DILLON CONSULTING

County of Essex

County Road 20
Kingsville to Leamington
Environmental Study Report

Schedule C Municipal Class Environmental Assessment

Revised February 2019 15-2971

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Executive Summary

Introduction and Study Area

The Corporation of the County of Essex (the County) undertook the completion of a Schedule "C" Environmental Assessment (EA) and Preliminary Design Study under the Municipal Class Environmental Assessment (EA) process (Class EA), for County Road 20 (CR 20), from Kratz Sideroad in the Town of Kingsville to Sherk Street in the Municipality of Leamington.

The purpose of the study was to:

Correct operational deficiencies, examine roadway capacity and safety, improve the corridor for all modes of transportation, and provide a framework for access management within the Study Area.

In response to this study purpose, an EA was undertaken to:

- Assess the need and justification for the proposed project or undertaking;
- Assess the environmental effects of the alternatives;
- Identify a preferred solution and design; and
- Recommend measures to mitigate any potential adverse effects.

In completing the above steps, consultation with stakeholders, regulatory agencies, Indigenous Communities, and the general public was undertaken.

The study area includes approximately 10 km of CR 20, from Kratz Sideroad in the Town of Kingsville to Sherk Street in the Municipality of Leamington. Approximately two-thirds of the study area is located in Kingsville, with the remaining portion within Leamington. County Road 31 (Albuna Townline) forms the boundary between Kingsville and Leamington. Within the study area, CR 20 is a two-lane arterial roadway that includes rural and urban sections. The study area is presented below in **Figure 1.**

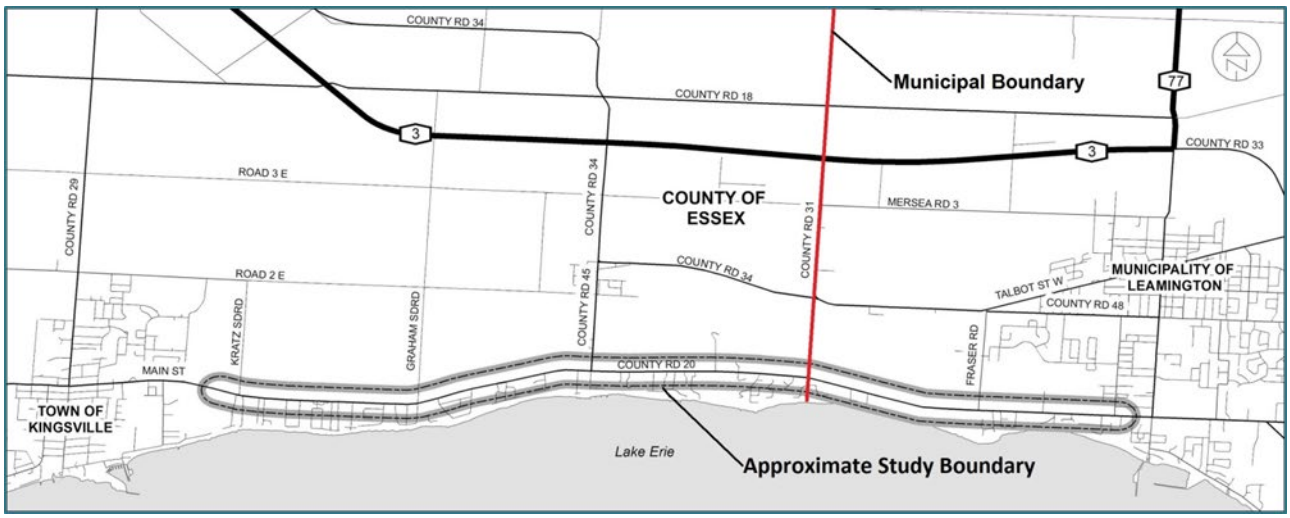

Figure 1: Project Study Area

CONSULTATION

Stakeholder consultation during the Class EA process was an integral component of this study. The primary purpose of the consultation program was to involve the local community, government agencies and other potentially affected stakeholders in project design and decision-making. Specifically, the overall objectives of the consultation program were to:

- Create general awareness of the project to as many potentially interested stakeholders as possible; and
- Generate an open and interactive approach to the planning process by creating opportunities for the public, government agencies and interest groups to provide project comments and suggestions.

A number of consultation activities were undertaken for this project including:

- Development of a stakeholder contact list, including federal departments, provincial ministries/agencies, the Essex Region Conservation Authority, the Town of Kingsville and the Municipality of Leamington;
- Development of a project-specific website (www.CR20.ca), which was updated throughout the study;
- Distribution of project notices, including publishing in the local newspapers and mailings/emails;
- Holding two Public Information Centres (PICs);

- Meetings with key stakeholders, including affected property owners and local cycling groups;
- Engagement with Indigenous Communities;
- Presentation at County of Essex Council; and
- Public release of the Environmental Study Report (ESR).

Comments received from stakeholders throughout the study were considered in the decision making process and are summarized in this ESR.

PIC 1 was held on November 15, 2016, in Kingsville. The PIC was an informal drop-in centre format with display boards set up around the room, along with two plan drawings of the entire corridor. In total, 69 people signed the Record of Attendance. Information provided at the PIC included: project overview, policy context, study purpose, problems/opportunities in the corridor, and draft alternative solutions.

PIC 2 was held in Leamington on August 17, 2017. As with PIC 1, this PIC was also an informal drop-in centre format. In total, 75 people signed the Record of Attendance. Information presented at this PIC focused on updated alternative solutions, evaluation criteria and process, a recommended preferred solution, and alternative designs including the preferred design.

Problems and Opportunities

The problems/opportunities which provided the justification or need for the undertaking were determined through consideration of the following:

- The project planning context including relevant Municipal planning policies, and other related studies including multi-modal transportation plans (e.g. CWATS);
- Review of existing and potential roadway operational deficiencies including intersection operations, roadway capacity needs, and pedestrian and cycle use;
- Review of roadway safety including collision data and with particular consideration to cyclists and pedestrian movements;
- Projected future transportation demands; and
- Stakeholder input.

Considering the identified problems and opportunities identified for the corridor, the project problem/opportunity statement has been identified as follows:

"Modifications to the County Road 20 corridor are needed to address traffic control issues and pedestrian and cyclist safety. The improved transportation corridor will serve the needs of the transportation system and area growth for a 20-year period to 2035. Key priorities of the project include inclusion of active transportation facilities, mitigation of operational deficiencies, and access management for the corridor".

ALTERNATIVE SOLUTIONS

Considering the identified problems and opportunities, eight alternative solutions were developed, assessed and evaluated. They included:

- **Alternative 1** - Status Quo/Do Nothing (Interim Active Transportation Facility to be implemented through CWATS).
- **Alternative 2** - Improve Other Roads in the Network.
- **Alternative 3** - Implement Transportation Demand Management (TDM) Measures.
- **Alternative 4** - Intersection Operational Improvements with Interim Active Transportation Facilities.
- **Alternative 5** - Intersection Operational Improvements with Ultimate Active Transportation Facilities.
- **Alternative 6** - Widen Road for Two-Way Centre Turn Lane with Ultimate Active Transportation Facilities.
- **Alternative 7** - Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane and Interim Active Transportation Improvements.
- **Alternative 8** - Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane and Ultimate Active Transportation Facilities (including dedicated on-road cycling lanes and an off-road multi-use pathway and/or sidewalk).

Based on the evaluation, **Alternative 8 was identified as the preferred long-term or ultimate alternative solution**. Alternative 8 is illustrated in **Figure 2,** illustrating sidewalks as the off-road A/T facility.

The next step of the process was the development and evaluation of alternative designs for the recommended solution (Alternative 8). The alternative designs primarily varied in regards to the design of the active transportation facilities. **Alternative 8C** includes intersection operational improvements with intermittent two-way centre turning lane (at 2 locations), one-way cycle tracks (1.5 m to 1.8 m), one sidewalk (1.5 m on north side) and multi-use path (3.5 m - south side).

Based on the assessment and evaluation of design alternatives and the 'best-fit' approach, the technically preferred solution was identified as **Alternative 8C** which encompassed the following key aspects:

1. The implementation of the intersection operations improvements (within 5 years).
2. The implementation of the western TWLTL near Kratz Sideroad (within 5 years).
3. The implementation of the ultimate A/T facility (multi-use trail on the south side of the corridor and sidewalk on the north side of the corridor), and the TWLTL from Fuller Drive to west of Ravine Line Road within 15-20 years or earlier, considering facility demand and available funding.

Alternative 8C is recommended as the preferred design for the following reasons:

- By providing active transportation facilities to meet the needs of a wide variety of users including: residents, cyclists of varying skills and abilities, tourists, migrant farm workers, and vulnerable groups such as children, the alternative best achieves the goals and objectives of CWATS, the A/T plans of Kingsville and Leamington and is also consistent with the Provincial Policy Statement and Ontario Cycling Strategy of providing a range of transportation choices in and between communities. Further, it provides an "A" level of service for pedestrians and cyclists as per the A/T facilities level of services categories presented in **Table 11** of this ESR.

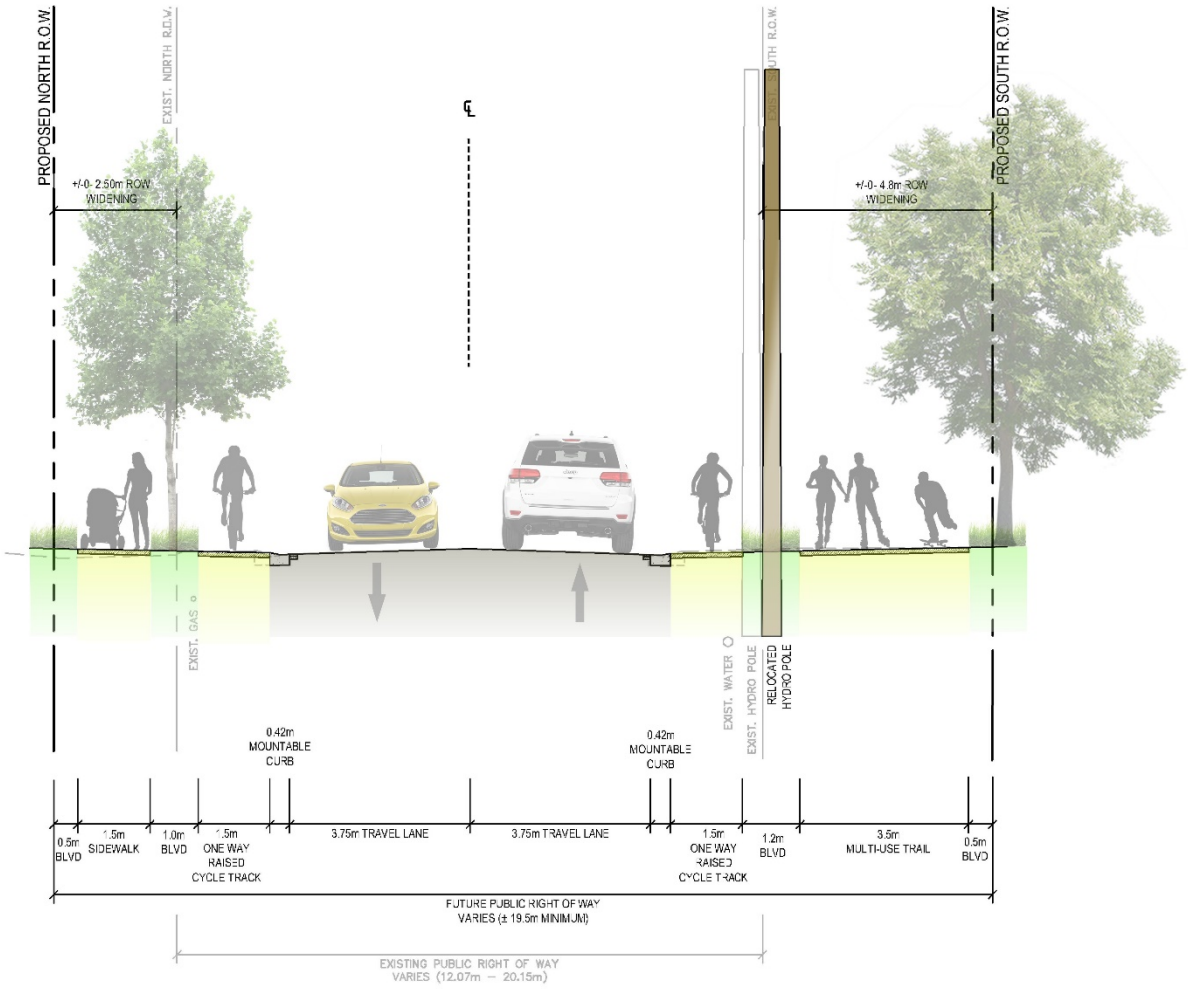

Figure 2: Alternative 8 – Preferred Solution

Alternative 8C is recommended as the preferred design for the following reasons:

- By providing active transportation facilities to meet the needs of a wide variety of users including: residents, cyclists of varying skills and abilities, tourists, migrant farm workers, and vulnerable groups such as children, the alternative best achieves the goals and objectives of CWATS, the A/T plans of Kingsville and Leamington and is also consistent with the Provincial Policy Statement and Ontario Cycling Strategy of providing a range of transportation choices in and between communities. Further, it provides an "A" level of service for pedestrians and cyclists as per the A/T facilities level of services categories presented in **Table 11** of this ESR.

- Significant benefits are expected to be achieved through the implementation of the facilities including an increase in use of active transportation modes, connects the communities of Kingsville and Leamington and provides the potential for economic benefits by attracting tourist to the area by increasing the growing network of cycle facilities throughout the County – this includes the opportunity to route the Waterfront Trail along this section of CR 20.
- Both the multi-use path and the sidewalk are generously separated from the roadway thus increasing user safety and providing space for additional landscaping/street trees to help fulfill the creation of a complete street.
- The recommended intersection operational improvements including new turning lanes at key intersections and the provision of a centre two-way left turn lane at two locations in the corridor will improve the movement and operation of traffic in the corridor.
- The higher cost of this alternative is justifiable considering the transportation benefits.
- The acquisition of property frontage (up to 5 m of depth) from +/-274 parcels is the most significant impact of this alternative (although all alternatives will require property). In most cases, as residences and buildings are set well back from the existing right-of-way, the impact is considered to be minimal. Landowners will be compensated for the loss of land.

RECOMMENDED/ PREFERRED DESIGN

The main improvements elements of the project are to involve the following and are illustrated in **Figure 3:**

- Maintain the existing two-lane road cross-section for the majority of the 9.4 km corridor. The typical lane widths are 3.75 m.
- Install of two-way left turn lanes (TWLTL) of 3.35 m width at the following locations:
  - Extending an existing TWLTL by 220 m at the western end of the project area; and
  - From Fuller Drive to west of Ravine Line Road, approximately 800 m.
- All minor intersections will be reconstructed to accommodate the new A/T facilities.
- Develop the ultimate A/T facility that builds off the CWATS facility and includes a multi-use path of the south side of the corridor and a sidewalk on the north side of the corridor. Maintain the CWATS context-sensitive paths (paved shoulder/raised cycle track) as one-way bike facilities.

Implement improvements at the following intersections:

County Road 20/Graham Sideroad

- CR 20 eastbound left-hand turn lane;
- CR 20 westbound right-hand turn lane;
- Graham Sideroad southbound left-hand turn lane;
- AODA compliant pedestrian crossing for east/westbound users; and
- Barrier curbs installed.

County Road 20/County Road 45 (Union Avenue)

- Slightly increased curb radii to improve truck turning; and
- AODA compliant pedestrian crossings for all road crossings.

County Road 20/County Road 45 (Union Avenue)

- Slightly increased curb radii to improve truck turning; and
- AODA compliant pedestrian crossings for all road crossings.

County Road 20/County Road 31 (Albuna Townline)

- CR 20 eastbound left-hand turn lane;
- CR 20 westbound left-hand turn lane;
- AODA compliant pedestrian crossing for east/westbound users; and
- Barrier curbs installed.

County Road 20/Fraser Road

- CR 20 eastbound left-hand turn lane;
- Fraser Road southbound left-hand turn lane; and
- Barrier curbs installed.

PROJECT PHASING

There are numerous infrastructure improvement elements recommended along the CR 20 corridor. Due to the length of the study area, implementation of all the recommended improvements in one phase is not practical. The below phasing breakdown assumes that all recommended CWATS raised cycle tracks in Kingsville and Leamington have been installed. The following is a summary of the potential phasing for implementation of the new works:

Phase 1

- Reduce the corridor posted speed limit from east of Kratz Sideroad to CR 45 (Union Avenue) to a harmonious 60 km/hr;
- All major improvements at the Graham Sideroad, CR 45 (Union Avenue), CR 31 (Albuna Townline), and Fraser Road intersections with CR 20; and
- Extension of TWLTL from east of Kratz Sideroad to east of Woodbridge Lane.

Phase 2

- 3.5 m wide Multi-Use Trail on south side of CR 20; and
- TWLTL east of Union Avenue, and replacement of back of curb raised cycle track from Whitewood Road to end of TWLTL.

Phase 3

- 1.5 m wide concrete sidewalk on north side of CR 20.

Once the CR 20 EA is completed and adopted, planning for the Phase 1 improvements should commence. Recommendations for the sequencing of construction of the works are as follows:

The Phase 1 works are either recommended or considered to be required in the "NOW" timeframe. It is recommended to reduce the speed limit east of Kratz Sideroad to CR 45 (Union Avenue) to a harmonious 60 km/hr. As previously mentioned, some intersection improvements are noted as immediately required at four intersections along the corridor, while others are not anticipated until further in the horizon period. In order to provide the most benefit for road users, and economy of scale construction costing, it is recommended that all proposed improvements for a specific intersection are to be constructed at the same time. The intersection improvements may be phased over several construction seasons to spread out the construction costs and impacts to the local residents.

The main component of the Phase 2 of the works is the installation of the multi-use trail on the south side of the road. The timing for construction of this phase will be difficult of assess. Presently, the corridor has limited non-vehicular users as there is no area for them to safely utilize. Once the interim CWATS facility is fully built out, the County will be better able to assess the level of use of the new trail system. It is recommended that

A/T user counts be conducted to assess the number and type of users of the CWATS trail system. While the A/T user counts may help to justify the need for the construction of the additional MUT, the need for the MUT should also reflect the CWATS objectives and the desire for improved A/T facility along the corridor by the community. Typically A/T user volumes increase when improvements are made to facilities that appeal to a wider user group. As such, Phase 2 of the works will likely be triggered by road/pathway lifecycle improvements, local requests, and political needs or through available funding.

The TWLTL from Fuller Drive to west of Ravine Line Road is to be installed when one of the following triggers occurs:

Rehabilitation to County Road 20 is required in the TWLTL area:

1. If CR 20 is to be reconstructed or rehabilitated from Fuller Drive to Ravine Line Road by the County of Essex, a TWLTL and relocated A/T facilities are to be included in the works.
2. The existing CWATS active transportation facility has reached the end of its life cycle (expected to be approximately 15 years) and requires replacement.

If the installed CWATS raised cycle track required improvements or rehabilitation, the TWLTL and other associated improvements will be installed at that time.

The timing for Phase 3 of the works (1.5 sidewalk on the north side), as with Phase 2, may be difficult to ascertain through user counts. As previously noted, A/T user volumes typically increase when improvements are made to facilities that appeal to a wider user group. The construction of the north side sidewalk will be determined in conjunction with local municipalities or by mutual desires to complete the CWATS objectives.

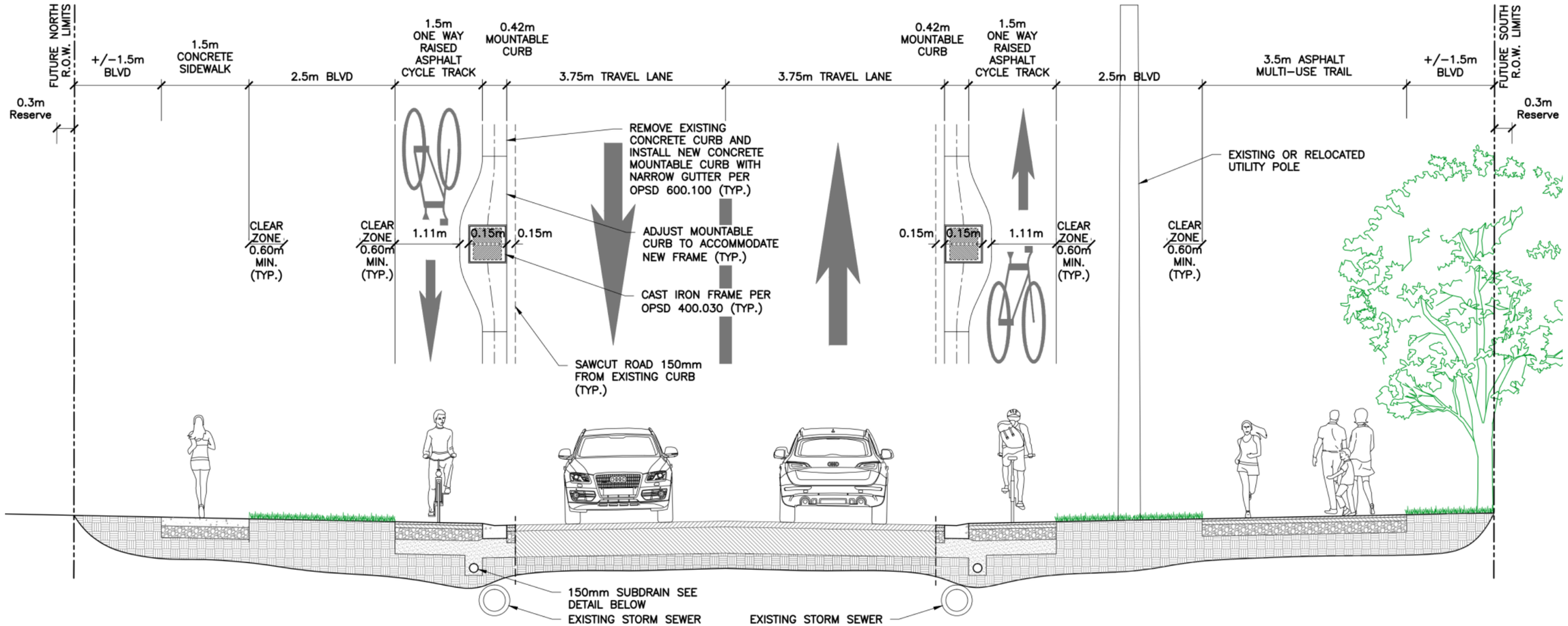

Figure 3: Preferred Alternative (Curbed Areas)

Impacts and Mitigation

The EA study has identified potential impacts of the preferred Alternative 8C design which are detailed in **Section 8.0** of the ESR. Some of these impacts include:

- Temporary delays to traffic and possibly property access during construction;
- Temporary construction related air and noise disturbance effects to local properties;
- Minor increase in impervious area leading to minimal increase in surface water flows;
- Property frontages (up to 5 m) will need to be acquired from 274 parcels. The total area of property that will need to be acquired is approximately 3.9 ha;
- Removal of about 0.5 Ha of agricultural zoned land as a result of the planned road corridor improvements;
- A total of 17 treed natural features will be impacted resulting in a total area of 0.6 Ha being removed;
- Potential for impact to aquatic/riparian habitat from potential for modifications or extensions to approximately 6 existing culvert crossings;
- Potential for disturbance to wildlife on adjacent natural features;
- Potential for effects to archaeological resources (to be confirmed through Stage 2 investigations); and
- Potential for temporary disturbance to surface water and aquatic habitat during construction.

To minimize these and other potential effects, the ESR includes recommendations for several mitigation measures. Some of these measures will need to be further developed as part of the detailed design.

Project Preliminary Cost Estimate

There are numerous infrastructure improvement elements recommended along the CR 20 corridor. Due to the length of the study area, implementation of all the recommended improvements in one phase is not practical. Preliminary phasing and construction cost estimates for the CR 20 improvements are provided in **Table 1** below. All costs are in 2018 dollars and exclude the costs for third party utility relocations, property acquisitions, and engineering costs.

Any cost sharing with local municipalities will be in accordance with existing CWATS Master Plan or other County policy's as applicable.

Table 1: Preliminary Construction Cost Estimates

Phase	Works	Estimated Cost
Phase 1	All intersection improvements (Except CR 45), including traffic signal improvements and intersection street lighting replacements	$1.6 mil
Phase 2	3.5 m wide MUT on south side of the road	$4.0 mil
Phase 2	County Road 45 intersection improvements	$1.0 mil
Phase 2	Two Way Left Turn Lane (TWLTL) east of Union Avenue	1.8 mil
Phase 3	1.5 m concrete sidewalk on north side of road	$3.0 mil
Total	Phases 1, 2, and 3	$11.4mil

1.0 Introduction

1.1 Purpose of Study

The Corporation of the County of Essex (the County) retained Dillon Consulting Limited (Dillon) in 2016, to prepare a Schedule "C" Environmental Assessment (EA) and Preliminary Design, under the Municipal Class Environmental Assessment (EA) process (Class EA), for County Road 20 (CR 20), from Kratz Sideroad in the Town of Kingsville to Sherk Street in the Municipality of Leamington (the project). The purpose of the study is to: correct operational deficiencies, examine roadway capacity and safety, improve the corridor for all modes of transportation, and provide a framework for access management within the Study Area.

In response to this study purpose, an EA was undertaken to:

- Assess the need and justification for the proposed project or undertaking;
- Assess the environmental effects of the alternatives;
- Identify a preferred solution/design; and
- Recommend measures to mitigate any potential adverse effects.

In completing the above steps, consultation with stakeholders, regulatory agencies, Indigenous Communities, and the general public was undertaken.

Within the study area, CR 20 is a two-lane arterial roadway that includes rural and urban sections. The study involved the review of potential roadway operational deficiencies and examined roadway capacity and safety with particular consideration to vehicle, cyclists and pedestrian movements. As well, the Class EA considered several existing policies including the Essex Windsor Regional Transportation Master Plan (2005) (EWRTMP) which identified the need for improvements to CR 20 as a result of growth and future traffic needs, the recommendations of the County Wide Active Transportation Study (CWATS), and local area Municipal transportation related plans.

As a Schedule "C" project, the County is required to prepare this Environmental Study Report (ESR) to document the planning process and preliminary design and submit it for review by the public, agencies and Indigenous Communities.

It is noted that the County Wide Active Transportation System (CWATS) interim active transportation (A/T) facility that is under construction as of 2016 which includes a paved shoulder at the west end of the corridor (in rural area) and a 1.5 m back of curb paved pathway at the east end of the corridor (in semi-urban area) is not dependant on the outcome of this ESR. Such improvements will continue to be implemented through CWATS, while this EA assesses and recommends improvements to the corridor, including but not limited, to further enhancing active transportation.

