MOVING ROADS FORWARD

Niagara Region

Niagara Escarpment Crossing Comprehensive Environmental Assessment

Proposed Terms of Reference

October 2024

Prepared by:

CIMA+ GHD

Land Acknowledgement

The Regional Municipality of Niagara is situated on treaty land. This land is steeped in the rich history of the First Nations such as the Hatiwendaronk, the Haudenosaunee, and the Anishinaabe, including the Mississaugas of the Credit First Nation. There are many First Nations, Métis and Inuit peoples from across Turtle Island that live and work in Niagara today. The Regional Municipality of Niagara stands with all Indigenous peoples, past and present, in promoting the wise stewardship of the lands on which we live.

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1 Introduction

This Terms of Reference (ToR) sets out the proposed framework that will be followed during the preparation of the Niagara Escarpment Crossing Environmental Assessment (EA) to satisfy the applicable requirements of the *Environmental Assessment Act* (*EA Act*). For projects in the Province of Ontario that are subject to Part II.3 of the *EA Act*, a ToR is the first step of a two-step Comprehensive Environmental Assessment (EA) approval process as illustrated in **Figure 1-1**[1].

Figure 1-1: Two-step Comprehensive Environmental Assessment Approval Process

A ToR is a document prepared by a proponent that sets out the framework or work plan for the planning and decision-making process to be followed during preparation of the environmental assessment. A ToR is submitted to the Ontario Minister of the Environment, Conservation and Parks (Minister) for approval.

If the ToR is approved by the Minister, then the preparation of the EA follows as the second step of the *EA Act* approvals process. The Niagara Escarpment Crossing EA must be prepared in accordance with the approved ToR.

[1] On February 22, 2024, amendments to the *Environmental Assessment Act* came into effect that defined what projects require a comprehensive EA (previously called an individual EA). Comprehensive EA projects are now defined as Part II.3 projects.

2 Identification of the Proponent

The Regional Municipality of Niagara (Niagara Region) is the proponent for the Niagara Escarpment Crossing EA.

3 How the EA will be Prepared

In accordance with subsection 17.4(2)(a) of the *EA Act*, the Niagara Escarpment Crossing EA will be prepared as set out in subsection 17.6(2)[2] of the *EA Act*. As a result, the Niagara Escarpment Crossing ToR includes the following elements:

- Identification of the Proponent (**Section 3.0**)
- Purpose of the project (**Section 4.0**)
- Description of and rationale for the project (**Section 5.0**)
- Description of and rationale for the alternatives to the project (**Section 6.0**)
- Description of the environment and potential effects (**Section 7.0**)
- Description of the assessment and evaluation methodology (**Section 8.0**)
- Commitments and monitoring (**Section 9.0**)
- Consultation plan for the Niagara Escarpment Crossing EA (**Section 10.0**)
- Flexibility for accommodating new circumstances (**Section 11.0**)
- Other approvals required (**Section 12.0**)

[2] *17.6(2) Subject to clauses 17.4 (2) (b) and (c), the environmental assessment must consist of,*

(a) a description of the purpose of the Part II.3 project;

(b) a description of and a statement of the rationale for,

(i) the Part II.3 project,

(ii) the alternative methods of carrying out the Part II.3 project, and

(iii) the alternatives to the Part II.3 project;

(c) a description of,

(i) the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly,

(ii) the effects that will be caused or that might reasonably be expected to be caused to the environment, and

(iii) the actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment,

by the Part II.3 project, the alternative methods of carrying out the Part II.3 project and the alternatives to the Part II.3 project;

(d) an evaluation of the advantages and disadvantages to the environment of the Part II.3 project, the alternative methods of carrying out the Part II.3 project and the alternatives to the Part II.3 project; and

(e) a description of any consultation about the Part II.3 project by the proponent and the results of the consultation.

4 Purpose of the Project

4.1 Purpose/Opportunity Statement

The purpose of the project is to provide a north-south transportation corridor crossing of the Niagara Escarpment between the Queen Elizabeth Way (QEW) and Regional Road 20 that:

- Provides for safe and effective commercial vehicle movements and operations;
- Accommodates commercial vehicles and other transportation modes;
- Provides greater safety for local communities;
- Provides for additional transportation system capacity, redundancy and resiliency; and
- Improves the economy vitality with the efficient movement of goods and people.

This purpose / opportunity statement will be reviewed during preparation of the Niagara Escarpment Crossing EA, and a finalized statement will be presented in the EA Report based on the Transportation Planning and Engineering Work Plan **(Appendix A)** and Traffic, Operations and Safety Work Plan **(Appendix B)**.

4.2 Previous Findings and Recommendations for Accommodating Commercial Vehicles

Various jurisdictions including the Province and municipalities either on their own or in partnership with one another have previously studied the need for addressing commercial vehicles travelling on steep grades across the Niagara Escarpment through residential communities. These previously completed studies generally looked at the need for a new or improved crossing, considered various alternatives for accommodating commercial vehicles, and made recommendations on how best to address need.

Some of these studies were initiated in accordance with the MCEA and recommended or determined that the preferred solution consisted of a combination of alternatives (i.e., improvements on regional corridors and/or with a new Escarpment Crossing). **Table 4-1** provides a summary of these previous studies, along with their specific objectives and relevant findings and recommendations.

Table 4-1: Summary of Findings from Previous Related Niagara Escarpment Crossing Studies

Study	Study Objective	Relevant Study Findings / Recommendations
Niagara Escarpment Crossing Study, 1997 (Niagara Region)	To consider a new route to accommodate north-south truck traffic between Hamilton-Wentworth and Niagara Region.	Recommended the Park Road Corridor as the preferred route for the Niagara Escarpment Crossing.
MTO Niagara to GTA Corridor Planning Individual Environmental Assessment Terms of Reference, 2006 (Province of Ontario)	To address existing and future anticipated transportation capacity deficiencies (problems and opportunities) within the Niagara to Greater Toronto Area (GTA) corridor by providing additional capacity for a 30-year planning horizon and beyond.	Recommended the widening of QEW (required by 2031) to address forecast east-west capacity deficiency between Niagara Peninsula and the Greater Toronto Area.
Niagara Escarpment Crossing Transportation Study, 2016 (Niagara Region)	To re-examine the recommendations of the 1997 Niagara Escarpment Crossing Study and, if appropriate, advance the analysis of the design alternatives to select a preferred design alternative.	The Study fulfilled MCEA Phases 1 and 2 and recommended a series of short-term safety and operational improvements in advance of a medium-term extension of Bartlett Avenue southerly across the escarpment with a cross-section that accommodates commercial vehicles and other modes. Post-construction, Regional Roads 12 (Mountain Road) and 18 (Mountain Street) would be transferred to the respective

Study	Study Objective	Relevant Study Findings / Recommendations
		local municipalities, who would consider placing restrictions on non-local commercial vehicle traffic. The study examined alternative alignments for the Escarpment crossing in west Niagara, deferring them until a further analysis could be undertaken. Regional report PW27-2016 recommended completion of Phases 3 and 4 of the MCEA process. However, Phases 3 and 4 were ultimately not carried out in favour of commencing the Niagara Escarpment Crossing EA.
Niagara Region Transportation Master Plan, 2017	To provide direction, policies, and infrastructure improvements to address planned future growth and increasing travel demands to move people and goods within and through the Niagara Region to 2041.	Reaffirmed the need for a new Niagara Escarpment crossing by 2031 requiring funding from Niagara Region, Province of Ontario, and the Federal Government.
Niagara Escarpment Crossings Traffic Operations and Safety Study, 2019 (Niagara Region)	To update traffic data and recommendations on the need for an escarpment crossing.	Recommended operational and safety improvements and reaffirmed the need for a Niagara Escarpment crossing.

Study	Study Objective	Relevant Study Findings / Recommendations
Town of Lincoln Transportation Master Plan, 2019	To develop transportation policies, plans, and strategies geared towards moving Lincoln residents around the Town in a safe, comfortable, enjoyable and efficient way.	Recommended a new Niagara Escarpment crossing.
Towards a Greater Golden Horseshoe Transportation Plan, 2021 (Province of Ontario)	To set out a 30-year vision for mobility in the Greater Golden region to guide and align decisions and investments with a focus on the transportation system at a regional scale and solutions that will have a region-wide impact.	The QEW between Guelph Line and Highway 406 identified as a long term (next 30 years) freeway capacity expansion project.
Town of Lincoln Beamsville Truck By-Pass Implementation Study, 2021	To address truck traffic safety and enhancing road safety in the community.	Recommended camera monitoring technology to assist MTO enforcement. In 2022, the approved budget allowed the Town to lead the Truck Bypass Camera Monitoring Pilot Project in partnership with MTO.

4.3 Existing North-South Crossings of the Niagara Escarpment in Grimsby and Lincoln

The northwestern portion of Niagara Region is comprised of the municipalities of the Town of Grimsby, Town of Lincoln, and Township of West Lincoln. The Niagara Escarpment, which spans east-west through Grimsby and Lincoln, is recognized as a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Biosphere Reserve.

All three local municipalities house many commercial businesses that are home to some of Niagara Region's most successful agricultural operations and include a wide range of economic activities such as gravel quarries that provide aggregate for construction projects throughout southern Ontario. The communities of Grimsby, Lincoln, and West Lincoln have experienced significant growth that is anticipated to continue in the coming years because of an increase in new housing starts and subdivisions bringing additional requirements such as schools, recreational facilities, and religious institutions. This increase in growth is expected to drive greater demand for north-south transportation connections between these communities and the QEW.

Presently, the area surrounding the Niagara Escarpment is serviced by a municipal and Regional road system that is connected to the provincial highway system via the QEW at several interchanges including Casablanca Boulevard (Regional Road 10), Christie Street (Regional Road 12) / Ontario Street / Maple Avenue, and Bartlett Avenue (Regional Road 14) in Grimsby and Ontario Steet (Regional Road 18) and Victoria Avenue (Regional Road 24) in Lincoln. The Regional and municipal road system in west Niagara consists mainly of 2-lane corridors in a grid pattern.

The main Regional north-south corridors include Mountain Road (Regional Road 12), Ontario Street/Mountain Street (Regional Road 18), and Victoria Avenue (Regional Road 24). The main Regional east-west corridors include King Street (Regional Road 81), Mud Street East/Fly Road (Regional Road 73), and Highway 20/Twenty Mile/Twenty Road (Regional Road 69). In addition to the Regional Roads, local municipal road corridors such as Park Road South (North/South), Mountain View Road (North/South), Bartlett Road (North/South), Cherry Avenue (North/South), Young/Yonge Street (East/West), and Spring Creek Road (East/West) are a key part of the road network (**Figure 4-1**).

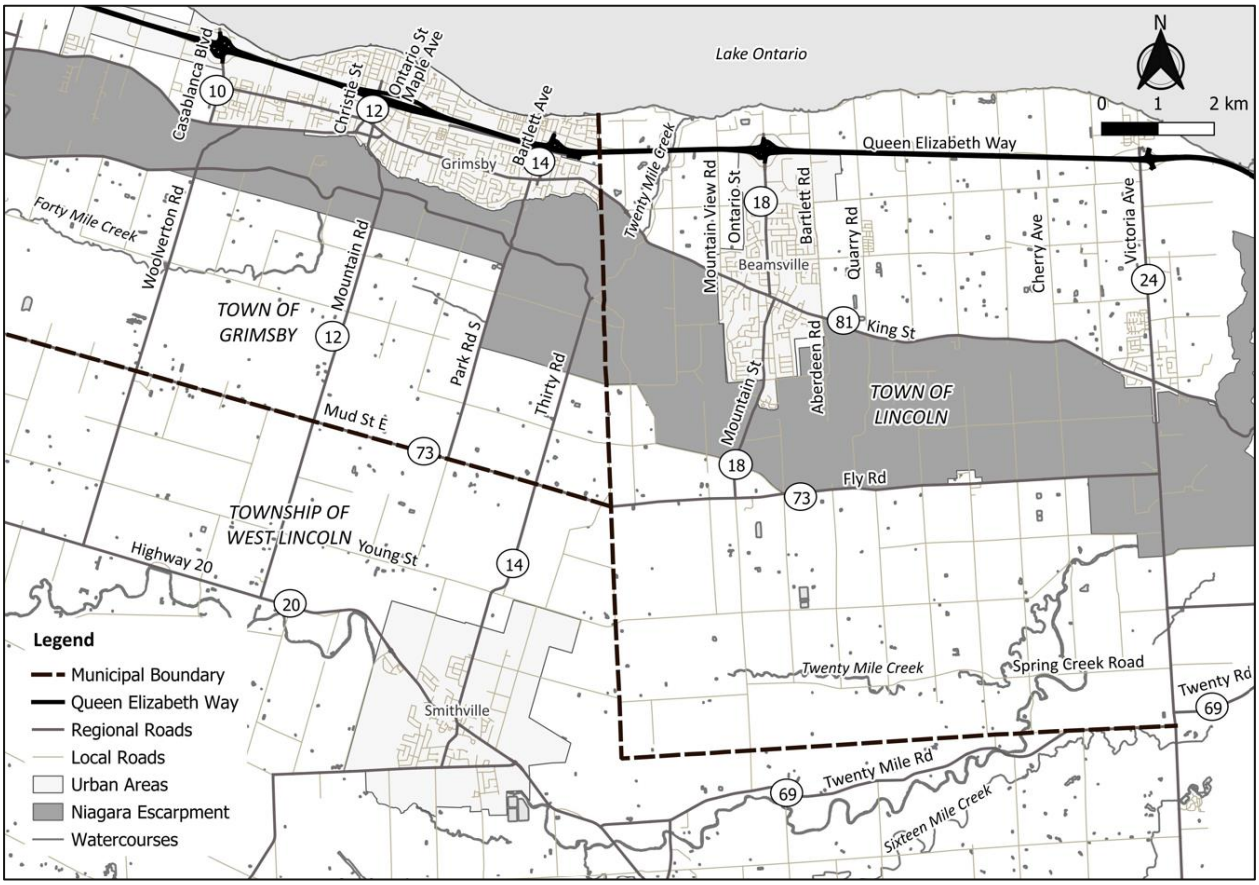

Figure 4-1: Road Network Map

Within the Smithville Master Community Plan (Township of West Lincoln), the Smithville Bypass was highlighted as one of the infrastructure elements that is required to support future growth. The Smithville Bypass was also identified within the Region's Transportation Master Plan (TMP). Different corridor options were reviewed, and the alignment of the potential Smithville Bypass will be subject to a Municipal Class Environmental Assessment (MCEA), which is anticipated to be undertaken by Niagara Region in 2024. There are also approved Secondary Plans for two areas within the Urban Area of Smithville: Northwest Quadrant Secondary Plan and Spring Creek Heights Secondary Plan.

Currently, there are ten road crossings of the Niagara Escarpment within the Towns of Grimsby (three) and Lincoln (seven) which presently exhibit steep grades (10% to 16%), narrow shoulders, limited roadside protection, and traffic operation and sight line issues. The ten road crossings of the Niagara Escarpment are listed by municipality as follows:

1. Mountain Road (Regional Road 12) – Town of Grimsby
2. Park Road – Town of Grimsby

3. Thirty Road – Town of Lincoln / Town of Grimsby
4. Mountain Street (Regional Road 18) – Town of Lincoln
5. Victoria Avenue (Regional Road 24) – Town of Lincoln
6. Woolverton Road – Town of Grimsby
7. Mountainview Road – Town of Lincoln
8. Aberdeen Road – Town of Lincoln
9. Quarry Road – Town of Lincoln
10. Cherry Road – Town of Lincoln

The main north – south crossings of the escarpment that were found to carry significant truck volumes were Victoria Avenue in Vineland, Mountain Road in Grimsby, and Mountain Street in Beamsville based on the 2016 Niagara Escarpment Crossing Master Plan Study (2016 Study). Truck patterns were established through a series of roadside surveys that identified truck trip origins, destinations, and reasons for choosing a particular route across the Niagara Escarpment. These surveys identified that more than half of the trucks using the current crossings have an origin or destination in the area generally bounded by Regional Road 8 (Casablanca Boulevard/Woolverton Road) to the west and Regional Road 24 (Victoria Avenue) to the east, as shown in the shaded “Escarpment Crossing Study Area” portion of the 2016 Study in **Figure 4-2**.

