 (Rice Road) from 200 meters north of Merritt Road to Quaker Road.

Further, a transportation assessment was completed as part of this study to assess traffic operations and safety within the study area in the context of anticipated development that will be occurring within the study area in accordance with three separate Secondary Plans (East Fonthill Secondary Plan in the Town of Pelham, Port Robinson Secondary Plan in the City of Thorold and Northwest Welland Secondary Plan in the City of Welland). As a result of the proposed development, the transportation assessment identified significant congestion on the road network, particularly on Merritt Road between the Merrittville Highway/Niagara Street and the Highway 406 interchange by 2041. With the Merritt Road extension remaining closed, Niagara Street between Merritt Road and Quaker Road and Quaker Road between Rice Road and Niagara Street will also experience a significant increase in traffic volumes given the need for motorists to take an indirect route between the Town of Pelham and the Highway 406 intersection, necessitating the need for capacity improvements on those roadways by 2041.

The Niagara Region is committed to creating a safe, integrated and environmentally sustainable network of cycling and pedestrian facilities, transit, and roads. The Niagara Region is taking this opportunity to improve Merritt Road and Rice Road in the Town of Pelham, City of Thorold and City of Welland in order to:

- Address transportation capacity issues
- Address active transportation connectivity issues
- Address Complete Street theme

3.0 Identification and Evaluation of Alternative Solutions

Phase 2 of the Class EA process requires that various reasonable solutions shall be identified to address the problem and opportunity. The potential solutions are then evaluated against criteria related to natural, socio-economic, and cultural environments and technical and cost considerations. Based on the evaluation, the preferred solution is presented to the government review agencies, the public, Indigenous Nations, and key stakeholders for review and input.

3.1 Identification of Alternative Solutions

The following alternative solutions were identified as part of this study:

Alternative Solution 1 - Do Nothing: As the name implies, this alternative would not propose any improvements to the Merritt Road and Rice Road within the study area. This alternative maintains existing transportation conditions.

Alternative Solution 2 - Manage Transportation Demand: Transportation Demand Management (TDM) alternative would manage the demands placed on transportation infrastructure by implementing a set of policies, programs, services, and/or initiatives that aim to increase efficiency in the transportation network by changing how, how much, when, where, and why people travel. This alternative would improve facilities for other modes of transportation, such as, walking, cycling and transit.

Alternative Solution 3 – Limit Growth and Development: Land development and other changes in land use may give rise to roadway capacity problems. This alternative would involve restricting development of adjacent lands.

Alternative Solution 4 – Improve Other North-South and East-West Roads: This alternative considers infrastructure improvements to the other north-south and east-west roads.

Alternative Solution 5 – Improve Merritt Road and Rice Road: This alternative would involve the following:

- Extension of Merritt Road between Rice Road and Cataract Road;
- Improvements to Merritt Road between Cataract Road and Highway 406;

- Improvements to Rice Road between 200m north of Merritt Road and Quaker Road;
- Localized intersection improvements, such as addition of dedicated turn lanes, traffic signals/roundabouts and/or improvements to the timing of the existing traffic signal at Merritt Road and Merrittville Highway/Niagara Street intersection to improve traffic operations; and
- Providing active transportation facilities on both Merritt Road and Rice Road.

3.2 Evaluation Criteria

To identify the impacts and advantages of each alternative solution, evaluation criteria were developed within each of the categories related to transportation, socio-economic, natural, and cultural environments and technical and cost considerations. These criteria were chosen based on their ability to identify potential positive and negative effects of each alternative and distinguish the advantages and disadvantages between them.