1.2 Study Area

The study area was established early on in the Class EA process and includes approximately 10 km of CR 20, from Kratz Sideroad in the Town of Kingsville to Sherk Street in the Municipality of Leamington. Approximately two-thirds of the study area is located in Kingsville, with the remaining portion within Leamington. County Road 31 (Albuna Townline) forms the boundary between Kingsville and Leamington. The study area includes lands up to 250 m on either side of the existing roadway (500 m total width) as identified in **Figure 4**. Several components of the study considered areas beyond the 500 m corridor, as outlined in **Section 3.0**.

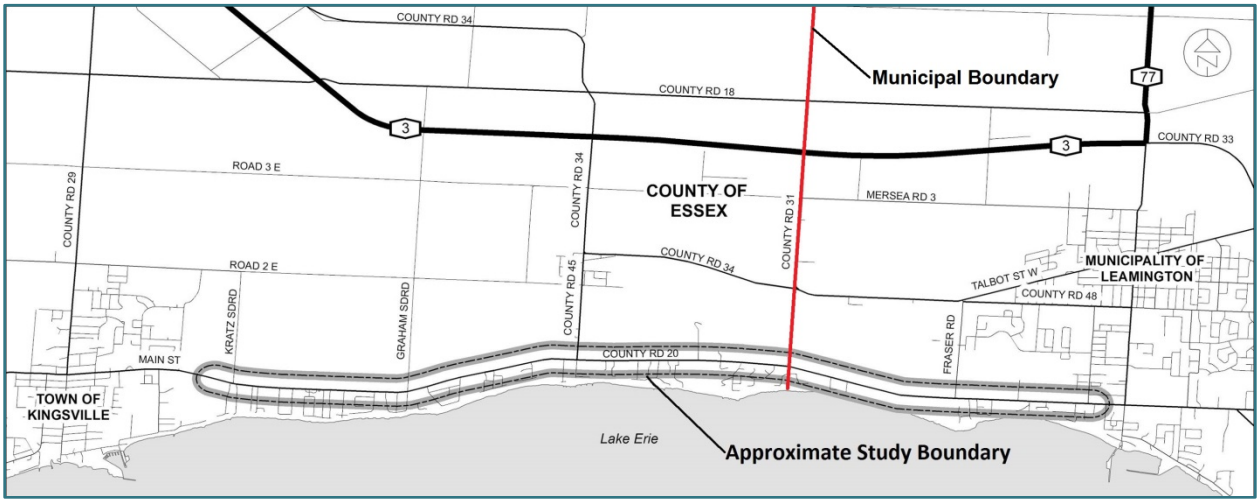

Figure 4: Study Area

1.3 Ontario Environmental Assessment Act, 1990

The EA is a planning and decision-making process used to promote environmentally responsible decision-making. In Ontario, this process is defined and finds its authority under the EA Act. The purpose of the EA Act is to provide for the protection, conservation and wise management of Ontario's environment. To achieve this purpose, the EA Act promotes responsible environmental decision-making and ensures that interested persons have an opportunity to comment on undertakings that may affect them. In the EA Act, the environment is broadly defined and includes the physical, natural, and socio-economic environments.

1.3.1 Municipal Class EA Process

This Class EA was carried out in accordance with the Ontario Municipal Class EA (October 2000, amended 2007, 2011 and 2015). A Class EA is an approved planning process that describes the steps that a proponent of a Municipal project must follow in order to meet the requirements of the EA Act. The Class EA approach requires the evaluation of both alternative solutions and alternative designs. It includes mandatory requirements for public input and expedites smaller recurring projects with known and mitigatable impacts.

The Class EA process includes the following five phases (this study fulfills Phases 1-4) (Figure 5):

- Phase 1: Problem/Opportunity Identification;
- Phase 2: Identification and Evaluation of Alternative Solutions;
- Phase 3: Identification and Evaluation of Alternative Design Concepts;
- Phase 4: Environmental Study Report Documentation; and
- Phase 5: Implementation.

Figure 5: Municipal Class EA Process

CLASS EA PROJECT SCHEDULES

Under the Class EA, projects are categorized according to their environmental significance and their effects on the surrounding environment. Planning methodologies are described within the Class EA and are different according to the type of undertaking.

Projects are classified into three schedules according to their environmental significance including Schedule A/A+, B or C. The overall significance and level of potential impact of a project determines its schedule.

Schedule A/A+ projects are limited in scale, have minimal adverse effects and include the majority of Municipal road maintenance and operational activities. Other projects may be included in this category such as traffic control devices depending on their anticipated construction cost as specified in the Class EA. These projects are generally pre-approved and may proceed directly to Phase 5 for implementation with the exception of A+ projects which require the public to be advised prior to implementation.

Schedule B projects generally include improvements and minor expansions to existing facilities. These projects have some potential for adverse environmental impacts, and consultation with those who may be affected is required. Examples of Schedule B projects include the installation of traffic control devices, smaller road-related works or the extension of certain types of Municipal water/wastewater infrastructure. These kinds of projects typically require completion of a screening exercise under the Class EA process including consultation with those who may be affected.

Schedule C projects generally include the construction of new facilities and major expansions of existing facilities and require the completion of Phases 1-4 of the Class EA process.

This Project is being carried out as a Schedule "C" undertaking. Such projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA document. Schedule "C" projects require that an ESR be prepared and submitted for review by the public. Five key principles of planning are outlined in the *EA Act* including the following:

- Consultation with affected parties early in and throughout the process, such that the planning process is a co-operative venture;
- Consideration of a reasonable range of alternatives, both the functionally different alternatives to the project (known as alternative solutions) and the alternative methods of implementing the preferred solution;
- Identification and consideration of the effects of each alternative on all aspects of the environment;
- Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects; and
- Provision of clear and complete documentation of the planning process followed, to allow "traceability" of decision-making with respect to the project.

1.3.2 Part II Order

If concerns arise during the ESR review period that cannot be resolved through discussions with the County, a person or party may request that the Minister of the Ministry of Environment and Climate Change make an order for the project to comply with Part II of the EA Act. The Minister will consider the request and make one of the following decisions, with the Minister's decision being final:

- Deny the request, stating the reason for the decision;
- Deny the request with conditions, such as requiring that the proponent prepare an annual report on the environmental impact of the project;
- Refer the matter to mediation, whereby one or more appointed persons will endeavor to resolve the concern; or
- Issue what is referred to as a "Part II Order," which requires that the proponent comply with Part II of the EA Act and undertake the planning and design as an Individual EA. An Individual EA requires that the proponent define a planning and design process specifically for the proposed project, and submit it to the Minister of the Environment and Climate Change for approval prior to carrying out the EA.

1.3.3 Environmental Study Report

This Environmental Study Report (ESR) documents the process followed to identify the recommended undertaking and the potential environmental and socio-economic effects of the planning, design, and construction of the project, as well as consultation efforts undertaken and any commitments to be followed during subsequent steps relating to the implementation of the recommended project or undertaking (Phase 5 of the Class EA). In particular, this ESR describes:

- The problems and opportunities being addressed;
- Alternative solutions and designs that were considered;
- A description of the preferred alternative;
- Description of existing environmental and socio-economic setting, potential effects and proposed mitigation measures;
- Public, stakeholder and Indigenous Community consultation that was undertaken; and
- Commitments to further work, consultation, and monitoring.

The ESR is organized as follows:

Section 1 provides an introduction and purpose of the project, the study area, related studies, an overview of the *EA Act* and Class EA process, applicability of CEAA (2012), project team and consultation program.

Section 2 describes the policy context for the project.

Section 3 provides a description of the existing transportation, technical, socio-economic, natural, physical environments (i.e. baseline conditions).

Section 4 describes the projected future transportation conditions and outlines the identified study area problems and opportunities that have been addressed through this EA study.

Section 5 identifies the alternative solutions identified for the project including their description and evaluation.

Section 6 describes the alternative designs of the recommended solution including how they were developed, rationalized and evaluated.

Section 7 provides a description of the recommended project design including intersections, pedestrian/cycling facilities, stormwater requirements, utilities, traffic signals, phasing, access management, and preliminary cost estimates.

***Section* 8** presents the anticipated environmental effects and proposed mitigation measures for the recommend design.

Section 9 provides a description of additional considerations/future requirements prior to project implementation including for example permitting, implementing policies, detailed design requirements, etc.

1.4 Canadian Environmental Assessment Act, 2012

When a project has the potential to cause environmental effects that are within federal jurisdiction, a federal EA may be required. The Canadian Environmental Assessment Agency (CEAA) created a list, referred to as the Regulations Designating Physical Activities List, which identifies the types of projects that may require a federal EA. As the proposed project is not identified in the list of Designating Physical Activities, an EA under CEAA is not required. It is noted that CEAA 2012 is current under review by the federal government and there is potential for changes to the Act to be in place by 2018/2019.

Non-CEAA designated projects may still however, require federal approvals (e.g. Navigable Waters Protection Act, Fisheries Act).

1.5 Study Approach & Organization

The project followed the Class EA process to ensure a thorough understanding of the problems and opportunities, the various alternatives and their potential environmental effects and associated mitigation measures. As previously indicated, the project is a Schedule "C" project and thus Phases 1 to 4 of the Class EA were carried out as follows:

Phase 1: Problem/Opportunity Identification (Project Need/Justification) - To establish the need and justification for the project, the County undertook a review of

existing and future projected roadway capacity and operational issues (for all modes of transportation) and assessed opportunities in the context of existing plans and policies including the County Transportation Master Plan and the County Wide Active Transportation Strategy (CWATS).

Phase 2: Identification and Evaluation of Alternative Solutions (Identify Preferred Solution) - Considering the identified problems and opportunities, alternative solutions (alternative ways of solving the problem) were developed, assessed and evaluated considering environmental, socio-economic, technical and cost considerations. The alternative solutions were presented to the public for review and comment. Through this process a preferred solution was identified.

Phase 3: Identification and Evaluation of Alternative Design Concepts (Identify Preferred Design) -Considering the recommended solution, alternative ways of implementing it (alternative designs) were then developed, assessed, and evaluated considering environmental, socio-economic, technical and cost considerations. The alternative designs were presented to the public for review and comment. Through this process a preferred design (the undertaking) was identified.

Phase 4: Environmental Study Report Documentation - The final phase of the process involved the preparation and public released of the ESR (this document).

Phase 5: Implementation - Subject to the completion of the above phases, the implementation phase would involve the following:

- Fulfil the EA commitments;
- Property acquisition;
- Prepare detailed design;
- Construction tendering;
- Construction of the project; and
- Follow-up.

It is noted that the County has already begin the implementation of the interim solution (paved shoulder/cycle tracks) which does not require the completion of an ESR.

The study organization includes those responsible for the technical aspects and those who participated from a stakeholder perspective as shown in **Figure 6**. Details regarding the agencies that were engaged with are presented in **Section 1.7.2**.

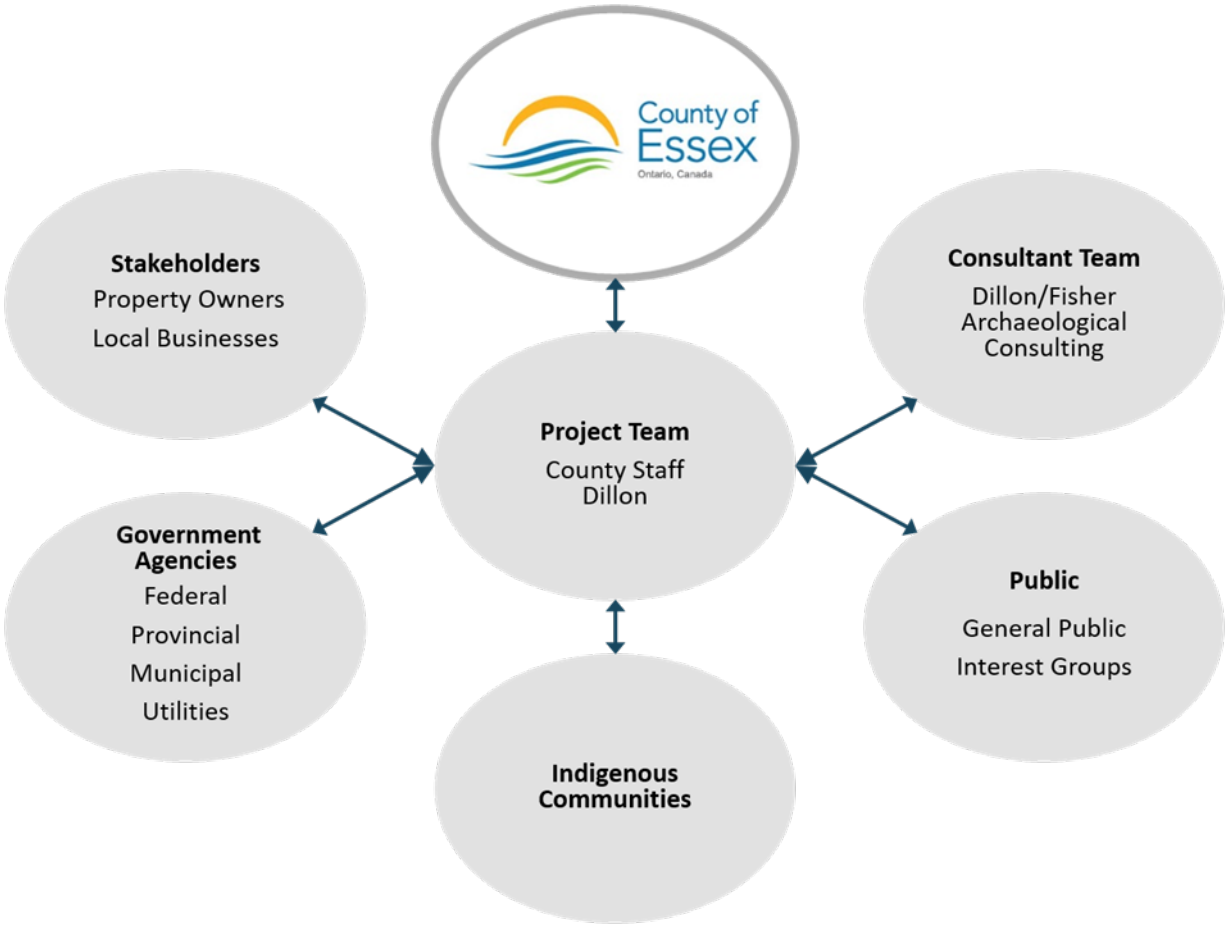

Figure 6: Project Organization

1.6 Project Team

The project was led by the County of Essex and supported by Dillon Consulting Limited. The County is made up of seven Municipalities, two of which are within the study area including the Town of Kingsville and Municipality of Leamington. The County government is responsible for issues that include transportation along County jurisdiction roadways, community and social services (e.g. homes for the aged, child care, social housing), libraries, planning, emergency management coordination and corporate-wide business such as finance and taxation policies, general corporate policy and labour relations.

Day-to-day activities were carried out by the project team which included representatives from the County and Dillon. Dillon supplied specialized discipline

expertise in the areas of natural environment, social environment, land use, and road planning and design. Sub-consultants were engaged by Dillon to complete required work relating to archaeology.

County of Essex

Jane Mustac, P.Eng. – Manager, Transportation Planning & Development

James Bryant, P.Eng. – EA Coordinator

Dillon Consulting Limited (Planning and Design Consultant)

Don McKinnon, RPP – EA Project Manager

Chris Patten, P.Eng. – Engineering Lead

Other

The team was also assisted by sub-consultants including **Fisher Archaeological Consulting**.

Project team contact information is below:

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Essex, ON, N8M 1Y6

Phone: 519-776-6441, Ext. 1397

Email: cr20@dillon.ca

1.7 Consultation Overview

Stakeholder consultation during the Class EA process was an integral component of this project. The primary purpose of the consultation program was to involve the local community, government agencies and other potentially affected stakeholders in project design and decision-making. Specifically, the overall objectives of the consultation program were to:

- Create general awareness of the project to as many potentially interested stakeholders as possible; and
- Generate an open and interactive approach to the planning process by creating opportunities for the public, government agencies, and interest groups to provide project comments and suggestions.

The following describes the stakeholder consultation program that was undertaken for this Class EA. Subsequent sections of this ESR describe the input received and how it was considered in the study. **Appendix A** includes the consultation program supporting materials including summaries of consultation events and the materials presented.

A number of consultation activities were undertaken as part of the Class EA process for this project including:

- Development of a stakeholder contact list, which was updated throughout the study;
- Development of a project-specific website (www.CR20.ca), which was updated throughout the study;

- Project notices and mailings/emails;
- Two Public Information Centres (PICs);
- Meetings with key stakeholders, including affected property owners and local cycling groups;
- Consultation and engagement with Indigenous Communities;
- Presentation to County of Essex Council; and
- Public release of the ESR.

1.7.1 Project Notes

The Notice of Study Commencement was issued in March 2016 to the contact list and was advertised in the *Kingsville Reporter* on March 15, 2016, and *Leamington Southpoint Sun* on March 16, 2016.

The notice regarding PIC 1 was published in the *Kingsville Reporter* (November 1 and November 8, 2016), and *Leamington Southpoint Sun* (November 2 and November 9, 2016).

The PIC 2 notice was sent to the contact list on August 10, 2017, and published in the *Kingsville Reporter* (August 8, 2017), and *Leamington Southpoint Sun* (August 9, 2017). The PIC 2 notice was also hand delivered to all residences that front or side onto CR 20 within the study area.

Following presentation of the study recommendations to County Council, the Notice of Study Completion will be sent to the study contact list and will be published in the *Kingsville Reporter* and *Leamington Southpoint Sun*.

1.7.2 Agency Emergency

Government agency consultation has been a cornerstone of this project with multiple information sharing and stakeholder feedback opportunities provided throughout the course of this Class EA. Agency consultation was initiated through the Notice of Commencement. Project related meetings and other correspondence such as comments received from agencies and responses received are provided in **Appendix A**.

Government agencies that were contacted as part of this study include federal departments, provincial ministries/agencies, and local authorities including

Municipalities and the Essex Region Conservation Authority. Agencies contacted as part of the consultation program included the following:

Federal Department

- Canada Post;
- Department of Fisheries and Oceans;
- Environment and Climate Change Canada*;
- Agriculture and Agri-Food Canada; and
- Indigenous and Northern Affairs Canada.

*Requested to be removed from the contact list following the Notice of Study Commencement

Provincial Ministries and Agencies

- Ministry of Agriculture, Food and Rural Affairs;
- Ministry of Tourism, Culture and Sport;
- Ministry of Environment and Climate Change;
- Ministry of Aboriginal Affairs;
- Ministry of Municipal Affairs and Housing;
- Ministry of Natural Resources and Forestry;
- Infrastructure Ontario; and
- Ontario Clean Water Agency.

Municipalities

- Municipality of Leamington; and
- Town of Kingsville.

Utilities

- Bell Canada;
- Cogeco Connexion;
- Hydro One Networks;
- Essex Power Corporation;
- ELK Energy Inc.; and
- Union Gas Limited.

Emergency Services

- Leamington Fire Services;
- Kingsville Fire and Emergency Services;
- Central Ambulance Communications Centre;
- Ontario Provincial Police; and
- Essex-Windsor Emergency Medical Services.

Other Agencies, Interest Groups and Local Businesses

- Essex Region Conservation Authority;
- Greater Essex County District School Board;
- Windsor-Essex Catholic District School Board;
- Windsor-Essex Student Transportation Services;
- Windsor-Essex County Health Unit;
- Windsor-Essex County Active Listing Coalition;
- Windsor-Essex Economic Development Corporation;
- Essex Agricultural Workers Alliance – Leamington;
- Ciociaro Cycling Club;
- East Side Riders Cycling Club;
- Anna's Flowers;
- Cindy's Home and Garden;
- Kiwanis Camp Leamington;
- Migrant Worker Community Program;
- St Clair College; and
- Ontario Greenhouse Vegetable Growers (OGVG).

1.7.3 Public Engagement

The main opportunities for consultation during this project included:

- Two Public Information Centres;
- Meetings with various agencies and interest groups including school board/transportation services and local cycling group;
- Project website – for release of information and receipt of public input; and
- Distribution of notices and letters during key milestones of the project.

Comments received were considered in the completion of the EA study and are documented in various sections of this ESR.

1.7.3.1 Public Information Centre #1

The first PIC was held at the Kingsville Arena Complex located at 1741 Jasperson Road in Kingsville, Ontario, on Tuesday, November 15, 2016, from 3:00 p.m. to 8:00 p.m.

Notification

The PIC notice was distributed as follows:

- Uploaded to the project website on November 4, 2016;
- Mailed to agencies and Indigenous Communities on November 4, 2016;
- Mailed to property owners along County Road 20 from Kratz Sideroad in the Town of Kingsville to Sherk Street in the Municipality of Leamington; and
- Emailed to residents who do not live along the Kratz Sideroad to Sherk Street corridor, but had requested through the project website to be kept apprised of the project, on November 7, 2016.

As a result of the public's high level of interest in the project, PIC notices were published in consecutive issues of local newspapers to provide notice to those that may be affected by the project. The publications were as follows:

- Kingsville Reporter (November 1 and November 8, 2016); and
- Leamington Southpoint Sun (November 2 and November 9, 2016).

Format and Information Presented

The PIC was an informal drop-in centre format with display boards set up around the room, along with a plan drawing of the entire corridor. In total, 69 people signed the Record of Attendance. Representatives from the County and Dillon Consulting Limited were available to explain the project and displays, record verbal comments, and answer questions. The following display panels were presented for public viewing, discussion, and comment:

- Study Overview;
- Class EA Process;
- Policy Context;
- CWATS;
- Existing Corridor Conditions;
- Existing School Bus Stop Locations;
- Collision History;
- Traffic Conditions;
- Intersection Treatment Options;
- Corridor Access Management;
- Problems and Opportunities and How They Are Addressed by the Alternative Solutions;
- Alternative Solutions; and
- Interim Active Transportation Facility.

A copy of the display boards is provided in **Appendix A**.

Comments Received

The comments received at and following the PIC indicated that respondents are in favour of active transportation improvements along the County Road 20 corridor. The safety of cyclists, pedestrians and motorists was a common theme in the input received. **Section 5.3** of this ESR describes the input which was primarily related to the alternative solutions that were presented. Comments and responses are also detailed in **Appendix A.**

1.7.3.2 Public Information Centre #2

The PIC was held at the Leamington Kinsmen Recreation Complex located at 249 Sherk Street in Leamington, Ontario, on Thursday, August 17, 2017, from 3:00 p.m. to 8:00 p.m.

The PIC notice, provided in **Appendix A**, was distributed as follows:

- Published in the Kingsville Reporter (August 8, 2017) and Leamington Southpoint Sun (August 9, 2017);
- Uploaded to the project website under the URL www.CR20.ca on August 10, 2017;

- E-mailed to agencies, Indigenous Communities and residents/property owners that provided their email address on August 10, 2017;
- Mailed to property owners along County Road 20 from Kratz Sideroad in the Town of Kingsville to Sherk Street in the Municipality of Leamington on August 10; and
- Hand delivered to property owners along County Road 20 from Kratz Sideroad in the Town of Kingsville to Sherk Street in the Municipality of Leamington on August 11, 2017.

Format and Material Displayed

The PIC was an informal drop-in centre format with display boards set up in the room, along with a roll plan drawing set showing the proposed design along the entire corridor. In total, 75 people signed the Record of Attendance. Representatives from the County of Essex and Dillon Consulting Limited were available to: explain the displays, record verbal comments and answer questions.

The following display panels were presented for public viewing, discussion and comment:

- Municipal Class EA Process;
- Study Overview;
- Problems and Opportunities;
- Policy Context for the Study;
- County Wide Active Transportation System;
- Traffic Conditions and Improvements;
- Interim Active Transportation Facility;
- Consultation Results to Date;
- Alternative Solutions;
- Evaluation of Alternative Solutions;
- Proposed Intersection Improvements;
- Alternative Designs;
- Evaluation of Alternative Design Options and Preferred Option;
- Commitment to Mitigation and Continued Consultation; and
- Construction Phasing.

A copy of the display boards is provided in **Appendix A**.

Comments Received

Comments received were primarily related to the alternative designs. A summary of the comments received at PIC 2 and follow-up meetings with interested stakeholders is included in **Section 6.2** of this ESR. Comments received and responses are presented in **Appendix A.**

1.7.4 Indigenous Communities Engagement

Indigenous Community consultation was an important part of the consultation process. The following describes the activities that were undertaken to ensure Indigenous Communities were provided with an opportunity to become informed about the project and provide input.

Indigenous and Northern Affairs Canada as well as the Ministry of Aboriginal Affairs were consulted to determine potential Indigenous Community interest in the project. In addition, the project team completed a search of the Aboriginal and Treaty Rights Information System (ATRIS). Based on this search and information received, it was determined that the following communities should be consulted:

- Caldwell First Nation;
- Walpole Island First Nation/Bkejwanong Territory;
- Métis Nation of Ontario (MNO); and
- First Nations Secretariat for Southwestern Ontario.

These Indigenous Communities were sent project notices (Notice of Study Commencement, Notice of Public Information Centre 1 and Notice of Public Information Centre 2). Follow-up phone calls were made to the communities within two weeks of project mailings. At the request of Caldwell First Nation and Walpole Island First Nation, copies of the Public Information Centre 2 materials were provided to share with the Chief and Council.

Following PIC 2, the project team identified that Oneida Nation of the Thames should also be consulted regarding the project. An email with project information was sent to Oneida Nation of the Thames on September 25, 2017, and phone calls were made to follow-up on the information that was submitted.

Indigenous Communities were sent project notices and follow-up calls were made within two weeks following the mailings. **Appendix A** provides additional information related to correspondence with Indigenous Communities including any comments received.

Correspondence with Indigenous Communities did not lead to the identification of any specific or comprehensive claims or litigation that materially affected the project. The identified communities will be notified of the ESR release and the County is committed to working with Indigenous Communities should any issues arise.

1.7.5 Notice of Study Completion

The filing of this ESR completes the Class EA process for the project. As per the Class EA, this ESR was made available for public review for a minimum period of thirty (30) calendar days through publication of the Notice of Completion. Project information was also provided on the County's website. During the review period, copies of the report were available at the following locations:

- County of Essex, 360 Fairview Avenue West, Suite 201, Essex, ON N8M 1Y6;
- The Corporation of the Town of Kingsville, 2021 Division Road North, Kingsville, ON N9Y 2Y9;
- Municipality of Leamington, 111 Erie Street North, Leamington, ON, N8H 2Z9; and
- Dillon Consulting Limited, 3200 Deziel Drive, Suite 608, Windsor, ON, N8W 5K8.

The minimum thirty day review period closed on February 10, 2019. Prior to closure of the review period, no public comments received. Subject to receipt of all necessary approvals, the County intends to proceed with the detailed design and construction as documented in this ESR.

2.0 Policy/Planning Context

2.1 Project Planning Context

In reviewing and assessing the existing infrastructure and future requirements of the study area, it is essential to establish a policy context for infrastructure expansion, considering both growth, and transportation objectives. The policy framework guides strategic investment decisions to support community objectives and accommodate forecasted population and economic growth. The assessment and evaluation of the study area problems and opportunities was carried out with due consideration to the policy framework to ensure that the ultimate improvement plan is consistent with the policies and objectives of the various levels of government (i.e. Municipal, provincial). There are a number of plans and studies that provided guidance regarding the need and justification for the project as described below.