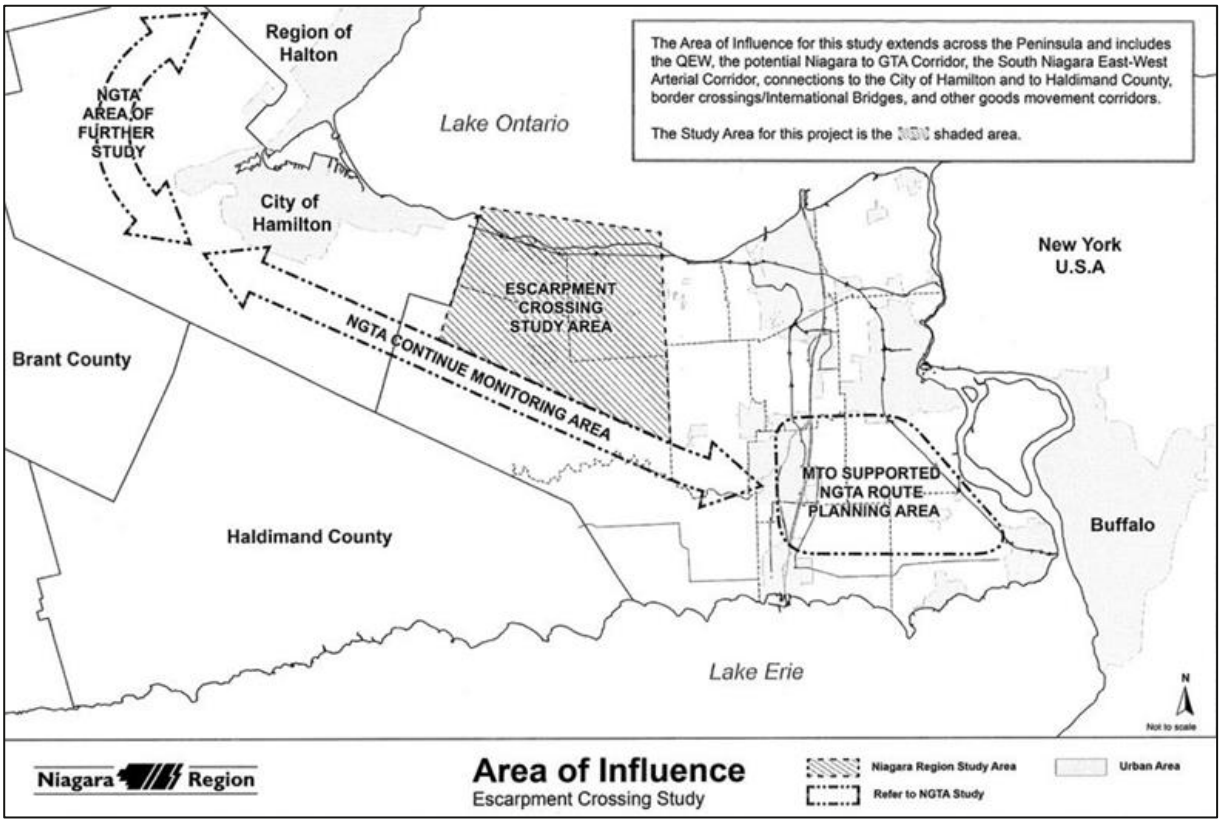

Figure 4-2: Niagara Escarpment Crossing 2016 Study Area

The 2016 Study confirmed that there was sufficient capacity to accommodate present and future travel demand on a screenline basis. However, the capacity analysis also indicated localized areas of congested conditions in the built-up areas of Grimsby, Beamsville, Vineland, and Smithville. The 2016 Study concluded that all existing crossings have geometric features that make them unsuitable for use as truck routes.

The 2019 Niagara Escarpment Crossings Traffic Operations and Safety Study (2019 Study) reviewed traffic operations of four key crossings in the west end of Niagara Region: (1) Victoria Avenue (Regional Road 24) between King Street (Regional Road 81) and Fly Road; (2) Mountain Street (Regional Road 18) (Lincoln); (3) Mountain Road (Regional Road 12) (Grimsby); and (4) Main Street-King Street (Grimsby). There have been many concerns raised regarding the real and perceived safety of these escarpment crossings and of particular concern is the operations of trucks and goods movement across the escarpment.

The 2019 Study concluded that heavy vehicle volumes are within the acceptable range for the area. The Origin-Destination Surveys revealed that local trips are a significant contributor to heavy vehicle traffic and that speeding is a concerning problem at three of

the four data collection points. Additionally, the road geometry is inconsistent and varies across the different crossings along Mountain Street (RR 18). The 2019 Study recommended short-term, medium-term, and long-term improvement plans to address the concerns regarding the heavy vehicle traffic along the crossings. The recommended improvements included enhanced signage, lowering speed limits, introducing minor design improvements on crossings, creating a Goods Movement Committee or Council, and finalizing a new escarpment study EA.

In addition, commercial vehicles using the existing Niagara Escarpment crossings pose safety risks and undesirable impacts on local communities and residential areas with respect to noise and vibration issues.

Intersections at the base of the Niagara Escarpment often exhibit skewed alignment, steep grades, and buildings in proximity with pedestrian and parking movements that contribute to truck related collisions. The increasing truck volumes through the built-up areas conflict with the downtown areas in Lincoln and Grimsby, which impacts local business operations.

Of the ten crossings of the Niagara Escarpment, the following five crossings exhibit the highest total volume and percentage of heavy trucks on a typical day:

- Mountain Road (Regional Road 12) – Grimsby
- Park Road – Grimsby (has a by-law prohibiting trucks over a certain gross weight that is in effect from March 1 to April 30)
- Thirty Road – Grimsby / Lincoln
- Mountain Street (Regional Road 18) – Lincoln
- Victoria Avenue (Regional Road 24) - Lincoln

4.3.1 Traffic Management Measures Completed for Existing Niagara Escarpment Crossings

As an outcome of both the 2016 Study and the 2019 Study, Niagara Region and local area municipalities have undertaken a series of traffic management measures to the existing crossings. **Table 4-2** lists the traffic management measures that Niagara Region and the local area municipalities have implemented to date.

Table 4-2: Implemented Traffic Management Measures To Date

Road Name	Jurisdiction	Existing Conditions	Truck Restriction	Improvements
Woolverton Road	Town of Grimsby	- Very steep, road often closed	- No trucks over 15000kg	- Signage erected on Main Street to advise motorists if road is closed.
Regional Road 12 (Mountain Road)	Niagara Region	- 12% slope in areas, road has many residential homes and accesses. - Sidewalk on east side.	- None, used as a truck route	- Signage for hidden driveways - Pavement marking message and traffic calming - Electronic speed sign with slow down messaging - Pavement markings “Check Speed” on the northbound side - A northbound stop control was introduced at the intersection of Mountain Road and Ridge Road West to stop all vehicles prior to descent
Thirty Road	Town of Lincoln	- Steep with warning sign, no sidewalks	- 30 and 40km/h speed advisory signage (for all	- Chevron placement - “Hidden driveway” (signage - Guide rails along sections

Road Name	Jurisdiction	Existing Conditions	Truck Restriction	Improvements
			vehicle types)	
Regional Road 18 (Mountain Street)	Niagara Region	- 8% slope, road has many residential homes and accesses	- None, used as a truck route	- Pavement marking message and calming - Electronic speed sign with slow down messaging - Painted bike lanes - 40km/h flashing school area - School crossing

Although traffic management measures have been implemented, there continues to be concerns raised regarding the safety and operations of the escarpment crossings in Niagara including the intrusion of trucks into residential areas and where there is high pedestrian and/or cyclist activity.

4.4 Commercial Vehicle Travel Demands

The 2016 Study provided the 2012 Average Daily Traffic (ADT) Volumes and associated Commercial Vehicle Percentages and Distribution for the following north-south escarpment crossings: Mountain Road (Grimsby), Park Road (Grimsby), Thirty Road (Lincoln/Grimsby), Mountain Street (Lincoln), and Victoria Avenue (Lincoln) (**Table 4-3**). Victoria Avenue in Lincoln and Mountain Road in Grimsby had the highest commercial vehicle volumes as more than 70% of the total truck traffic utilized these two crossings.

Table 4-3: 2012 Traffic Data for North-South Escarpment Crossings

North South Escarpment Crossing	2012 ADT (Total Traffic)	2012 Truck Volume	2012 Truck %	Escarpment Crossing Truck Distribution
Mountain Road (Grimsby)	7,800	375	4.8%	24.4%
Park Road (Grimsby)	3,100	95	3.0%	5.9%
Thirty Road (Lincoln/Grimsby)	1,750	70	4.1%	4.6%
Mountain Street (Lincoln)	4,050	275	6.8%	17.8%
Victoria Avenue (Lincoln)	9,000	735	8.2%	47.3%

As part of the 2016 Study, a roadside Origin-Destination Survey was also conducted to gain an understanding of the overall patterns of the truck movement and their origins/destinations in relation to the 2016 study area. The survey consisted of seven total roadside stations, four of which were north-south escarpment crossings (Mountain Road and Park Road (Grimsby), Mountain Street and Victoria Avenue (Lincoln)). The following insights were derived from the provided survey responses:

- 77.5% of commercial vehicles chose their route because it was the most direct to the start or end of their trip
- More than half (53%) of the trips to/from the 2016 study area have an origin and/or destination within the 2016 study area
- 32% of the truck trips originating in Town of Grimsby remain within the Town of Grimsby and 37% of the truck trips originating in Town of Lincoln remain within the Town of Lincoln
- 48% of the drivers indicated that nothing would change the route choice – which may be partly due to the result of high degree of local truck trips noted in the survey.

The 2019 Study compared 2013 and 2018 weekly total and truck volumes along three north-south escarpment crossings: Mountain Road (Grimsby), Mountain Street (Lincoln), and Victoria Avenue (Vineland), which are shown in **Table 4-4**. Similar to the 2016 Study, the highest commercial vehicle volume was on Mountain Road and Victoria Avenue. Furthermore, Victoria Avenue saw a decrease in commercial vehicle volume between 2013 and 2018, whereas the other crossings saw an increase in commercial vehicle volumes.

Table 4-4: 2013 and 2018 Weekly Traffic Volumes at North-South Escarpment Crossing – Passenger and Heavy Vehicles

North South Escarpment Crossing	Direction	2013 Passenger Vehicles	2018 Passenger Vehicles	Passenger Vehicles % Change	2013 Heavy Vehicles	2018 Heavy Vehicles	Heavy Vehicles % Change
Mountain Road (Grimsby)	NB	25,766	22,861	-11.3%	1,453	1,673	15.1%
	SB	26,234	23,827	-9.2%	1,185	2,210	86.5%
Mountain Street (Beamsville)	NB	12,995	13,243	1.9%	1,135	647	-43.0%
	SB	13,482	12,626	-6.4%	781	825	5.6%
Victoria Avenue (Vineland)	NB	29,197	32,644	11.8%	2,209	2,099	-5.0%
	SB	28,589	30,921	8.2%	2,885	1,994	-30.9%

5 Description of and Rationale for the Project

Although the purpose of the project has been identified in **Section 4.1**, the specific project itself has not yet been determined because the Niagara Escarpment Crossing EA is being prepared as set out in subsection 17.6(2) of the *EA Act*.

As part of preparing the Niagara Escarpment Crossing EA, a description of and the rationale for the project will be provided in the EA Report.

6 Description of and Rationale for the Alternatives

Since the Niagara Escarpment Crossing EA will be prepared in accordance with the specific requirements set out in subsection 17.6(2) of the *EA Act*, both "**alternatives to**" the project and "**alternative methods**" of carrying out the project will be considered through two successive stages as described in the following sections.

Alternatives to the project are functionally different ways of approaching and dealing with a problem or opportunity.

Alternative methods of carrying out the project are different ways of doing the same activity.

6.1 Alternatives To the Project

The alternatives to the project will include, but may not be limited to, the following:

- Alternative 1 - Do Nothing
- Alternative 2 - Implement Additional Traffic Management Measures
- Alternative 3 - Extend Bartlett Avenue Southerly and Utilize Park Road Corridor
- Alternative 4 - Construct a New North-South Corridor between Grimsby and Beamsville

A brief description of and rationale for each of these alternatives is provided in the following sections. The descriptions will be elaborated upon during preparation of the Niagara Escarpment Crossing EA as proposed in the Transportation Planning and Engineering Work Plan (**Appendix A**).

6.1.1 Alternative 1 - Do Nothing

In the “Do Nothing” alternative, the existing transportation crossings of the Niagara Escarpment in the Towns of Grimsby and Lincoln would remain unchanged, and no new transportation crossing would be constructed between the QEW and Regional Road 20.

The “Do Nothing” alternative has been included for consideration during preparation of the Niagara Escarpment Crossing EA and will serve as a benchmark against which to assess other alternatives.

6.1.2 Alternative 2 - Implement Additional Traffic Management Measures

As stated in **Section 4**, traffic management measures to address safety and operational problems on the existing north-south crossings of the Niagara Escarpment in the Towns of Grimsby and Lincoln have been implemented on various roads in Niagara Region.

Previous reports (such as the Niagara Escarpment Crossing Transportation, 2016 and the Niagara Escarpment Crossings Traffic Operations and Safety Study, 2019) have recommended improving road and shoulder widths where possible, installing guiderail and illumination treatments, adding traffic control devices (e.g., pavement marking, signing, traffic control), installing traffic calming measures to reduce traffic speeds as well as making active transportation enhancements. The recommendations also included consideration of a prohibitive restriction of truck movements on one or more of the three Regional roads crossing of the Escarpment serving the western portion of Niagara Region (Regional Roads 12, 18 and 24).

Although other traffic management measures have been planned, several others could still be implemented. As a result, this alternative would consist of confirming those outstanding recommendations from previous planning studies (e.g., the Niagara Escarpment Crossing Transportation Study, 2016 and the Niagara Escarpment Crossing Traffic Operations and Safety Study, 2019) as still appropriate for implementation and adding to them, as appropriate, based on findings from the Traffic, Operations and Safety Assessment Work Plan (**Appendix B**).

6.1.3 Alternative 3 – Extend Bartlett Avenue Southerly and Utilize the Park Road Corridor

As mentioned in **Section 4**, the Niagara Escarpment Transportation Study (2016) and Niagara Region Transportation Class EA Master Plan (2017), identified or reflected the Bartlett Avenue / Park Road Corridor as the preferred route for crossing the Niagara Escarpment. As illustrated in **Figure 6-1**, the previously identified preferred route consisted of extending Regional Road 14 (Bartlett Avenue) southerly to Regional Road 73 (Mud Street East) utilizing a portion of Park Road.

Considering these previous Studies' conclusions and recommendations, Alternative 3 would extend Bartlett Avenue southerly to Regional Road 20 via the Park Road South/South Grimsby Road 6 corridor.

The proposed corridor for this alternative would be approximately 500 m wide centered on Bartlett Avenue, Park Road South, and South Grimsby Road 6 (approximately 250 m

on either side of the roads). The corridor width would allow for the generation of a reasonable/feasible list of alternative methods of carrying out the project (see **Section 8.2.1**). For example, the 500 m wide corridor would be sufficiently sized to accommodate new road alignments located to the east or west of the existing Park Road South/South Grimsby Road 6 alignment and/or utilize a portion(s) of the existing Park Road South/South Grimsby Road 6 alignments. **Figure 6-1** graphically illustrates the proposed corridor.