Table 3-1: Evaluation Criteria for Alternative Solutions

Factor	Evaluation Criteria
Transportation	<p>Municipal Planning Policies: Addresses recommendations of the Niagara Region's TMP (2017), for improvements to Merritt Road and Rice Road in alignment with Complete Streets guidelines</p> <p>Provincial Planning Policies: Complies with the Provincial Policy Statement (2020) and conforms with Growth plan for the Greater Golden Horseshoe (2020)</p> <p>Capacity and Level of Service: Potential to improve existing and future traffic congestion and level of service on Merritt Road and Rice Road</p> <p>Safety: Potential to improve road safety by removing roadside hazards along Merritt Road and Rice Road</p> <p>Active Transportation: Potential to incorporate active transportation facilities for walking and cycling</p>






Evaluation of Alternative Solutions
Merritt Road and Rice Road
Municipal Class Environmental Assessment Study

Factor	Evaluation Criteria
	<p>Network Connectivity: Potential to provide a direct route between Highway 406 interchange and areas west of the study area (Town of Pelham).</p> <p>Goods Movement: Potential to improve goods movement</p>
<p>Socio-economic Environment</p>	<p>Private Property: Potential for property requirements</p> <p>Economic Development: Supports future growth and economic sustainability along Merritt Road and Rice Road</p> <p>Public Realm: Ability to provide opportunities to enhance streetscaping, landscaping, and public realm along Merritt Road and Rice Road</p> <p>Accessibility: Provides opportunities to improve accessibility and reduce barriers in the built environment</p> <p>Construction Impacts: Potential impacts to residents, businesses and institutions during construction</p> <p>Health: Provide active transportation infrastructure which will promote walking and cycling</p> <p>Noise: Potential for noise impacts</p>
<p>Natural Environment</p>	<p>Terrestrial Environment: Potential impacts to terrestrial resources (vegetation, wetlands, trees and wildlife)</p> <p>Aquatic Environment: Potential impacts to fish and fish habitats</p> <p>Air Quality: Impacts to air quality</p>

Evaluation of Alternative Solutions
Merritt Road and Rice Road
Municipal Class Environmental Assessment Study

Factor	Evaluation Criteria
Cultural / Archaeological Environment	<p>Archaeological Resources: Potential impacts to lands identified to retain potential archaeological resources</p> <p>Built Heritage and Cultural Resources: Potential impacts on built heritage and cultural heritage landscapes</p>
Engineering/Constructability	<p>Utilities: Impacts on utilities</p> <p>Stormwater Management: Provides opportunities to reduce stormwater quantity and/or improve stormwater quality</p> <p>Climate Change: Provides opportunities to improve resilience of the subject roads to changing climatic conditions</p> <p>Implementation: Potential for impacts associated with project implementation/construction</p>
Cost	<p>Implementation Cost: Cost to construct</p> <p>Operation and Maintenance Cost: Cost to operate and maintain</p>

The alternative solutions were evaluated using the evaluation criteria presented in **Table 3-1**. The alternatives were assigned a score based on the scoring system presented below:

				
Highest negative impacts or lowest benefits	Higher negative impacts or lower benefits	Moderate negative impacts and benefits	Lower negative impacts or greater benefits	Lowest negative impacts or greatest benefits

Alternatives represented by a full dark circle symbol were given the highest score where the evaluation criteria resulted in the lowest anticipated impacts, or highest benefits from the alternative. In cases where the alternative had the highest anticipated impact or lowest benefit according to the evaluation criteria, a lowest score represented by white circle with black outline was assigned.

Accordingly, circles shaded one-quarter, half, or three-quarters, represented a range between higher negative impacts or lower benefits, moderate negative impacts and benefits and lower negative impacts or greater benefits. Results of the evaluation of alternative solutions is presented in **Table 3-2**.