2.2 Provincial

2.2.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) was issued under the authority of Section 3 of the *Planning Act* and came into effect on April 30, 2014. The PPS sets of the Province's vision for how lands are settled, infrastructure is designed and built and land and resources are managed to achieve the long-term objective of liveable and resilient communities. The PPS supports and promotes providing a range of transportation choices in and between communities, which includes through active transportation facilities. Section 3 of the *Planning Act* requires decisions affecting planning matters "shall be consistent with" policy statements issued under the Act.

The PPS supports and promotes healthy and active communities. This includes planning public streets to be safe, meet the needs of pedestrians, foster social interaction and facilitate active transportation and community connectivity (Section 1.5 - Public Spaces, Recreation, Parks, Trails and Open Space of the PPS).

Planned improvements to the corridor (defined as "infrastructure" in the PPS) are to be consistent with the relevant Transportation Systems and Transportation and

Infrastructure Corridors policies included in Sections 1.6.7 and 1.8 of the PPS as summarized as follows:

- The proposed improvements should be safe, energy efficient, facilitate(s) the movement of people and goods, and appropriate to address projected needs;
- The project shall make efficient use of existing and planned infrastructure;
- As part of a multimodal transportation system, connectivity within and among transportation systems and modes should be maintained and, where possible, improved including connections which cross jurisdictional boundaries; and
- Promote the use of active transportation in and between residential, employment (including commercial and industrial) and institutional uses and other areas.

The PPS provides a strong basis to include active transportation facilities within the corridor.

As the PPS is the guiding document for land use planning in Ontario, it is important that improvements to CR 20 are consistent with the policies. This project provides an opportunity to improve active transportation facilities along the corridor to support several of the policies within the PPS.

2.2.2 #CycleON – Ontario's Cycling Strategy

The Province of Ontario's Cycling Strategy, #CycleON, states recent Ministry of Transportation Ontario (MTO) surveys of road users suggests around 1.2 million adults in Ontario ride a bicycle daily during the spring, summer and fall, and 2.8 million ride at least once a week. The strategy also states, "Cycling generates a wide range of health, economic, environmental, and social and other benefits. These include improved personal health, reduced health care costs as a result of lower rates of chronic conditions through active living, reduced traffic congestion in urban areas, a cleaner environment and increased tourism opportunities across the Province."

The strategy includes the vision that by 2033, cycling in Ontario is recognized, respected, and valued as a core mode of transportation that provides individuals and communities with health, economic, environmental, and social and other benefits. The strategy includes five aspirational goals for the Province:

- Ontario is recognized as the best Canadian Province for cycling and ranked among the top 10 jurisdictions worldwide for cycling;
- The built environment in most Ontario communities supports and promotes cycling for all trips under 5 km;
- Ontario's cycling environment is safe for people of all ages, striving to achieve a record of zero fatalities and few serious injuries;
- Ontario's cities and towns will have interconnected networks of safe cycling routes enabling people to cycle to work, school, home and key destinations; and
- Ontario has an integrated Province-wide network of cycling routes.

The strategy identifies the need for MTO to partner with local Municipalities to implement the vision and goals of the strategy.

The strategy points to the increase in cycling tourism in Ontario. It states in 2010, two million Canadian visitors went cycling while travelling in Ontario and spent $391 million, which was an 18 per cent increase in spending over the previous year. The strategy also identifies the need to support the growth in cycling tourism in both rural and urban areas by developing a Province-wide cycling network. A study by Clean Air Partnership is cited in the Strategy notes the important benefits from day-to-day spending by Ontarians who cycle in urban areas, with cyclists and pedestrians spending more money with local businesses than motorists who visit the neighbourhood.

In addition, a 2015 report by the Ontario by Bike Network, From Niche to Now: Cycle Tourism in Ontario highlights the growing cycle tourism sector in Ontario. The report includes the following research:

- 54% of Ontarians indicated they would prefer to cycle more;
- 96% who want to cycle more said yes to more recreational cycling activities, 48% said yes to cycle tourism in Ontario; and
- 70% of experienced cyclists took cycling trips in Ontario vs. 30% of recreational/leisure cyclists.

2.3 County of Essex

2.3.1 County's Official Plan

The County's Official Plan (approved April 28, 2014) establishes the policy framework for managing growth, protecting resources and providing direction on land use decisions in the County through 2031.

The Plan outlines 20 goals (Section 1.5) for a healthy Essex County, which are implemented through the policies of the Plan. The goals are focused on the long-term prosperity and social well-being of the County to maintain strong, sustainable and resilient communities, a clean and healthy environment and a strong economy. The following goal is relevant to the current study:

- To promote and invest in a region-wide transportation system that connects urban areas with each other and with communities outside this area by providing a highly interconnected road network and accessible transportation system **that is designed and built for pedestrians, cyclists, transit and automobiles.**

Section 2.8.1 of the Plan includes the following relevant transportation-related policies that were taken into consideration throughout this study:

- Identify measures to optimize roadway network capacity through roadway access management and intersection optimization;
- Identify measures to reduce transportation needs such as managing the appropriate type and scale of growth, the use of alternative transportation choices and the development of an active transportation system;
- Discourage new development that would adversely impact traffic movement along the County road network;
- Encourage integration of transportation facilities provided by local Municipalities, adjacent Municipalities and the Province; and
- Encourage safe, convenient and visually appealing pedestrian facilities where appropriate along the County road system.

The County's Official Plan also references the *Essex-Windsor Regional Transportation Master Plan* completed in 2004 and which is described below in **Section 2.4.2** of this ESR. Section 2.8.4 of the Official Plan and Schedule D2 include policies related to Active

Transportation. Schedule D2 of the Plan shows "Active Transportation Systems", as recommended by the *County Wide Active Transportation Master Plan (CWATS)* approved by County Council in 2012 to promote walking and cycling. County Road 20 is designated as "Signed Route, Proposed" (through the urban areas of Kingsville and Leamington), "Paved Shoulder, Proposed" (along County Road 20 to County Road 45) and "Context-Sensitive Solution, Proposed" (from County Road 45 to the Leamington urban area). As noted in the Official Plan, a primary tool for implementing these facilities is road improvements.

The Official Plan outlines the primary tool to implement and enhance the A/T System is through the master planning exercise for County and Municipal infrastructure projects, i.e. road improvements, and through the review of development applications. It includes the following relevant policies:

a) *All County and local Municipal roads shall be considered accessible for active transportation unless otherwise designated, and that a vehicular approach to cycling be adopted that recognizes the bicycle as a vehicle which operates on public roadways or within road rights-of-way with the same rights and responsibilities as motor vehicles.*
b) *The County's Active Transportation System will continue to evolve over time through the addition of missing links and the incorporation of additional linkages such as the use of unopened right-of-way's, hydro right-of-way's, existing or abandoned rail corridors, open green-space and future roadway improvements. Amendments to the County Official Plan are not required for route or facility type revisions, provided the continuity and functionality of the network is maintained in the same general location and/or is consistent with the route selection principles contained within the CWAT Master Plan.*

The Plan encourages active transportation friendly (pedestrian and cyclist) streetscaping, urban design and active transportation oriented land development be considered as part of the review or update of local Official Plans as well as the development review process. The Plan also encourages the use of best practices when planning, designing, constructing, maintaining and operating active transportation facilities.

Land between Kingsville and Leamington along the south side of CR 20 are designated "Settlement Area" on Schedule A1, "Land Use Plan" and lands to the north are generally designated as "Agricultural". Further description and illustration of these designations are provided as part of the Socio-Economic Baseline Description in **Section 3.3** of this document.

2.3.2 Essex Windsor Regional Transportation Master Plan, 2005

The main goal of the Essex Windsor Regional Transportation Master Plan (EWRTMP) was to develop a comprehensive Regional Transportation Master Plan for the Essex-Windsor region with recommended policies and an implementation strategy that will serve the needs of the Region to the year 2021. The objectives of the study include:

- Fairly and equitably manage, coordinate and finance growth and non-growth related region-wide transportation improvements, with a balance of capacity enhancements and demand management that best benefits the region;
- Have the Region develop in a coordinated manner that will be effective in minimizing traffic congestion and associated environmental impacts, protecting and managing required transportation corridors and achieving the region's transportation management goals;
- Increase the availability of "viable" transportation options by making public transit, cycling and walking more attractive for Essex-Windsor residents;
- Identify achievable strategies, in the context of the County of Essex and the City of Windsor, to reduce the number of kilometres traveled by the private automobile per household by creating more compact built forms, mixed-use neighbourhoods and developments, and by adopting transit, cycling and pedestrian-supportive land use planning and urban design policies and plans;
- Formulate the Regional Transportation Master Plan in an integrated, inclusive and comprehensive manner; and
- Satisfy Phases 1 and 2 of the Municipal Class EA process dealing with transportation system needs and alternative planning strategies respectively.

The Plan identified roadway capacity enhancements, evaluated the levels of service, and recommended a new roadway classification system. The Master Plan identifies CR 20 as part of the regional road system. The plan does not identify the need to widen CR 20 based on the roadway capacity projections that were undertaken.

2.3.3 County Wide Active Transportation Master Plan (CWATS)

The County of Essex has developed a comprehensive County Wide Active Transportation (walking and cycling) Master Plan (CWATS) to guide the County and local area Municipalities in implementing a County-wide network of cycling and pedestrian

facilities over the next 20 + years. The vision established for the Master Plan is as follows:

"The County of Essex and its seven local area Municipalities support active transportation (walking and cycling) and in association with the Essex Region Conservation Authority, City of Windsor and Municipality of Chatham-Kent and other partners, are working together to foster a safe, comfortable, bicycle and pedestrian friendly environment by encouraging people of all ages and abilities to engage in non-motorized activities for everyday transportation and recreation. Residents and visitors are able to travel and experience the urban and rural areas of the County by way of a connected network of on and off-road pedestrian and cycling facilities."

The Master Plan was adopted by County Council in 2012 approving the phased implementation of over 700 km of active transportation facilities. At the time of preparing this ESR, there are approximately 275 km of new bicycle lanes, paved shoulders, cycle tracks, multi-use trails, and signed routes constructed in the Region. Within the CWATS Master Plan, County Road 20 between Kingsville and Leamington is considered a "highly desirable active transportation route" (**Section 5.2.2** and **Section 6.4.2.3**). The Context-Sensitive Solution proposed for the east end of the project (from west of Union Avenue to Sherk Street, where curb and gutter presently exist), consists of a multi-use path behind the curb on each side of the road, along with "Share the Road" signage on the road for more confident cyclists. According to the Master Plan, the actual width will be determined based on a more detailed analysis.

The design for the interim active transportation facilities has been further developed through Functional Design Studies (FDS) completed in 2014 for both the Kingsville and Leamington sections of the interim A/T facility. These functional design studies recommended the installation of a one-way active transportation facility behind a mountable curb along both sides of the roadway. The new pathway is to be 1.2 m to 1.5 m wide. Implementation of the recommended interim A/T facility began in 2015 and is expected to continue the next few years and is not dependent on the outcome of this Class EA.

2.4 Town of Kingsville

The local plans provide guidance for connective active transportation facilities to the County Wide Active Transportation Study (CWATS) active transportation network.

2.4.1 Kingsville Official Plan

The Town of Kingsville Official Plan was approved by Essex County on February 1, 2012. Kratz Sideroad (the project's western limits) is located on the eastern limits of the existing built-up urban area in Kingsville. As shown on Schedule A "Land Use Plan", lands north of County Road 20 are generally designated "Agricultural" and lands south of the road are generally designated "Residential".

County Road 20 is categorized as a "Collector Road" and is intended to accommodate moderate amounts of traffic between local and arterial roads, while providing access to abutting properties.

As shown in the Official Plan Schedule A, "Land Use Plan" (Appendix C):

- Lands north of County Road 20 are designated "Agricultural". According to the Plan, agriculture, including an extensive vegetable and flower greenhouse farming area, is extremely important in Kingsville;
- Lands south of the road are designated "Lakeshore Residential East". According to the Plan, since this area is currently serviced with private septic facilities, servicing will be a major consideration for any development proposals"; and
- Lands along County Road 45 to Ruthven are designated "Hamlet". Low density residential, institutional, recreational, small scale commercial and dry, light industrial uses are permitted.

2.4.2 Kingsville Active Transportation Plan

The Town of Kingsville Active Transportation Master Plan (June 2012) acknowledges pedestrian and cyclist use along CR 20 east of Kingsville and makes the following recommendations:

- Provide a shared signed route on road (short-term);
- Provide share the road signage and sharrows;

- Widen the cross-section of the road to accommodate paved shoulders or a bike lane (long-term); and
- Upgrade the existing sidewalk to multi-use trail (long-term).

2.5 Municipality of Leamington

2.5.1 Leamington Official Plan

The Municipality of Leamington Official Plan, which was approved by Council on February 5, 2008, applies to the east end of the study area.

County Road 20 is classified as an "Arterial" roadway on Schedule E. The Plan's road policies state that the County Road 20 right-of-way, from Albuna Townline (County Road 31) to Sherk Street, should be widened to 23 metres when development in the area occurs. This is the area of road that has the narrowest right-of-way, and is limited in terms of pathway options within the current road limits.

The Municipality has recently started the process to create a new Official Plan.

As shown on Schedules A-6A and A-6C of the Official Plan, lands along both sides of Seacliff Drive, are designated as "Residential" , bordered by lands designated "Agricultural" to the north. The eastern limits on the project at Sherk Street are residential neighbourhoods, part of the Leamington urban area. Other noted Official Plan designations in the study area include:

- Small areas south of County Road 20/Seacliff Drive to Lake Erie are designated "Natural Environmental Overlay", "Floodplain Development Control Overlay" and "Lake Erie Floodprone Overlay" on Schedule B. Development and site alteration are not permitted in these areas; and
- Lands between Jane Street and Sherk Street are part of the "Existing Service Area", as shown on Schedule C.

2.5.2 Leamington Transportation Action Plan

The Municipality of Leamington Short-Term Transportation Action Plan (2013) provides an analysis of existing transportation conditions and recommendations. The report recommends implementing elements of complete streets, including traffic calming, bike

lanes, pedestrian crossing facilities and curb extensions, and provides a ranking of priority projects.

The Municipality also developed a Long-Term Transportation Action Plan (LRTAP) (2013) to identify transportation network deficiencies and provide recommendations for short, medium and long-term strategic transportation improvements to the year 2031. The LRTAP is used to update the Municipality's Capital Improvement Program. The LRTAP identified that the circulation of cyclists, pedestrians and vehicles is important to transportation improvements, specifically in the downtown area.

2.5.3 Leamington Active Transportation Plan

The Municipality of Leamington Active Transportation Plan (A.T.P.) & Implementation Strategy (July 2016) outlines on Maps 2A and 2B in the Plan the various candidate active transportation routes in the Municipality. Identified on Map 2B is the context-sensitive solution that is recommended in CWATS for County Road 20 as described above. The Plan identifies that a context-sensitive solution is one that may vary from a typical design and has been selected for a particular location based on the roadway and surrounding conditions following the application of sound planning and engineering judgment.

2.6 Relevant Documents/Plans

2.6.1 Source Water Protection

The County of Essex Official Plan identifies “Intake Protection Zones” (Schedule C3) and “Highly Vulnerable Aquifers” (Schedule C4). Schedule C3 is based on the findings of the Thames-Sydenham and Region Source Protection Plan and Essex Region Source Protection Plan, prepared under the *Clean Water Act*, 2006.

As explained in the Plan, Intake Protection Zones are areas of land and water where drainage run-off could directly impact water quality at Municipal drinking water intakes. As shown on Schedule C3, the majority of the study area is designated as “Intake Protection Zone 2” (area of influence from run-off). An area south of the study area is designated as “Intake Protection Zone 1” (surrounding the intake crib) for the drinking water intake in Lake Erie, south of County Road 45. An area west of the study area and

sections of the study area east of County Road 31 are designated as “Intake Protection Zone 3” (area of influence from extreme rainfall or wind storm events).

An eastern portion of the study area (in Leamington) is within a “Highly Vulnerable Aquifer”, as shown on Schedule C4. Groundwater and aquifers in this area are highly susceptible to contamination. On Schedule C5, this area is shown as a “Groundwater Recharge Area” primarily with medium vulnerability. An area surrounding Fraser Road is designated as a “Groundwater Recharge Area” with high vulnerability.

The identification of threats to Municipal drinking water intakes is a key step to source water protection. A threat is an existing or potential land use activity that has the potential to impact water quality or the quantity of water that is used as a source for Municipal drinking water. The MOECC prescribes 21 types of activities considered as drinking water threats, which can be found in the Essex Region Source Protection Plan. In relation to this project, the application of road salt is one of these threats. The County’s Salt Management Plan outlines measures to reduce impacts of road maintenance activities on ground water and which would be applied to this road corridor.

Further description of potential effects of the undertaking as it relates to groundwater is described in **Section 8.5.4.**

3.0 Existing Conditions

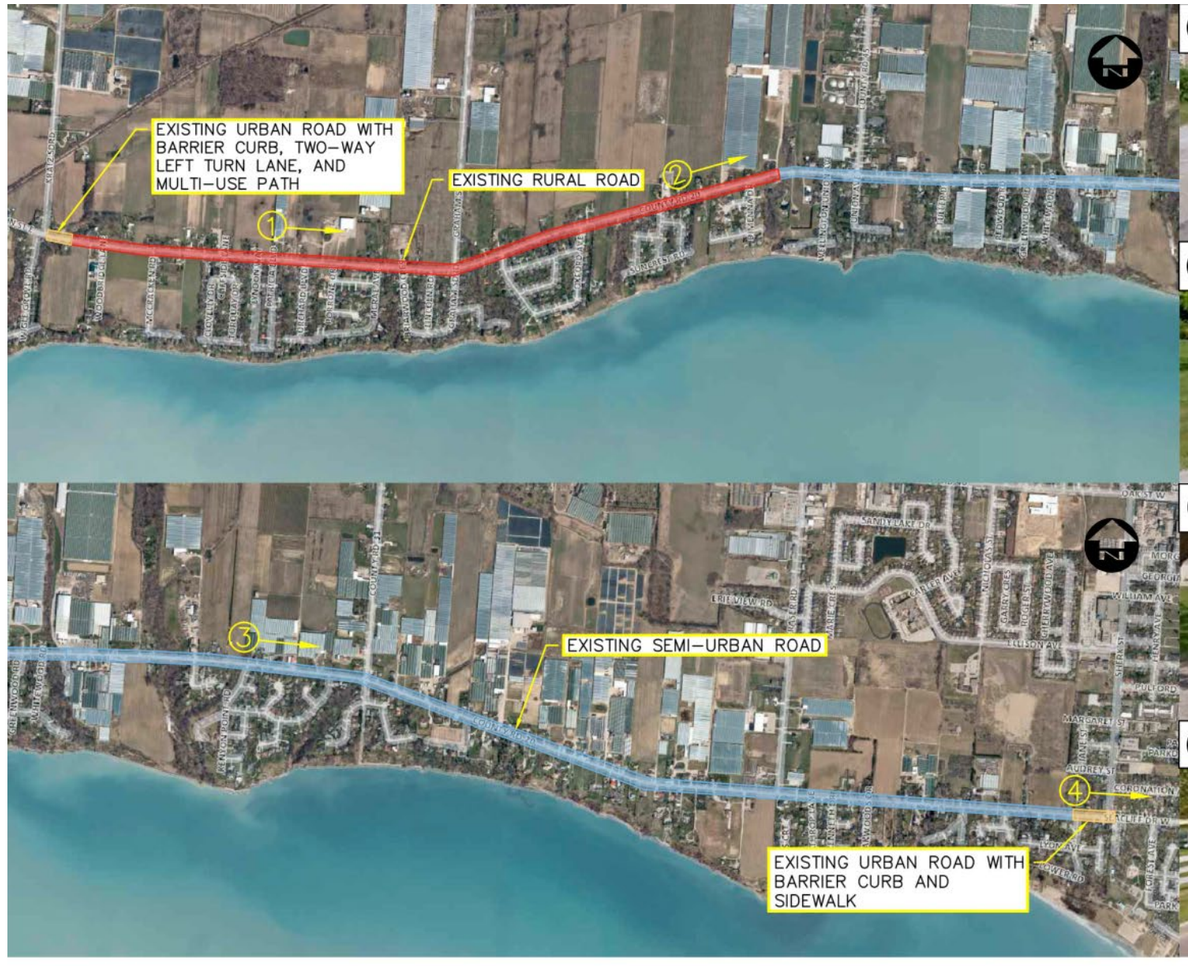
This section provides an overview of the existing or baseline conditions in the study area. Baseline conditions provide the context for addressing the identified problems and opportunities and the development and evaluation of alternatives. Baseline conditions are described for the project study area previously presented in **Figure 5**. In some cases, for contextual information, features located in the general area but outside this study area are noted. The section is organized on the basis of the following environmental components:

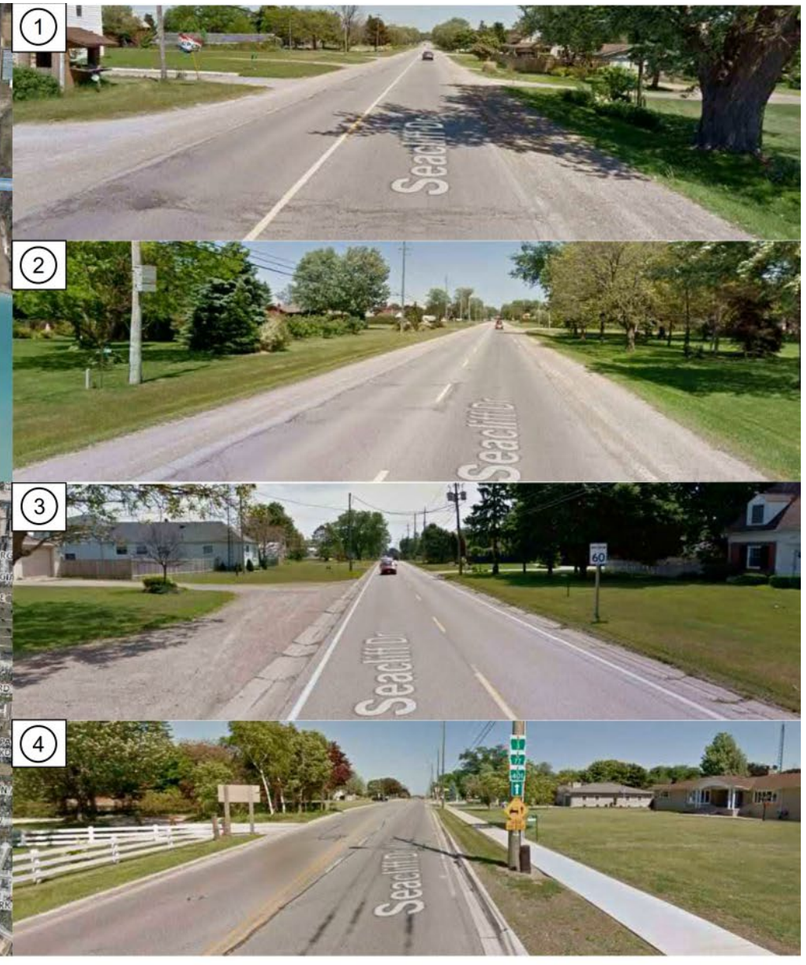
- Transportation & Infrastructure (Section 3.1);
- Drainage and Stormwater Management (Section 3.2);
- Socio-economic Environment (Section 3.3);
- Physical Environment (Section 3.4);
- Natural Environment (Section 3.5); and
- Cultural Heritage (Section 3.6).

It is noted that detailed technical reports (provided in **Appendices B to H**) are available to support the description of baseline conditions in this section. As such, this section is intended to provide an overview level and is supported by the various technical appendices as noted in the applicable subsections below.

It is useful to note that County Road 20 between Kingsville and Leamington includes both rural and semi-urban sections. **Figure 8** illustrates were these urban and rural sections are located.

Figure 7: Existing Road Conditions





NOTE:
- The existing road classification extents are approximate.
- All imagery courtesy of the County of Essex mapping. Copyright 2015.

LEGEND
- EXISTING SEMI-URBAN ROAD
- EXISTING RURAL ROAD
- EXISTING URBAN ROAD

COUNTY ROAD 20
Existing Road Conditions
Kratz Sideroad to Sherk Street
in the Town of Kingsville and the Municipality of Leamington

DILLON CONSULTING | County of Essex | Kingsville ONTARIO | MUNICIPALITY OF LEAMINGTON

PROJECT No. 15-2971 DATE: MARCH 2018

FIGURE 7

3.1 Transportation and Infrastructure

The following section provides a summary of baseline information for the following components of the transportation system:

- Existing Road Network;
- Existing Geometry;
- Traffic Signals and Illumination;
- Collision History;
- Corridor Operation and LOS;
- Active Transportation Facilities and LOS;
- Transit Operation;
- Student Transportation Services;
- Structures/Crossings; and
- Utilities.

More information is provided on each component below. **Appendix B** includes the County Road 20 Transportation Assessment Report, which provides a detailed technical analysis of the transportation system including an assessment of projected future traffic demands and capacities.

3.1.1 Existing Road Network

County Road 20 is a two-lane asphalt roadway under the jurisdiction of the County of Essex within the study area. It runs in an east-west direction, starting in LaSalle (to the west) and ending in Leamington (to the east). According to the Transportation Master Plan, County Road 20 within the study area is classified as a regional roadway whose primary function is the movement of traffic, including trucks. This section of County Road 20 also serves as a gateway to properties along the southern shore of Lake Erie.

The posted speed limit is 50 km/hr. in the vicinity of Kratz Sideroad and increases to 80 km/hr. approximately 145 m east of the Kratz Sideroad and County Road 20 intersection. The posted speed limit on County Road 20 decreases to 60 km/hr. approximately 430 m west of the Union Avenue (County Road 45) and County Road 20 intersection. A reduction in the posted speed limit on County Road 20 occurs again approximately 215 m west of Sherk Street from 60 km/hr. to 50 km/hr. **Table 2** provides a summary of the current road conditions along County Road 20.