Alternative 3 would utilize the existing full move access to the QEW at Bartlett Avenue, while having consideration for the need to improve the current configuration from a traffic operations perspective (i.e., address tight turns for commercial vehicles). Any required improvements to the existing Bartlett Avenue/QEW interchange would be coordinated with MTO.

As per the Transportation Plan for the Greater Golden Horseshoe (Map 4) (MTO 2021), the QEW through Niagara Region has been identified for future expansion to accommodate additional capacity and a future managed lane (e.g., High Occupancy Vehicle Lane, Express Toll Lane, Bus-only Lane, Truck-only Lane). The planning of the QEW expansion including the confirmation of lane configuration will be subject to a future MTO EA study; there is no defined initiation timeline for the MTO EA study at the time of this ToR.

As a result, Alternative 3 would make use of existing infrastructure north of the Niagara Escarpment (e.g., the Bartlett Avenue/QEW interchange and the section of Bartlett Avenue to the south of Main Street) and potentially south of the Niagara Escarpment (e.g., Park Road South and South Grimsby Road 6) for the connection between the QEW and Regional Road 20.

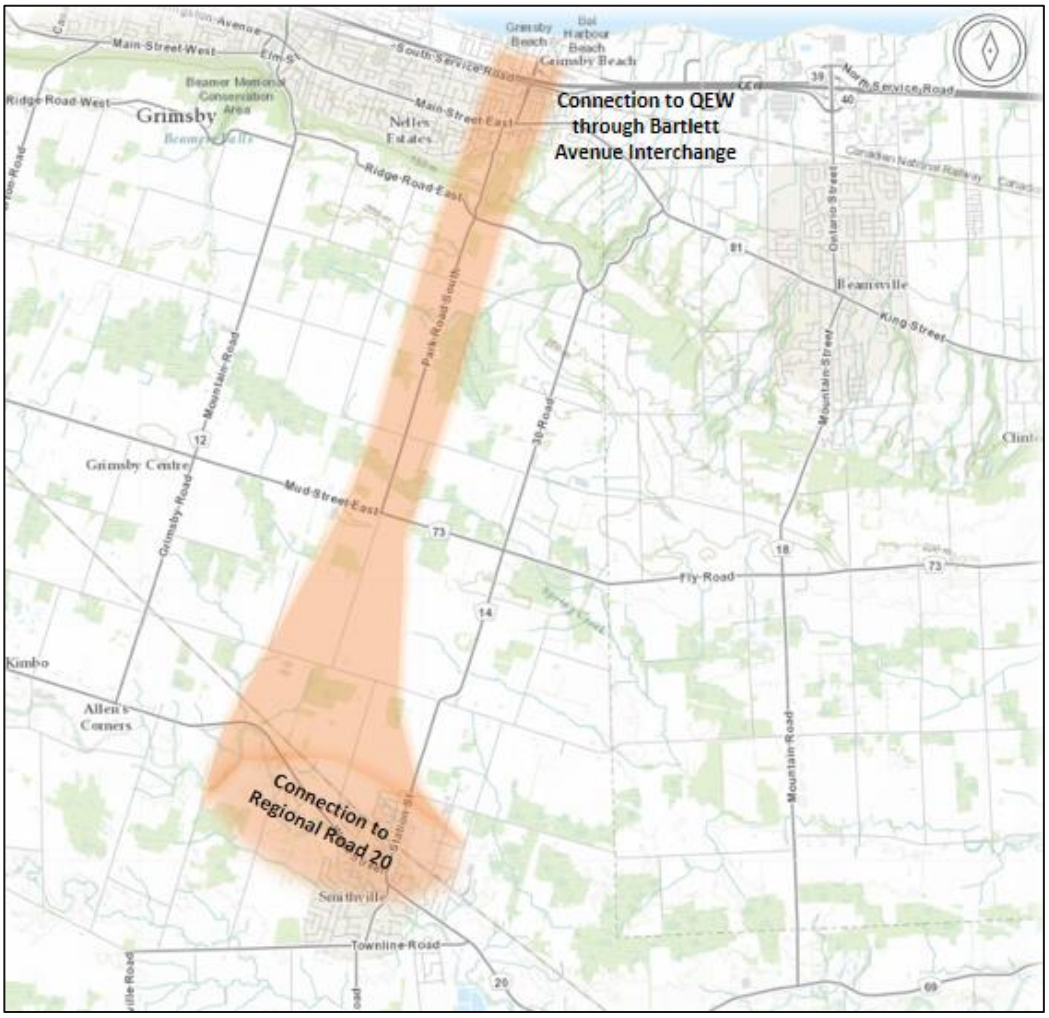

Figure 6-1: Extend Bartlett Avenue Southerly and Utilize Park Road Corridor

6.1.4 Alternative 4 - Construct a New North-South Corridor between Grimsby and Beamsville

As mentioned in **Section 4**, the Niagara Escarpment Crossing Transportation Study (2016) considered alternative corridors to the preferred Bartlett Avenue / Park Road Corridor for the Niagara Escarpment Crossing, deferring them from further analysis as "…adequate connection to the QEW which meets the MTO criteria for interchange spacing could not be provided".

Notwithstanding this, since the Niagara Escarpment Crossing EA will be prepared as set out in subsection 17.6(2) of the *EA Act*, a reasonable range of alternatives needs to be considered by Niagara Region subject to the Minister's approval in accordance with

MECP's Code of Practice[3]. The range of alternative(s) put forward by a proponent should address the problem/opportunity and be within the proponent's ability to implement.

In accordance with this guidance, Alternative 4 proposes a new transportation corridor crossing of the Niagara Escarpment between Grimsby and Beamsville considering the Niagara Escarpment Crossing Transportation Study (2016). The new corridor would connect the QEW to Regional Road 20.

The proposed corridor for Alternative 4 would be approximately 2,000 m wide between the communities of Grimsby and Beamsville. This corridor width would allow for the generation of a reasonable/feasible list of alternative methods of carrying out the project (see **Section 8.2.1**). For example, the 2,000 m wide corridor would be sufficiently sized to accommodate a combination of existing roads, realignments of existing roads, and/or new road alignments to connect the QEW to Regional Road 20 across the Niagara Escarpment. **Figure 6-2** graphically illustrates the proposed corridor.

Alternative 4 would require either the development of a new interchange with the QEW and/or the significant reconfiguration of the existing Bartlett Avenue or Ontario Street interchanges to provide full moves access for the new corridor. The location or design of any QEW connection would need to consider MTO's geometric requirements including, but not limited to the following: interchange spacing, merging and weaving distances, setback to adjacent land use, access management, etc. As a result, any changes to the QEW needed to accommodate Alternative 4 would be coordinated with MTO.

As mentioned, the QEW through Niagara Region has been identified for future expansion to accommodate additional capacity and a future managed lane (e.g., High Occupancy Vehicle Lane, Express Toll Lane, Bus-only Lane, Truck-only Lane) as per the Transportation Plan for the Greater Golden Horseshoe (Map 4) (MTO 2021). As stated, the planning of the QEW expansion including the confirmation of lane configuration will be subject to a future MTO EA study; there is no defined initiation timeline for the MTO EA study at the time of this ToR.

[3] Ministry of the Environment, Conservation and Parks, Code of Practice: Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario, January 2014, page 31.

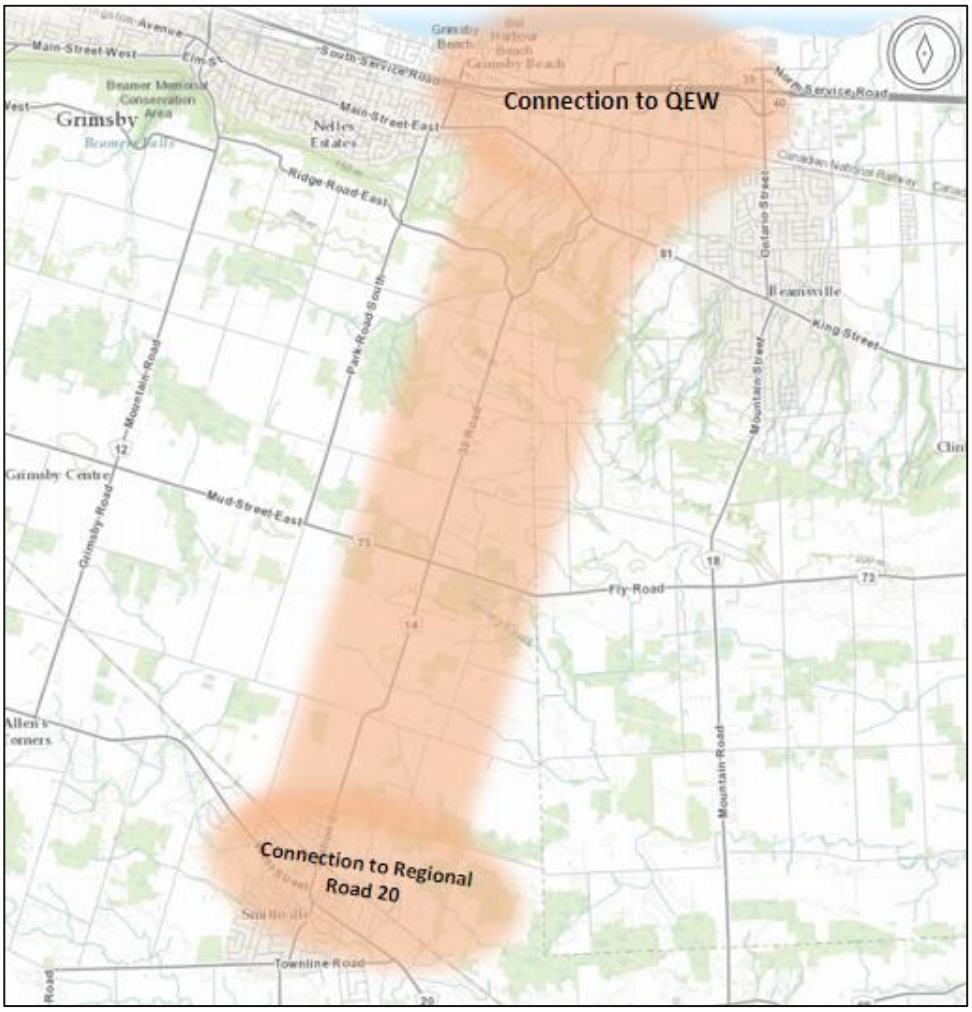

Figure 6-2: Construct a New North-South Corridor between Grimsby and Beamsville

6.2 Alternative Methods of Carrying out the Project

The alternative methods of carrying out the project cannot be determined at this time because they depend on the identification of the preferred alternative to. Therefore, the alternative methods of carrying out the project will be identified and described including their associated rationale during preparation of the Niagara Escarpment Crossing EA.

7 Description of the Environment and Potential Effects

7.1 Preliminary Study Area

The preliminary study area for the Niagara Escarpment Crossing EA extends from just north of the existing QEW to south of the community of Smithville and from just west of Mountain Road/Christie Road (Regional Road 12) – Town of Grimsby to just east of Mountain Road/Ontario Street (Regional Road 18) - Town of Lincoln, and includes the area along the QEW from east of the Casablanca Boulevard (Regional Road 14) interchange/ to just east of the Ontario Street (Regional Road 18) interchange (**Figure 7-1**). The preliminary study area reflects the range of alternatives to the project presently being considered and includes the Town of Grimsby (eastern portion), Town of Lincoln (western portion), and Township of West Lincoln (northeastern portion) in Niagara Region.

This preliminary study area is the location within which activities associated with the project will occur and where potential environmental effects will be studied. The preliminary study area will be finalized during preparation of the Niagara Escarpment Crossing EA when more detailed information has been obtained, the alternatives methods have been generated, and the potential environmental effects are better known.

7.2 Preliminary Description of the Environment

The following subsections provide a brief description of the environment within the preliminary study area. This description will be developed in more detail as the Niagara Escarpment Crossing EA progresses allowing for flexibility to refine the description as may be needed throughout the EA process. The preliminary description addresses the *EA Act* definition of the environment: natural, built, social, economic, and cultural.

The **natural environment** includes land, water, plant, and animal life. For purposes of the Niagara Escarpment Crossing EA, the preliminary description of the natural environment includes the geological setting, surface water, groundwater, aquatic species and their habitat, physiographic regions, natural heritage features, and wildlife species and their habitats within the preliminary study area.

The **built environment** includes any building or structure, or thing made by humans. For purposes of the Niagara Escarpment Crossing EA, the preliminary description of the built environment presents an overview of the existing land uses within the preliminary

study area including residential, commercial, industrial, institutional, recreational, transportation, and agricultural.

The **social environment** encompasses the social conditions that influence the life of humans or a community. For purposes of the Niagara Escarpment Crossing EA, the preliminary description of the social environment presents the communities within the preliminary study area in terms of their populations, characteristics, etc.

The **economic environment** includes the economic conditions that influence the life of humans or a community. For purposes of the Niagara Escarpment Crossing EA, the preliminary description of the economic environment provides an overview of the planning policy framework within the preliminary study area as well as the employment characteristics of the communities and approved and planned land uses.

The **cultural environment** encompasses the cultural conditions that influence the life of humans or a community. For purposes of the Niagara Escarpment Crossing EA, the preliminary description of the cultural environment includes an overview of cultural heritage resources within the preliminary study area, including archaeological resources, built heritage resources and cultural heritage landscapes.

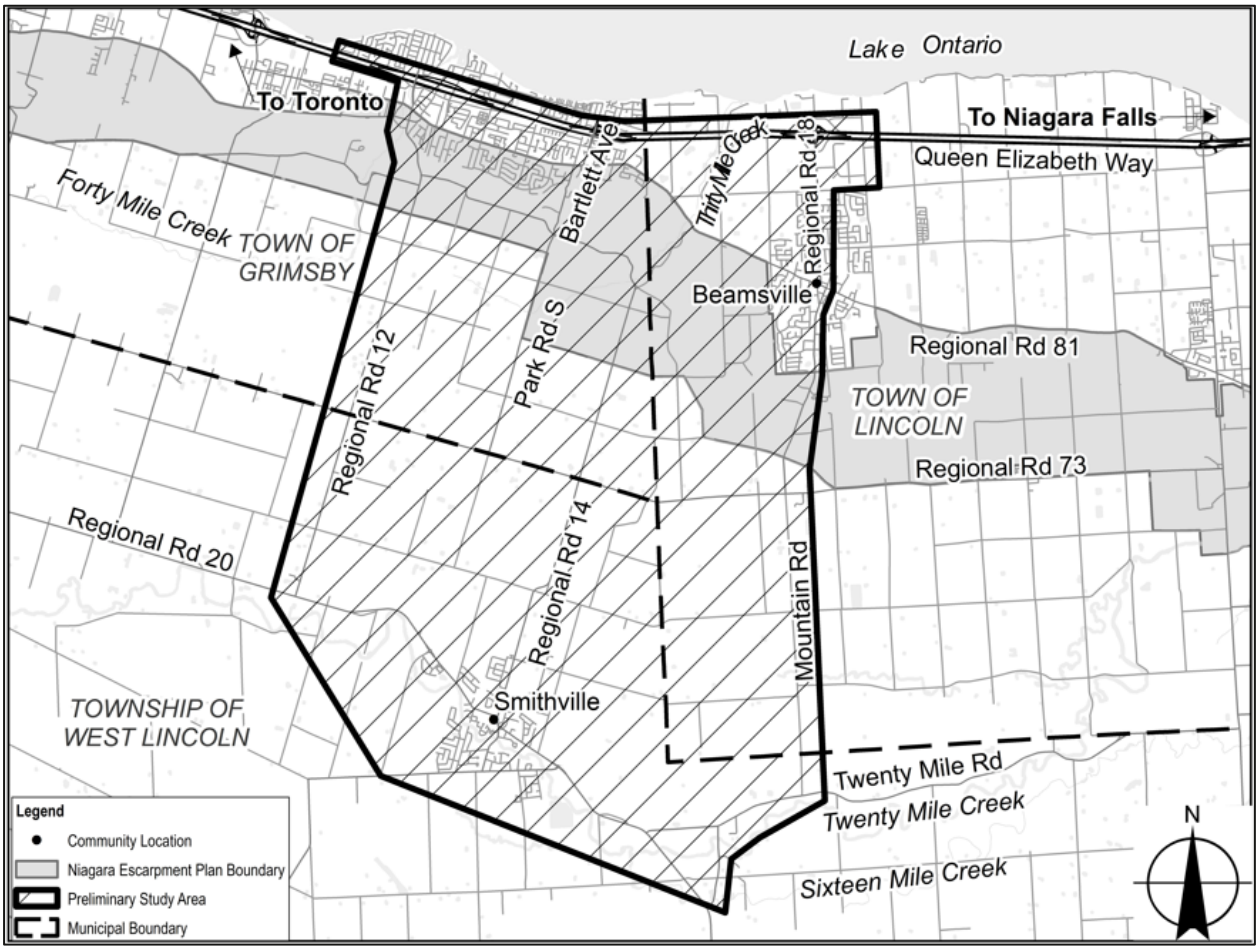

Figure 7-1: Preliminary Study Area

7.2.1 Natural Environment

As illustrated in **Figure 7-1**, the Niagara Escarpment Plan Boundary is situated within the middle of the preliminary study area and encapsulates the Niagara Escarpment. The Niagara Escarpment includes a combination of geological and ecological features that together results in a unique landscape.