Table 3-2: Evaluation of Alternative Solutions

Evaluation Criteria	Alternative Solution 1 – Do Nothing	Score	Alternative Solution 2 – Manage Transportation Demand	Score	Alternative Solution 3 – Limit Growth and Development	Score	Alternative Solution 4 – Improve Other North-South and East-West Roads	Score	Alternative Solution 5 – Improve Merritt Road and Rice Road	Score
Transportation										
Municipal Planning Policies Addresses recommendations of the Niagara Region's TMP (2017), for improvements to Merritt Road and Rice Road	It does not address the recommendations of the Niagara Region's TMP (2017), for improvements to Merritt Road and Rice Road	○	It does not address the recommendations of the Niagara Region's TMP (2017), for improvements to Merritt Road and Rice Road. Transportation Demand Management initiatives are being implemented as part of the Niagara Region's TMP (2017)	◐	It does not conform to Growth Plan for the Greater Golden Horseshoe (2020). It does not address the recommendations of the Niagara Region's TMP (2017), for improvements to Merritt Road and Rice Road to accommodate traffic growth.	◐	It does not address the recommendations of the Niagara Region's TMP (2017), for improvements to Merritt Road and Rice Road	○	Addresses the recommendations of the Niagara Region's TMP (2017), for improvements to Merritt Road and Rice Road. This option will accommodate future traffic demand from future development.	●
Provincial Planning Policies: Complies with the Provincial Policy Statement (2020) and conforms with Growth plan for the Greater Golden Horseshoe (2020)	Does not address objectives of provincial policies related to planning and protection of transportation corridors as well as planning of infrastructure to support growth	○	Complies with the Provincial Policy Statement (2020) and conforms to Growth plan for the Greater Golden Horseshoe (2020). However, this solution alone will not accommodate future traffic capacity and improve level of service associated with traffic growth.	◐	It does not conform to Growth Plan for the Greater Golden Horseshoe (2020). Does not address objectives of provincial policies related to planning and protection of transportation corridors as well as planning of infrastructure to support growth	○	Complies with the Provincial Policy Statement (2020) and conforms to Growth plan for the Greater Golden Horseshoe (2020). However, this solution alone will not address future traffic capacity and improve level of service associated with traffic growth on Merritt Road and Rice Road	◐	Complies with the Provincial Policy Statement (2020) and conforms to Growth plan for the Greater Golden Horseshoe (2020). This solution addresses objectives of provincial policies related to planning and protection of transportation corridors as well as planning of infrastructure to support growth	●

Evaluation Criteria	Alternative Solution 1 – Do Nothing	Score	Alternative Solution 2 – Manage Transportation Demand	Score	Alternative Solution 3 – Limit Growth and Development	Score	Alternative Solution 4 – Improve Other North-South and East-West Roads	Score	Alternative Solution 5 – Improve Merritt Road and Rice Road	Score
Capacity and Level of Service Potential to improve existing and future traffic congestion and level of service on Merritt Road and Rice Road	Does not provide opportunities to address existing and future traffic congestion and improve capacity on Merritt Road and Rice Road, resulting in undesirable traffic congestion (particularly on Merritt Road between Merrittville Highway/Niagara Street and the Highway 406 interchange and other roadways (Niagara Street and Quaker Road))	○	May reduce traffic demand to some degree, however, this solution alone will not accommodate future traffic capacity and improve level of service associated with traffic growth.	◐	Limiting future growth and development will result in reduced traffic demand in future.	◑	Merritt Road is a key gateway road into this area and will continue to experience unacceptable levels of congestion as a result of future development. Construction costs with improving Niagara Street and Quaker Road will be significant.	○	Provides opportunities to improve existing and future traffic congestion and level of service on Merritt Road and Rice Road	●
Safety Potential to improve road safety by removing roadside hazards along Merritt Road and Rice Road	Does not improve road safety within the Study Area	○	Does not improve road safety within the Study Area	◐	Does not improve road safety within the Study Area	○	May address safety issues on other roads, but safety issues within the Study Area will not be addressed	◐	Provides opportunities to improve road safety on Merritt Road and Rice Road	◑
Active Transportation Potential to incorporate active transportation facilities for walking and cycling	Does not provide opportunities to incorporate improvements to active transportation facilities	○	This alternative promotes use of active transportation, however, it does not align with the recommendations of the Niagara Region's TMP (2017) for Merritt Road and Rice Road	◐	Does not provide opportunities to incorporate improvements to active transportation facilities	○	Does not provide dedicated pedestrian and cycling facilities on Merritt Road and Rice Road	○	Provides opportunities to incorporate active transportation (dedicated pedestrian and cycling facilities) on Merritt Road and Rice Road	●
Network Connectivity Potential to provide a direct route between Highway 406 interchange and areas west of the study area (Town of Pelham)	No change in network connectivity. No direct route between Highway 406 and areas west of the study area.	○	No change in network connectivity. No direct route between Highway 406 and areas west of the study area.	○	No change in network connectivity. No direct route between Highway 406 and areas west of the study area.	○	No change in network connectivity. No direct route between Highway 406 and areas west of the study area.	○	Direct route between Highway 406 and areas west of the study area, decreasing travel time, and improve active transportation connectivity	●