Table 2: County Road 20 - Current Road Description

County Road 20 From	County Road 20 To	Road Description	Road Width EP to Ep (m)	Posted Speed Limit (km/hr.) Westbound	Posted Speed Limit (km/hr.) Eastbound
Kratz Sideroad	220 m east of Kratz Sideroad	3 lane, urban with two-way left turn lane, multi-use path on south side	10.65	50	50
220 m east of Kratz Sideroad	Graham Sideroad	2 lane, rural with granular shoulders	7.5	80	80
Graham Sideroad	375 m west of Union Avenue (CR 45)	2 lane, semi-urban with mountable curb	7.5	60	60
Union Avenue (CR 45)	Albuna Townline (CR 31)	2 lane, semi-urban with mountable curb	7.5	60	60
Albuna Townline (CR 31)	Fraser Road	2 lane, semi-urban with mountable curb	7.5	60	60
Fraser Road	Sherk Street	2 lane, semi-urban with mountable curb	7.5	50	50

3.1.2 Existing Geometry

County Road 20 is generally a 7.5 m wide asphalt road. A short section of 3 lane road exits at the far west end of the project area limits. A description of the current road conditions can be found in **Table 3** below:

Table 3: Current Road 20 - County Road 20 Current Road Conditions

From	To	Road Description	Road Width EP to EP
Kratz Sideroad	220 m east of Kratz Sideroad	3 lane, urban with two-way left turn lane, multi-use path on south side	10.65
220 m east of Kratz Sideroad	375 m west of Union Avenue (CR45)	2 lane, rural with granular shoulders	7.5
375 m west of Union Avenue (CR 45)	Sherk Street	2 lane, semi0urban with mountable curb	7.5

3.1.3 Traffic Signals and Illumination

Within the study area, the following intersections operate under signal control:

- Union Avenue (County Road 45) and County Road 20 intersection;
- Albuna Townline (County Road 31) and County Road 20 intersection; and
- Sherk Street and County Road 20.

All other intersections within the study area are STOP-controlled for side streets only.

To the east of the study area, a two-way left turn lane was implemented on County Road 20, between Sherk Street and Erie Street, to improve the capacity of this two-lane section as highlighted in the 2007 Long Range Transportation Action Plan (LRTAP).

The existing lane configuration, posted speed limits and traffic control measures within the study area are presented in **Figure 8**.

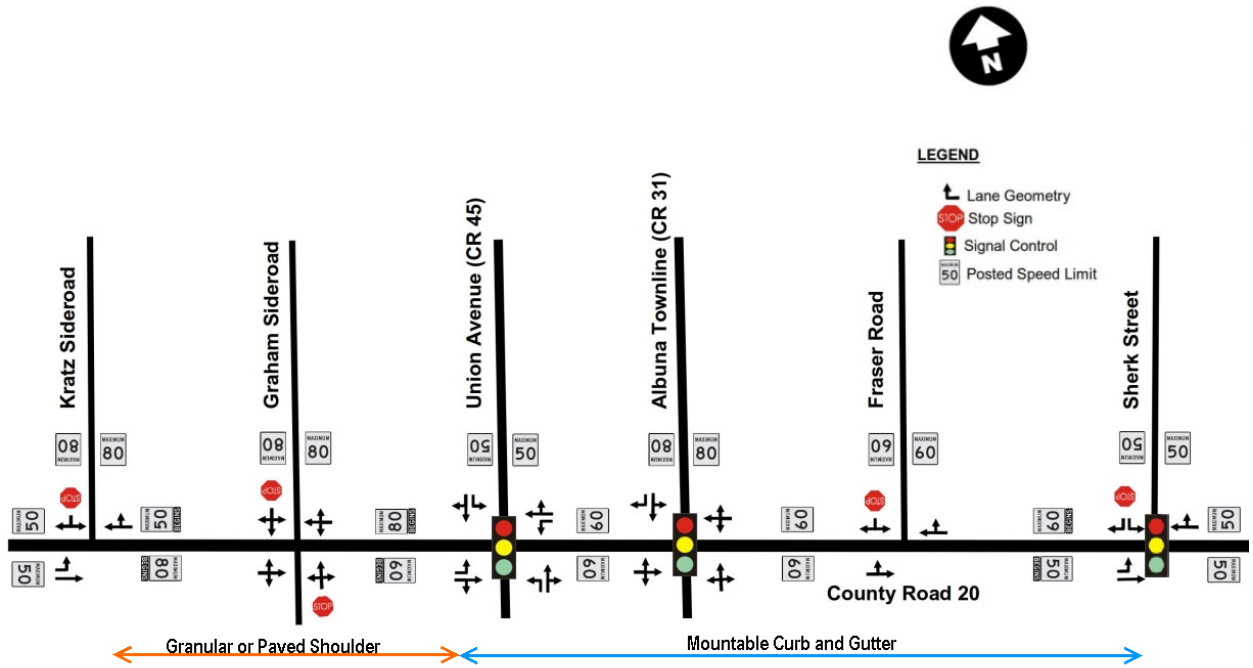


Figure 8: Existing Lane Configuration, Posted Speed Limits and Traffic Control Measures

Presently, there is no linear street lighting/illumination along the majority of the CR 20 corridor. Linear lighting is provided by the Municipality of Leamington in the eastern section of the project area, commencing approximately 200 m west of Sherk Street. As well, some intersections along the corridor are illuminated.

3.1.4 Collision History

Collision data for County Road 20 were provided by the Ontario Provincial Police (OPP). The collision data cover a 9.25 km section extending from Kratz Sideroad to Sherk Street. The data cover 5.2 years (January 2010 to February 2015 inclusive), and include a total of 124 reported collisions. **Figure 9** illustrates the location of the reported collisions along with the frequency of collisions at each location.

Collision rates were calculated for the County Road 20 corridor based on the number of collisions recorded per million vehicle kilometres (MVKM). The results are presented in **Table 4**. On average, the collision rate within the study area has been in the order of 0.50 collisions per MVKM.

Table 4: Historical Collision Rate (Collisions per MVKM in a year) within Study Area

Section	2010	2011	2012	2013	2014	2015*	Average
Kratz Sideroad to West of Union Avenue	0.62	0.96	0.69	0.62	0.14	0.00	0.51
Union Avenue to west of Fraser Road	0.59	0.53	0.77	0.83	0.47	0.36	0.59
Fraser Road to Sherk Street	0.00	0.32	0.54	0.97	0.75	0.64	0.54
Total**	0.43	0.58	0.63	0.72	0.38	0.27	0.50

*2015 collision rate was adjusted to reflect a one year period using the January to February 2015 data.

**Total collision rate is a weighted average, taking into account distance and AADT

The collision rates within the study area were compared to the average collision rate for roads other than the King's Highways in Ontario[The existing CWATS active transportation facility has reached the end of its life cycle (expected to be approximately 15 years) and requires replacement.]. The collision rates within the study area are below the average provincial collision rate of 2.7[2] collisions per MVKM.

THE COLLISION RATES WITHIN THE STUDY AREA ARE COMPARED TO THE AVERAGE COLLISION RATES FOR ROADS IN ONTARIO IN ORDER TO HAVE AN UNDERSTANDING OF THE FREQUENCY OF COLLISIONS IN THE STUDY AREA AND IF IT THE NUMBER OF COLLISIONS ARE MORE THAN OTHER LOCATIONS; IF THE COLLISION RATES IN THE STUDY AREA ARE MUCH HIGHER THAN THE AVERAGE PROVINCIAL COLLISION RATE, IT IS A PRELIMINARY INDICATION THAT THERE MAY BE AN UNDERLYING FACTOR THAT IS CAUSING A HIGHER NUMBER OF COLLISIONS THAN SHOULD BE.

2 AS SOURCED IN THE ONTARIO ROAD SAFETY ANNUAL REPORT, THE AVERAGE PROVINCIAL COLLISION RATE OF 2.7 COLLISIONS PER MVKM IS DERIVED FROM THE DIFFERENCE BETWEEN THE PROVINCIAL TOTAL AND HIGHWAYS TOTAL COLLISIONS AND REPRESENTS ALL THE NON-PROVINCIAL ROADS/HIGHWAYS IN THE PROVINCE.

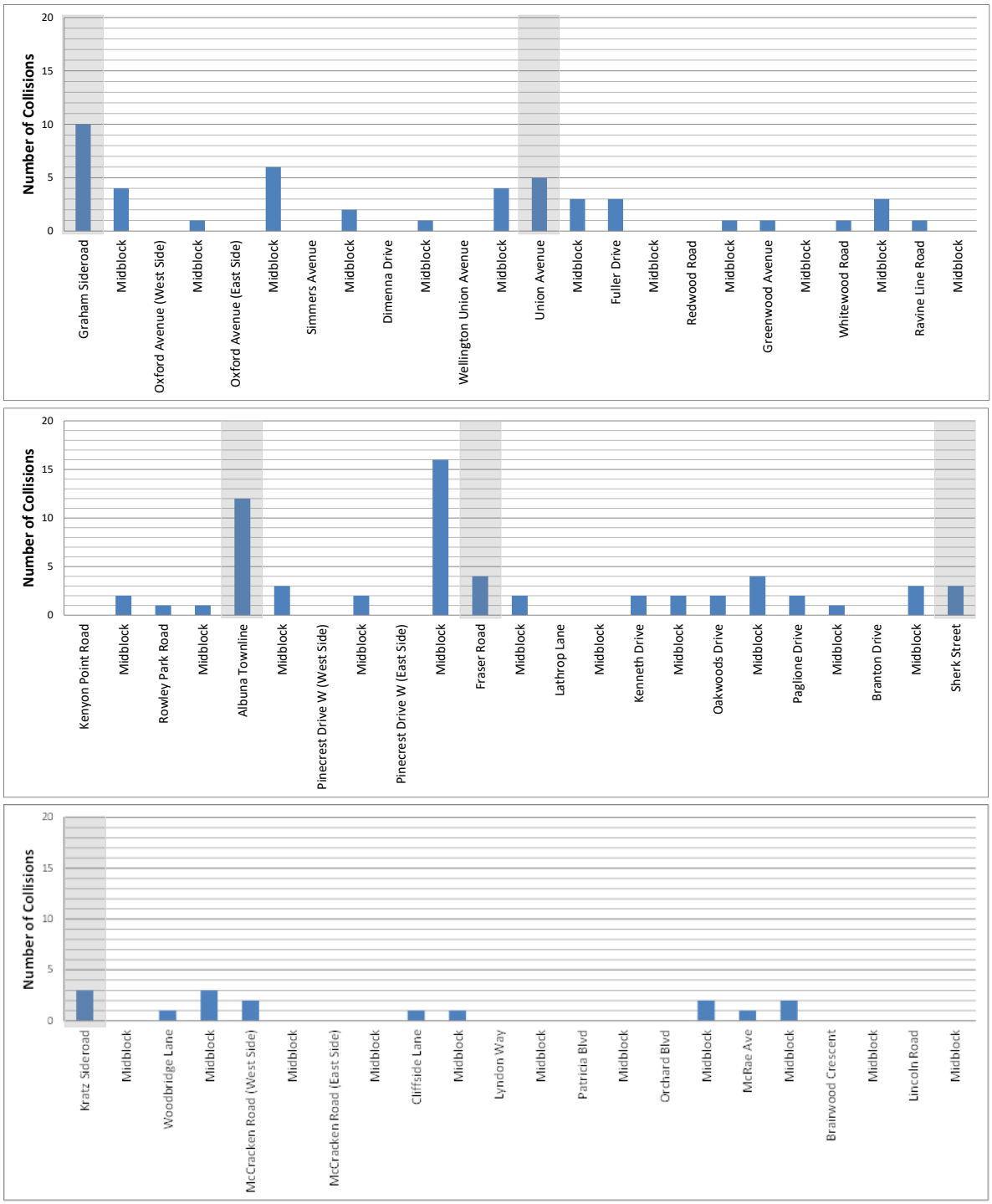


Figure 9: Geographic Distribution of Collisions

Over the five years of data that were reviewed, 124 collisions were reported or approximately 24 collisions/year. Two primary patterns of collisions were observed, depending on the location of the collision (at or related to an intersection vs. at a mid-block location).

Intersection collisions were predominantly rear-end collisions (76 percent), with a further 18 percent comprised of turning movement or angle collisions.

Mid-block collisions were also more likely to be rear-end collisions (45 percent), with a further 48 percent comprised of single-vehicle, approach, turning movement or animal-related collisions. Collisions were more likely to be related to peak travel times, when traffic volumes are higher and queues of vehicles approaching intersections tend to be longer. Furthermore, rear-end collisions due to congestion would likely coincide with capacity analyses showing intersections and mid-block sections operating at, or near, capacity (v/c > 0.90). However, as **Tables 5 and 6** (further below) shows, the corridor is operating under free-flow conditions. Therefore, it is likely that the rear-end collisions are occurring due to driver error (such as inattentive drivers) instead of congestion.

On average, the collision rate has been slightly higher in areas where the posted speed limit is 60 km/hr. Consequently, there is no apparent trend that relates to more collisions occurring because of a higher posted speed limit.

The overall collision rate (approximately 0.50 collisions per MVKM) is lower than the provincial average for roads other than King's Highways (2.7 per MVKM). This would indicate that this section of roadway is performing better than other similar roadways from a safety perspective. That said, there are always opportunities to improve on the safety performance of a roadway or intersection. Countermeasures were explored to examine opportunities to improve upon the safety performance within this section of County Road 20.

Approximately 2.5% of all incidents reported involved vulnerable road users. The addition of cycling facilities along County Road 20 will provide awareness to drivers that cyclists share this road, which should reduce the number of incidents involving vulnerable road users.

The percentage of midblock collisions resulting from turning movements can be reduced by the provision of a two-way left-turn lane.

3.1.5 Corridor Operation and Level of Service (LOS)

3.1.5.1 Traffic Volumes

Within the study area, County Road 20 acts as a route for commuters between Kingsville and Leamington, as well as serving local residents and tourists commuting to destinations within the corridor.

A traffic count was conducted in February 2016 and a factor of 28% was applied to reflect the anticipated increase in summer traffic volume. A detailed description of this methodology is provided in the County Road 20 Transportation Assessment Report, included in **Appendix B. Table 6** summarizes the approximate mid-block volumes for peak hour traffic on County Road 20 in each direction, based on the February 2016 counts that were factored by 28 percent.

Table 5: Typical Corridor Section Volumes

Road Section	Weekday AM Peak Hour Westbound	Weekday AM Peak Hour Eastbound	Weekday PM Peak Hour Westbound	Weekday PM Peak Hour Eastbound
Kratz Sideroad to Graham Sideroad	355	515	643	526
Graham Sideroad to Union Avenue (CR 45)	296	479	578	429
Union Avenue (CR 45) to Albuna Townline (CR 31)	279	461	583	462
Albuna Townline (CR 31) to Fraser Road	307	446	570	504
Fraser Road to Sherk Street	295	353	516	520

Table 7 provides a summary of the existing (2016) AADT within the corridor

Table 6: Existing AADT

Road Section	AADT
Kratz Sideroad to Graham Sideroad	11,700
Graham Sideroad to Union Avenue (CR 45)	10,100
Union Avenue (CR 45) to Albuna Townline (CR 31)	10,500
Albuna Townline (CR 31) to Fraser Road	10,700
Fraser Road to Sherk Street	10,400

3.1.5.2 Corridor Operations and Level of Service

The County's TransCad model identifies a planning-level capacity of 1,000 vehicles per hour per lane on County Road 20 between Kratz Sideroad and Fraser Road. The planning capacity decreases to 800 vehicles per hour per lane between Fraser Road and Sherk Street.

Roadway capacity is influenced by many factors. The amount of congestion or delay is typically defined by the concept of a volume-to-capacity (v/c) ratio. The v/c ratio indicates the amount of roadway capacity being utilized by the traffic volumes.

The Essex-Windsor Regional Transportation Master Plan (EWRTMP), completed in October 2005 by IBI Group, associated v/c ratios with the following four level of service (LOS) categories:

- LOS A to C: v/c < 0.80
- LOS D: v/c from 0.80 to 0.89
- LOS E: v/c from 0.90 to 0.99
- LOS F: v/c >= 1.00

LOS A represents free-flow traffic conditions; LOS F represents a breakdown in vehicular flow (volumes exceeding capacity). The EWRTMP identified that roadways operating at

LOS E or F would be candidates for measures to optimize existing capacity, add additional capacity, reduce demand and/or improve operations.

For analysis purposes, the corridor was subdivided into five sections corresponding to the key intersections:

- Kratz Sideroad to Graham Sideroad;
- Graham Sideroad to Union Avenue (County Road 45);
- Union Avenue (County Road 45) to Albuna Townline (County Road 31);
- Albuna Townline (County Road 31) to Fraser Road; and
- Fraser Road to Sherk Street.

The weekday PM peak hour was analyzed since it experiences heavier two-way traffic than the AM peak hour. The resulting existing corridor operations are summarized in **Tables 7** and **Table 8.** All sections of County Road 20 within the study area are operating within the roadway's planning-level capacity during the weekday PM peak hour and operate at LOS C or better. Existing corridor analysis summary sheets are included in Appendix B to the County Road 20 Transportation Assessment Report (found in **Appendix B** of this ESR).

Table 7: Existing Corridor v/c Ratios (Factored Counts), Weekday PM Peak Hour

Road Section	West Bound	East Bound
Kratz Sideroad to Graham Sideroad	0.64	0.53
Graham Sideroad to Union Avenue (CR 45)	0.58	0.43
Union Avenue (CR 45) to Albuna Townline (CR 31)	0.58	0.46
Albuna Townline (CR 31) to Fraser Road	0.57	0.50
Fraser Road to Sherk Street	0.65	0.65

In comparison, **Table 8** summarizes the existing corridor operations for a typical weekday PM peak hour when the June 2016 turning movement counts are used to analyze the corridor.

Table 8: Existing Corridor v/c Ratios (June Counts), Weekday PM Peak Hour

Road Section	West Bound	East Bound
Kratz Sideroad to Graham Sideroad	0.60	0.54
Graham Sideroad to Union Avenue (CR 45)	0.50	0.42
Union Avenue (CR 45) to Albuna Townline (CR 31)	0.49	0.46
Albuna Townline (CR 31) to Fraser Road	0.54	0.57
Fraser Road to Sherk Street	0.66	0.71

The operations are only marginally different with the use of the June count data. All sections of County Road 20 within the study area are operating within the roadway's planning-level capacity during the weekday PM peak hour.

3.1.5.3 Intersection Operations

Table 9 summarizes the existing (2016) weekday AM and PM peak hour traffic operations at the signalized intersections in the study area. **Table 10** summarizes the existing weekday AM and PM peak hour traffic operations at the un-signalized intersections in the study area. Under existing conditions, all movements are operating well below capacity. Capacity analysis worksheets are included in Appendix C of the County Road 20 Transportation Assessment Report, included in **Appendix B** of this ESR

Table 9: Existing 2016 Weekday Peak Hour Intersection Operations, Signalized

County Road 45 (Union Avenue) and County Road 20

Movement	Week day AM Peak Hour v/c	Week day A Peak Hour Delay (s/veh)	Weekday AM Peak Hour LOS	Week day AM Peak Hour 95 %ile Queue (m)	Week day PM Peak Hour v/c	Week day PM Peak Hour Delay (s/veh)	Week day PM Peak Hour LOS	Week day PM Peak Hour 95th %ile Queue (m)
Overall	0.32	9.9	A	N/A	0.49	11.8	B	N/A
Eastbound Left	0.17	5.0	A	13	0.22	6.7	A	8
Eastbound Through-Right	0.31	5.5	A	50	0.29	5.5	A	46
Westbound Left*	N/A	N/A	N/A	N/A	0.01	9.8	A	2
Westbound Through-Right	0.27	9.8	A	49	0.52	12.4	B	117
Northbound Left*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Northbound Through-Right	0.01	33.7	C	3	0.02	27.0	C	4
Southbound Left	0.30	29.3	C	21	0.34	28.8	C	23
Southbound Through-Right	0.13	10.1	B	9	0.31	8.9	A	12

County Road 31 (Albuna Townline) and County Road 20

Movement	Weekday Peak Hour Delay (v/c)	Weekday AM Peak Hour Delay (s/veh)	Weekday AM Peak Hour LOS	Weekday AM peak Hour 95 %tile Queue (m)	Weekday PM Peak Hour v/c	Weekday PM Peak Hour Delay (s/veh)	Weekday PM Peak Hour LOS	Weekday PM Peak Hour 95th %ile Queue (m)
Overall	0.38	6.9	A	N/A	0.48	8.7	A	N/A
Eastbound Left-Through-Right	0.39	5.8	A	39	0.46	8.0	A	50
Westbound Left-Through-Right	0.23	4.1	A	21	0.51	8.1	A	61
Northbound Left-Through-Right	0.09	11.5	B	6	0.04	11.7	B	4
Southbound Through-Left	0.18	17.1	B	10	0.34	18.8	B	18
Southbound Right	0.12	7.0	A	5	0.25	5.2	A	9

Sherk Street and County Road 20

Movement	Week day AM Peak Hour v/c	Week day AM Peak Hour Delay (s/veh)	Week day AM Peak Hour LOS	Week day AM Peak Hour 05th %tile Queue (m)	Week day PM Peak Hour v/c	Week day PM Peak Hour Delay (s/veh)	Week day PM Peak Hour LOS	Week day PM Peak Hour 95 %tie Queue (m)
Overall	0.31	8.3	A	N/A	0.53	11.3	B	N/A
Eastbound Left	0.22	4.3	A	10	0.38	6.9	A	13
Eastbound Through	0.20	4.0	A	18	0.34	5.5	A	39
Westbound Through-Right	0.34	9.6	A	39	0.54	14.3	B	89
Southbound Left	0.27	25.1	C	19	0.42	26.5	C	30
Southbound Right	0.24	8.0	A	9	0.36	7.0	A	12

** No vehicles were observed making the WB left turn in the AM and the NB left turn in the AM and PM.*

Table 10: Existing 2016 Weekday Peak Hour Intersection Operations, Un-signalized

Kratz Sideroad and County Road 20

Movement	Week day AM Peak Hour v/c	Week day AM Peak Hour Delay (s/veh)	Week day AM Peak Hour LOS	Week day AM Peak Hour 05th %ile Queue (m)	Week day PM Peak Hour v/c	Week day PM Peak Hour Delay (s/veh)	Week day PM Peak Hour LOS	Week day Peak Hour 05 %ile Queue (m)
Eastbound Left	0.04	8.4	A	1	0.03	9.2	A	1
Southbound Left-Right	0.11	16.5	C	3	0.23	6.6	C	7

Graham Sideroad and County Road 20

Movement	Week day AM Peak Hour v/c	Week day AM Peak Hour Delay (s/veh)	Week day AM Peak Hour LOS	Week day AM Peak Hour 05th %ile Queue (m)	Week day PM Peak Hour v/c	Week day PM Peak Hour Delay (s/veh)	Week day PM Peak Hour LOS	Week day Peak Hour 05 %ile Queue (m)
Northbound Movement	0.06	19.1	C	1	003	24.7	C	1
Southbound Movement	0.15	16.1	C	4	0.45	28.9	D	16

Fraser Road and County Road 20

Movement	Week day AM Peak Hour v/c	Week day AM Peak Hour Delay (s/veh)	Week day AM Peak Hour LOS	Week day AM Peak Hour 05th %ile Queue (m)	Week day PM Peak Hour v/c	Week day PM Peak Hour Delay (s/veh)	Week day PM Peak Hour LOS	Week day Peak Hour 05 %ile Queue (m)
Southbound Left-Right	0.18	14.4	B	5	0.50	25.4	D	20

3.1.6 Active Transportation Facilities LOS

The County of Essex has developed a comprehensive Active Transportation Master Plan (CWATS) to guide the County and local area Municipalities in implementing a County-wide network of cycling and pedestrian facilities. County Road 20 forms part of that County-wide network. Active transportation facilities along this section of County Road 20 are intended to accommodate both commuter and recreational cyclists.

An asphalt multi-use path located behind the barrier curb for pedestrians and cyclists is in place on the south side of County Road 20, east of Kratz Sideroad in the Town of Kingsville. The path extends approximately 140 m east from Kratz Sideroad behind the south side barrier curb. Once the curb terminates, a paved shoulder, which can be considered an extension of the multi-use path, extends an additional 125 m to Woodbridge Lane. In 2017, per CWATS recommendations, a 1.4 kilometre context-sensitive behind the curb raised cycle track for pedestrians and cyclists was constructed from Albuna Townline (CR 31) to Whitewood Road.

As there is no universal A/T LOS definition, in an effort to quantify how the current active transportation facilities are performing, and to provide a benchmark to compare future A/T facilities, **Table 11** was developed for this project. It outlines the level of service categories that are associated with varying levels of active transportation infrastructure. The current A/T LOS through the corridor varies by roadway section and ranges from a LOS of F to D. Based on these categories, once the interim A/T facility is implemented throughout the corridor, the LOS will generally have a LOS of D.

Table 11: A/T Level of Service Categories

Level of Service	Segment	Intersection
A	Separated cycling facilities (e.g cycle tracks, multi-use path)	Separated facilities. Bicycle box or clearly delineated bicycle treatment
B	≥1.8 m dedicated cycling facilities (e.g. paved shoulders with buffer). ≤1.5 m cycle path with buffer. ≤1.5 m sidewalk or separated facility with buffer.	Controlled intersection for cyclists and pedestrians. Bicycle box, clearly delineated bicycle treatment.
C	1.8 m dedicated cycling facilities with no buffer, 1.5 m cycle path/bicycle lane with buffer. ≥1.5 m sidewalk with buffer.	Bicycle box, clearly delineated bicycle treatment. Pedestrian signal head with sufficient pedestrian clearance time.
D	≤1.5 bicycle lane/paved shoulder with no buffer. ≤1.5 m cycle path with buffer (shared with pedestrians).	Bicycle box or clearly delineated bicycle treatment. Pedestrian signal head with sufficient pedestrian clearance time.
E	Shared facilities (e.g. signed routes, sharrows or paved shoulder with minimum 1.2 m in constrained area).	Shared facilities (e.g. signed routes, sharrows or paved shoulder with minimum 1.2 m in constrained area). No clearly delineated bicycle treatment.
F	No bicycle provision. No pedestrian provision	No bicycle provision. No pedestrian provision.

3.1.7 Transit Operation

Currently, there is no public transit service within the study area. The Municipality of Leamington provides transit service which operates on roadways to the north and east of the study area. If public transit service is extended into the study area in the future, coordination will be required with the County to review the proposed routes and locations of any bus stops.

3.1.8 Student Transportation Services

Windsor Essex Student Transportation Services (WESTS) runs school buses along County Road 20 and provided to the project team the location of existing school bus stops. It was noted that stop locations can change from year to year depending on student residence location. Discussions have been held with WESTS regarding the accommodation of school buses and school bus stops in this study. Their comments are further documented in **Section 7.1** of this ESR.

3.1.9 Pedestrian Crossing

At the time of the writing of this ESR, there are no pedestrian bridges or structures crossing over CR 20, all road intersections are at grade. Signalized intersections allow for pedestrian crossings, although there are no roadway markings/painted crossing areas. The intersections do not meet MTO Book 18 or AODA standards. There are no mid-block pedestrian crossing facilities. The CWATS improvements that are being implemented will include improved pedestrian crossing facilities at intersections (e.g. roadway markings, curb cuts).