Geology and Landform

Overburden within the preliminary study area consists of glaciolacustrine clay, silt and shale to the south and till to the north (Ontario Geological Survey, 2020). Bedrock geology consists of sandstone, shale dolostone and siltstone of the Guelph and Lockport Groups. Areas of known and potential Karst are present within the preliminary study area, primarily associated with the Niagara Escarpment.

Groundwater

Regional groundwater flow is to the north/northwest following surface topography and towards Lake Ontario. The preliminary study area is situated within the Niagara Peninsula Source Protection Area (Area), though not within an intake protection zone or wellhead protection area. The Area is identified has a Highly Vulnerable Aquifer (score 6). The Area has been identified as an area of significant groundwater recharge.

There is limited groundwater taking within the preliminary study area with most users being on municipal water. There are several active permits to take water, primarily located in Smithville and along the QEW.

Surface Water

The preliminary study area is situated within the Twenty Mile Creek watershed; the second largest watershed within the jurisdiction of the Niagara Peninsula Conservation Authority (NPCA). This watershed contains a provincially significant coastal wetland, Carolinian flora, and Niagara Escarpment features, and 32 percent of the watershed is located within the Greenbelt. The total drainage area of the Twenty Mile Creek watershed is 291 square kilometers (km^2). Within the preliminary study area (i.e. just south of Mountain Road), the watershed area of Twenty Mile creek is about 220 km^2.The Twenty Mile Creek watershed contains five sub-watersheds including the main channel of Twenty Mile Creek, Gavora Ditch, Spring Creek, North Creek and Sinkhold Creek.

Some surface water features flow from south to north such as Thirty Mile Creek, Forty Mile Creek, Konkle Creek, Bartlett Creek and some features drain from west to east such as Spring Creek, Gavora Ditch and Twenty Mile Creek. Spring Creek and Gavora Ditch are tributaries of Twenty Mile Creek.

Fish and Fish Habitat

As mentioned, there are several watercourses located within the preliminary study area namely, Twenty Mile Creek and tributaries, Thirty Mile Creek and tributaries, Forty Mile Creek and tributaries, Spring Creek, Gavora Ditch, along with unnamed watercourses and headwater features (HDFs). All watercourses eventually outlet to Lake Ontario through Jordan Marsh, which was created by lake waters flooding and is the lower reaches of the river valley.

Aquatic Habitat

Fish habitats are identified as spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly and or indirectly to carry out their life

processes. The majority of Twenty Mile Creek and its tributaries have been classified by the Ministry of Natural Resources and Forestry (MNRF) as critical (Type 1) and important (Type 2) fish habitat. Type 1 habitat is the most sensitive habitat that includes critical spawning and rearing areas, migration routes, over-wintering areas, productive feeding areas and habitats occupied by sensitive species. Type 2 habitat is less sensitive and requires a moderate level of protection. These areas are considered 'ideal for enhancement or restoration projects' and include feeding areas for adult fish and unspecialized spawning habitat.

Fish

According to the MNRF Aquatic Resource Area (ARA) online database, all mapped watercourses within the preliminary study area are representative of a tolerant warm water fishery. **Figure 7-2** illustrates the mapped aquatic features.

Species include banded killifish (*Fundulus diaphanous*), bluegill (*Lepomis macrochirus*), black bullhead (*Ameiurus melas*), black crappie (*Pomoxis nigromaculatus*), blacknose dace (*Rhinichthys atratulus*), bluntnose minnow (*Pimephales notatus*), brook stickleback (*Culaea inconstans*), brown bullhead (*Ameiurus nebulosus)*, brown trout (*Salmo trutta*), central mudminnow (*Umbra limi*), chinook salmon (*Oncorhynchus tshawytscha*), common carp (*Cyprinus carpio*), creek chub (*Semotilus atromaculatus*), emerald shiner (*Notropis atherinoides*), fathead minnow (*Pimephales promelas*), golden shiner (*Notemigonus crysoleucas*), grass pickerel (*Esox americanus*), green sunfish (*Lepomis cyanellus*), Johnny darter x tesselated darter, lake chub (*Couesius plumbeus*), logperch (*Percina caprodes*), rainbow trout (*Oncorhynchus mykiss*), rock bass (*Ambloplites rupestris*), tadpole madtom (*Noturus gyrinus*), northern red belly dace (*Chrosomus eos*), pumpkin seed (*Lepomis gibbosus*), white crappie (*Pomoxis annularis*), white perch (*Morone americana*), white sucker (*Catostomus commersonii*), yellow bullhead *(Ameiurus natalis*)*.*

Department of Fisheries and Oceans (DFO) mapping displayed no critical habitat for any aquatic species at risk, although grass pickerel (*Esox americanus vermiculatus)* has been documented within the preliminary study area by DFO.

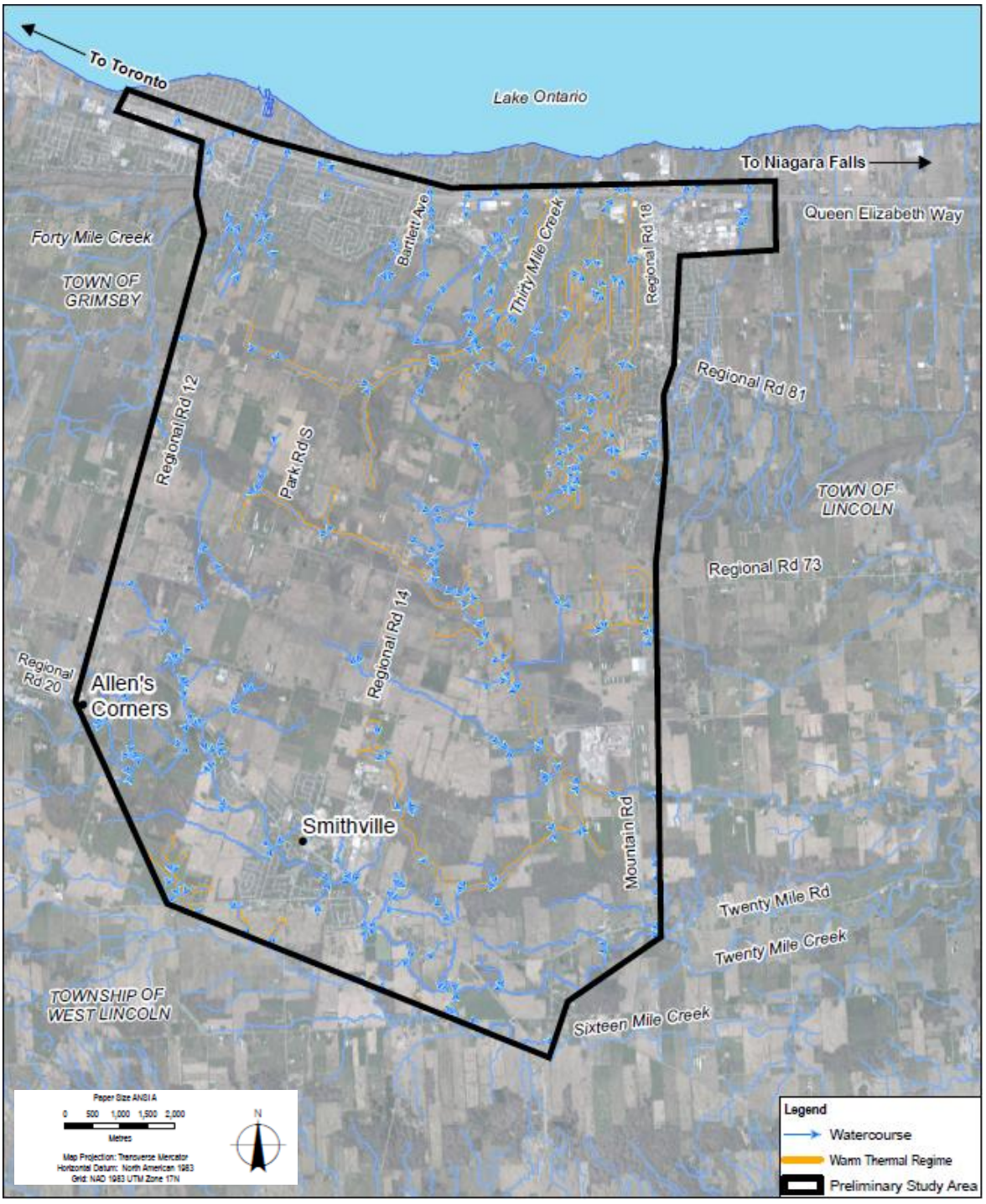

Figure 7-2: Aquatic Features

Natural Heritage and Ecosystems

The preliminary study area is predominately agricultural lands and contains some residential areas and the QEW. Notwithstanding this, there are several natural heritage features within preliminary study area including designated lands, wetlands, woodlots, Areas of Natural and Scientific Interest (ANSI) and Environmentally Significant Areas. The entire length of Twenty Mile Creek has an associated designation as a provincially significant wetland (PSW). **Figure 7-3** shows the mapped natural heritage features**.**

Terrestrial Ecosystems

Wetland Habitat

Several wetlands exist throughout the preliminary study area including the Beamsville Escarpment Wetland Complex, Fairbrother Road Wetland, Grimsby Escarpment East Wetland Complex, Spring Creek Wetland Complex, Lower Twenty Mile Creek Wetland Complex, Upper Forty Mile Creek Wetland Complex, Iroquois Plains Wetland Complex and Grimsby Woodlot Wetland Complex.

Woodland Habitat

There are several woodlands located within the preliminary study area including Thirty Mile Creek Headwater Forest, Grimsby Centre Forest West, East Smithville Slough Forest, Suttell Forest and Pignut Hickory Grove.

Areas of Natural and Scientific Interest

There are several ANSIs within the preliminary study area including Grimsby Terrace Valleys, Grimsby Beach Terrace Valleys, Grimsby Centre Forest West, Niagara Section Escarpment, Mountainview Valentino Escarpment and Beamsville Escarpment.

Significant Wildlife Habitat

According to the Significant Wildlife Habitat Criteria Schedules (SWHCS) for Ecoregion 7E, Significant Wildlife Habitats (SWH) consists of the following:

- Season concentration area for animals
- Rare vegetation communities
- Specialized habitat for wildlife
- Habitat for species of conservation concern
- Animal movement corridor

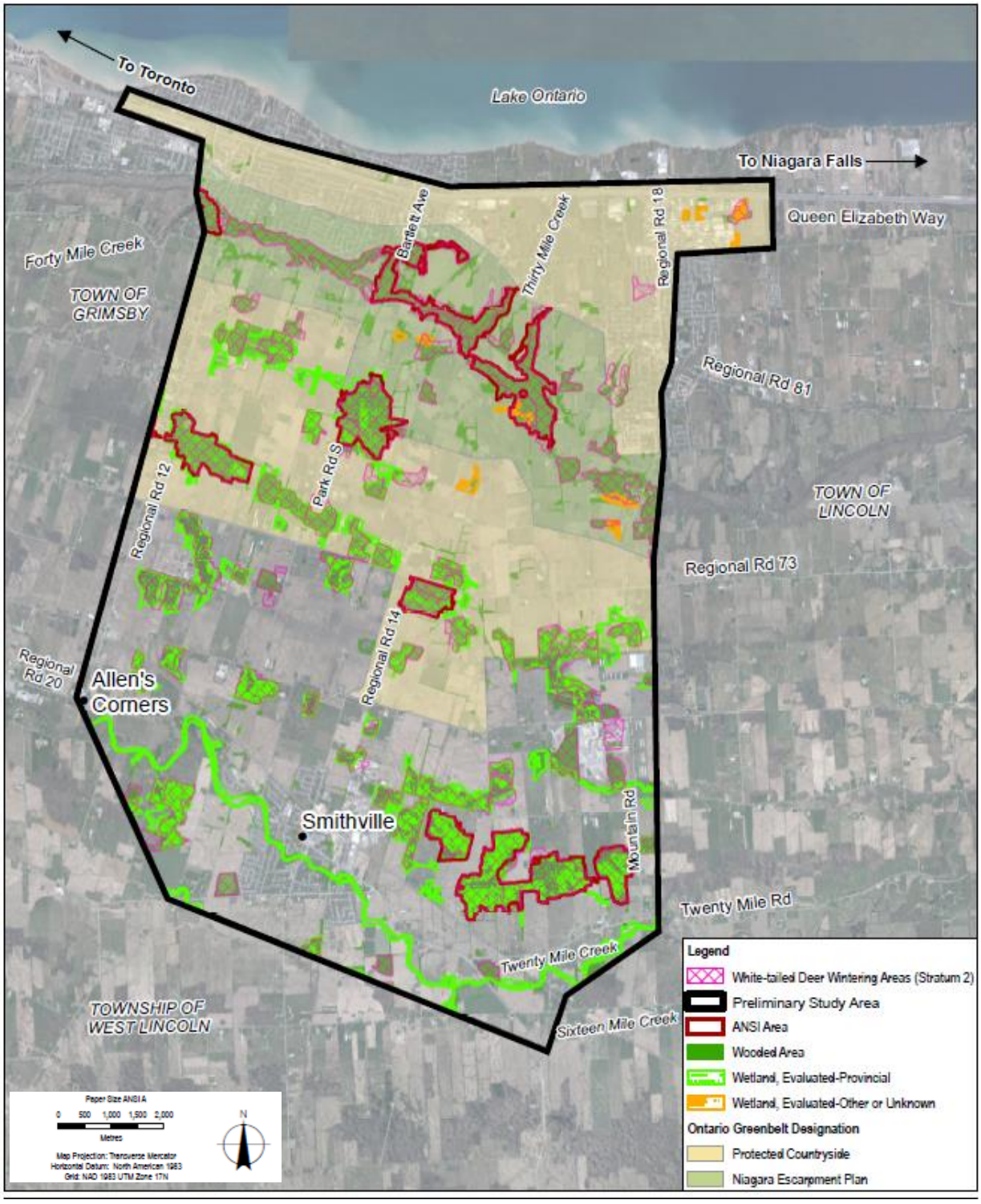

Figure 7-3: Natural Heritage Features

Seasonal concentration areas

Seasonal concentration areas are those habitats where large number of a single species or many species congregate at one (or several) times a year. The SWHCS for Ecoregion 7E outlines a series of seasonal concentration areas. Specifically, there are two candidates within the preliminary study area including white-tailed deer wintering areas (present in patches throughout preliminary study area) and an important bird area (located in the northern portion of the preliminary study area at the West end of Lake Ontario).