Evaluation Criteria	Alternative Solution 1 – Do Nothing	Score	Alternative Solution 2 – Manage Transportation Demand	Score	Alternative Solution 3 – Limit Growth and Development	Score	Alternative Solution 4 – Improve Other North-South and East-West Roads	Score	Alternative Solution 5 – Improve Merritt Road and Rice Road	Score
Goods Movement Potential to improve goods movement	Do nothing scenario will not improve subject roads, hence no improvements to the service of goods movement	○	TDM initiatives will cause a shift in transportation modes. However, with the projected traffic growth, this solution alone will not improve the service of goods movement	◐	Limiting growth and development will not improve subject roads, hence no improvements to the service of goods movement	○	Improving other roads will somewhat improve goods movement	◐	Improvements to Merritt Road and Rice Road, will provide network connectivity between Highway 406 interchange and areas west of the study area (Town of Pelham), resulting in improved goods movement	●
Socio-economic Environment										
Private Property Potential for property requirements	No property required	●	No property required	●	No property required	●	Private property will likely be required to incorporate improvements on other north-south or east-west roads	◐	Private property will likely be required to accommodate improvements to Merritt Road and Rice Road. Property impacts can be minimized through identification and evaluation of alternative design concepts and design refinements of the preferred design	◐

Evaluation Criteria	Alternative Solution 1 – Do Nothing	Score	Alternative Solution 2 – Manage Transportation Demand	Score	Alternative Solution 3 – Limit Growth and Development	Score	Alternative Solution 4 – Improve Other North-South and East-West Roads	Score	Alternative Solution 5 – Improve Merritt Road and Rice Road	Score
Economic Development Supports future growth and economic sustainability along Merritt Road and Rice Road	Do nothing scenario will not address traffic congestion associated with project traffic growth, hence it will inhibit future growth and economic sustainability	○	TDM initiatives will cause a shift in transportation modes. However, with the projected traffic growth, this solution alone will not support future growth and economic stability	◐	Limiting growth will inhibit future growth and economic sustainability in this area	○	Improvements to the other north-south or east-west roads will not support growth and economic sustainability along Merritt Road and Rice Road	○	Improvements to Merritt Road and Rice Road will support future growth and economic sustainability by providing a good level of service for all modes of transportation (vehicular and pedestrian traffic, cycling, and transit), which collectively support economic development	●
Public Realm Ability to provide opportunities to enhance streetscaping, landscaping, and public realm along Merritt Road and Rice Road	Does not provide opportunities to enhance streetscaping, landscaping and the public realm along Merritt Road and Rice Road	○	Does not provide opportunities to enhance streetscaping, landscaping and the public realm along Merritt Road and Rice Road	○	Does not provide opportunities to enhance streetscaping, landscaping and the public realm along Merritt Road and Rice Road	○	Does not provide opportunities to enhance streetscaping, landscaping and the public realm along Merritt Road and Rice Road	○	Provides opportunities to enhance streetscaping, landscaping and the public realm along Merritt Road and Rice Road	●
Accessibility Provides opportunities to improve accessibility and reduce barriers in the built environment	Does not provide opportunities to improve accessibility and reduce barriers along Merritt Road and Rice Road	○	Does not provide opportunities to improve accessibility and reduce barriers along Merritt Road and Rice Road	○	Does not provide opportunities to improve accessibility and reduce barriers along Merritt Road and Rice Road	○	Does not provide opportunities to improve accessibility and reduce barriers along Merritt Road and Rice Road	◐	Provides opportunities to improve accessibility/reduce barriers by providing active transportation facilities	●
Construction Impacts Potential impacts to residents, businesses and institutions during construction	No construction related impacts to residents, businesses and institutions	●	No construction related impacts to residents, businesses and institutions	●	No construction related impacts to residents, businesses and institutions	●	Potential short-term construction impacts, which can be mitigated through noise, dust and odour mitigation and traffic staging and planning	◐	Potential short-term construction impacts, which can be mitigated through noise, dust and odour mitigation and traffic staging and planning	◐