3.1.10 Utilities

Based on consultation with utility providers, there are several confirmed utilities within the study area. **Figures 10 and 11** conceptually illustrate the location of utilities in the study area. Detailed information on utilities, including the location of services, is provided in the Roads and Utilities Report (see **Appendix E**):

- Watermains are located along the entire length of the corridor and range in diameter from 150 mm to 300 mm. Watermains are located on the north side of the road from Kratz Sideroad to Union Avenue, on the south side from Union Ave to east of Oakwood Drive, and on the north side from east of Oakwood to Sherk Street. The watermain(s) along the entire corridor is owned by Union Water Supply System but is operated by the respective Municipalities.
- Small sections of sanitary sewer are located at the eastern and western limits of the study area near the developed areas of Kingsville and Leamington.
- Hydro One is the electrical service provider from Kratz Sideroad to Fraser Road. Essex Power Corporation is the service provider from Fraser Road to Sherk Street. Electrical main lines are aerial on poles (owned by Bell Canada) and travel the length

of the corridor. In general, the mainline poles are on the north side of the road from Kratz Sideroad to Union Avenue, and on the south side of the road from Union Avenue to Sherk Street. Service lines cross CR 20 overhead at most hydro poles to provide connections to individual properties.

- Bell Canada (telephone) and Cogeco Connexion (cable television) cables are located along the entire length of the corridor aerially. Bell Canada is the owner of the majority of the mainline poles along the corridor. Some service cables cross the road aerially, whereas some service cables travel down hydro poles and are directed underground to provide individual lot service connections.

Natural gas service is provided by Union Gas Ltd. – Spectra Energy. Main lines are located along the length of the entire corridor. Service lines to individual properties connect to the main along its length.

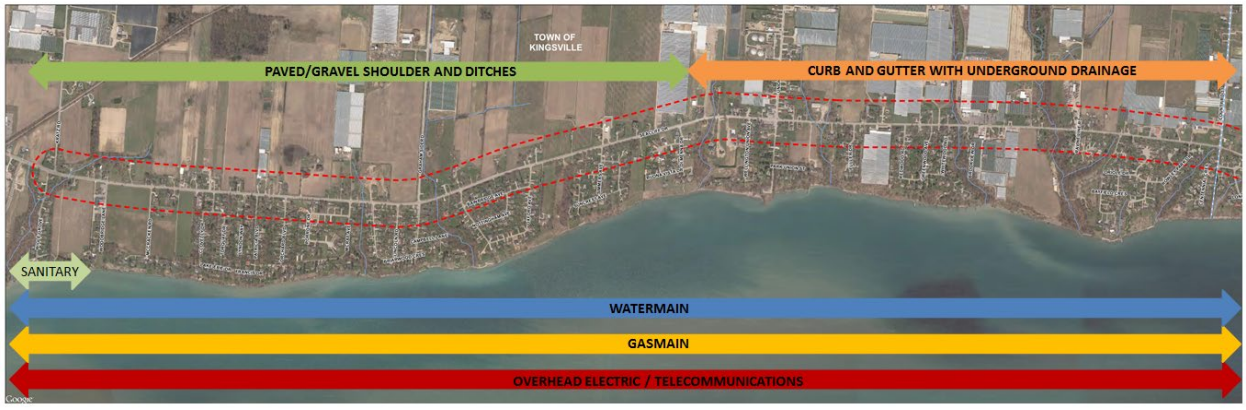


Figure 10: Utilities in the Town of Kingsville

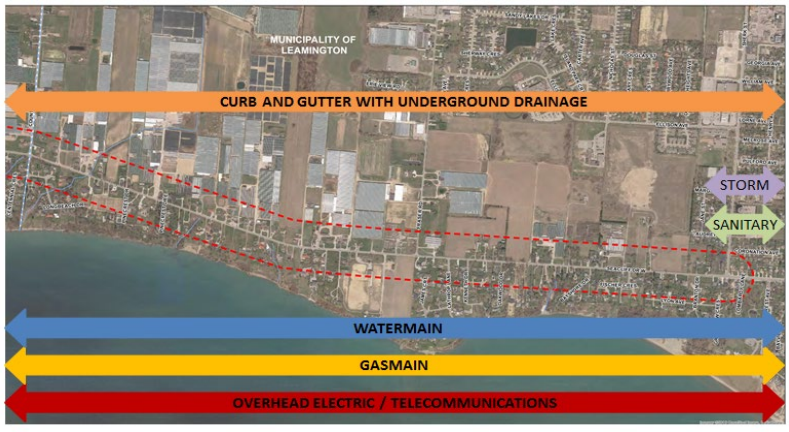


Figure 11: Utilities in the Municipality of Leamington

A summary of utility providers is included in **Table 12**. Utility providers have been consulted with throughout the study.

Table 12: Summary of Service Providers

Utility	Municipality	Utility Operating Authority
Watermain	Kingsville	Union Water Supply
Watermain	Leamington	Union Water Supply
Sanitary Sewer	Kingsville	Town of Kingsville
Sanitary Sewer	Leamington	Municipality of Leamington
Storm Sewer	Kingsville	Town of Kingsville
Storm Sewer	Leamington	Municipality of Leamington
Hydro Electric	Kingsville/Leamington (Kratz Sideroad to Fraser Road)	Hydro One
Hydro Electric	Leamington (Fraser Road to Sherk Street)	Essex Power Corporation
Telephone	Kingsville/Leamington	Bell Canada
Cable Television	Kingsville/Leamington	Cogeco Connexion
Natural Gas	Kingsville/Leamington	Union Gas (Spectre

3.2 Drainage and Stormwater Management Conditions

Drainage along County Road 20 is accomplished through a combination of roadside swales, storm sewers and road crossing culverts. County Road 20 is in close proximity to the shore of Lake Erie, the ultimate outlet for all the drains within the corridor and surrounding lands. The distance from the road to the lake varies between approximately 200 m to 500 m downstream of the road.

Due to the length of the corridor and the proximity to Lake Erie, there are numerous drains within the study area including 13 Municipal drains, 9 natural watercourses and 1 Municipal drain that is outside of the right-of-way. The overall tributary area north of and including the County Road 20 area totals approximately 1,922 ha. The Drainage

Report in **Appendix F** provides a description of each drain in the study area including: name, location, designation, drainage area served, bridge/culvert sizing, etc.

As noted, the overall tributary area north of, and including, the County Road 20 corridor totals approximately 1,922 Ha. Approximately 1,656 Ha of which are in Kingsville, and 266 Ha are in Leamington. The areas of the existing County Road 20 right-of-way within Kingsville are approximately 16.0 Ha, and 5.5 Ha in Leamington. Thus, the relative area of the County Road 20 corridor represents approximately 1.1% of the overall watershed.

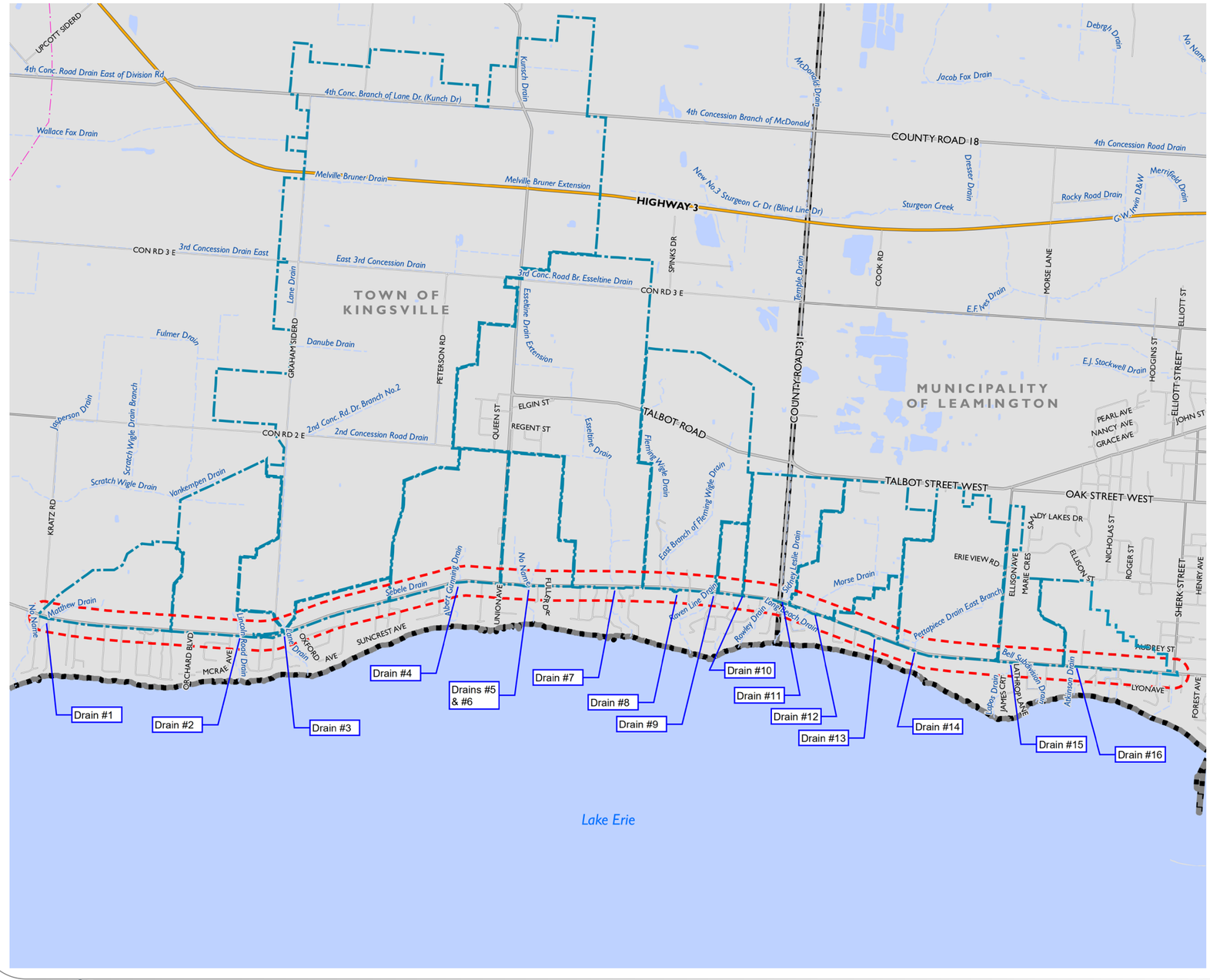
The upstream catchment areas for the major crossings were delineated using Municipal drainage reports and public topographic mapping data. **Figure 12** illustrates the drains/drainage areas in the study area. The catchments are primarily used for agricultural production, with some rural residential and forested lands. Approximately 25 percent of the drainage area is used for greenhouse crop production; which provides a relatively high impervious coverage for agricultural lands.

Based on the soil survey of Essex County (Richards et al, 1949) and the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA) soil mapping data, the drainage areas of concern are composed of multiple soil types which include hydrologic soil group (HSG) A, B, C and D classifications. The upstream drainage area for the 16 structures is composed of approximately 50% HSG Type A soils, 40% HSG Type C soils, 10% HSG Type B soils and less than 1% HSG Type D soils.

Also included in **Appendix F** are the results of the hydrologic and hydraulic assessments of the crossing structures. While full condition assessments of the culverts were not completed as a part of this study, there were no observable immediate improvements noted. As the proposed corridor improvements include an increase in the amount of impervious land, pre-condition and post-construction (preferred EA alternative full buildout) capacity assessments of the culvert crossings were completed as a part of the study and are documented in **Section 7.5.**

Due to the age of the existing roadway infrastructure, there is no stormwater quality infrastructure presently in place along the corridor. The areas with a rural road section (Kratz Sideroad to west of County Road 45) includes roadside ditches, which provide some level of water quality management. The roadside ditches act as bioswales that settle out a portion of any suspended solids and pollutants

Figure 12: Drains/Drainage Areas in the Study Area



COUNTY OF ESSEX
ROAD 20 EA

EXISTING STORM DRAINAGE AREAS
FIGURE 12

- Study Area
- Storm Drainage Area
- Hydro Line
- Constructed Drain
- Lower Tier Municipality
- Water Body

1:30,000
0 0.5 1 2 km

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: DB
MAP PROJECTION: NAD 1983 UTM Zone 17N

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PROJECT: 152971
STATUS: FINAL
DATE: 2017-12-15

DILLON CONSULTING

3.2.1 Drainage and Road Crossings

There are sixteen (16) “major” road storm sewer crossings of County Road 20 varying in size, shape (circular or box), material and capacity. Lake Erie is the ultimate outlet for all the drains within the corridor. The distance from the road to the lake varies between approximately 200 m to 500 m downstream of the road.

Table 13 provides a listing of bridge and culvert crossings of County Road 20 in both the Town of Kingsville and Leamington. The structures have been given projects specific ID numbers (001 to 016), and are listed in order from the west end of the project at Kratz Sideroad to the east end of the project at Sherk Street. The approximate stationing provided for the crossing is the stationing of the drainage structure as it passes the centerline, based on available MTO stationing for the corridor.

Table 13: Inventory of Bridges and Culverts

ID	Crossing	Location	Designation	Bridge/Culvert	Construction Year	Type
001	Mathew Drain	0.08 km E of Kratz Sideroad (MTO Station 19+110.52)	Municipal Drain	Culvert	2011	900 mm RCP
002	Natural Watercourse	0.29 km W of Graham Sideroad (MTO Station 20+634.8)	Natural Watercourse	Culvert	Unknown	1800 mm RCP
003	Lane Drain	0.09 km E of Graham Sideroad (MTO Station 21+017.7)	Municipal Drain	Bridge and Culvert	1970	3600 x 1800 mm Concrete Rigid Frame
004	Sunny Brook Drain	0.32 km W of Union Avenue (MTO Station 22+514.20)	Natural Watercourse	Culvert	Unknown	1200 mm CSP
005	Natural Watecourse	0.16 km E of Union Avenue (MTO Station 23+038.40)	Natural Watercourse	Culvert	Unknown	900 mm CSP with 900 mm RCP extension

ID	Crossing	Location	Designation	Bridge/Culvert	Construction Year	Type
007	Esseltine Drain	0.94 km E of Union Avenue (MTO Station 23+785.25)	Municipal Drain	Bridge and Culvert	Unknown	3600 x 2400 mm Concrete Rigid Frame
008	Fleming Wigle Drain	1.45 km E of Union Avenue (MTO Station 24+287.91)	Municipal Drain	Culvert	Unknown	1500 mm CSP
009	Sunrise Drain	1.78 km E of Union Avenue (MTO Station 24+619.31)	Municipal Drain	Culvert	1993	600 mm CSP
010	Aurelia and St. Luke Creek Drain	2.00 km E of Union Avenue (MTO Station 24+830.03)	Municipal Drain	Culvert	Unknown	450 mm RCP
011	Rowley Drain	0.03 km W of Albuna Townline (MTO Station 25+118.79)	Natural Watercourse	Culvert	Unknown	2400 x 1200 mm Concrete Rigid Frame
012	Judson Morse Drain	0.28 km E of Albuna Townline (MTO Sta. 10+195.94)	Municipal Drain	Culvert	1992	1600 mm CSP
013	Natural Watercourse/ Gorrell Drain	1.0 km W of Fraser Road (MTO Sta. 10+770.0)	Natural Watercourse	Culvert	UNK	850 mm CSP

ID	Crossing	Location	Designation	Bridge/Culvert	Construction Year	Type
014	Pettapiece Drain	1.22 km E of Albuna Townline (MTO Sta. 11+137.13)	Municipal Drain	Culvert	1976	1200 mm RCP
015	Lapos Drain	0.10 km E of Fraser Road (MTO Sta. 11+888.82)	Municipal Drain	Culvert	UNK	900 mm RCP
016	Atkinson-Lockery Drain	0.65 km E of Fraser Road (MTO Sta. 12+439.23)	Natural Watercourse	Culvert	UNK	750 mm RCP

3.3 Socio-Economic Environment

The description of baseline socio-economic conditions completed for the study area included a review of Official Plans (Essex County, the Town of Kingsville and the Municipality of Leamington), data collected through site reconnaissance activities, background reviews and input received through consultation efforts. The study area that was used for the characterization of surrounding land use and socio-economic environment includes the County Road 20 right-of-way as well as lands within the approximate 500 m corridor.

The socio-economic environment section provides baseline information on the following features:

- Existing Land Use and Planning Policies;
- Population and Demographics;
- Economic Activities, Employment and Labour Force;
- Tourism and Recreation;
- Indigenous Communities; and
- Community Services.

Information on each feature is provided in the following sections. More detailed information on existing socio-economic conditions is provided in the Land Use and Socio-Economic Existing Environment Report, included in **Appendix C**.

3.3.1 Existing Land Use and Planning Policies

The County of Essex is an upper tier Municipality that includes the lower tier governments of the Municipality of Leamington and the Town of Kingsville. Approximately two-thirds of the study area is located in Kingsville, with the remaining portion within Leamington. County Road 31 (Albuna Townline) forms the boundary between Kingsville and Leamington. Existing land use is described below from west to east; however, the area generally consists of a mix of agricultural fields, greenhouses, and residential subdivisions, as well as independently operated farm markets and garden centres, churches, convenience stores and gas stations which are present along the County Road 20 corridor. Primarily Class 2 agricultural soils are found throughout the study area.

3.3.1.1 Town of Kingsville Land Use

A description of existing land use in the Town of Kingsville (from west to east) is included below. For a description of natural features (e.g. wooded areas) please refer to **Section 3.5.2**. **Figure 13** illustrates land use in the Kingsville section of the study area.

Kratz Sideroad to Graham Sideroad

On the north side of County Road 20, between Kratz Sideroad and Graham Sideroad, land use is primarily agricultural farms and greenhouses. There are also some rural residences and farmhouses that front County Road 20 in this area. The Chrysler Greenway is also located along the north side approximately 365 m to the north of Country Road 20. The south side includes a few large open agricultural fields and a low-rise residential subdivision that continues to Lake Erie.

Graham Sideroad to County Road 45 (Union Avenue)

Between Graham Sideroad and County Road 45, the north side of County Road 20 is primarily agricultural farms and greenhouses with some rural residences and farmhouses that front County Road 20. The south side includes low-rise residential subdivisions that continue to Lake Erie.

County Road 45 (Union Avenue) to County Road 31 (Albuna Townline)

Between County Road 45 and County Road 31, predominate land use on the north side of County Road 20 is agricultural fields with a high concentration of greenhouses. There are also some rural residences in this area. The south side of County Road 20 consists primarily of low-rise residential subdivisions with two large greenhouse operations, a few wooded areas and a couple large open agricultural fields.

3.3.1.2 Municipality of Leamington Land Use

A description of existing land use in the Municipality of Leamington (from west to east) is included below. **Figure 14** illustrates land use in the Leamington section of the study area.

County Road 31 (Albuna Townline) to Fraser Road

Between County Road 31 and Fraser Road, the north side of County Road 20 consists primarily of greenhouses with some large open agricultural fields. Rural residences are located on the south side of County Road 20 that back onto Lake Erie.

Fraser Road and Sherk Street

Between Fraser Road and Sherk Street, the north side consists primarily of open agricultural fields with four greenhouse operations. A few rural residences are also located in this area that front County Road 20. The Queen of Peace Catholic School is also located on the north side approximately 550 m north of County Road 20. The south side of County Road 20 consists primarily of low-rise residential subdivisions that continue to Lake Erie.

3.3.1.3 Development Applications

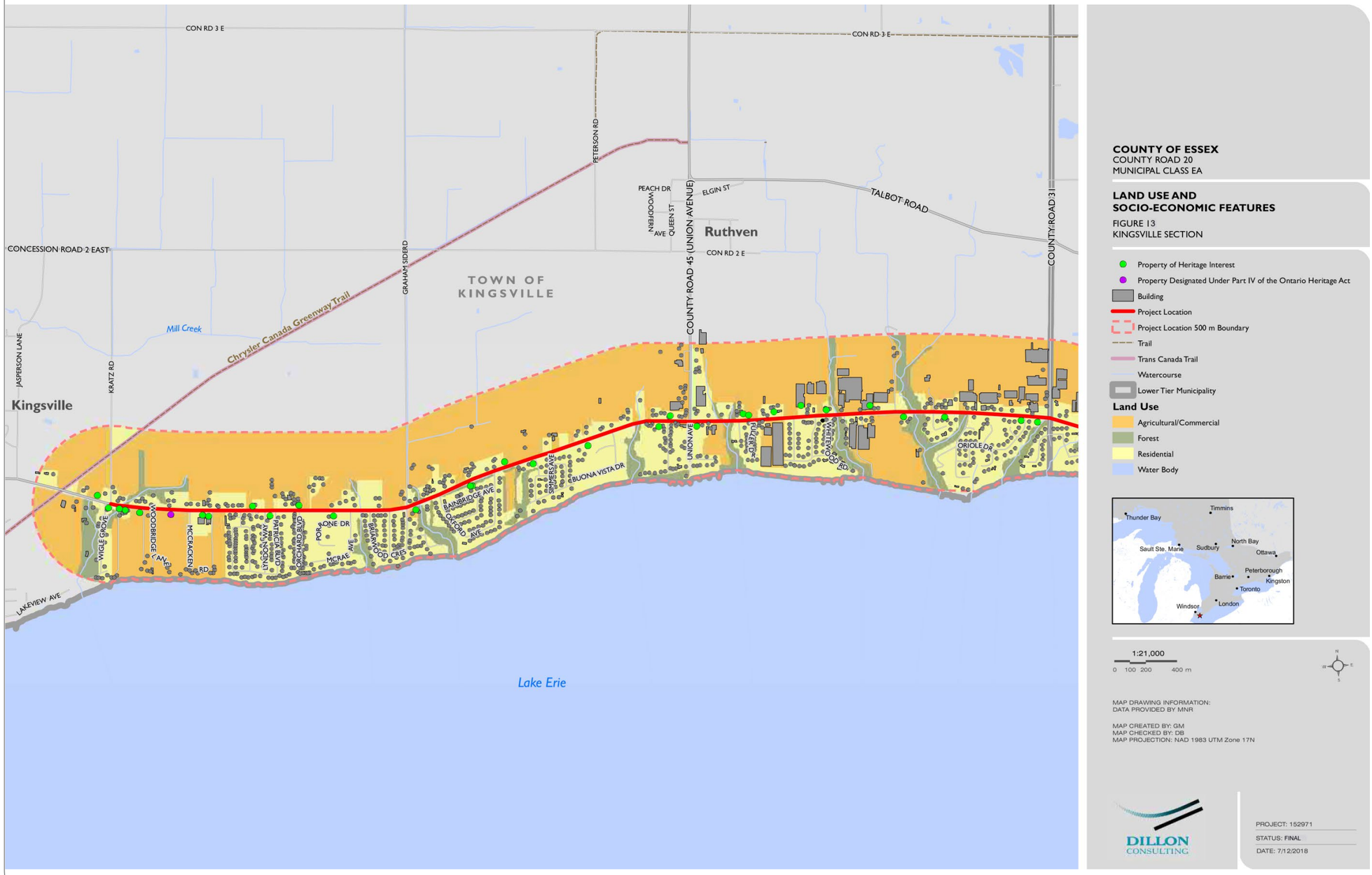
Based on requests made to the local municipalities during the course of the study, only two development applications were identified in the corridor as outlined below:

- A greenhouse expansion plan is approved for the north side of County Road 20, between Kratz Sideroad and Graham Sideroad. This information was provided by the Town of Kingsville's Director of Municipal Services in February 2016.
- The Municipality of Leamington has identified a proposed low density residential development (14 single-unit dwellings) on the south side of County Road 20, in the vicinity of 268 Seacliff Drive West, in Leamington. The location is shown on **Figure 14**.

As well it is noted that there are some undeveloped lands used for agriculture but designated for residential development on the south side of County Road 20, but there are no active applications on file for these lands.

It is recommended that prior to implementation of the project, including detailed design, that future development activities in the corridor be confirmed.

Figure 13: Kingsville Land Use



COUNTY OF ESSEX
COUNTY ROAD 20
MUNICIPAL CLASS EA

LAND USE AND SOCIO-ECONOMIC FEATURES
FIGURE 13
KINGSVILLE SECTION

- Property of Heritage Interest
- Property Designated Under Part IV of the Ontario Heritage Act
- Building
- Project Location
- Project Location 500 m Boundary
- Trail
- Trans Canada Trail
- Watercourse
- Lower Tier Municipality

Land Use

- Agricultural/Commercial
- Forest
- Residential
- Water Body

1:21,000
0 100 200 400 m

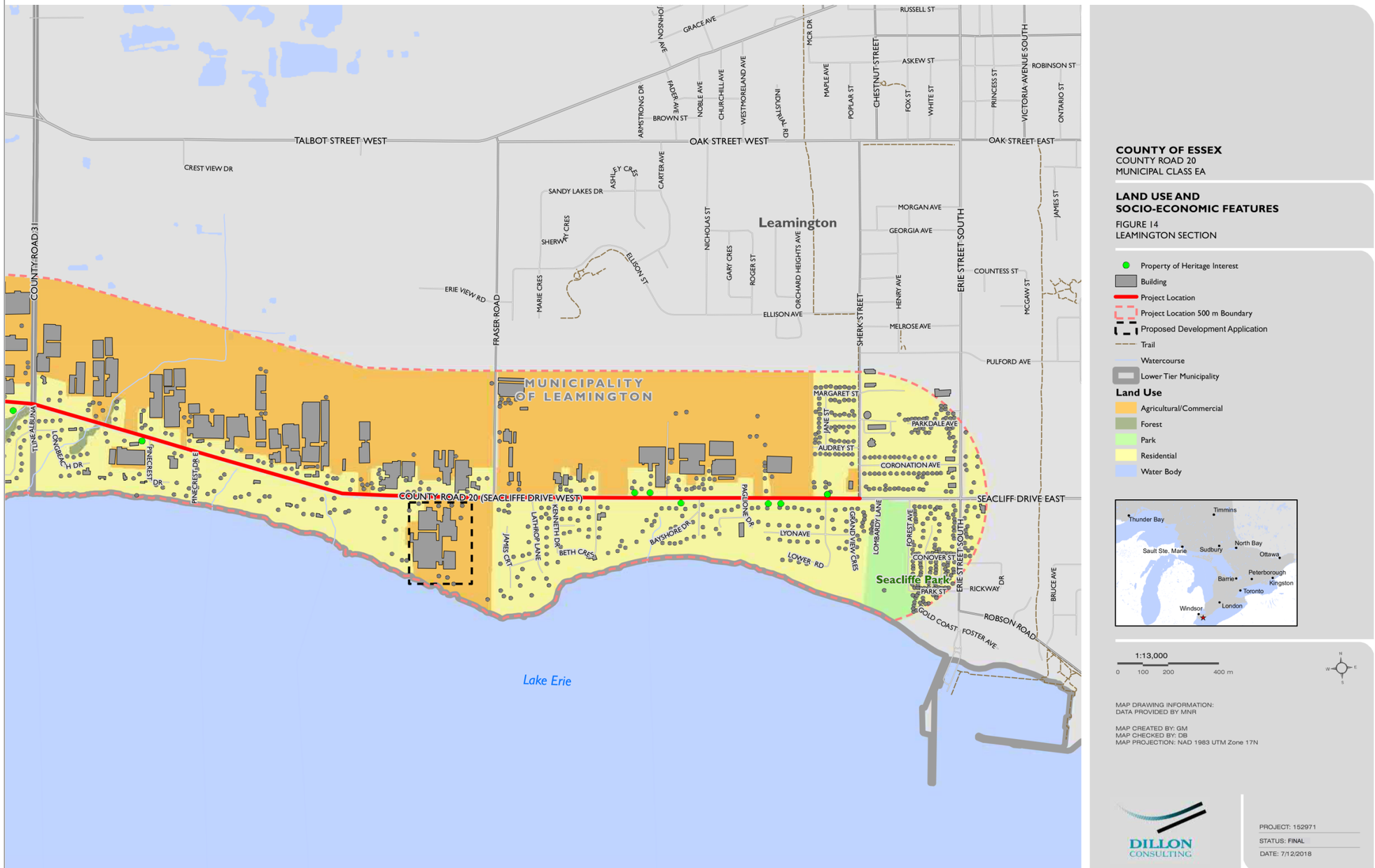
MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: DB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 152971
STATUS: FINAL
DATE: 7/12/2018

Figure 14: Leamington Land Use



COUNTY OF ESSEX
COUNTY ROAD 20
MUNICIPAL CLASS EA

LAND USE AND SOCIO-ECONOMIC FEATURES
FIGURE 14
LEAMINGTON SECTION

- Property of Heritage Interest
- Building
- Project Location
- Project Location 500 m Boundary
- Proposed Development Application
- Trail
- Watercourse
- Lower Tier Municipality

Land Use

- Agricultural/Commercial
- Forest
- Park
- Residential
- Water Body

1:13,000
0 100 200 400 m

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MAP CREATED BY: GM
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3.3.2 Population and Demographics

An understanding of the area's population and demographic composition provides an understanding of the local community. The main communities in the study area from west to east include Kingsville, Ruthven, Union and Leamington:

- According to Statistics Canada (2016), the County of Essex experienced a population increase of approximately 2.6 percent between 2011 (388,782 people) and 2016 (398,953 people). The average age of the population in the County of Essex is 41.4 years;
- The Municipality of Leamington experienced a population decrease of approximately 2.8 percent between 2011 and 2016 decreasing from 28,403 to 27,595 between 2011 and 2016. The average age in Leamington is 41.3 years;
- The population in the Town of Kingsville increased 0.9 percent from 2011 (21,362) to 2016 (21,552). The average age is 42.7 years in Kingsville (Statistics Canada, 2016); and
- There is a large population of migrant workers in the area who rely on walking and cycling as a primary mode of transportation to get to and from work, including along CR 20.