Rare vegetation communities

Rare vegetation communities are those that contain provincially rare vegetation communities or those which are rare to the area. One of the most important criteria for determining a rare vegetation community is the current representation of the community within a planning area based on its area relative to the total landscape or the number of examples within the planning areas. Natural Heritage Information Centre (NHIC) uses a system that considers the provincial rank of a species or community type as a tool to prioritize protection efforts (S-rank). Rare vegetation communities may be present in the preliminary study area subject to additional work carried out during the Niagara Escarpment Crossing EA.

Specialized habitat for wildlife

Specialized habitats for wildlife consist of those which support wildlife that has highly specific habitat requirements (e.g., nesting habitat – vernal pools), those areas that contain high species and community diversity and those which provide habitat that can greatly enhance species survival. Like seasonal concentration areas, specialized habitats for wildlife may be present in the preliminary study area subject to additional work carried out during the Niagara Escarpment Crossing EA.

Habitat for species of conservation concern

Habitats for species of conservation concern are those that contain species that are rare or substantially declining and are rare or uncommon in the planning area. These habitats are associated with provincially rare wildlife species (i.e., species with S-Ranks S1, S2 or S3) and/or wildlife species listed under the *Endangered Species Act* (*ESA*) as Special Concern. Six species associated with the preliminary study area were found to have S-Ranks of S3 or less; these were American chestnut [*Castanea dentata* (S2)], butternut [*Juglans cinerea* (S3)], cucumber tree [*Magnolia acuminata* (S2)], eastern

flowering dogwood [*Cornus florida* (S2)], Virginia mallow [*Ripariosida hermaphrodita* (S1)] and white wood aster [*Eurybia divaricate* (S2S3)].

Species classified as Special Concern (SC) under the *ESA* that are historically known to occur within the areas that overlap the preliminary study area are as follows: snapping turtle (*Chelydra serpentina*), grass pickerel, barn swallow (*Hirundo rustica*), common nighthawk (*Chordeiles minor*), eastern wood-peewee (*Contopus virens*), grasshopper sparrow (*Ammodramus savannarum pratensis*), wood thrush (*Hylocichla mustelina*), maplelef (*quadrula quadrula*) and monarch (*Danaus plexippus*).

Species at Risk

There is the potential presence of 26 Species at Risk (SAR) within the preliminary study area as listed in **Table 7-1** based on a review of available information of potential *ESA* Threatened (THR) and Endangered (END) SAR.

Table 7--1: Threatened and Endangered Species

Common Name	Scientific Name	ESA Status
Transverse lady beetle	*Coccinella transversalis*	END
Jefferson salamander	*Ambystoma jeffersonianum*	END
Bank swallow	*Riparia riparia*	THR
Least Bittern	*Lxobrychus exilis*	THR
Bobolink	*Dolichonyx oryzivorus*	THR
Chimney swift	*Chaetura pelagica*	THR
Eastern meadowlark	*Sturnella magna*	THR
Louisiana waterthrush	*Parkesia motacilla*	THR
Northern bobwhite	*Colinus virginianus*	END
Red-headed woodpecker	*Melanerpes erythrocephalus*	END
Short-eared owl	*Asio flammeus*	THR
Eastern small-footed myotis	*Myotis leibii*	END
Little brown myotis	*Myotis lucifugus*	END
Northern myotis	*Myotis septentrionalis*	END
Tri-coloured bat	*Perimyotis subflavus*	END
Lilliput	*Toxolasma parvum*	THR
Blanding's turtle	*Emydoidea blandingii*	THR
Five-lined skink	*Plestiodon fasciatus*	END

Common Name	Scientific Name	ESA Status
Gray ratsnake	*Pantherophis spiloides*	END
American chestnut	*Castanea dentata*	END
Butternut	*Juglans cinerea*	END
Cucumber tree	*Magnolia acuminata*	END
Eastern flowering dogwood	*Cornus florida*	END
Virginia mallow	*Ripariosida hermaphrodita*	END
White wood aster	*Eurybia divaricate*	THR
Red Mulberry	*Morus rubra*	END

7.2.2 Built Environment

The preliminary study area is associated with the western portion of Niagara Region and consists largely of an agricultural/rural setting with the urban communities of Grimsby, Beamsville, and Smithville situated within it (**Figure 7-4**).

Town of Grimsby

The Town of Grimsby is in the northwestern portion of the preliminary study area. The urban area of the Town of Grimsby is situated below the Niagara Escarpment and extends to Lake Ontario and along the QEW. The urban area of the Town of Grimsby situated within the preliminary study area is primarily composed of residential land uses with institutional uses, such as retirement homes, schools, and places of worship, amongst the homes. There are also industrial/business land uses located at the western end (between the QEW and Regional Road 81) and eastern end (along Regional Road 81) of the urban area. The commercial core of Grimsby is situated in the vicinity of the intersection of Regional Roads 12 and 81 south of the QEW.

The rural area of the Town of Grimsby is situated south of the Niagara Escarpment and is composed of primarily agricultural related land uses with some rural residential homes present throughout and a couple of institutional uses such as a cemetery and a fire station.

Town of Lincoln

The eastern portion of the preliminary study area is in the Town of Lincoln. The Town of Lincoln within the preliminary study area is primarily composed of agricultural and rural residential land uses. However, there are several industrial and commercial land uses including several greenhouse operations within the preliminary study area. They are situated along the south side of the QEW and along both sides of Regional Road 18 between the QEW and railway in Beamsville. Approximately half of the urban residential area of Beamsville is within the preliminary study area. The urban area of Beamsville is primarily composed of residential land uses with a few institutional uses, such as retirement homes, health centres, schools, places of worship and cemeteries, amongst the homes.

In addition, there a numerous wineries situated in the preliminary study area primarily north of the Niagara Escarpment in the Town of Lincoln. As well, Nelson Aggregates operates a quarry in the southwest quadrant of the Yonge Street and Mountain Street intersection in the preliminary study area.

Township of West Lincoln

The Township of West Lincoln makes up the southeastern portion of the preliminary study area. The Township of West Lincoln within the preliminary study area is primarily agricultural and rural residential except for the communities of Smithville and Allens Corner. Smithville is in the very southern portion of the preliminary study area on Regional Road 20. Smithville is primarily composed of residential land uses with an industrial/commercial area situated in the northeastern portion of the community. A railway passes through Smithville just to the north of Regional Road 20.

Allens Corner is a small community located at the Regional Road 12 and Regional Road 20 intersection with a few residences and industrial uses. The Niagara Road 12 Waste Management Facility, operated by Niagara Region, is located within the preliminary study area.

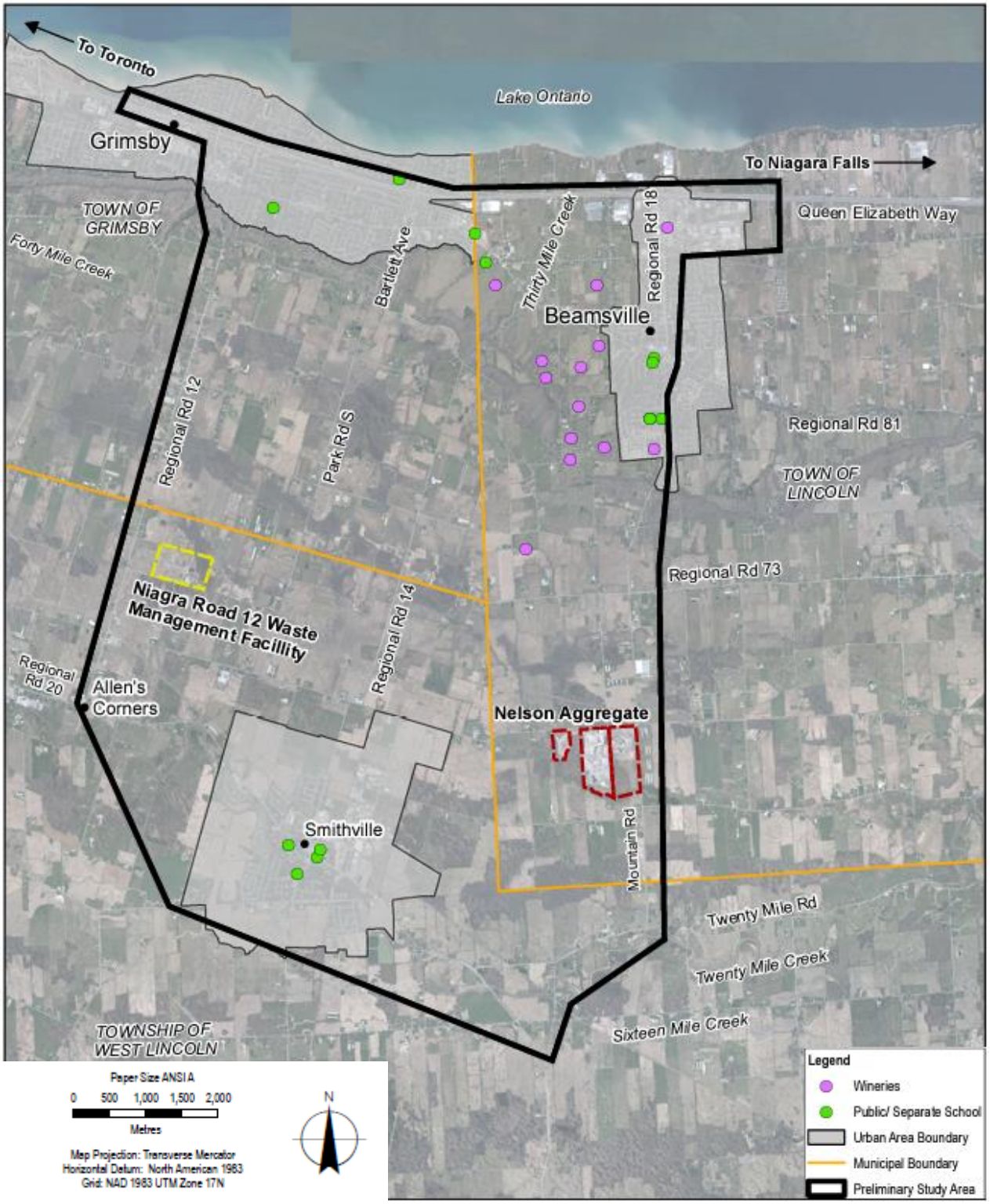

Figure 7-4: Built Environment

7.2.3 Social Environment

As mentioned, the preliminary study area includes the three municipalities of the Towns of Grimsby and Lincoln and Township of West Lincoln. Although the populations of the Towns of Grimsby and Lincoln are significantly larger as a percentage than the Township of West Lincoln, all three municipalities have similar social profiles.

Town of Grimsby

The Town of Grimsby has a 2021 population of 28,883.[4] Approximately 63% of the population is between the ages of 15 and 64 and 21% of the population is over the age of 65. The Town of Grimsby's population grew by 5.7% between 2016 and 2021. The median income for employed individuals is $48,000. Approximately 75% of employed individuals commute outside of the Town of Grimsby for work.

Town of Lincoln

The Town of Lincoln has a 2021 population of 25,719[5]. Approximately 61% of the population is between the ages of 15 and 64 and 22% of the population is over the age of 65. The Town of Lincoln's population grew by 8.1% between 2016 and 2021. The median income for employed individuals is $44,800. Approximately 49% of the employed individuals commute outside of the Town of Lincoln for work.

Township of West Lincoln

The Township of West Lincoln has a 2021 population of 15,454[6]. Approximately 62% of the population is between the ages of 15 and 64 and 17% is over the age of 65. The Township of West Lincoln's population grew by 6.6% between 2016 and 2021. The median income for employed individuals is $43,600. Approximately 80% of the employed population commute outside of the Township of West Lincoln for work.

7.2.4 Economic Environment

Provincial Policy

Provincial policies and legislation directly influencing the Niagara Escarpment Crossing EA include the *Planning Act*, the Provincial Policy Statement, the Greenbelt Plan, and the Niagara Escarpment Plan. The *Planning Act* defines municipal authority in land use planning matters, working in concert with other Provincial legislation such as the *EA Act*.

[4] Statistics Canda, 2021 Census Profile, Town of Grimsby
[5] Statistics Canada, 2021 Census Profile, Town of Lincoln
[6] Statistics Canada, 2021 Census Profile, Township of West Lincoln

The Provincial Policy Statement 2020, issued under the *Planning Act*, provides principles and policy direction on matters of provincial interest relating to land use planning and development. These matters include building strong communities with an emphasis on efficient development and land use patterns, wise use and management of resources and protecting public health and safety. The *Planning Act* requires that any decisions relating to planning matters shall be consistent with policy statements under the *Planning Act*.

The Greenbelt Plan 2017, authorized under the *Greenbelt Act, 2005*, identifies where urbanization should not occur to provide permanent protection of the agricultural land and the ecological features and functions occurring in the Greenbelt Plan Area, which includes the Niagara Escarpment Plan Area. Most of the preliminary study area is within the Greenbelt Plan Area designated as 'Protected Countryside'. The Greenbelt Plan provides that the policies of the Niagara Escarpment Plan are the policies of the Greenbelt Plan for the Niagara Escarpment Plan Area and the Protected Countryside policies do not apply with the exception of section 3.3 (Parkland, Open Space and Trails).

The Niagara Escarpment Plan 2017, established by the *Niagara Escarpment Planning and Development Act*, serves as a framework of objectives and policies to strike a balance between development, protection and the enjoyment of the Niagara Escarpment and the resources it supports. Section 2.12 of the Plan addresses infrastructure with the objective to design and locate it so that the least possible impact occurs on the Escarpment environment and to encourage green infrastructure and low impact development, where appropriate.

Niagara Region

The Niagara Region Official Plan (2022) (NROP) implements the Greenbelt Plan and Niagara Escarpment Plan ensuring that the requirements for development and protection of natural resources are addressed. Section 3 of the NROP addresses the requirements of the Greenbelt Plan and Niagara Escarpment Plan and Section 5 outlines Niagara Region's infrastructure policies.

In terms of a regional structure, the NROP designates the communities of Grimsby, Beamsville, and Smithville as urban areas. Within this designation, the NROP further delineates them as built-up areas with some limited designated greenfield areas in Grimsby and Beamsville and significant designated greenfield areas in Smithville.

Town of Grimsby

The Urban Area of the Town of Grimsby is located north of the Niagara Escarpment and is identified in the Town of Grimsby Official Plan (2012) as being nearly completely developed.[7] There are currently five planning applications within the preliminary study area:

- 19 Elm Street and 13 Mountain Road, a proposed seven story mixed use building
- 141-149 Main Street East, a proposed seven storey residential building
- 133 Main Street East, a proposed preservation of an existing building with a new five storey mixed use commercial and residential apartment building
- 226 and 228 Main Street East, eight single detached residences proposed on a private condominium driveway
- 37 Bartlett Avenue, a proposed townhouse development.[8]

Town of Lincoln

The Town of Lincoln Official Plan (2018) identifies that the portion of the Town within the preliminary study area is primarily Agricultural except for the industrial area north of Beamsville.[9] There are currently four planning applications with the Town situated within the preliminary study area. Three of these applications are in the industrial area north of Beamsville near the Ontario Street and QEW Interchange. The fourth development application is located near Regional Road 73 and Zimmerman Road at the eastern edge of the preliminary study area.[10]

Township of West Lincoln

The Township of West Lincoln Official Plan identifies the community of Smithville as the only urban area within the Township where most of the growth and economic development is focused on. There are approved Secondary Plans for two areas within the Urban Area of Smithville: Northwest Quadrant Secondary Plan and Spring Creek Heights Secondary Plan. Employment areas within the community are focused on the downtown commercial core and the northeast industrial zone.[11]

[7] Town of Grimsby, Town of Grimsby Official Plan, May 2012.
[8] Town of Grimsby, "Current Planning Applications" https://www.grimsby.ca/en/doing-business/current-planning-applications.aspx
[9] Town of Lincoln, Town of Lincoln Official Plan, December 2018.
[10] Town of Lincoln, Speak up Lincoln " Development in Lincoln" https://speakuplincoln.ca/development-in-lincoln
[11] Township of West Lincoln Official Plan, Consolidated October, 2018.