Evaluation Criteria	Alternative Solution 1 – Do Nothing	Score	Alternative Solution 2 – Manage Transportation Demand	Score	Alternative Solution 3 – Limit Growth and Development	Score	Alternative Solution 4 – Improve Other North-South and East-West Roads	Score	Alternative Solution 5 – Improve Merritt Road and Rice Road	Score
Health Provide active transportation infrastructure which will promote walking and cycling	Does not provide opportunities to promote walking and cycling through appropriate active transportation infrastructure	○	Although this alternative promotes use of active transportation, it does not align with the recommendations of the Niagara Region's TMP (2017) for Merritt Road and Rice Road	◐	Does not provide opportunities to promote walking and cycling through appropriate active transportation infrastructure	○	Does not provide opportunities to promote walking and cycling through appropriate active transportation infrastructure on Merritt Road and Rice Road	○	Provide opportunities to transform Merritt Road and Rice Road within the Study Area to Complete Streets, which will provide opportunities for incorporating walking and cycling	●
Noise Potential for noise impacts	No potential for noise impacts to the existing and/or future sensitive land uses	●	No potential for noise impacts to the existing and/or future sensitive land uses	●	No potential for noise impacts to the existing and/or future sensitive land uses	●	Potential for noise impacts to the existing and/or future sensitive land uses. Opportunities to minimize impacts through appropriate mitigation measures	◐	Potential for noise impacts to the existing and/or future sensitive land uses. Opportunities to minimize impacts through appropriate mitigation measures	◐
Natural Environment										
Terrestrial Environment Potential impacts to terrestrial resources (vegetation, wetlands, trees, wildlife)	No impacts on terrestrial resources and wildlife are anticipated	●	No impacts on terrestrial resources and wildlife are anticipated	●	No impacts on terrestrial resources and wildlife are anticipated	●	Impacts on terrestrial resources and wildlife elsewhere. Opportunities to minimize impacts through appropriate mitigation measures. Less impacts than Alternative 5	◐	Impacts on terrestrial resources and wildlife habitat. Opportunities to minimize impacts through appropriate mitigation measures	◐