3.3.3 Economic Activities, Employment and Labour Force

The main economic sectors in the Windsor-Essex region include agri-business, information and communication technology, and manufacturing. Information on economic sectors in the Municipality of Leamington and the Town of Kingsville are provided below.

Municipality of Leamington

Agri-Business and the Greenhouse Industry

The area's rapidly growing greenhouse industry represents $1 billion in farm gate value. Over 60 percent of Ontario's greenhouses can be found in the Leamington/Kingsville area. The majority of crops grown are destined for markets in the United States. Principal crops include tomatoes, seedless cucumbers and peppers. Floriculture, including potted plants, bedding plants and roses is also an important part of Leamington's greenhouse economy (Windsor-Essex Economic Development, 2017).

Known as the "Tomato Capital of Canada," Leamington's fertile soils sustain a variety of agricultural crops for fresh markets and processing. A supportive business environment has influenced the establishment of numerous industries related to Leamington's fast growing and profitable agri-business and greenhouse sector (Windsor-Essex Economic Development, 2017).

Within the Municipality there are a number of greenhouses that are located largely along the north side of the roadway. Many of these greenhouse operations have access onto CR 20 and use it to transport their products to market. There are also a few actively cropped farm fields on the north side as well that extend to the northern edge of the corridor.

Employment/Labour Force

The total population aged 15 years and older in 2017 in the workforce was 23,727 individuals. The Municipality had a labour participation rate of 56.68 and an unemployment rate of 6.15 percent. The top three labour force by industry was Manufacturing; Agriculture, Forestry Fishing and Hunting; and, Retail Trade (Windsor-Essex Economic Development, 2017).

Town of Kingsville

Agri-Business and the Greenhouse Industry

The Town of Kingsville provides for gardening and outdoor activities, as well as an abundance of fresh farm produce from local farmers. The Town of Kingsville is primarily an agricultural community, and is the hub of a rapidly expanding greenhouse industry, producing tomatoes, cucumbers, peppers, flowers and potted plants. It also very recently became home to three estate wineries, producing a variety of wine from their local vineyards. In Kingsville there is also a substantial sand and gravel industry, as well as a commercial fishing industry (Windsor-Essex Economic Development, 2017).

Similar to Leamington, within the Town there are also several greenhouses that are located along the north side of the CR 20 corridor. There are more actively cropped farm fields on the north side that extend down to the northern edge of the corridor.

Employment/Labour Force

The total population aged 15 years and older in 2017 in the workforce was 19,036 individuals. The Municipality had a labour participation rate of 60.25 and an unemployment rate of 5.5 percent. The top three labour force by industry was Manufacturing; Retail Trade; and, Agriculture, Forestry Fishing and Hunting (Windsor-Essex Economic Development, 2017).

3.3.4 Tourism and Recreation

Tourism activities include increasingly popular agri-tourism operations and enjoyment of natural areas. Farmer's markets located along County Road 20 are likely frequented by a variety of individuals including visitors to the area.

3.3.4.1 Parks and Recreational Trail Areas

County Road 20 is part of and/or connected to several local trail systems. The following parks and recreational trail areas are located within or in close proximity to the study area. **Figure 15** illustrates existing trails in the local area as well as planned trails and pathways as per the CWATS and local Municipal Active Transportation Plans.

Great Lakes Waterfront Trail and Trans Canada Trail: The Trans Canada Trail is an 18,000 km community based recreational corridor that winds its way through every Province and Territory in Canada, linking 800 communities together along its route. The trail accommodates six preferred activities: walking, cycling, horseback riding, canoeing, cross country skiing and snowmobiling. The TransCanada Trail touches the study area at the northern boundary.

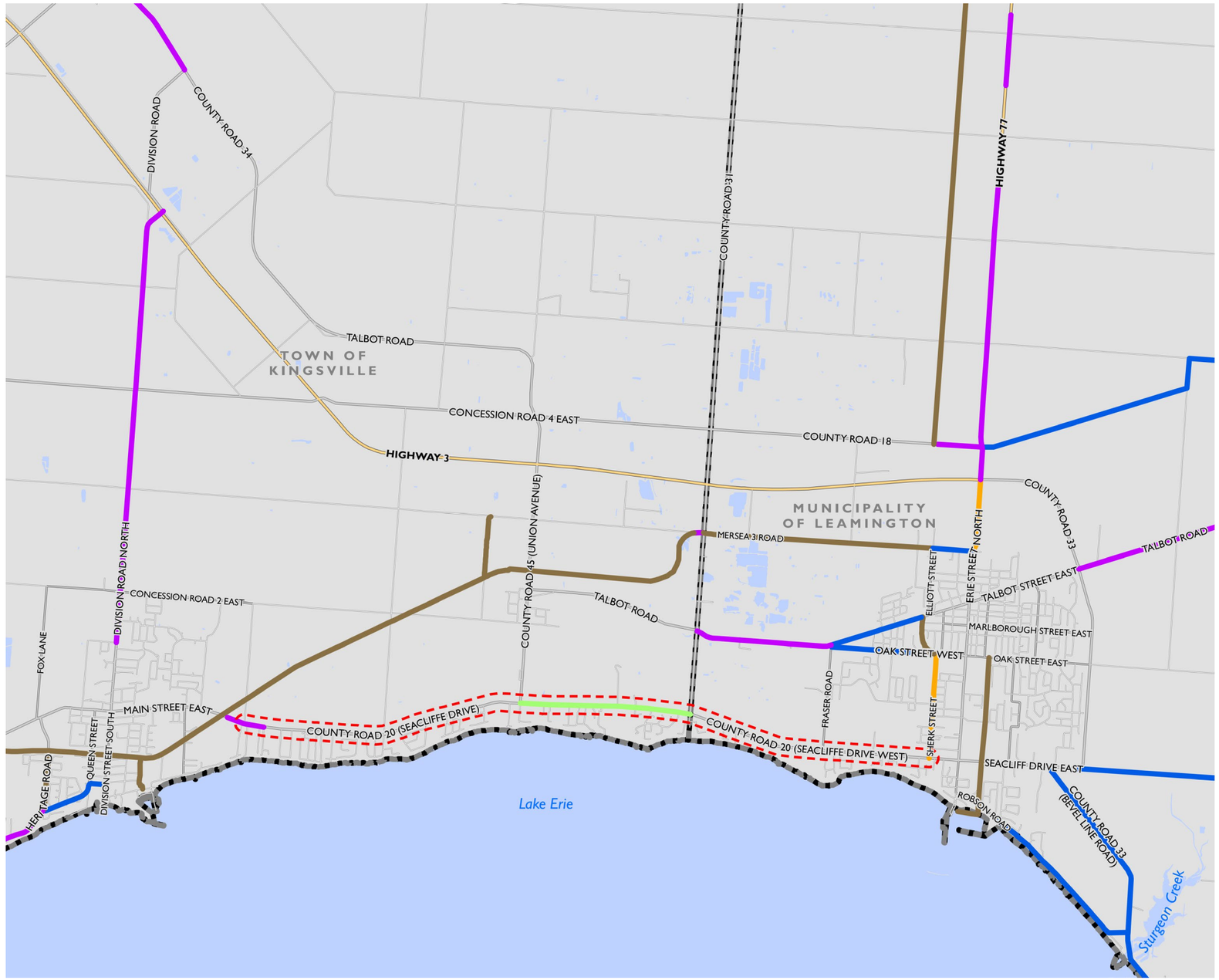
Between Leamington and Kingsville, the Waterfront Trail is primarily off-road and is not along the waterfront. There is an opportunity for provide a more direct on-road connection to this trail on CR 20.

Chrysler Canada Greenway: Located near the northwest end of the study area. The Greenway is an approximate 50 km long multi-use trail that is the southern-most section of the Trans Canada Trail. The corridor begins south of Oldcastle, and continues south through the Towns of McGregor and Harrow, and proceeds through Kingsville to Ruthven at Colasanti's Tropical Gardens. In the past several years, additional extensions have been added (ERCA, 2017).

Seacliff Park: Located within the study area approximately 250 m south of County Road 20 and Sherk Street. The park provides walking trails, parking, playground, splash pad and access to a sand beach along the waterfront of Lake Erie.

Point Pelee National Park: Located outside of the study area, the park is in Leamington, approximately 7 km south of County Road 20. It is noted due to its significance as a tourist destination. Point Pelee consists of a peninsula of land, mainly of marsh and woodland habitats, that tapers to a sharp point as it extends into Lake Erie. Point Pelee is the southernmost point of mainland Canada, and is located on a foundation of glacial sand, silt and gravel that bites into Lake Erie (Windsor-Essex Economic Development, 2017).

Figure 15: CWATS Routes and Connections



COUNTY OF ESSEX
COUNTY ROAD 20
MUNICIPAL CLASS EA

FIGURE 15
ACTIVE TRANSPORTATION SYSTEM

Project Location 120 m Boundary
Lower Tier Municipality

County Wide Active Transportation System

- Bike Lane
- CSS (1 or 2 Way Cycle Path)
- Multi Use Trail
- Paved Shoulder
- Signed Route

LOCAL A/T PLANNED TRAILS/PATHS TO BE ADDED
- WAITING ON DIGITAL FILES FROM MUNICIPALITY

1:50,000
0 0.5 1 2 km

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: DB
MAP PROJECTION: NAD 1983 UTM Zone 17N

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PROJECT: 152971
STATUS: FINAL
DATE: 7/12/2018

Pelee Island: Pelee Island is located in Lake Erie and is a popular tourist destination. A ferry service is provided by the Pelee Island Transportation Service to access the island. The ferry sails from April to December and has terminals in Kingsville and Leamington that are proximate to County Road 20.

3.3.5 Community Services

Due to the length of the corridor and the connection that it provides between the communities of Kingsville and Leamington, the type and scale of community services that are within or close to the study area varies widely. Community facilities include local community centres, churches, schools, employment centres, parks, marinas, trails and active transportation facilities, libraries and cemeteries. Although the list below is not exhaustive, the following are some of the community facilities that are located in the vicinity of the County Road 20 corridor.

Community Centres

- Leamington Kinsmen Recreation Complex (Sherk Street north of Seacliff Drive West/County Road 20);
- The Bridge Youth Resource Centre (Sherk Street north of Seacliff Drive West/County Road 20); and
- Kinsmen Baseball Diamonds (Seacliff Drive West/County Road 20 east of Erie Street).

Churches

- Faith Reformed Church (County Road 20 and Graham Sideroad);
- St. Paul's Lutheran Church (Seacliff Drive West/County Road 20 and Sherk Street);
- Church of Jesus Christ of Latter-Day Saints (Fraser Road north of County Road 20);
- Faith Mennonite Church (Sherk Street north of Seacliff Drive West/County Road 20);
- Church of the Lord Jesus Christ – United Pentecostal Church (Erie Street north of Seacliff Drive West/County Road 20); and
- Kingdom Hall of Jehovah's Witnesses (County Road 45/Union Ave north of County Road 20).

Schools

- Margaret D. Bennie Public School (Sherk Street north of Seacliff Drive West/County Road 20); and
- Kingsville District High School (Main Street East west of Kratz Sideroad).

School Busses

Existing school bus stops, as provided by the Windsor Essex Student Transportation Services (WESTS) are shown on **Figure 16** below (red dots). Note that school bus stop locations are subject to change depending on student needs. Based on consultation with WESTS, at the time of this report there are 67 bus stops within the study area corridor with approximately 70% of students coming from the south side of the corridor. Bus stops are generally less than 200m apart, although stops in rural areas are fluid and are based on where students reside. Each dot on **Figure 16** may represent multiple bus stops for both AM and PM since there are 9 schools serviced in the larger area. School busses are active in the County Road 20 corridor from 7-9 a.m. and 2-4 p.m. Some stakeholders did indicate that school bus activity along CR 20 can contribute to traffic delays.

Parks and Marinas

- Seacliff Park (Seacliff Drive West/County Road 20 east of Sherk Street).

Cemetery

- Erie Memorial Gardens Cemetery (Erie Street north of Seacliff Drive East/County Road 20).

3.3.6 Indigenous Communities

A review of the Aboriginal and Treaty Rights Information System (ATRIS) revealed no Indigenous reserves located within, or near, the study area. The closest reserve lands are approximately 50 km north of the study area and belong to the Walpole Island First Nation (Bkejwanong). The closest Métis community is the Region 9 Windsor-Essex Métis Council.

Based on the above, consultation was undertaken with the following communities:

- Caldwell First Nation;

- Walpole Island First Nation/Bkejwanong Territory;
- Oneida Nation of the Thames;
- Métis Nation of Ontario; and
- First Nations Secretariat for Southwestern Ontario.

Indigenous Communities that were on the list developed using the ATRIS system were sent project notices (Notice of Study Commencement, Notice of Public Information Centre 1 and Notice of Public Information Centre 2). Oneida Nation of the Thames was provided with a project update letter following Public Information Centre 2. Follow-up phone calls were made to communities within two weeks of project related mailings. At the request of Caldwell First Nation and Walpole Island First Nation, copies of the display boards used at Public Information Centre 2 were provided to share with the Chief and Council. **Appendix A** provides additional information related to correspondence with Indigenous Communities. No input from Indigenous Communities has been received to date.

Figure 16: School Bus Stop Locations

Images Courtesy of Windsor Essex Student Transportation Services (Nov. 2016)

3.4 Physical Environment

The physical environment section provides baseline information on the following features:

- Physiography;
- Bedrock and Soils; and
- Groundwater.

3.4.1 Physiography

The topography of southern Ontario is primarily the result of glacial and post-glacial action. Within Essex County, a clay plain was created through the settling of sediment of the former glacial Lake Whittlesey and Lake Warren. The Essex Clay Plain is situated between Lake Erie and Lake St. Clair and consists of a till plain overlying the bedrock.

The County Road 20 EA study area is within a sand plain of the Essex Clay Plain that stretches along the Lake Erie shoreline from Kingsville to Point Pelee and also to the northeast across Leamington. Within the sand plain are a series of glacial beach ridges; County Road 20 follows one short beach ridge between Fraser Road and Sherk Street in Leamington, the eastern 1.4 km of the study area (Fisher, 2017 as in Chapman and Putnam, 2007).

Also of note, just west of the Municipality of Leamington is the Leamington Moraine,] which stands about 100 feet above the surrounding lake plain. The shoulders and sides of the moraine consists of gravel which were the beaches of the former glacial Lakes Whittlesey and Warren" (Fisher, 2017 as in Chapman & Putnam 1984).

3.4.2 Bedrock and Soils

The bedrock in this region is Middle Devonian in age, more specifically belonging to the Detroit River Group, with Lucas formation dolomite to the west, and Amherst Formation limestone and dolomite to the east (Fisher 2017 as in Sanford 1969), although there are no bedrock outcrops in the vicinity of the study area (Fisher, 2017).

The study area is located on sandy or loamy soils. The majority of the eastern half of the study area is found on Fox Sandy Loam, whose profile is typical of the development on a

well-drained site (Fisher, 2017 as in Richards et al. 1949). Class 2 agricultural soils are found throughout the study area.

The west half of the study area is mostly composed of Harrow Sandy Loam, except for two small patches of Berrien Sandy Loam, one in the middle of the study area interspersed with veins of bottom land and the other on the far western edge of the study area. Harrow Sandy Loam is known for being well-drained while Berrien Sandy Loam is known for draining imperfectly. The clay base and smooth to undulating terrain, result in this sandy loam also having only fair to poor natural drainage. However, within the Berrien Sandy Loam are pockets of undulating to rolling land composed of Plainfield Sand, a soil type with good to excessive drainage and subject to drifting. Several small streams cross the study area and the soils adjacent to these stream beds are bottom land, featuring immature soils that are sometimes subject to flooding (Fisher, 2017).

Harrow Sandy Loam and Fox Sandy Loam generally have undulating to rolling topography, are well drained, moderately acidic and generally used to farm early vegetables, tobacco, melons and other tree fruits. Berrien Sandy Loam is moderately acidic and generally has smooth to undulating topography, fair to poor drainage, and is mostly used for general farming, dairy, and canning crops. Bottom Land is generally undulating and drainage can vary. It is mostly used for forest, pasture or considered wasteland (Fisher, 2017 as in Richards et al 1949: Soil Map of Essex County).

The majority of the study area has fair to good natural drainage due to the sandy and loamy soils.

3.4.3 Groundwater

Protection and control of water quality and quantity is a key component of Ontario's water management strategy. In the Essex Region groundwater monitoring is managed by the Essex Region Conservation Authority (ERCA) through the Provincial Groundwater Monitoring Network (PGMN).

Currently, the ERCA monitors eight groundwater monitoring wells in the Essex Region with Well ID W0000359-1 being the closest to the study area located west of Union Avenue between County Road 20 and Highway 3. At the monitoring well the ground elevation and well depth is approximately 203.27 MASL (meters above sea level) and

41.15 MBGL (meters below ground level), respectively. The lithology and type of the aquifer is limestone bedrock.

Groundwater monitoring began in 2003 with the maximum and minimum recordings being 201.15 MASL (2005) and 195.27 MASL (2012), respectively. Between the years 2003 and 2012 annual average groundwater levels were steadily dropping. Since 2012 annual average groundwater levels have been steadily increasing but still almost a meter below the average in 2003 of 200.6 MASL.

Specific water quality parameters in the well are analyzed annually which includes chemical parameters and metals. The water quality parameters were compared with the Ontario Drinking Water Standards and its relevant Provincial Water Quality Objectives. Chloride levels were well below the aesthetic objective (AO) of 250 mg/L with values ranging from 0.2 to 1.6 mg/L. The maximum acceptable concentration (MAC) for fluoride ions in drinking water is 1.5 mg/L with values ranging from 0.72 to 0.96 mg/L. Sodium concentrations ranged from 4.6 to 5.31 mg/L, which is below the AO of 200 mg/L.

The average pH level was 8.1 ranging from 7.94 to 8.55. Zinc concentrations were well below the AO of 5 mg/L with a peak of 1.2 ug/L, but iron concentration are consistently close to the AO of 300ug/L with two occasions exceeding.

Relevant Source Water Protection policies for the study area are previously described in **Section 2.7.1**.

3.5 Natural Environment

This section provides a summary of natural environment baseline conditions and includes a summary description of:

- Fisheries and Aquatic Habitat;
- Terrestrial Resources; and
- Species at Risk.

In developing the description of baseline conditions a variety of data sources were considered including provincial data sets (from Ministry of Natural Resources and Forestry), Municipal Official Plans, Essex Regional Conservation Authority data, and from field surveys completed by Dillon Consulting along the corridor. **Appendix D** includes a more detailed description of natural heritage baseline conditions for the study area.

3.5.1 Fisheries and Aquatic Habitat

The study area is located within the ERCA designated Mill Creek and Ruthven Area Drainage sub-watersheds. The Mill Creek sub-watershed has a drainage area of 2162.22 hectares (ha) while the Ruthven Area Drainage sub-watershed has a drainage area of 2260.83 Ha (ERCA, 2013). The two combined sub-watersheds comprise approximately 2.6% of the larger Essex Region watershed.

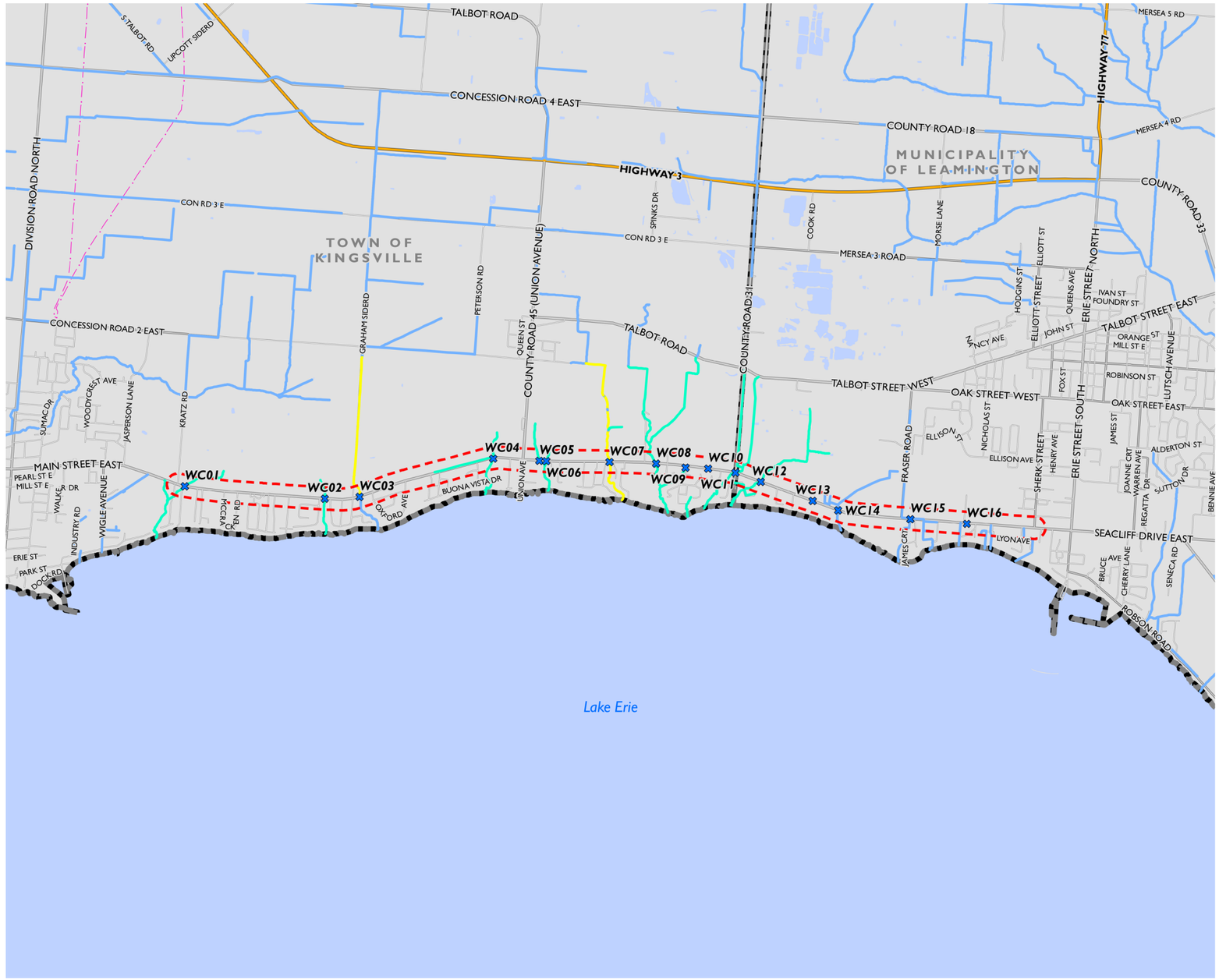
A review of base mapping provided by the MNRF indicates that there are 22 waterbody features located within the study area (13 Municipal drains, 9 natural watercourses). Based on available mapping, sixteen (16) watercourses cross County Road 20 in the study area. These features generally drain in a southerly direction, outletting into Lake Erie. **Figure 17** illustrates the locations of the watercourse crossings.

The majority of the waterbody features within the study area are Municipal drains that have been classified as Class F drains. An “F” classification indicates that the features

are known to have an intermittent flow. Two waterbodies in the study area are classified as Class C Municipal drains. A "C" classification indicates that the feature is a permanent watercourse with no sensitive fish species present (with a restricted activity timing window corresponding to DFO's Southwest Region). The two Class C features are Lane Drain, located between Graham Sideroad and Oxford Avenue and Esseltine Drain, which is located between Whitewood Road and Brookview Drive.

Fish species information for Lake Erie in proximity to the study area was provided by Essex Region Conservation Authority (ERCA). The species list indicates a warm/cool water fish community comprising mostly of baitfish, panfish and some sportfish species. All of the species identified are considered to be common in Ontario. Due to the proximity of the study area to Lake Erie, if there is access from Lake Erie, it is reasonable to believe that these species may be found in the waterbody features within the study area during certain times of the year. A list of the species provided by ERCA is below in **Table 14**.