The Township of West Lincoln developed an Economic Development Plan in 2016, which was updated in 2020, to respond to changing demographics, develop economic goals and guide development within the Township.[12][13]

7.2.5 Cultural Environment

Archaeological Resources

Several Indigenous archaeological sites from the Late-Paleo period through the contact period are located within the preliminary study area in addition to 19th century archaeological sites and modern cemeteries. The Niagara Region Archaeological Management Plan (AMP) is currently pending Council endorsement. The AMP presents an archaeological potential model consistent with provincial legislation and policy, based on known archaeological site locations, past and present land uses, environmental and socio-cultural data for the preliminary study area.

Additionally, there are multiple known or potential built heritage resources (BHRs) and cultural heritage landscapes (CHLs) within the preliminary study area, which also indicate archaeological potential.

Cultural Heritage Landscapes and Built Heritage Resources

As stated, there are multiple known or potential BHRs and CHLs within the preliminary study area. These include 38 properties designated under Part IV of the *Ontario Heritage Act*. The municipal heritage registers of Grimsby, Lincoln, and West Lincoln also include 366 listed properties within the preliminary study area. There is also one potential Town of Grimsby heritage conservation district currently under study within the preliminary study area. The plaque for one National Historic Person, George Herbert Locke, is also located within the preliminary study area in Beamsville. The presence of provincial heritage properties or Ontario Heritage Trust properties or easements in the preliminary study area is unknown.

The Town of Grimsby has previously identified 27 CHLs and 14 cemeteries within the preliminary study area.

The Niagara Escarpment Biosphere Reserve is also a provincially recognized heritage landscape and part of the Greenbelt as well as being recognized as a UNESCO Biosphere Reserve. The Bruce Trail is another significant CHL. Additional potential BHRs and CHLs are expected throughout the preliminary study area.

[12] Township of West Lincoln, Economic Development Plan, March 2016.
[13] Township of West Lincoln, Economic Development Plan 2020 Update, February 2020.

7.3 Detailed Inventory of the Environment

A more detailed description of the environment will be developed during preparation of the Niagara Escarpment Crossing EA and will be provided in the EA Report. This detailed description will be developed based on available existing information sources and additional work such as field investigations and modelling, as appropriate, through several investigative studies including, but not limited to, the following:

- Air Quality
- Agricultural
- Archaeology
- Built Heritage and Cultural Heritage Landscapes
- Contaminated Property
- Groundwater
- Land Use
- Natural Heritage
- Noise and Vibration
- Surface Water
- Visual Impact

The details associated with each of these studies are provided in separate work plans (**Appendices C to M**, respectively). The work plans outline what will be done during the Niagara Escarpment Crossing EA to generate a more detailed description and understanding of the environment and how that information will be utilized in the generation, possible screening, assessment, and comparative evaluation of the alternatives, as well as the assessment of impacts associated with the preferred alternative.

7.4 Types of Potential Environmental Effects

The types of potential environmental effects that will be assessed during preparation of the Niagara Escarpment Crossing EA include, but are not limited to, those that are summarized in **Table 7-2**. These potential environmental effects are based on the alternatives to the project presented in **Section 6.1** and preliminary description of the

environment provided in **Section 7.2**. The types of potential environmental effects have been grouped into the five environmental components: natural, built, social, economic, and cultural.

The specific potential environmental effects will be determined during the preparation of the Niagara Escarpment Crossing EA and documented in the EA Report.

Table 7-2: Potential Environmental Effects

Natural	Built	Social	Economic	Cultural
- Temporary and/or long-term change in groundwater quality and/or quantity - Temporary and/or long-term change in surface water quality and/or quantity - Temporary or permanent loss of aquatic features or categorical loss of functions - Change in geomorphic form/function/stability in affected channels - Temporary or permanent disturbance to aquatic and/or	- Displacement of residences, businesses (e.g., commercial, industrial, agricultural-related, wineries, tourist-related, etc.), and/or community, institutional, and recreational facilities - Temporary or permanent disruption to residences, businesses (e.g., commercial, industrial, agricultural-related, wineries, tourist-related, etc.), and/or community, institutional, and recreational facilities - Alteration to transportation infrastructure (e.g.,	- Temporary or permanent disruption to well users (e.g., water quality/quantity) - Temporary or permanent disturbance to sensitive receptors due to odours - Temporary or permanent disturbance to sensitive receptors due to noise - Temporary or permanent alteration of visual landscape/views of the Niagara Escarpment	- Changes to approved/planned land uses - Temporary or permanent disruption to business operations (e.g., commercial, industrial, agricultural-related, wineries, tourist-related, etc.) - Temporary or permanent removal of soil resources related to agriculture (e.g., removal of Class 1, Class 2, and/or Class 3 soils, or Specialty Cropland)	- Impacts to archaeological resources and areas of archaeological potential - Impacts to known and/or potential built heritage resources and/or cultural heritage landscapes

Natural	Built	Social	Economic	Cultural
terrestrial species and habitat - Temporary or permanent loss of recharge and discharge areas - Temporary or permanent loss of sensitive environmental features or natural heritage features	highways, roads, and cycling and pedestrian facilities) - Alteration to utilities (above and below ground) - Temporary use of or permanent acquisition of private property - Disturbance /alteration to existing buildings due to vibration - Temporary or permanent disruption to active agricultural operations (e.g., fragmentation of agricultural fields, and/or disturbance to artificial drainage systems and/or disturbance of farm fences, entrances and paddocks)			

8 Description of the Assessment and Evaluation Methodology

Since the Niagara Escarpment Crossing EA will be prepared as set out in subsection 17.6(2) of the *EA Act*, the assessment and evaluation methodology will be carried out through three successive stages as outlined in **Figure 8-1**. The assessment and evaluation methodology for each stage is further described in the following subsections.

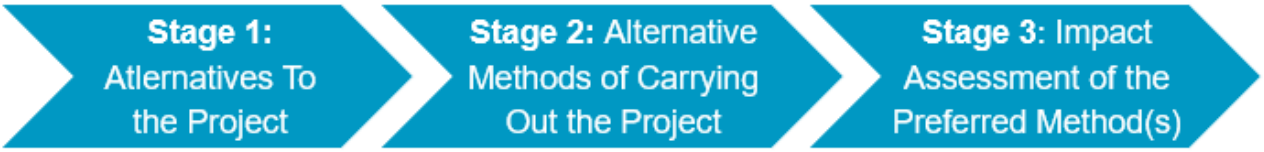

Figure 8-1: Assessment and Evaluation Methodology

8.1 Alternatives To the Project

Following confirmation of the alternatives to the project, they will be assessed and comparatively evaluated leading to a recommended alternative(s) for confirmation following consultation with review agencies, Indigenous Governments and Community Organizations (Indigenous Communities)[14], and the public. **Figure 8-2** illustrates the proposed methodology and tasks that will be carried out during the preparation of the Niagara Escarpment Crossing EA to identify the preferred alternative(s). Each of these tasks is further described in the subsections that follow.

[14] Indigenous Governments include the Mississaugas of the Credit First Nation, Six Nations of the Grand River, Haudenosaunee Confederacy Chiefs Council, and Métis Nation of Ontario.

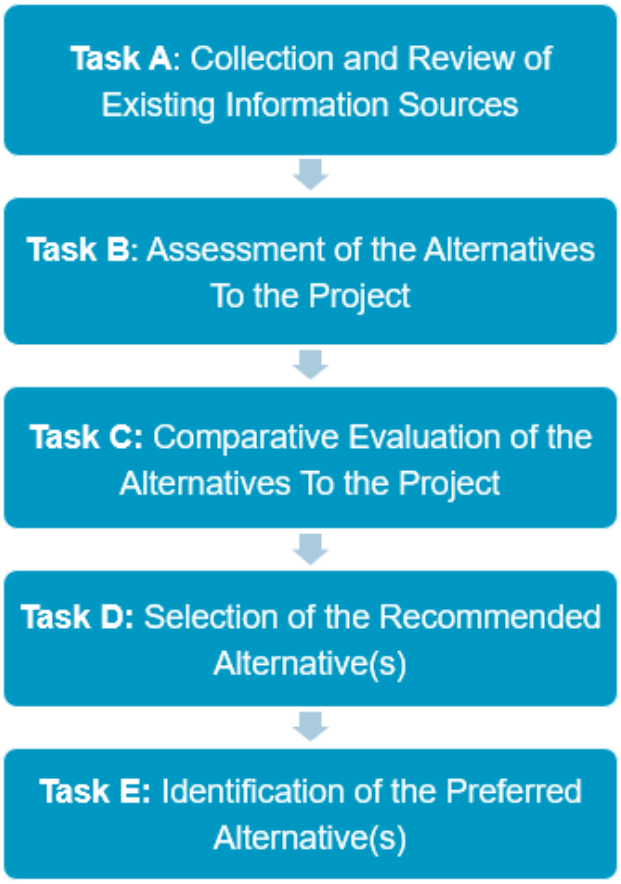

Figure 8-2: Proposed Methodology for Identifying the Preferred Alternative(s) to the Project

8.1.1 Task A: Collection and Review of Existing Information Sources

As mentioned in **Section 7.3**, a more detailed description of the environment will be provided during preparation of the Niagara Escarpment Crossing EA based on at least 11 investigative studies. In each case, available existing information sources will be collected and reviewed to determine existing environmental conditions, including any data gaps that need to be addressed through subsequent work (e.g., field investigations, modelling, etc.) completed as part of alternative methods of carrying out the project stage. Presently, the list of available existing information sources that will be collected and reviewed includes, but may not be limited to, those listed in the work plans found in **Appendices C** to **M**.

8.1.2 Task B: Assessment of the Alternatives To the Project

The alternatives to the project will be assessed based on a net effects analysis. The net effects analysis will be composed of the following activities as illustrated in **Figure 8-3**:

Figure 8-3: Assessment of the Alternatives to the Project

Activity No. 1 - Identify Potential Effects on the Environment

First, the potential effects on the environment (both positive and negative) for each alternative will be identified. Preliminary evaluation criteria have been developed to identify and consider the potential effects of each alternative to the project on the environment in a traceable, logical, understandable, and reproducible manner.

The preliminary evaluation criteria have been developed based on the alternatives to the project being considered, the preliminary description of the environment, the type of potential environmental effects anticipated, and comments from review agencies, Indigenous Communities, and the public received as part of preparing the proposed Niagara Escarpment Crossing EA ToR. In addition, one or more indicators have been proposed for each evaluation criterion to identify how the potential environmental effects will be measured for each criterion.

The preliminary criteria and indicators that will be used for assessing the alternatives to the project during the Niagara Escarpment Crossing EA include, but may not be limited to, those set out in **Table 8-1.** The preliminary evaluation criteria and indicators are grouped under the following categories based on the definition of the environment provided in the *EA Act* and proposed work plans:

1. Transportation
2. Natural Environment
3. Built Environment
4. Social Environment
5. Economic Environment
6. Cultural Environment
7. Financial

The preliminary evaluation criteria and indicators will be finalized based on comments received during the Niagara Escarpment Crossing EA along with a supporting definition/rationale for each criterion and documented in the EA Report.

Table 8-1: Preliminary Criteria and Indicators for Assessing the Alternatives To the Project

Category	Criterion	Indicator
Transportation	- Conformance to applicable Niagara Region, Local Municipalities, and Ministry of Transportation safety and design standards	- Degree of conformance, or number of design exceptions necessary
Transportation	- Constructability	- Number and type of engineering challenges (e.g., water course crossings, potential utility relocations, soil instability, construction staging and accesses, etc.), including understanding of how those challenges will be addressed
Transportation	- Ability to accommodate auto and commercial vehicle traffic demand to support efficient movement of people and goods across Niagara Escarpment	- Network-wide Passenger Vehicles and Commercial Vehicle Density - Network-wide Vehicle Kilometers Travelled (VKT)
Transportation	- Ability to improve road network redundancy and connectivity in the area by providing an alternative travel route	- Reduced local congestion and improve QEW access (Travel Time, Travel Delay, LOS, V/C) at key locations within the study area, as identified in Section 2.1.3.
Transportation	- Ability to improve corridor accessibility and operations	- Corridor Congestion level (Travel Time, Travel Delay, LOS, V/C) - Overall reduction in operating speeds across the escarpment.

Category	Criterion	Indicator
Transportation	- Ability to enhance traffic safety	- Reduction in predicted collisions and conflicts for the interim and ultimate horizon year on network and corridor level
Transportation	- Ability to provide and/or improve emergency access in Niagara Escarpment	- Connectivity in travel distance and travel time to nearest hospital - Additional breakdown areas for commercial vehicles on the escarpment
Natural Environment	- Effect on air quality and greenhouse gas emissions and climate change from vehicular road traffic	- Estimated air contaminant and carbon dioxide equivalent emission rates
Natural Environment	- Effect on groundwater resources	- Changes to groundwater resources
Natural Environment	- Effect on groundwater and surface water interactions	- Changes to groundwater and surface water interactions
Natural Environment	- Effect on groundwater from impacted geological features including karst	- Changes to groundwater from impacted geological features including karst
Natural Environment	- Effect on terrestrial habitat functions	- Effects on sensitive environmental features (Niagara Escarpment, provincially significant wetlands (PSWs), etc.)