Evaluation Criteria	Alternative Solution 1 – Do Nothing	Score	Alternative Solution 2 – Manage Transportation Demand	Score	Alternative Solution 3 – Limit Growth and Development	Score	Alternative Solution 4 – Improve Other North-South and East-West Roads	Score	Alternative Solution 5 – Improve Merritt Road and Rice Road	Score
Aquatic Environment Potential impacts to fish and fish habitat	No impacts to fish and fish habitat	●	No impacts to fish and fish habitat	●	No impacts on fish and fish habitat are anticipated	●	Impacts on fish and fish habitat are anticipated. Opportunities to minimize impacts through appropriate mitigation measures. Less impacts than Alternative 5.	◐	Impacts on fish and fish habitat. Opportunities to minimize impacts through appropriate mitigation measures	◐
Natural Heritage Potential impacts to natural features, geological formations, and delineated natural areas	No impacts to natural features, geological formations, and delineated natural areas.	●	No impacts to natural features, geological formations, and delineated natural areas.	●	No impacts to natural features, geological formations, and delineated natural areas.	●	Impacts to natural features, geological formations, and delineated natural areas. Opportunities to minimize impacts through appropriate mitigation measures. Less impacts than Alternative 5.	◐	Impacts to natural features, geological formations, and delineated natural areas. Opportunities to minimize impacts through appropriate mitigation measures.	◐
Air Quality: Impacts to air quality	No changes to air quality	●	Potential for changes to air quality and shift from vehicular to other modes of transportation may reduce emissions	◐	No changes to air quality	●	Potential for changes to air quality	◐	Potential for changes to air quality	◐

Evaluation Criteria	Alternative Solution 1 – Do Nothing	Score	Alternative Solution 2 – Manage Transportation Demand	Score	Alternative Solution 3 – Limit Growth and Development	Score	Alternative Solution 4 – Improve Other North-South and East-West Roads	Score	Alternative Solution 5 – Improve Merritt Road and Rice Road	Score
Cultural / Archaeological Environment										
Archaeological Resources Potential impacts to lands identified to retain potential archaeological resources	No impacts to areas of archaeological potential	●	No impacts to lands identified to retain potential archaeological resources	●	No impacts to lands identified to retain potential archaeological resources	●	Potential impacts to lands identified to retain potential archaeological resources elsewhere	◐	Potential impacts to lands identified to retain potential archaeological resources. Stage 2 archaeological assessment will be required to identify any potential impacts and associated mitigation measures	◐
Built Heritage and Cultural Heritage Landscapes Potential impacts on built heritage and cultural heritage landscapes	No impacts to built heritage and cultural heritage landscapes	●	No impacts to built heritage and cultural heritage landscapes	●	No impacts to built heritage and cultural heritage landscapes	●	Potential impacts to built heritage and cultural heritage landscapes elsewhere. Opportunities to minimize impacts through appropriate mitigation measures	◐	Impacts to built heritage and cultural heritage landscapes. Opportunities to minimize impacts through appropriate mitigation measures	◐
Engineering/Constructability										
Utilities Impacts on utilities	No impacts to utilities	●	Minor potential impacts to utilities	◐	No impacts to utilities	●	Likely impacts to utilities. Coordination will be required with utilities companies to relocate utilities	◐	Likely impacts to utilities. Coordination will be required with utilities companies to relocate utilities	◐