Figure 17: Locations of the Watercourse Crossings



COUNTY OF ESSEX
ROAD 20 EA

WATERCOURSE CROSSINGS
FIGURE 17

- Watercourse Crossing

Drain (DFO Drain Class)
- C
- F
- Unclassified Drain
- Study Area
- Hydro Line
- Lower Tier Municipality
- Water Body

1:40,000
0 0.5 1 2 km

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF.
DRAIN CLASSIFICATIONS PROVIDED BY OMAFRA

MAP CREATED BY: GM
MAP CHECKED BY: DB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 152971
STATUS: FINAL
DATE: 2017-12-21

Table 14: Fish Species in Proximity to the Study Area

Scientific Name	Common Name	Federal SARA Registry Status	Ontario ESA Species At Risk List Status	Provincial Conservation Rank (Srank)	Source (ERCA)
Labidesthes sicculus	Brook Silverside	N/A	N/A	S4	●
Alosa pseudoharengus	Alewife	N/A	N/A	SNA	●
Dorosoma cepedianum	Gizzard Shad	N/A	N/A	S4	●
Cyprinella spiloptera	Spotfin Shiner	N/A	N/A	S4	●
Notropis hudsonius	Spottail Shiner	N/A	N/A	S5	●
Notropis stramineus	Sand Shiner	N/A	N/A	S4	●
Notropis volucellus	Mimic Shiner	N/A	N/A	S5	●
Semotilus atromaculatus	Creek Chub	N/A	N/A	S5	●
Osmerus mordax	Rainbow Smelt	N/A	N/A	S5	●
Micropterus dolomieu	Smallmouth Bass	N/A	N/A	S5	●
Neogobius melanostomus	Round Goby	N/A	N/A	SNA	●
Morone americana	White Perch	N/A	N/A	SNA	●
Morone chrysops	White Bass	N/A	N/A	S4	●
Perca flavescens	Yellow Perch	N/A	N/A	S5	●
Percina caprodes	Logperch	N/A	N/A	S5	●

A field survey of the study area was completed in late July 2017 by a Dillon Biologist within the roadway ROW. At the time of the field survey, 9 open watercourses were observed to be present. General conditions of each crossing have been provided below in **Table 15**.

Table 15: Summary of Watercourses Crossing County Road 20

ID	Crossing Name	Approximate Wetted Width (m)	Approximate Depth (m)	Fish Habitat at Crossing?	Notes (Conditions at Time of Survey)	Photo Reference (Appendix F)
001	Mathew Drain	0.4	5-10	Yes	At the time of the survey, both the upstream and downstream banks were vegetated (dominant species consisted of Spotted Jewelweed, Reed Canarygrass and Common Reed). A treed riparian forest dominated by Black Walnut was also present both upstream and downstream of the watercourse.	Photo # 1-2
002	Natural Watercourse	0.5	10-15	Yes	At the time of the survey, the downstream of section of the watercourse was channelized and had a small riparian buffer (<1 m), than manicured grass immediately adjacent. Upstream of CR 20, the channel was confined to a roadside drainage ditch mainly consisting of Reed Canary grass and Spotted Jewelweed. Just upstream, watercourse appeared to be piped.	Photo # 3-4
003	Lane Drain	1.0 to 1.5	10-15	Yes	At the time of the survey, downstream of CR 20 contained dense vegetation consisting of reed canary grass, Manitoba Maple and Staghorn Sumac. Both upstream and downstream of CR 20, the riparian deciduous forest was dominated by Manitoba Maple and Black Walnut.	Photo # 5-6
004	Sunny Brook Drain	0.3 to 0.6	5	Yes	Deciduous forest consisting of black walnut and Manitoba Maple was observed both upstream and downstream of CR 20. Substrates within the ROW consisted of sand and small cobble.	Photo # 7-8
005	Natural Watercourse	0.3 to 0.5	5	Yes	At the time of the survey, downstream of CR 20 was heavily channelized with armor stone along the eastern bank and manicured grass in the riparian area. Upstream of CR 20 riparian area was a forest community consisting of Black Walnut, Staghorn Sumac and Manitoba Maple.	Photo # 9-10
006	Natural Watercourse	0.2 to 0.4	5	Yes	Upstream banks of the watercourse were dominated by a deciduous forest consisting of Manitoba Maple, Stag Horn Sumac with some Tree-of Heaven and Black Walnut. Mapped section of this watercourse downstream of CR 20 was not observed.	Photo # 11-12

ID	Crossing Name	Approximate Wetted Width (m)	Approximate Depth (m)	Fish Habitat at Crossing?	Notes (Conditions at Time of Survey)	Photo Reference (Appendix F)
007	Esseltine Drain	1	5	Yes	Dense Riverbank Grape obscured observations of watercourse upstream of CR 20. Both the upstream and riparian area consisted of Black Walnut, Manitoba Maple, Norway Maple and Willow.	Photo # 13-14
008	Fleming Wigle Drain	0.3 to 0.7	5	Yes	The riparian area upstream and downstream of CR 20 consisted of Black Walnut and Manitoba Maple dominated deciduous forest.	Photo # 15-16
009	Sunrise Drain	0.2	2	No	No upstream section of watercourse was present as the watercourse north of Seacliff Dr. (it appeared to be pipe). Minor amount of flow was present of the downstream sections of the feature. Manicured lawn was present on both banks of the watercourse.	Photo # 17
010	Aurelia & St. Luke Creek Drain	N/A	Unknown	N/A	Not visually observed, likely a tiled drain.	N/A
011	Rowley Drain	0.6	8	Yes	Downstream of CR 20, subrate observed consisted of sand, gravel and cobble. Riparian area consisted of manicured grass. No feature was observed upstream of CR 20 (watercourse north of Seacliff Dr. appeared to be buried).	Photo # 18
012	Judson Morse Drain	0.6 to 0.9	5	Yes	Observed substrate within the watercourse consisted of sand gravel and cobble with some submerged algae. A narrow riparian area of deciduous forest was present upstream and downstream (beyond the manicured grass).	Photo # 19-20
013	Natural Watercourse/ Gorrell Drain	N/A	Unknown	N/A	Not visually observed, likely a tiled drain.	N/A
014	Pettapiece Drain	N/A	N/A	No	Not visually observed, likely a tiled drain.	Photo # 21
015	Lapos Drain	N/A	Unknown	N/A	Not visually observed, likely a tiled drain.	N/A
016	Atkinson-Lockery Drain	N/A	Unknown	No	Not visually observed, likely a tiled drain.	Photo # 22

3.5.2 Terrestrial Resources

As described previously in **Section 3.3.1**, adjacent land-use along the corridor is primarily residential, agriculture and agri-businesses. The natural heritage features that do exist along the corridor include seventeen treed features (i.e. woodland, hedgerow, and shrub agriculture/plantation) which are shown in **Figure 18**. These features are located in the central and western sections of the study area and primarily classified as Deciduous Forest. For more detailed mapping of these features please refer to **Appendix D** - **Figure 2**, **Maps 1 to 7**). A few of these features cross the corridor (i.e. the road corridor cuts through the feature).

Numerous sources were consulted to characterize baseline conditions. These are summarized below.

3.5.2.1 Ministry of Natural Resources and Forestry

A review of base mapping provided by the MNRF indicates that none of the following significant natural features are located within the study area:

- Wildlife Concentration Areas;
- Areas of Natural and Scientific Interest (ANSI); and
- Provincially Significant Wetlands (PSW).

As well, no unevaluated or locally significant wetlands are located within the study area.

NHIC Database records (i.e. 1 km data squares 17LG6554, 17LG6654 and 17LG6754 that intersect with the study area) indicate there is potential for Hop-tree Dune Shrubland, a significant vegetation community, to occur within the study area. This vegetation community has been designated by the NHIC as having a sub-national/conservation rank of S1, indicating the community is extremely rare in Ontario. This community was not identified during the field studies that were completed for the corridor. Potential locations for this species may be closer to the Lake Erie shoreline as it can be found active rolling sand hills formed by shoreline processes.

The County and local Municipal Official Plans were also consulted to characterize baseline conditions along the corridor. This is described below.

3.5.2.2 Essex Region Conservation Authority

ERCA online mapping indicates nine (9) Significant Valleyland features are located within the study area (**Figure 19**). According to ERCA (2013), Significant Valleylands represent features identified by ERCA that occur in a valley or other landform depression that has water flowing through or standing for some period of the year. These features often link or border natural areas and provide ecological functions such as habitat (including refuge), corridor, or buffering from adjacent land use impacts. Significant Valleyland features are identified utilizing guidelines provided in the Natural Heritage Reference Manual (OMNR, 2010) and are based on the following features:

- More or less continuous natural areas providing connections within the watershed;
- Contains a diversity of native species, natural communities, and landscapes; and
- Provides ecological functions such as habitat, passage, refuge, hydrological flow, and buffering from adjacent areas.

3.5.2.3 Essex County Official Plan – Natural Systems

Schedule B1 to the Essex County Official Plan shows the Natural Heritage System. There are no "Significant Terrestrial Features" or "Provincially Significant Wetlands" along the County Road 20 corridor. Schedule B2 shows several small areas designated "Natural Environment Overlay" south of County Road 20, consisting of small woodlots. These same areas are designated as "Inland Flood Prone Areas" on Schedule C1. No lands in the study area are designated "Restoration Opportunities Overlay" on Schedule B3. However, significant areas of land south of County Road 20 are shown as "Regulated Areas under the Conservation Authorities" on Schedule C2.

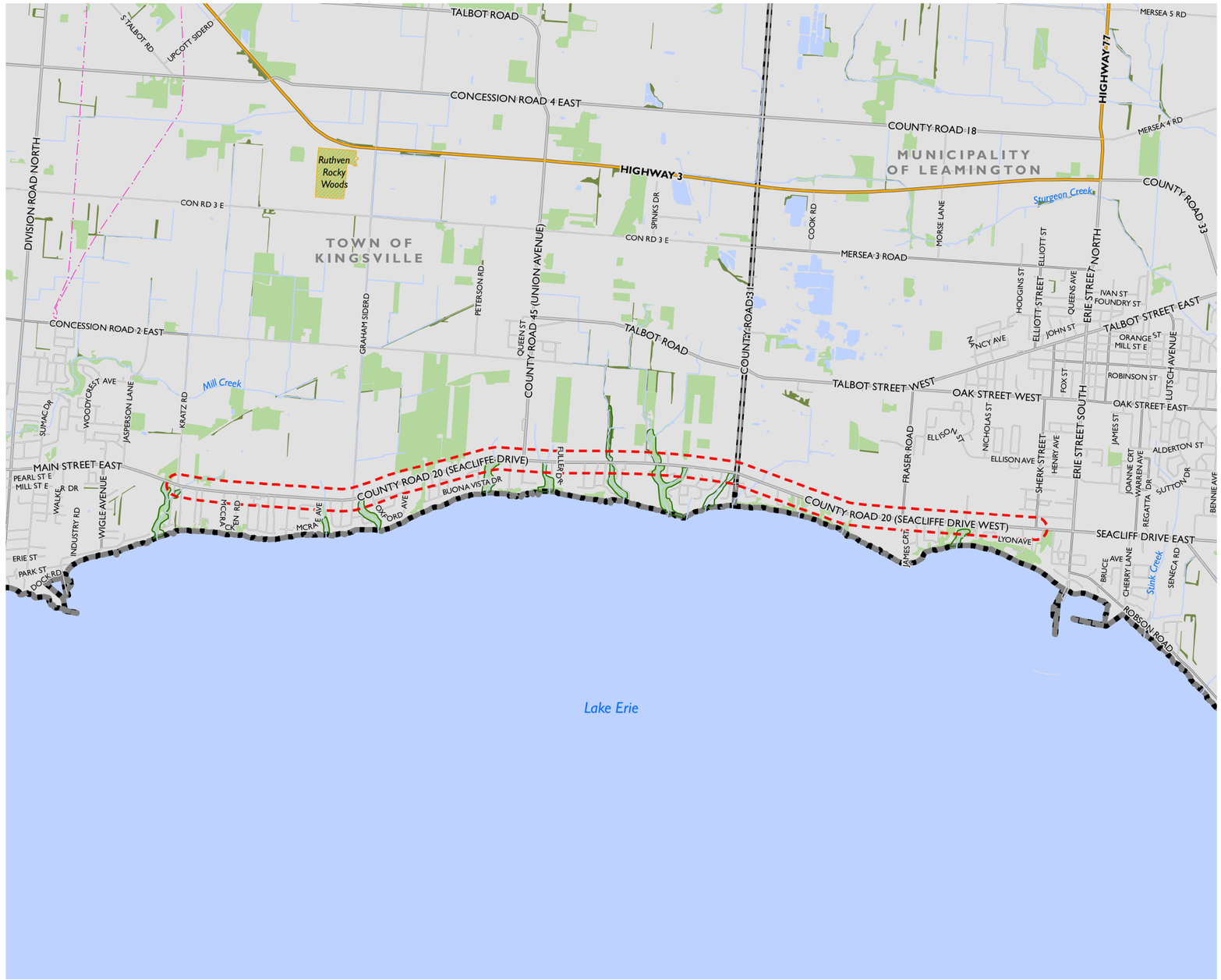
3.5.2.4 Town of Kingsville Official Plan – Natural Systems

The Town of Kingsville Official Plan Schedule B, "Natural Heritage Features" shows several "Environmentally Significant Features" on the south side of County Road 20, consisting of wooded areas along watercourses. These watercourses are shown on Schedule C. These areas include significant woodlands, valleylands and wildlife habitat and Areas of Natural and Scientific Interest (ANSIs). The Plan's policies protect these areas and require an Environmental Impact Assessment for development on adjacent lands (within 120 m).

3.5.2.5 Municipality of Leamington Official Plan – Natural Systems

There are no natural features or areas noted within the study area on the Municipality of Leamington Official Plan.

Figure 18: Terrestrial Natural Heritage Features



COUNTY OF ESSEX
ROAD 20 EA

TERRESTRIA8. NATURAL HERITAGE FEATURES
FIGURE 18

- Study Area
- Hydro Line
- Watercourse
- Significant Valley Land (ERCA)
- ANSI, Life Science
- Lower Tier Municipality
- Woodland
- Hedgerow
- Water Body

1:40,000
0 0.5 1 2 km

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: DB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 152971
STATUS: FINAL
DATE: 2017-12-21

3.5.2.6 Results of Field Investigations

Field investigations to confirm background information were completed within the road corridor ROW in July 2017. Observations made during the field investigation are consistent with background information. The treed features along the drains consisted of deciduous forests containing common species that would be found within an adjacent riparian area of a watercourse. Species commonly observed consisted of Black Walnut, Staghorn Sumac, Box Elder, Green Ash and Maples. Overall the forests were in good to fair condition. Emerald ash borer was suspected in some of the mature ash trees.

Detailed information pertaining to the field investigations are presented in **Appendix D**.

3.5.3 Species at Risk

A review of secondary source information, including NHIC GIS Database records, indicates that 33 Species at Risk (SAR) and 56 Species of Conservation Concern (SCC) have the potential to occur within 1 km of the study area (See **Appendix D**).

An assessment was completed to determine the potential for the habitat of SAR identified during background review to be present in the study area. This was done by identifying each SAR's habitat requirements and comparing those to the conditions and ELC communities observed in the study area. The assessment determined that habitat requirements for following 16 SAR have the potential to be in the study area:

- Colicroot
- Barn Swallow
- Eastern Prairie Fringed-orchid
- Bank Swallow
- Dense Blazing Star
- Bobolink
- Butternut
- Eastern Meadowlark
- American Water-willow
- Barn Owl
- Red Mulberry

- Eastern Foxsnake (Carolinian population)
- Chimney Swift
- Massasauga (Carolinian population)
- Northern Bobwhite
- Northern Riffleshell

Results of the assessment are presented in **Appendix D**. Future follow-up work is recommended confirm the presence or absence of species (and/or habitat) at the detailed design phase.

In addition, of the 16 species, there are three (3) that have regulated habitat under *Ontario Regulation 242/08* (Eastern Prairie Fringed-orchid, Barn Owl and Eastern Foxsnake). There were no Species at Risk identified during field studies although follow-up work is recommended as part of future project design work to confirm the absence of species and/or habitat at project impacted locations (see **Section 8.5**).

3.5.4 Candidate Significant Wildlife Habitat

Significant Wildlife Habitats (SWHs) are types of natural heritage features that are identified for protection by provincial policy. They consist of wildlife habitats, including vegetation communities, that are ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or a Natural Heritage System. SWHs are identified on the basis of ELC communities using applicable criteria specific to a region.

In order to identify candidate SWH within the study area, ELC communities identified in the study area were compared to those listed in the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, January 2015). Candidate SWH types that may be present in the study area are outlined below in **Table 16**. The table also includes the corresponding ELC community as well as the criteria (i.e. field studies) required to confirm the presence of each candidate SWH (as defined by the Criteria Schedules). Candidate SWH in the study area has been delineated in Figure 2 in **Appendix D.**

Table 16: Candidate Significant Wildlife Habitats Identified in the Study Area

Candidate Habitat Type	Matching ELC Community in the Study Area	Candidate SWH Criteria	Defining Criteria Required to Confirm SWH
Raptor Wintering Area	Deciduous Forest (FOD) in combination with upland community	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering (hawk/owl) sites need to be > 20 Ha with a combination of forest and upland. Sites include least disturbed sites, idle, fallow or lightly grazed field or meadow (>15 Ha) with adjacent woodlands. Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites are not likely to be present as the study area does not have large areas of open water.	Studies are required to confirm use of the habitats by one or more Short-eared Owls or; One or more Bald Eagles or; At least 10 Individuals and two of the target hawk/owl species. To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds.
Bat Maternity Colony	FOD	Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario. Maternity colonies located in mature deciduous or mixed forest stands with >10/Ha large diameter (>25 cm dbh) wildlife trees. Female bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 Snags per Ha are preferred.	Studies to identify maternity colonies with confirmed use by >10 Big Brown Bats and/or >5 Adult Female Silver-haired Bats. The area of the habitat includes the entire woodland or a forest stand ELC ecosite or an eco-element containing the maternity colonies.
Landbird Migratory Stopover Areas	FOD	Woodlots >5 Ha in size and within 5 km of Lake Erie and Lake Ontario. If woodlands are rare in an area of shoreline, woodland fragments 2-5 Ha can be considered for this habitat. If multiple woodlands are located along the shoreline, those Woodlands <2 km from Lake Erie and Lake Ontario are more significant. Sites have a variety of habitats; forest, grassland and wetland complexes. The largest sites are more significant. Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5 km of Lake Erie and Lake Ontario are Candidate SWH.	Studies are required to confirm use of the habitat by >200 birds/day and with >35 species with at least 10 bird species recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. Studies should be completed during spring (Mar to May) and fall (Aug to Oct) migration using standardized assessment techniques.

Candidate Habitat Type	Matching ELC Community in the Study Area	Candidate SWH Criteria	Defining Criteria Required to Confirm SWH
Old Growth Forest	FOD	Old Growth Forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris. Woodland area must be >0.5 Ha.	Field studies are required to determine if dominant trees are >140 years old. The forested area containing the old growth characteristics will have experienced no recognizable forestry activities. The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH.
Seeps and Springs	FOD ecosites within the headwaters areas of watercourses	Any forested area (with <25% meadow, field, or pasture) within the headwaters of a stream or river system. Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species.	Field studies are required to confirm presence of a site with 2 or more seeps/springs should be considered SWH. The area of an ELC forest ecosite or an eco-element within the ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation of the habitat.
Rare Vegetation Community: Hop-Tree Dune Shrubland	None confirmed, but possible based on NHIC records for 1 km grid overlapping the study area.	Rare vegetation community SWH types are identified on an individual basis using detailed ELC surveys to determine vegetation composition to the ELC ecosite level. Presence of the SBSD1-2 ecosite would indicate presence of this rare vegetation community SWH.	Detailed ELC and vegetation surveys would be required to determine the presence or absence of the SBSD1-2 ecosite. If the ecosite is present, it would comprise the boundary of the confirmed rare vegetation community SWH.
Amphibian Breeding Habitat (Woodland)	FOD	Presence of a wetland, pond or woodland pool (including vernal pools) >500 m^2 (about 25 m diameter) ccvii within or adjacent (within 120 m) to a woodland (no minimum size. Some small wetlands may not be mapped and may be important breeding pools for amphibians. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.	A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands.

3.6 Cultural Heritage Environment

The following section provides baseline information for the following features:

- Built and Cultural Heritage Resources; and
- Archaeological Resources.

A memo on cultural heritage and technical archaeological report (included as part of **Appendix J**) is available to support the description of baseline conditions in this section.

3.6.1 Built and Cultural Heritage Resources

The County of Essex Official Plan requires that archaeological, cultural and built heritage resources and landscapes be identified, recognized and enhanced. Both the Municipality of Leamington and the Town of Kingsville maintain a register of heritage properties (included in the Land Use and Socio-Economic Report – see **Appendix C**) that inventory properties that are officially designated and protected under Part IV of the *Ontario Heritage Act* and properties of cultural heritage value or interest that are not designated by the Province under Part IV but have been identified by the municipal heritage committee as being of interest. Non-designated properties are often eventually recommended for designation; in the interim, they are protected and require an approved building permit from the municipality prior to alteration.

There is one designated property within the study area, located at 608 Seacliff Drive in the Town of Kingsville. The designated property and properties of heritage potential that are within the study area are appended to the Land Use and Socio-Economic Report (**Appendix C**).

Following consultation with the Ministry of Tourism, Culture and Sport in August 2017, the Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes checklist for the non-specialist was completed for the study area. In order to complete the checklist, heritage planners from the Municipality of Leamington and the Town of Kingsville were consulted with. Properties of heritage value or interest and the designated property were identified during this consultation. No further heritage concerns were identified by the Municipality of Leamington, the Town of Kingsville or Indigenous Communities.

Based on the completion of the checklist the study area has been screened for built and cultural heritage resources. The potential for impacts on heritage properties from the project are described in Section 8.4.1 of this ESR.

3.6.2 Archaeological Resources

A Stage 1 Background Study was completed by Fisher Archaeological Consulting for the entire study area and can be found in **Appendix J**.

Background research indicated that the majority of the study area has high archaeological potential for Indigenous and Euro-Canadian history. The distance to a watercourse is a major factor in determining the archaeological potential of a site. In particular, areas that are within 300 m of a source of running water have a high potential to have Indigenous archaeological potential. In general, most of the study area is within 500 m of Pigeon Bay, a portion of Lake Erie. Other indicators of archaeological potential in the study area include streams, sandy and well-draining soils, and the situation of the study area on the top of a bluff.

Background review indicated that there are 40 archaeological sites within a 1.5 km radius of the study area that are registered in the Ontario Archaeological Sites Database (OASD). Most of the sites are Indigenous, and some sites have Euro-Canadian components. Many of the sites are located close to Lake Erie, the Selkirk Drain or Sturgeon Creek. None of the registered sites are within 100m of the study area.

A Stage 1 archaeological study is conducted to determine the presence of known cultural heritage resources and identify the potential for previously undocumented cultural heritage resources. A Stage 2 archaeological study includes field investigation of high potential areas. Areas that have been extensively disturbed in modern times, including the current CR 20/Seacliff Drive footprint, sites that have modern housing or commercial complexes, areas with ditching/sewers/berming/utilities and sites that are steeply sloped or permanently wet were identified as having low archaeological potential. In areas of high potential, further archaeological investigations are recommended as the project design progresses. Based on the Stage 1 Background Study, the following work is recommended:

- A Stage 2 Assessment conducted in sections of the CR 20/Seacliff Drive right-of-way (ROW) that are identified as having high potential. These areas are typically

identified as fields and lawns within the ROW that have not been visibly disturbed beyond the shoulder (i.e. ditching, sewers, berms, utilities, driveways) and are not steeply sloped or wet.

- A Stage 2 Assessment conducted along the length of the CR 20/Seacliff Drive study area in areas that are beyond the ROW and will be impacted by the proposed or future improvements. This entire area has been identified as having high potential, with the exception of disturbed (ex. driveways), steeply sloped or wet areas.

Locations that are deemed to be of low potential (areas within the ROW or beyond the ROW that have been previously disturbed) require no further archaeological work. Maps of the areas of high archaeological potential are provided in the Archaeological Stage 1: Background Study (see **Appendix J)**.

4.0 Identification of Problems/Needs/Opportunities

Phase I of the Municipal Class EA process involves the identification of the problem and/or opportunity to be addressed by the EA study. The identified problems/opportunities, which provided the justification or need for the undertaking, were determined through consideration of the following:

- The project planning context including relevant Municipal planning policies, and other related studies including multi-modal transportation plans;
- The existing multi-modal transportation network including traffic volumes and capacities, intersection operations, and existing collision data, pedestrian and cycle use, etc.;
- Projected future transportation demands; and
- Stakeholder input.

Previous reports sections have described relevant government policies and plans (**Section 2.0**) and the existing transportation system (**Section 3.1**). The following describes future growth and projected transportation demand, presents a summary of the identified problems and opportunities and concludes with a definition of the problem and opportunity statement.

4.1 Future Growth

It is anticipated that between 2016 and 2025 the traffic volumes along County Road 20 will grow at an annual rate of 1% from Kratz Sideroad to Albuna Townline and 2% from Albuna Townline to Sherk Street. Between 2025 and 2035 the annual growth rate along County Road 20 is anticipated to increase to 2% between Kratz Sideroad and Sherk Street.

In terms of local development, the Town of Leamington has identified a proposed low density residential development (14 single-unit dwellings) on the south side of County Road 20, in the vicinity of 268 Seacliff Drive West, in Leamington. Given the relatively minor impact (from a traffic generation perspective) of these planned 14 houses, this

future development has not been explicitly accounted for in the analysis as it can be accounted for as part of general annual growth within the corridor.

The Municipality of Leamington has also identified that secondary plans for the area will be reviewed in the near future. The area bounded by Fraser Road, Seacliff Drive (County Road 20), Sherk Street and Ellison Avenue is anticipated to be designated as residential development area.

At this time, there are no planned developments in Kingsville or Leamington other than the identified small subdivision above. If any development is to occur in the potential secondary planning area between Fraser Road and Sherk Street, it is recommended that the proponent complete an updated traffic study to review the AADT impacts on the corridor.

Future traffic volumes that accommodate the growth projects are described in the next section.

4.2 Forecasted Travel Characteristics

Traffic volumes at the 2020, 2025 and 2035 horizon were forecasted by applying an annual growth rate, based on the growth derived from the County's model, to the existing volumes. In addition, the future greenhouse trips generated were added to the network to reflect the increase in drivers as a result of the future greenhouse expansion.

Analyses of the midblock segments were undertaken using the two-way highway methodology outlined in MTO's Geometric Design Standards for Ontario Highways. Level of service reflects traffic volume over road capacity (v/c) ratios, based on a maximum two-way capacity of 2,800 vehicles per hour (further adjusted to reflect factors such as passing opportunities, lane and shoulder widths, and truck activity). The v/c ratio thresholds between different levels of service are different from those applied in the EWRTMP. The planning-level level of service thresholds applied in EWRTMP are solely related to capacity utilization, whereas the levels of service in the MTO method more closely correlate capacity utilization with motorists' perceived driving experience along the highway (e.g. delay, time spent following).

Table 17 presents v/c ratios and level of service (LOS) for the future corridor and **Table 18** presents same using the MTO highway methodology.