Category	Criterion	Indicator
Natural Environment	- Effect on terrestrial habitat functions	- Effects to vegetation (wetlands, woodlands, meadow/thickets etc.)
Natural Environment	- Effect on terrestrial habitat functions	- Effects on threatened or endangered species and habitat
Natural Environment	- Effect on aquatic habitat functions	- Effects on aquatic species, habitat availability and quality
Natural Environment	- Effect on aquatic habitat functions	- Effects on threatened or endangered species and habitat
Natural Environment	- Effect on surface water drainage patterns and features	- Changes to surface water drainage patterns and features
Natural Environment	- Effect on surface water quantity and quality	- Changes to surface water quantity and quality
Built Environment	- Effect on existing land uses (e.g., agricultural, residential, commercial, industrial, institutional, recreational, etc.)	- Approximate number and type of existing land uses potentially affected
Built Environment	- Effect on property	- Approximate number of properties affected

Category	Criterion	Indicator
Built Environment	- Effect on existing infrastructure and facilities (e.g., pedestrian, cycling, transit, road, highway, rail, water/wastewater, utility, etc.)	- Approximate number and type of existing infrastructure and facilities affected
Built Environment	- Effect on existing agricultural land uses (e.g., loss, fragmentation, etc.)	- Extent of agricultural land uses affected - Number of landowners affected
Built Environment	- Effect on existing agricultural operations including capital investment	- Extent of agricultural operations affected (e.g., irrigation, tile drainage, field access, etc.)
Built Environment	- Effect on potentially contaminated property	- Extent of potentially contaminated properties affected
Built Environment	- Effect of vibration during construction on existing buildings	- Approximate number of standard and vibration sensitive structures potentially affected
Social Environment	- Effect on air quality conditions on residents from vehicular road traffic	- Approximate number of sensitive receptors affected and extent and duration of adverse effects
Social Environment	- Effect on private water wells	- Approximate number of wells and type affected
Social Environment	- Effect on Noise Sensitive Areas (NSAs) during construction (e.g., noise, vibration, etc.)	- Approximate number of NSAs potentially affected

Category	Criterion	Indicator
Social Environment	- Effect of increased noise levels on sensitive receptors from road traffic noise	- Approximate number of sensitive receptors potentially affected
Social Environment	- Effect on the visual quality of the landscape and scenic resources from the alternative	- Offers scenic potential and/or protects key landscape features
Social Environment	- Effect on adjacent dwellers sensitive to views of the alternative	- Approximate number of sensitive viewer groups potentially affected
Social Environment	- Effect on passive recreation (e.g., trails, hiking, etc.) potential of scenic/natural adjacent sites	- Approximate number of sites with scenic/natural features potentially affected
Social Environment	- Effect on First Nation Communities	- Approximate area of hunting and harvesting lands removed
Economic Environment	- Effect on provincial, regional, and municipal land use plans, policies, strategies, and guidelines	- Compatibility with provincial land use plans, policies, strategies, and guidelines - Compatibility with regional land use plans, policies, strategies, and guidelines - Compatibility with municipal land use plans, policies, strategies, and guidelines
Economic Environment	- Effect on proposed, planned, and approved development applications	- Approximate number and type, proposed/planned/ approved development applications affected

Category	Criterion	Indicator
Economic Environment	- Effect on proposed, planned, and approved provincial, regional, and municipal projects	- Approximate number and type of proposed, planned, and approved provincial projects affected - Approximate number and type, of proposed, planned, and approved regional projects affected - Approximate number and type, of proposed, planned, and approved municipal projects affected
Economic Environment	- Effect on the agricultural land base (i.e., Specialty Crop Area, Prime Agricultural Area)	- Extent of the agricultural land base affected
Economic Environment	- Effect on the continuity of the agricultural land base	- Ability to develop future agricultural operations
Economic Environment	- Effect on agricultural production (e.g., one time replacement costs, increased operating costs, etc.)	- Extent of disruption to existing agricultural operations
Cultural Environment	- Effect on archaeological resources	- Number of previously identified archaeological sites impacted
Cultural Environment	- Effect on areas of archaeological potential	- Area (ha) of archaeological potential impacted (i.e., lands with potential for the presence of significant archaeological resources)

Category	Criterion	Indicator
Cultural Environment	- Effect on registered cemetery properties	- Number and extent of registered cemeteries impacted
Cultural Environment	- Effect on built heritage resources and cultural heritage landscapes	- Number of known and/or potential built heritage resources and cultural heritage landscapes impacted
Financial	- Estimated construction costs	- Conceptual capital cost estimate to construct the alternative
Financial	- Estimated land acquisition costs	- Conceptual land acquisition cost estimate to implement the alternative

Activity No. 2 - Develop and Apply Impact Management Measures

Develop appropriate impact management measures, where possible and as required, and apply to avoid, mitigate, or compensate for potential negative environmental effects for each alternative. The intent of the impact management measures will be as follows:

- Avoidance: The priority will be to prevent the occurrence of negative (adverse) environmental effects associated with implementing an alternative. Avoidance-by-design.
- Mitigation: Where negative environmental effects cannot be avoided, appropriate measures to remove or alleviate, to the greatest extent possible, the negative effects associated with implementing an alternative will be sought.
- Compensation: In situations where appropriate mitigation measures are not available, or significant net negative effects will remain following their application, compensation measures may be required to counterbalance these negative effects through replacement in kind, substitution, reimbursement, or other agreed compensation.

The impact management measures will be developed based on professional expertise of the Project Team reflecting current procedures, historical performance, and existing environmental conditions.

Activity No. 3 - Determine Net Effects on the Environment

Once the appropriate impact management measures are developed, they will be applied to the potential environmental effects to determine the remaining net effects on the environment (both positive and negative) for each alternative.

The results of carrying out the preceding assessment will be documented in the EA Report.

8.1.3 Task C: Comparative Evaluation of the Alternative Methods

Following completion of Task B, the alternatives to the project will be comparatively evaluated using the Reasoned Argument or “Trade-off” approach based on the results of the net effects analysis. This approach identifies the relative differences in net effects between the alternatives to determine the relative advantages (positive) and disadvantages (negative) to the environment of each alternative to the project.

As per MECP's Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario, the *EA Act* does not differentiate between the importance of the different key considerations of a Project, and it is expected that the net effects to one key consideration may be greater than the effects to another[15]. In light of this, one alternative is rarely preferred to all others in every respect and relative advantages in one environment may be offset by relative disadvantages in another. As a result, the evaluation process consists of trade-offs in which the advantages and disadvantages to the environment are considered holistically in determining a recommended alternative. In general, the alternative that has the best balance of advantages and disadvantages is identified as the recommended alternative to the project.

The information generated through the comparison of the alternatives to the project will be documented in the EA Report.

8.1.4 Task D: Selection of the Recommended Alternative(s)

A recommended alternative(s) will be selected based on the preceding methodology and more specifically the results of Task C. The rationale for the decision-making process undertaken to select the recommended alternative(s) will be provided in the EA Report.

8.1.5 Task E: Identification of the Preferred Alternative(s)

The recommended alternative(s) will be presented to review agencies, Indigenous Communities, and the public for a defined period to receive comments, following which a preferred alternative(s) will be identified. The rationale for the preferred alternative(s) will be documented in the EA Report.

8.2 Alternative Methods of Carrying Out the Project

Following the identification of the preferred alternative(s), alternative methods of carrying out the project will be generated, screened if appropriate, assessed, and comparatively evaluated leading to a recommended method(s) for implementing the preferred alternative(s). **Figure 8-4** illustrates the proposed methodology and tasks that will be carried out during the preparation of the Niagara Escarpment Crossing EA to identify the preferred method(s). Each of these tasks is further described in the subsections that follow.

[15] Ministry of the Environment, Conservation and Parks, Code of Practice, Preparing and Reviewing Environmental Assessments in Ontario, January 2014, page 32.

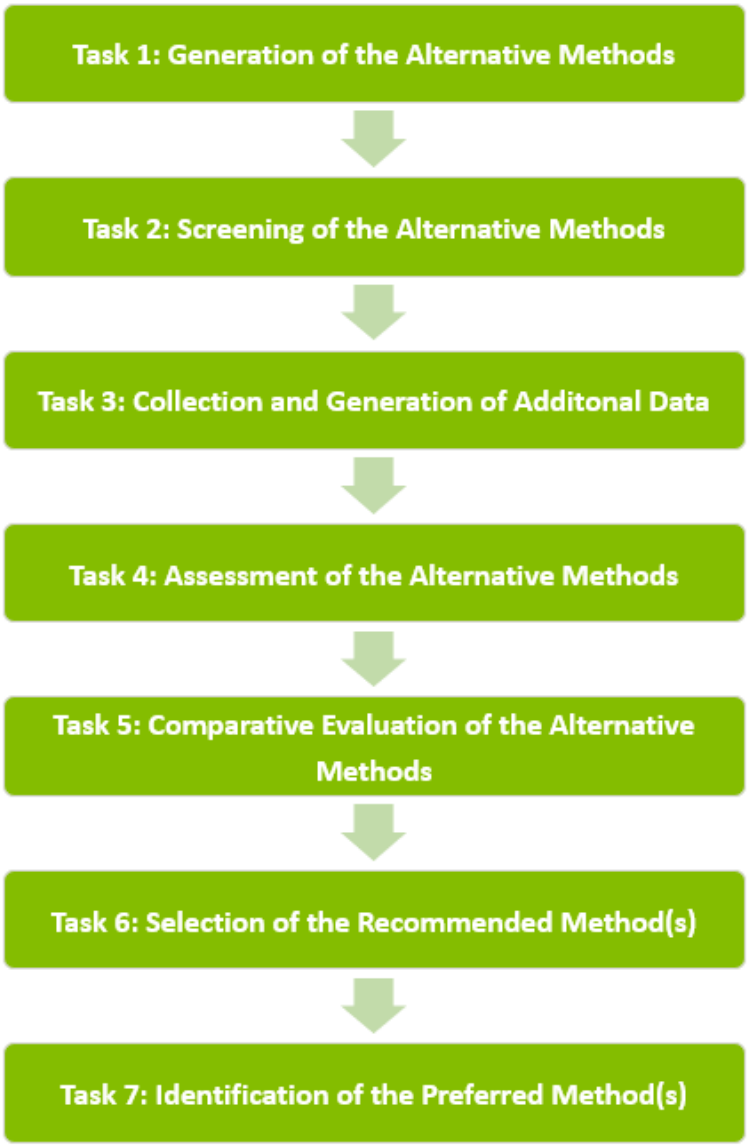

Figure 8-4: Proposed Methodology for Alternative Methods of Carrying Out the Project

8.2.1 Task 1: Generation of the Alternative Methods

Using the existing conditions information collected and reviewed as part of Task A in **Section 8.1.1**, alternative methods will be generated in the final study area at a concept level of design (see the Transportation Planning and Engineering Work Plan in **Appendix A** for further information). Depending upon the preferred alternative(s) to the project selected during the Niagara Escarpment Crossing EA, a “long list” of alternative

methods of carrying out the project may be generated. A long list consists of more than five alternatives for implementing the preferred alternative(s).

8.2.2 Task 2: Screening of the Alternative Methods

Since only reasonable and feasible alternatives should be considered in an environmental assessment, the long list of alternative methods generated in Task 1 may be screened to arrive at a short list of between three and five alternative methods of carrying out the project. As a result, the short list would represent the most reasonable and feasible alternative methods of carrying out the project.

So, if required, screening criteria will be developed during preparation of the Niagara Escarpment Crossing EA for application to the generated long list of alternative methods. The alternative methods will be screened based on available existing information sources as documented in the Baseline Conditions Reports. The screening process and its results will be documented in the EA Report, as required, providing a rationale for selecting the short list of alternative methods of carrying out the project.

8.2.3 Task 3: Collection and Generation of Additional Data

Following the establishment of the alternative methods through Task 1 and Task 2, as required, additional work will be undertaken (e.g., field investigations, modelling, etc.) as appropriate. The additional work will be used to supplement the available existing information sources so that additional data is generated to carry out a net effects analysis of the alternative methods (i.e., identifying potential environmental effects, developing appropriate impact management measures (i.e., avoidance, mitigation, and/or compensation) for addressing potential adverse environmental effects, and identifying net environmental effects).

The need for additional work will be based on the level of detail provided by the available existing information sources, accessibility of the final study area, and comments received from review agencies, Indigenous Communities, and the public. Currently, the additional work proposed includes, but may not be limited to, that listed in the work plans found in **Appendices C** to **M.**

8.2.4 Task 4: Assessment of the Alternative Methods

The alternative methods of carrying out the project established through Task 1 and Task 2, as required, will be developed at a higher concept level of design (see the Transportation Planning and Engineering Work Plan in **Appendix A** for further information) and assessed through a net effects analysis as described previously in

Section 8.1.2 (Task B). With this in mind, preliminary evaluation criteria and indicators have been developed, which will include, but may not be limited to, those set out in **Table 8-2**.

Again, like the alternatives to the project stage, the preliminary evaluation criteria and indicators are grouped according to the following categories based on the definition of the environment provided in the *EA Act* and proposed work plans:

- Transportation
- Natural Environment
- Built Environment
- Social Environment
- Economic Environment
- Cultural Environment
- Financial

The preliminary evaluation criteria and indicators will be finalized during preparation of the Niagara Escarpment Crossing EA and documented in the EA Report along with a supporting definition/rationale for each criterion. In addition, the results of carrying out the assessment of the alternative methods will be documented in the EA Report.

Table 8-2: Preliminary Criteria and Indicators for Assessing the Alternative Methods

Category	Criterion	Indicator
Transportation	- Conformance to applicable Niagara Region, Local Municipalities, and Ministry of Transportation safety and design standards	- Degree of conformance, or number of design exceptions necessary
Transportation	- Constructability	- Number and type of engineering challenges (e.g., water course crossings, potential utility relocations, soil instability, construction staging and accesses, etc.), including understanding of how those challenges will be addressed
Transportation	- Effect on Traffic Operations	- Future Interim and Ultimate Conditions Traffic Operations (Travel Time, Travel Delay, LOS, Density, Queueing) along QEW Mainline, Interchange, and corridors and intersections (as identified in Section 2.1.3 and confirmed by Niagara Region) impacted by the preferred corridor alternative - Impact of Construction Staging - Commercial Vehicles Travel Times traversing the preliminary study area along the escarpment crossings - Feasibility of Active Transportation facility

Category	Criterion	Indicator
Transportation	- Effect on Traffic Safety	- Predicted collisions for future interim and ultimate horizon years - Traffic signal and illumination warrant analysis
Natural Environment	- Effect on air quality and greenhouse gas emissions and climate change from vehicular road traffic	- Estimated air contaminant and carbon dioxide equivalent emission rates
Natural Environment	- Effect on groundwater resources	- Changes to groundwater resources
Natural Environment	- Effect on groundwater and surface water interactions	- Changes to groundwater and surface water interactions
Natural Environment	- Effect on groundwater from impacted geological features including karst	- Changes to groundwater from impacted geological features including karst
Natural Environment	- Effect on watershed/subwatershed drainage patterns and features	- Change to watershed/subwatershed drainage patterns - Encroachment, severance, displacement, long-term alteration / disruption, as applicable, to the following: • Watercourse crossings (permanent, intermittent, and ephemeral) • Flood plain • Riparian areas • Headwater areas

Category	Criterion	Indicator
Natural Environment	- Effect on significant habitat or functions	- Temporary and/or long-term loss of significant features or categorical loss of functions by type, including PSWs, Locally Significant Wetland, environmentally sensitive areas (ESAs), areas of natural and scientific interest (ANSI's), wildlife corridors
Natural Environment	- Effect on sensitive aquatic habitat or functions	- Temporary and/or long-term loss of sensitive aquatic habitat including areas known to support key life cycle stages such as spawning areas and upwelling zones, known to support sensitive species
Natural Environment	- Effect on sensitive terrestrial habitat or functions	- Temporary and/or long-term loss of sensitive terrestrial habitat including Significant Wildlife Habitat and areas or features known to support key life cycle stages, such as particular trees for nesting, known to support sensitive species
Natural Environment	- Effect on sensitive aquatic species: native, area-sensitive	- Temporary and/or long-term loss of aquatic species requiring sensitive or uncommon habitat to complete life cycle
Natural Environment	- Effect on significant aquatic species: species of special concern, threatened, endangered, and species of local concern	- Temporary and/or long-term loss of aquatic species

Category	Criterion	Indicator
Natural Environment	- Effect on significant terrestrial species: species of special concern, threatened, endangered, species of local concern	- Temporary and/or long-term loss of terrestrial species
Natural Environment	- Effect on terrestrial species: native, area-sensitive flora and fauna	- Temporary and/or long-term loss of terrestrial flora or fauna species
Natural Environment	- Effect on plants and animals important to First Nation Communities	- Temporary and/or long-term loss of plants and animals
Natural Environment	- Effect on surface water	- Temporary and/or long-term change in surface water quantity due to increased impervious surfaces
Natural Environment	- Effect on surface water	- Temporary and/or long-term change in surface water quality through direct and indirect discharges of contaminated and sediment-laden runoff
Natural Environment	- Effect on stream geomorphology	- Temporary and/or long-term change in geomorphic form/function/stability in affected channels
Built Environment	- Effect on existing agricultural land uses (e.g., loss, fragmentation, etc.)	- Approximate area (ha) of active agricultural operations affected - Number of landowners affected - Approximate area (ha) of fragmented farm parcels

Category	Criterion	Indicator
Built Environment	- Effect on existing agricultural operations including capital investment	- Fragmentation of agricultural fields - Minimum distance separation requirements met - Disturbance to artificial drainage systems and agricultural drains - Removal of farm fences, entrances, and paddocks - Disruption of agricultural related businesses - Disruption of normal external haul routes for farm machinery movements
Built Environment	- Effect on the proposed transportation corridor from potential soil and groundwater contamination	- Proximity of the proposed transportation corridor to property of potential environmental concern
Built Environment	- Effect on existing residences, businesses/industries, and/or community, institutional, and recreational facilities	- Number, type and extent of existing residences, businesses/industries, and/or community, institutional, and recreational facilities affected
Built Environment	- Effect on property	- Number, type, and extent of properties affected
Built Environment	- Effect on property	- Total area of property required (ha)

Category	Criterion	Indicator
Built Environment	- Effect on existing infrastructure and facilities (e.g., pedestrian, cycling, transit, road, highway, rail, water/wastewater, utility, etc.)	- Number, type, and extent of existing infrastructure and facilities
Built Environment	- Effect of vibration on existing buildings	- Number of standard and vibration sensitive structures affected and extent and duration of vibration impacts
Social Environment	- Effect on residents during construction (e.g., dust and construction related emissions)	- Approximate number of sensitive receptors affected and extent and duration of adverse effects
Social Environment	- Effect on the visual landscape and scenic resources from facility	- Extent of scenic value captured by the proposed alignment - Extent of landscape features removed
Social Environment	- Effect on adjacent dwellers sensitive to views of the facility	- Number of sensitive viewer groups exposed to the proposed alignment - Extent of existing vegetation/visual buffer retained - Extent of visually intrusive structure/retaining walls
Social Environment	- Effect on passive recreation potential of scenic/natural adjacent sites	- Number of sites with scenic/natural features impacted

Category	Criterion	Indicator
Social Environment	- Effect on air quality conditions on residents from vehicular road traffic	- Approximate number of sensitive receptors affected and extent and duration of adverse effects
Social Environment	- Effect on private water wells	- Approximate number of wells and type affected
Social Environment	- Effect on Noise Sensitive Areas (NSAs) during construction (e.g., noise, vibration, etc.)	- Number of NSAs affected, extend and duration of noise and vibration impacts, predicted through noise modelling
Social Environment	- Effect of increased noise levels on sensitive receptors from road traffic noise	- Number of sensitive receptors affected, extent and duration of road traffic noise impacts, predicted through noise modelling
Social Environment	- Effect on First Nation Communities	- Approximate area of hunting and harvesting lands removed
Economic Environment	- Effect on Provincial, Regional, and Municipal plans and policies	- Compatibility with approved Provincial plans and policies (e.g., Greenbelt Plan, Provincial Policy Statement, Niagara Escarpment Plan, etc.)
Economic Environment	- Effect on Provincial, Regional, and Municipal plans and policies	- Compatibility with approved Regional plans and policies affected (Regional Official Plan, etc.)