Evaluation Criteria	Alternative Solution 1 – Do Nothing	Score	Alternative Solution 2 – Manage Transportation Demand	Score	Alternative Solution 3 – Limit Growth and Development	Score	Alternative Solution 4 – Improve Other North-South and East-West Roads	Score	Alternative Solution 5 – Improve Merritt Road and Rice Road	Score
Stormwater Management Stormwater quantity and stormwater quality	Does not provide opportunities to reduce stormwater quantity/ improve quality	○	Does not provide opportunities to reduce stormwater quantity/ improve quality	○	Does not provide opportunities to reduce stormwater quantity/ improve quality	○	Does not provide opportunities to reduce stormwater quantity and/or improve stormwater quality within the Study Area	○	Provides best opportunity to reduce stormwater quantity and/or improve stormwater quality	●
Climate Change Provides opportunities to improve resilience of the subject roads to changing climatic conditions	Does not provide opportunities to improve resilience to changing climatic conditions	○	Does not provide opportunities to improve resilience to changing climatic conditions	○	Does not provide opportunities to improve resilience to changing climatic conditions	○	Provides opportunities to improve resilience of other roads to changing climatic conditions	◐	Provides opportunities to improve resilience of the subject roads to changing climatic conditions	●
Implementation Potential for impacts associated with project implementation/construction	Do nothing scenario will not cause any implementation related impacts	●	TDM initiatives will likely not cause traffic diversion/disruption or any other project implementation related impacts	◐	Limiting growth and development will not cause any implementation related impacts	●	This alternative will likely cause traffic disruption during construction. Traffic management plan will be required to minimize traffic disruptions during construction	◐	This alternative will likely cause traffic disruption during construction. Traffic management plan will be required to minimize traffic disruptions during construction	◐
Cost										
Implementation Cost Cost to construct	No construction costs	●	Low potential implementation costs	●	No construction costs	●	High capital costs to incorporate improvements	◐	High capital costs to incorporate improvements	◐
Operation and Maintenance Cost Cost to operate and maintain	No operation and maintenance costs	●	Low potential maintenance costs	●	No operation and maintenance costs	●	Low potential operation and maintenance costs	◐	Low potential operation and maintenance costs	◐
Overall Recommendation										
	Not Recommended	◐	Not Recommended	◐	Not Recommended	◐	Not Recommended	◐	Recommended	◐

3.3 Summary of Evaluation of Alternative Solutions

A summary of the evaluation of each alternative solution is provided below:

Alternative Solution 1 – Do Nothing: This alternative will not address the recommendations of the Niagara Region's TMP (2017), for improvements to Merritt Road and Rice Road. In addition, this alternative does not address objectives of provincial policies related to planning and protection of transportation corridors as well as planning of infrastructure to support growth. Without any improvements to these two roads, the existing and future traffic congestion problems and the disconnect in the transportation network and active transportation facilities will continue to remain unaddressed. As such, this alternative was not recommended to be carried forward.

Alternative Solution 2 – Manage Transportation Demand: Transportation Demand Management initiatives are being implemented as part of the Niagara Region's TMP (2017). This alternative does not address the recommendations of the Niagara Region's TMP (2017), for improvements to Merritt Road and Rice Road. Even with the shift to other modes of transportation (such as, walking, cycling and transit), the existing and future traffic congestion problems on Merritt Road and Rice Road will continue to remain unaddressed. As such, this alternative was not recommended to be carried forward.

Alternative Solution 3 – Limit Growth and Development: Limiting growth and development will result in reduced traffic demand in future. In addition, this alternative will have no impacts on a number of criteria (including natural environment and cultural environment, and cost). However, this alternative does not conform to the policies of Growth Plan for the Greater Golden Horseshoe (2020) that promote growth and infrastructure to support that growth. As such, this alternative was not recommended to be carried forward.

Alternative Solution 4 – Improve Other North-South and East-West Roads: This alternative will not address the recommendations of the Niagara Region's TMP (2017), for improvements to Merritt Road and Rice Road. Improving other parallel roads instead of Merritt Road and Rice Road will not address the existing and future traffic congestion problems and the disconnect in the active transportation facilities on these two roads. As such, this alternative was not recommended to be carried forward.

Alternative Solution 5 – Improve Merritt Road and Rice Road: This alternative was identified as preferred solution as it addresses the recommendations of the Niagara

Region's TMP (2017), for improvements to Merritt Road and Rice Road. It provides opportunities to address existing and future traffic congestion on Merritt Road and Rice Road, as well provide active transportation facilities. Potential impacts associated with this alternative can be mitigated through appropriate mitigation measures. The preferred solution is discussed in detail below.

3.4 Preferred Solution

Alternative 5 – Improve Merritt Road and Rice Road was identified as the preferred solution. This alternative would involve the following:

- Extension of Merritt Road between Rice Road and Cataract Road;
- Improvements to Merritt Road between Cataract Road and Highway 406;
- Improvements to Rice Road between 200m north of Merritt Road and Quaker Road;
- Localized intersection improvements, such as addition of dedicated turn lanes, and traffic signals/roundabouts and/or improvement of the timing of the existing traffic signal at Merritt Road and Niagara Street intersection to improve traffic operations; and
- Providing active transportation facilities on both Merritt Road and Rice Road.