Category	Criterion	Indicator
Economic Environment	- Effect on Provincial, Regional, and Municipal plans and policies	- Compatibility with approved Municipal plans and policies affected (e.g., Official Plans, etc.)
Economic Environment	- Effect on approved/planned land uses	- Number, type, and extent of approved/planned land uses affected (e.g., registered and draft approved plans of subdivision)
Economic Environment	- Effect on approved/planned infrastructure and facilities	- Number, type, and extent of approved/planned infrastructure and facilities affected
Economic Environment	- Effect on agricultural soil resources	- Approximate area (ha) of Class 1, Class 2, and Class 3 soils removed (priority in that order) - Approximate area (ha) of Specialty Cropland removed
Economic Environment	- Effect on the continuity of the agricultural land base	- Ability to develop future agricultural operations
Economic Environment	- Effect on agricultural production (e.g., one time replacement costs, increased operating costs, etc.)	- Extent of disruption to existing agricultural operations
Cultural Environment	- Effect on archaeological resources	- Number of previously identified archaeological sites impacted

Category	Criterion	Indicator
Cultural Environment	- Effect on areas of archaeological potential	- Area (ha) of archaeological potential impacted (i.e., lands with potential for the presence of significant archaeological resources)
Cultural Environment	- Effect on registered cemeteries	- Number and extent of registered cemeteries impacted
Cultural Environment	- Effect on built heritage resources and cultural heritage landscapes	- Number of known and/or potential built heritage resources and cultural heritage landscapes impacted.
Financial	- Estimated construction costs	- Capital cost estimate to construct the alternative
Financial	- Estimated land acquisition costs	- Land acquisition cost estimate to implement the alternative
Financial	- Estimated operation and maintenance costs	- 50-year net present worth cost estimate for the constructed alternative

8.2.5 Task 5: Comparative Evaluation of the Alternative Methods

Following completion of Task 4, the alternative methods will be compared using a Reasoned Argument (or Trade-off) Method as a means of selecting the recommended alternative method(s) as previously described in **Section 8.1.3** (Task C). The information generated through the comparison of the alternative methods will be documented in the EA Report.

8.2.6 Task 6: Selection of the Recommended Method(s)

A recommended method(s) for carrying out the project will be selected based on the preceding methodology and more specifically the results of Task 5. The rationale for the decision-making process undertaken to select the recommended method(s) of carrying out the project will be documented in the EA Report.

8.2.7 Task 7: Identification of the Preferred Method(s)

The recommended method(s) for carrying out the project will be presented to review agencies, Indigenous Communities, and the public for a defined period to receive comments, following which a preferred method(s) of carrying out the project will be identified. The rationale for the preferred method(s) for carrying out the project will be provided in the EA Report.

8.3 Impact Assessment of the Preferred Method(s)

The preferred method(s) of carrying out the project will be further developed at a preliminary design level of detail during preparation of the Niagara Escarpment Crossing EA (see the Transportation Planning and Engineering Work Plan in **Appendix A** for further information)) so that the following can be accomplished:

- Potential environmental effects can be confirmed with greater certainty.
- More site-specific impact management measures can be developed for application.
- Net environmental effects can be identified with additional certainty.
- Appropriate monitoring requirements can be more clearly defined.
- Post EA approvals/permits needed prior to constructing the project can be specified.

During the preparation of the preliminary design level of detail, it may be necessary to undertake additional work (e.g., field investigations, modelling, etc.) at this stage of the Niagara Escarpment Crossing EA. Currently, the additional work proposed includes, but may not be limited to, that listed in the work plans found in **Appendices C** to **M**.

The impact assessment of the preferred method(s) of carrying out the project will be documented in the EA Report.

9 Commitments and Monitoring

9.1 ToR and EA Commitments

As part of preparing this ToR, several commitments are being made by Niagara Region that will need to be fulfilled during preparation of the Niagara Escarpment Crossing EA. **Table O-1** of **Appendix O** lists these commitments. If approval of the ToR is granted by the Minister, then the list of commitments will be finalized and included in the EA Report, documenting where and how they were dealt with during preparation of the Niagara Escarpment Crossing EA.

Similarly, commitments that may be made by Niagara Region during preparation of the Niagara Escarpment Crossing EA will be documented in the EA Report.

9.2 Environmental Effects and EA Compliance Monitoring

Niagara Region is committed to developing a monitoring framework during preparation of the Niagara Escarpment Crossing EA that will address environmental effects and, as applicable, EA compliance.

The purpose of the environmental effects monitoring will be to monitor the net effects associated with the construction, operation, and maintenance of the project, as necessary, and implement further mitigation measures, monitoring, and contingency plans, where possible, so that:

- Predicted net negative effects are not more than expected.
- Unanticipated negative effects are addressed.
- Predicted benefits are realized.

The purpose of the EA compliance commitment monitoring will be to track the commitments made by Niagara Region during preparation of the Niagara Escarpment Crossing EA, as well as any conditions of *EA Act* approval, so that they are followed through as applicable in the construction, operation, and maintenance of the project.

The EA Report will include a strategy on how and when the commitments will be fulfilled and how Niagara Region will report on this to MECP and other regulatory agencies, as appropriate, on compliance.

10 Consultation Plan for the Niagara Escarpment Crossing EA

As part of initiating the Niagara Escarpment Crossing EA ToR process, a list of participants was developed, which was divided into three broad groups corresponding with the MECP Codes of Practice[16]: review agencies, Indigenous Communities, and the public. Next, a participant sensitivity analysis was carried out by Niagara Region to identify the following for each group:

- Their anticipated areas of interest, views, and perspectives regarding the Niagara Escarpment Crossing EA ToR; and
- Their anticipated level of involvement in the Niagara Escarpment Crossing EA ToR.

This effort provided Niagara Region with a better understanding of participant issues and perspectives and in turn tailored the ToR consultation efforts accordingly. The results of the participant sensitivity analysis are documented in the Record of Consultation prepared under separate cover for the ToR and are reflected in the proposed consultation plan for the Niagara Escarpment Crossing EA, which is described in the subsections that follow.

10.1 Proposed Consultation Activities

The consultation activities proposed for the Niagara Escarpment Crossing EA will include, but will not be limited to, those carried out during preparation of the ToR. The proposed consultation activities are briefly summarized as follows:

- Niagara Region's Project webpage – providing clear and accurate information to participants as well as an opportunity for them to give feedback to Niagara Region (niagararegion.ca/projects/niagara-escarpment-crossing).
- Niagara Region's social media accounts – distributing Niagara Escarpment Crossing EA updates.
- Notices – providing information to interested persons about the Niagara Escarpment Crossing EA and how they can be involved. The notices will be distributed through a variety of methods including, but not limited to, the

[16] Ministry of the Environment, Conservation and Parks (MECP) Codes of Practice for Preparing and Reviewing Terms of Reference (2014) and Codes of Practice for Consultation in Ontario's Environmental Assessment Process (2014).

following: local area newspapers, unaddressed Neighbourhood Mail, Project webpage, email.

- Letters – issuing directly to participants listed in the Project contact list, potentially affected property owners.
- Individual or group in-person and/or virtual meetings – discussing project-specific issues with review agencies, Indigenous Communities, and/or the public.
- Public Information Centres (PICs) – seeking a highly participative approach, various in-person and virtual formats will be explored including, but not limited to, the following: open house, workshop, formal presentations, and facilitated discussions.
- Presentations to Regional and Local Councils, Boards, Committees, etc. – providing status updates as required.

10.2 Obtaining Input from Interested Participants

Input will be obtained from interested participants during the Niagara Escarpment Crossing EA through a variety of means specific to each of the following three participant groups:

- Review agencies as applicable (includes federal agencies and departments, provincial ministries and agencies, municipalities, conservation authority, school boards, utilities, rail companies, etc.)
- Indigenous Communities consisting of Indigenous Governments (Mississaugas of the Credit First Nation, Six Nations of the Grand River, Haudenosaunee Confederacy Chiefs Council, and Métis Nation of Ontario)
- Public (includes individuals, groups or associations, property owners, residents, business owners, etc.)

10.2.1 Review Agencies

Input from interested review agencies will be received primarily through written correspondence, email, and individual or group meetings.

10.2.2 Indigenous Communities

Input from interested Indigenous Communities will be obtained primarily through individual or group meetings and to a lesser extent written and email communications and documented telephone follow-up calls.

10.2.3 Public

Input from the public will be received primarily through written correspondence and e-mails, PICs, the Project webpage, documented telephone calls, and to a lesser extent individual or group meetings.

10.3 Key Decision-Making Milestones when Consultation will Occur

There are a number of key decision-making milestone points when consultation will occur during preparation of the Niagara Escarpment Crossing EA. These key decision-making milestones have been grouped as follows:

Alternatives to the project

- Confirming the alternatives to the project
- Confirming the evaluation criteria and indicators for applying to the alternatives to the project
- Reviewing the recommended alternative(s) to the project identified through the comparative evaluation process

Alternative methods of carrying out the project

- Reviewing the generated alternative methods
- Reviewing the screening criteria, if applicable, to be applied to the generated alternative methods
- Reviewing the short list of alternative methods identified through the screening process, if applicable
- Confirming the evaluation criteria and indicators to be applied to the alternative methods
- Reviewing the recommended alternative method(s) identified through the comparative evaluation process

Impact assessment of the preferred method(s)

- Reviewing the potential environmental effects, recommended impact management measures, proposed monitoring requirements, and proposed approvals/permits required for implementing the project

Pre-submission review of the draft EA Report

- Reviewing the draft EA Report prior to its finalization and formal submission to the Minister for approval

Notwithstanding these key decision-making milestones, consultation will be ongoing throughout the Niagara Escarpment Crossing EA.

10.4 Proposed Issues Resolution Strategy

Recognizing that there may be issues raised or disputes during preparation of the Niagara Escarpment Crossing EA that may be difficult to resolve, an issues resolution strategy is proposed as part of the ToR. With this in mind, should an issue or dispute arise during preparation of the Niagara Escarpment Crossing EA, Niagara Region will discuss the nature of the issue or dispute with the interested persons and attempt, in good faith, to reach a resolution that is agreeable to both Niagara Region and the interested persons.

This strategy will benefit all parties potentially involved by providing an agreed to and well understood issues resolution process to ensure that disputes are effectively and appropriately dealt with.

11 Flexibility for Accommodating New Circumstances

If approval of the ToR is granted by the Minister, the ToR will provide the framework for undertaking the Niagara Escarpment Crossing EA and preparing the EA Report. Given the nature of EA ToRs; however, the ToR is not intended to present every detail of all the activities that will occur when undertaking the EA. It is therefore possible that, in carrying out the work contemplated by the ToR, it may become evident that certain additions or modifications are appropriate.

These additions/modifications may include, but are not limited to, the following:

- Additional problems and opportunities
- Additional alternatives
- Revisions and/or modifications to the preliminary study area
- Additional evaluation criteria and/or indicators
- Additional assessment and evaluation methodologies utilized to select the recommended alternative(s) to and/or alternative method(s)
- Additional and/or expanded investigative studies to ensure that the nature and magnitude of potential effects are accurately identified and avoided, mitigated, or compensated for
- Additional consultation activities
- Examination of additional environmental effects

This list of potential additions and/or modifications is not exhaustive. It provides examples of the types of changes that could be considered within the framework of the ToR without the need to prepare and submit a new ToR to the Minister for approval. Other additions and/or modifications may arise during preparation of the Niagara Escarpment Crossing EA, which would be considered in a similar manner.

12 Other Approvals Required

In addition to requiring *EA Act* approval, other approvals may be required for the project prior to its implementation. Although it is not possible at this time to state which approvals will be required, the following is a list of some approvals that potentially apply:

- *Federal Impact Assessment Act*
- *Fisheries Act* - Department of Fisheries and Oceans
- *Navigable Waters Protection Act* - Transport Canada
- *Endangered Species Act* - MECP
- Permit to Take Water - MECP
- Fill, Construction and Alteration to Waterways Permit - Niagara Peninsula Conservation Authority (NPCA)
- Certificate of Approval to Construct Sewer Works - MECP
- Certificate of Approval for Air - MECP
- Certificate of Approval for Noise – MECP
- *Ontario Heritage Act* - Ministry of Citizenship and Multiculturalism
- Development Permit – Niagara Escarpment Commission
- Right of Way Encroachment Permit for Railways (CNR, CPR) - Transport Canada
- Road Occupancy Permits – Niagara Region and local municipalities
- Local Approvals (noise bylaws, road closures, tree removals, site alteration, etc.) - Town of Grimsby, Town of Lincoln, and Township of West Lincoln
- Right of Way Encroachment Permit for Highways - Ministry of Transportation
- Hydro One Class EA for Minor Transmission Facilities
- Ministry of Infrastructure Government Property Class EA
- *Lakes and Rivers Improvement Act* - Ministry of Natural Resources and Forestry
- Easements or Acquisitions – Infrastructure Ontario, NPCA

The actual approvals required for the Project will be identified during preparation of the Niagara Escarpment Crossing EA and a final list will be provided in the EA Report.

12.1 Federal/Provincial EA Coordination

The project is subject to the requirements of the Ontario *EA Act*. The requirements of the federal *Impact Assessment Act* (*IAA*), which came into force on August 28, 2019, and repeals the *Canadian Environmental Assessment Act, 2012*, may also apply. Should requirements under the *IAA* apply, Niagara Region intends to work in a coordinated effort with the provincial and federal governments to satisfy both levels of environmental assessment legislation to meet the objective of "**one project, one assessment**" thus reducing duplication and increasing efficiency and certainty about the process.