It is recognized that the Niagara Region and specifically the adjacent lands to Merritt Road and Rice Road will continue to experience population and employment growth in the near future. The proposed improvements to these two roads will help address transportation capacity and active transportation connectivity issues. These improvements will also implement complete street approach which will improve safety for drivers; bicyclists; and pedestrians of all ages and abilities, while provide opportunities for walking and cycling. Stormwater management measures will also be recommended as part of the proposed improvements to manage stormwater.

It is anticipated that the proposed improvements will impact the following Regional Core Natural Heritage System features (Niagara Region, 2014):

- Environmental Conservation Area
- Potential Natural Heritage Corridor

- Provincially Significant Wetland (Niagara Street Cataract Road Woodlot Wetland Complex)
- Significant Woodland
- Life Science Area of Natural and Scientific Interest
- Fish Habitat

Each municipal Official Plan delineates the same areas as natural heritage. The Niagara Region Official Plan Policy 7.B.1.14 allows “essential public uses of a linear nature, including transportation routes, may be permitted within the Core Natural Heritage System or adjacent lands where an Environmental Assessment for the proposed use has been approved under Provincial or Federal legislation” (Niagara Region, 2014). Likewise, the Provincial Policy Statement (2020) supports the development of transportation and infrastructure corridors and does not consider activities that create or maintain infrastructure authorized under an EA process as development (Ministry of Municipal Affairs and Housing, 2020).

Accordingly, this Class EA will aim to protect natural heritage features, by evaluating all potential natural environmental impacts, identifying appropriate mitigation measures and complying with all other environmental protection requirements, including but not limited to identifying potential permits required by the Niagara Peninsula Conservation Authority and other agencies (e.g., Ministry of the Environment, Conservation and Parks and Fisheries and Oceans Canada).

Given the proximity of the intersection to the Core Natural Heritage features listed above, the alternative design concepts will recognize the sensitivity of these natural areas. Any future works will avoid negative impacts to the Port Robinson Creek system wherever possible and consider enhancement of the features and associated buffers.

After habitat has been evaluated and delineated the guiding principle in understanding impacts will be to protect habitat to maintain habitat function. Standard mitigation measures to minimize impacts during construction phases (e.g., erosion and sediment control plans, spill plans, etc.) will be included. To prevent long-term impacts such as road mortality and hydrology changes various road designs that include road ecology principles will be explored and incorporated (e.g., elevated road or tunnels and fencing). Habitat enhancement, restoration, and compensation will also be required. Long-term monitoring and adaptive mitigation/monitoring will also be included in the recommendations to ensure impacts to the surrounding habitat features are reduced and mitigated.

4.0 Next Steps

As required by the Municipal Class EA process, the results of the evaluation of alternative solutions shall be presented to the public for review and input. The results of the evaluation of alternatives process presented in this document will be shared with the public at the Public Information Centre #2.

Following the Public Information Centre #2, the project will proceed to Phase 3 of the Municipal Class EA process, where alternative design concepts for the Merritt Road and Rice Road improvements will be identified and evaluated to identify a recommended design.

5.0 References

IBI Group et al. (2017). Niagara Region Transportation Master Plan (October 2017). Retrieved from <https://www.niagararegion.ca/2041/transportation-master-plan/default.aspx>

Ministry of Municipal Affairs and Housing. (2020). Provincial Policy Statement, 2020. Retrieved from <https://www.ontario.ca/page/provincial-policy-statement-2020>

Municipal Engineers Association. (October 2000, as amended in 2007, 2011 & 2015). Municipal Class Environmental Assessment. October 2000, as amended in 2007, 2011 & 2015.

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