Table 17: Future Corridor v/c Ratios, Weekday PM Peak Hour

Road Section	2020 West Bound v/c	2020 West Bound LOS	2020 East Bound v/c	2020 East Bound LOS	2025 West Bound v/c	2025 West Bound LOS	2025 East Bound v/c	2025 East Bound LOS	2035 West Bound v/c	2035 West Bound LOS	2035 East Bound v/c	2035 East Bound LOS
Kratz Sideroad to Graham Sideroad	0.70	A-C	0.58	A-C	0.74	A-C	0.61	A-C	0.90	E	0.75	A-C
Graham Sideroad to County Road 45 (Union Avenue)	0.60	A-C	0.51	A-C	0.63	A-C	0.53	A-C	0.79	A-C	0.63	A-C
County Road 45 (Union Avenue) to County Road 31 (Albuna Townline)	0.62	A-C	0.55	A-C	0.66	A-C	0.57	A-C	0.79	A-C	0.68	A-C
County Road 31 (Albuna Townline) to Fraser Road	0.61	A-C	0.60	A-C	0.67	A-C	0.64	A-C	0.80	D	0.75	A-C
Fraser Road to Sherk Street	0.70	A-C	0.78	A-C	0.77	A-C	0.85	D	0.92	E	0.99	E

Table 18: Two-Lane Highway Analysis Results, Weekday PM Peak Hour

Road Section	Existing v/c	Existing LOS	2020 v/c	2020 LOS	2025 v/c	2025 LOS	2035 v/c	2035 LOS
Kratz Sideroad to Graham Sideroad	0.44	D	0.48	D	0.49	D	0.61	E
Graham Sideroad to County Road 45 (Union Avenue)	0.38	D	0.41	D	0.43	D	0.53	D
County Road 45 (Union Avenue) to County Road 31 (Albuna Townline)	0.43	D	0.47	D	0.50	D	0.59	E
County Road 31 (Albuna Townline) to Fraser Road	0.41	D	0.46	D	0.50	D	0.59	D
Fraser Road to Sherk Street	0.44	D	0.51	D	0.56	D	0.66	E

The two-way highway analyses indicate that the road is anticipated to operate at LOS D through the 2025 horizon year; by 2035, the westernmost and easternmost sections will have passed the threshold for LOS E, and the central section (east of Union Avenue) will have just reached the LOS E threshold. The road would still operate under capacity but delays could still be experienced by motorist at times that may exceed what they might expect considering the function of County Road 20 as a through corridor.

The Essex Windsor Regional Transportation Master Plan (2005, IBI Group) identifies that CR 20 east of CR 31 (Union Avenue) will be operating at a LOS F by 2021. However, population and traffic growth in the area has not been as great as forecasted, and as such, additional roadway through lanes to increase traffic capacity are not warranted/recommended at this time and the classification of the roadway is not recommended for change.

An analysis of future intersection operations was also undertaken for the 2020, 2025, and 2035 horizon years. The signalized intersections are anticipated to continue operating below capacity in these horizon years, with the exception of the westbound approach to Sherk Street during the PM peak hour for 2035, which is projected to be nearing capacity.

Signal warrant analyses were undertaken at the un-signalized County Road 20 intersections with Kratz Sideroad, Graham Sideroad and Fraser Road. Traffic signals were not found to be warranted at any of these three intersections under the projected 2035 traffic volumes. It is noted that members of the public and the municipalities did comment that there can be delays at the intersection of County Road 20 and County Road 31 which is not captured in the warrant analysis.

4.3 Access Management

Lands abutting the CR 20 corridor provide a mix of differing land uses including residential, agricultural, agri-business and commercial. The majority of the south side of the road is residential, with a few businesses. The north side is a mix of agricultural, agri-business and residential uses.

Until 2000, the roadway was owned and operated by the MTO as King's Highway 18. The County of Essex did not commence obtaining permits for access points onto CR 20 until after the year 2000 when the road ownership was transferred from the MTO. Due to the older nature of the area, and the previously uncontrolled approach to access monitoring, there are numerous locations where properties have access points that do not adhere to the current County of Essex Access Management best practices. The County of Essex *Highways Best Management Practice Manual – Access Management* by-law does not directly apply to the CR 20 corridor, and the County requires additional by-laws/provisions in place to protect the corridor now and in the future. As such, corridor specific best management practices should be developed taking all users into account.

The following is a summary of noted access management issues along the corridor:

- High number/density of residential entrances, particularly at the east end of the corridor in Leamington;
- Multiple access points to a single property (2 or more);
- Driveway width exceeds recommended maximum;

- Driveways located in close proximity to an intersection or within an intersection sight triangle;
- Seasonal vendor roadside stands and patron parking located in/or in close proximity to the road right-of-way;
- Private property parking located within public right-of-way;
- Intersection daylight corner property reserves are smaller than County preferred minimum; and
- The addition of the CWATS facility increases vehicle and A/T user conflict points.

As noted, the existing road section is a mixture of rural (paved or granular shoulder) and semi-rural (mountable curb). Due to the nature of the road, there are limited existing access controls along on the corridor. Currently, vehicle parking is not permitted along the CR 20 corridor although this does occur on occasion (e.g. when visiting roadside produce stands).

As well, should there be additional growth in the corridor; access management issues will become even more challenging.

Recommendations for access management are presented in Section 7.7 of this ESR.

4.4 Summary of Future Problems/Needs/Opportunity

Considering the planning context/policy basis including the various County and local Municipal transportation plans, existing CR 20 transportation system and projected transportation demands, the following summarizes the problem and opportunities for the study area.

Problems to Address in the Study Area

- Traffic operation challenges and conflicts between roadway users - CR 20 is a regional roadway that is an important part of the regional transportation network. The corridor attracts a variety of users: private automobiles (commuters, tourists, and local residents), agri-business related truck traffic, cyclists, pedestrians (including migrant farm workers) and students waiting for school buses. Local stakeholders have expressed concerns regarding delays while travelling though the corridor and extended wait times when turning to/from the roadway. As the roadway is a single-lane in each direction, vehicles waiting to turn can result in queues of vehicles wanting to pass. There is also a lack of opportunities to pass slow moving agri-business vehicles at some locations/times. Some businesses along the corridor also attract high volumes of traffic that can contribute to delays in the corridor. In addition to resulting in vehicle delays, the above noted situation can lead to unsafe situations with vehicles travelling on the road shoulder to pass vehicles.
- Potential long-term capacity issues - As the surrounding area and local communities develop the demand on CR 20 will likely increase leading to further delays. Traffic forecasting work indicates that the road is anticipated to operate at LOS D through the 2025 horizon year; by 2035, the westernmost and easternmost sections will have passed the threshold for LOS E, and the central section (east of Union Avenue) will have just reached the LOS E threshold.
- Intersections deficient in traffic safety and capacity and do not provide service to pedestrians and cyclists - There are several intersections in the corridor that do not allow for the efficient movement of vehicles including provisions for right and left turns so that through traffic is not delayed. As well, the corridor intersections do not provide adequate facilities/design for corridor and side-street crossing by pedestrians and cyclists and are not generally in compliance with the Accessibility for Ontarians with Disabilities Act (AODA).
- Lack of corridor access management policies – Land development has occurred along the corridor in the past with limited regard to the impact of new entrances on the operation and safety of CR 20. Future development along the corridor may result in additional roadway entrances potentially contributing to further delays and safety issues. The CWATS facility will add further complexity to access along the corridor. The County has limited tools to manage current access issues and future development and requires policies and mechanisms for this.

- Lack of dedicated pedestrian and cyclist facilities - Pedestrians and cyclists are presently required to use the roadway, shoulder and/or the edge of roadway to travel along the corridor. With the exception of recently constructed sections of interim A/T facilities in Kingsville, there is no pedestrian facility for migrant farm workers that walk to the various agri-businesses in the corridor. A lack of A/T facilities does not encourage alternative modes of transportation and can lead to potentially unsafe situations. The interim context-sensitive solution does partially address this deficiency although pedestrians and cyclists will need to share the same pathway which can lead to potential user conflicts. To fully accommodate all active transportation users in the corridor, a long-term solution is required to fully meet the objectives of CWATS.
- Drainage deficiencies and opportunities for Stormwater Management - Potential for existing road crossing drains to be under sized or in need of improvements to accommodate increases in storm water flow from the study area.

Opportunities Identified in the Study Area

- Improve character of the road corridor - The character of the road corridor is uneven and varies from rural to semi-urban. The corridor primarily is oriented to the automobile users and is not generally inviting or attractive for pedestrians and cyclists. There is an opportunity to improve the character of the corridor to make it more attractive to users including the fulfillment of complete street policies as supported in the Municipality of Leamington's 2013 Transportation Action Plan. Complete streets refers to a policy and design approach that requires streets be planned, designed, operated and maintained to allow for the safe, convenient and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation. Complete streets usually include well designed pedestrians spaces, including landscaping, and are complimentary to the local context. Complete streets are focussed on safely moving people through a corridor – not just vehicles. They are intended to provide access to all users including those with disabilities. The Ontario PPS generally supports this concept stating that public streets are to be safe, meet the needs of pedestrians, foster social interaction and facilitate active transportation and community connectivity (Section 1.5 Public Spaces, Recreation, Parks, Trails and Open Space of the PPS). There is a growing interest in the development of complete streets in Canada and a growing list of Municipalities that are developing complete street's policies and guidelines (e.g. City of Toronto

Complete Streets Guidelines). With the east and west limits of the study area extending into the urban areas of Kingsville and Leamington, and recognizing the role that CR 20 can play to link these two communities, there is an opportunity to implement a complete streets approach to enhance the attractiveness and accessibility of the corridor.

- Attract all roadway users to support various local markets and tourism - There are several businesses as well as seasonal roadside markets/stands along the corridor. The provision of A/T facilities to attract other modes of travel through the corridor could contribute to the local tourism and agri-business industry.
- Improve active transportation opportunities by providing dedicated space for all users - The current condition of the corridor is not attractive to alternative modes of travel. The provisions of new A/T facilities are expected to increase travel by other modes that would help to fulfill the CWATS vision that identifies the development of an "off-road" A/T facility through the CR 20 corridor under this study. As outlined in **Section 2**, there are a number of Provincial and County Plans and policies that encourage active transportation facilities when planning new infrastructure.
- Provide better connections to the CWATS network - The development of the A/T facilities in the corridor will provide the opportunity to better connect to existing pathway network (e.g. Chrysler Canada Greenway and Great Lakes Waterfront Trail that crosses CR 20) as well as other planned on and off-road pathways extending into/out of Leamington and Kingsville as shown in the CWATS plan.
- Improve safety along the corridor - As summarized further above, the collision analysis undertaken for this study identified a collision rate that is below the provincial average. However, as user volumes increase, including active transportation modes, it will be important to ensure that the facility provides a high level of user safety.
- Improve operation issues along the corridor - While the roadway operates at a reasonable level of service there are operational issues including delays associated with turns from and onto the roadway as reported by local stakeholders. Through this project there is an opportunity to improve the operating performance of the corridor including vehicular movements, A/T movement and access management. As well, as adjacent lands are further developed in the future there is a need to control and manage new access and entrance onto the roadway.

- Traffic calming - Sections of the corridor have posted speed limits as high as 80 km/hr. These speeds are not conducive to developing a corridor that is attractive to all user groups. A consistent lower speed through the corridor would contribute to an improved character and user experience as well as improve transportation safety levels through the corridor.
- Cycling tourism - The proximity of Lake Erie and tourist destinations such as Point Peele provide an opportunity for the County to promote itself as a cycling tourism destination as active transportation facilities are developed.

4.5 Problem and Opportunity Statement

Considering the above summary of problems and opportunities identified for the corridor, the project problem/opportunity statement has been identified as follows:

"Modifications to the County Road 20 corridor are needed to address traffic control issues and pedestrian and cyclist safety. The improved transportation corridor will serve the needs of the transportation system and area growth for a 20-year period to 2035. Key priorities of the project include enhancement of active transportation facilities, mitigation of operational deficiencies, and access management for the corridor".

5.0 Alternative Solutions

5.1 Identification of Alternative Solutions

Alternative solutions were developed in an effort to address the problem and opportunities in the study area as previously summarized in **Section 4.4** including:

Identified Problems

- Impacts on traffic flow and resulting conflicts between roadway users;
- Traffic safety, operational issues at select locations including key intersections;
- Lack of corridor access management policies; and
- Lack of dedicated pedestrian and cyclist facilities.

Identified Opportunities

- Improve character of the roadway;
- Attract all roadway users to support various local markets and tourism;
- Improve active transportation opportunities by providing dedicated space for all users;
- Improve safety along the corridor;
- Improve operation issue along the corridor; and
- Traffic calming.

Considering the problem/opportunity statement, the following Alternative Solutions were identified, presented to the public at PIC #1 and #2, and subsequently assessed/evaluated. The following sections provide a description of this process.

It is noted that active transportation (e.g. walking and cycling) alternatives were not assessed as a standalone alternative, although active transportation infrastructure was included in several of the alternative solutions.

5.2 Description and Analysis of Alterative Solutions

This section provides a description and analysis of the alternative solutions that were developed to address the problems and opportunities.

5.2.1 Alternative 1 - Status Quo/Do Nothing (Interim Active Transportation Facility to be Implemented through CWATS)

The EA Act requires the consideration of the "Do Nothing" or base case scenario. The Do Nothing alternative is included to identify for comparison purposes what would happen if no further action was taken to improve the transportation conditions on County Road 20. It is noted that the Do Nothing alternative assumes that the interim active transportation improvements for County Road 20 as identified in the CWATS/follow-up design feasibility studies are in place including a paved shoulder multi-use path at the west end of project area (rural area) or 1.5 m back of curb multi-use path (semi-urban area) at the east end of the project area. This study has confirmed the CWATS/Feasibility Design Study recommendation as an interim solution that addresses the immediate need for pedestrian/cycling facilities. The remaining planning alternatives were focused on long-term needs, all of which compliment/enhance the CWATS active transportation path.

The interim cycling facility included as part of the Do-Nothing alternative is supported by the CWATS Master Plan that recommends, through the CR 20 study area, the development of either a paved shoulder or a context-sensitive solution (paved path on the back of the existing curb). This is identified in Tables C-3 (Kingsville) and C-6 (Leamington) of the CWATS Master Plan. It is also noted that in follow-up to CWATS, feasibility design studies for County Road 20 were undertaken and completed in June 2014 (Leamington) and December 2014 (Kingsville). These studies reviewed and identified that the preferred solution for the context-sensitive A/T facility is to include: a 1.2 m to 1.5 m wide one-way active transportation facility with new mountable curbs in the existing location**.** As the AODA requires a minimum sidewalk/pathway width of 1.5 m, the minimum width for the Context-Sensitive Solution was increased to 1.5 m. **Figures 19 and 20** illustrate the two CWATS identified A/T facilities for the CR 20 corridor.

The advantages associated with this alternative include:

- Accommodates cyclists;
- Minimal impacts to existing services and utilities along the corridor;
- No anticipated property acquisition requirements;
- Lower construction and utility relocations costs;
- Fewer drainage improvements would be required; and
- Minimal impact on natural features/habitat.

Some of the disadvantages include:

- No dedicated space for pedestrians or other active transportation users;
- Minimal separation between pedestrians/cyclists and motor vehicles;
- No intersection or midblock roadway improvements to improve traffic flow;
- Does not address potential future traffic capacity issues;
- Does not address corridor access management issues; and
- Does not significantly contribute to improved street character.

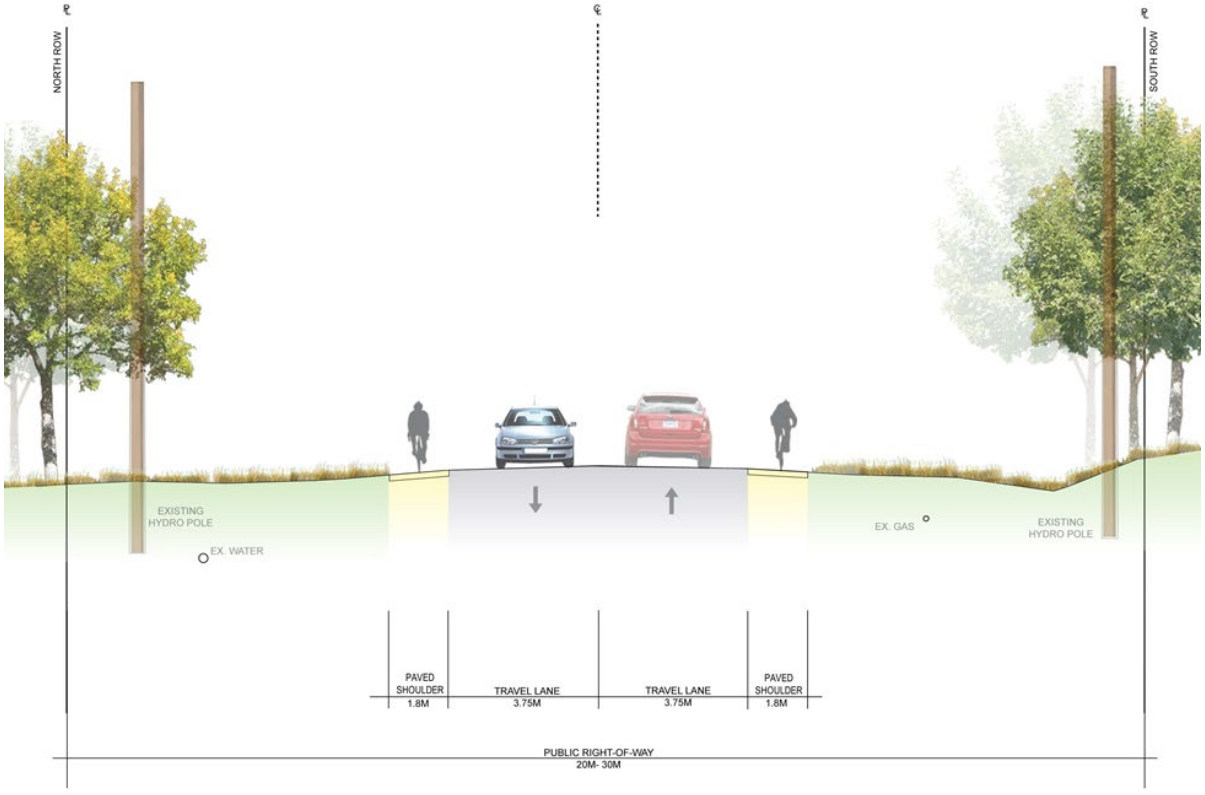


Figure 19: Alternative 1 Status Quo - Kratz Sideroad to 400 m West of CR45

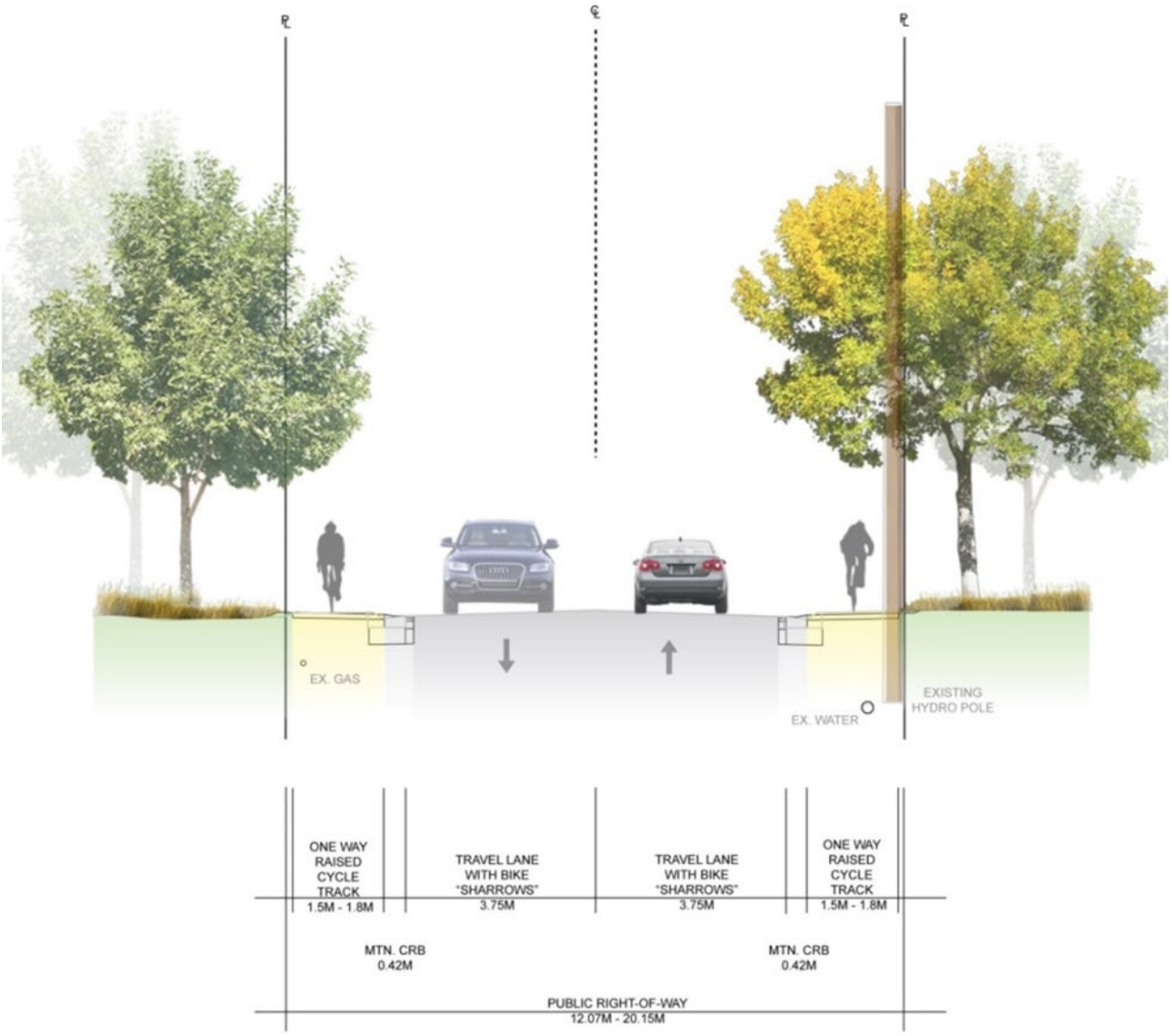


Figure 10: Alternative 1 Status Quo - Dimenna Dr. to Branton Dr.

5.2.2 Alternative 2 - Improve Other Roads in the Network

This alternative involves upgrading adjacent/parallel roadways to reduce the travel demand on County Road 20. It assumes that the interim A/T facility included as part of the Do Nothing alternative is in place. There is a significant distance (greater than 1 km) between County Road 20 and the nearest east/west travel route (County Road 34).

The advantage of this alternative is that it would not result in any impacts in the CR 20 road corridor. Disadvantages include not solving the identified problems, not improving active transportation opportunities through the corridor, and potential resulting in impacts to other road corridors.

5.2.3 Alternative 3 - Implement Transportation Demand Management Measures

This alternative includes integrating Transportation Demand Management (TDM) measures with the interim active transportation facility included as part of the "Do Nothing" Alternative. TDM measures include a wide range of policies, programs, services and products that influence how, why, when, and where people travel to make travel behaviors more sustainable. The emphasis of TDM strategies is to reduce the overall demands on the transportation network, shift demands to non-peak times and to encourage the use of other modes of transportation.

This study recognizes the importance of promoting and implementing TDM efforts including key policy tools such as the support of complete streets.

Typical TDM measures other than additional A/T facilities that are included as part of other alternative solutions include for example:

- Charging for car parking;
- Priority parking spaces for carpools;
- Discounted transit passes;
- Bike racks;
- Change-room and shower facilities for cyclists; and
- Telecommuting programs and flexible work hours.

The key advantage of this alternative is that it may help to improve traffic flow in the corridor (through reduction in vehicles during peak periods) and would not result in additional impacts to the CR 20 corridor over the "Do Nothing". For TDM measures to be effective, several would likely need to be implemented and there may be some challenges regarding the extent to which some of these measures would be applicable or effect change to the CR 20 corridor.

The key disadvantages are that this alternative does not provide any additional capacity to support future population and employment growth and does not provide a dedicated space for active transportation beyond what is included in the Do Nothing Alternative (back of shoulder paved pathway for cycle and pedestrian use). Further, as there is no public transit offered through the corridor, and through study engagement activities the local Municipalities did not identify any plans to extend transit through the corridor, initiatives related to transit use would not be effective.

5.2.4 Alternative 4 - Intersection Operational Improvements with Interim Active Transportation Facilities

This alternative includes the interim A/T facility described under Alternative 1 plus intersection improvements at key intersections (e.g. Graham Sideroad, Fraser Road and County Road 31) to improve traffic operations, safety, and compliance with Accessibility for Ontarians with Disabilities Act (AODA). The intersection improvements envisioned include for example the provision of turn lanes and designated crossings for pedestrians and cyclists. The signalization of intersections currently without signals would also be considered as part of this alternative subject to warrant analysis.

Some of the advantages associated with Alternative 4 include:

- Accommodates cyclists;
- No corridor widening so minimal impacts to existing services and utilities along the corridor;
- Minimal property acquisition requirements that is largely limited to lands at/near intersections;
- Modest construction, property acquisition and utility relocations costs;
- Fewer drainage improvements would be required;
- Improves intersection operation for all modes of transportation; and
- Opportunity to accommodate pedestrian/cycling crossing signals at intersections.

Some of the disadvantages of Alternative 4 include:

- Intersection improvements may require additional property acquisition, and impact to utilities and services;
- Does not address potential future traffic capacity issues;
- Does not provide dedicated space for pedestrians; and
- Does not address midblock traffic capacity/operational issues.

5.2.5 Alternative 5 - Intersection Operational Improvements with Ultimate Active Transportation Facilities

This alternative includes improvements as described in Alternatives 1 (interim A/T facility), and Alternative 4 (intersection improvements) plus the addition of dedicated space for pedestrians and other active transportation activities. This additional A/T facility could include a sidewalk and/or a multi-use path, separated from the cycle track with a buffer area. Two sub options were developed:

1) Alternative 5A, in addition to the interim A/T facility becoming a dedicated cycle track, a separated multi-use trail would be developed. See **Figure 21**; and

2) Alternative 5B is similar but instead of a single multi-use path on one side of the road, it includes sidewalks on both sides of the roadway. See **Figure 22**.

Some of the advantages of Alternative 5A/5B include the following:

- Provides a dedicated space for pedestrians and other active transportation activities;
- Improves traffic safety;
- Improves intersection operation for all modes of transportation;
- Provides opportunity to improve character/vision of the roadway with a "complete street" solution and better connects Kingsville and Leamington with dedicated spaces for all modes of transportation; and
- Salvages the interim active transportation facility currently being constructed.

The disadvantages of Alternative 5A/5B include:

- Wider ROW results in greater impact to utilities, services and the natural and cultural features and requires property acquisitions;
- Does not address midblock traffic capacity/operational issues;
- Potential for additional drainage improvements required; and
- Higher overall construction costs.

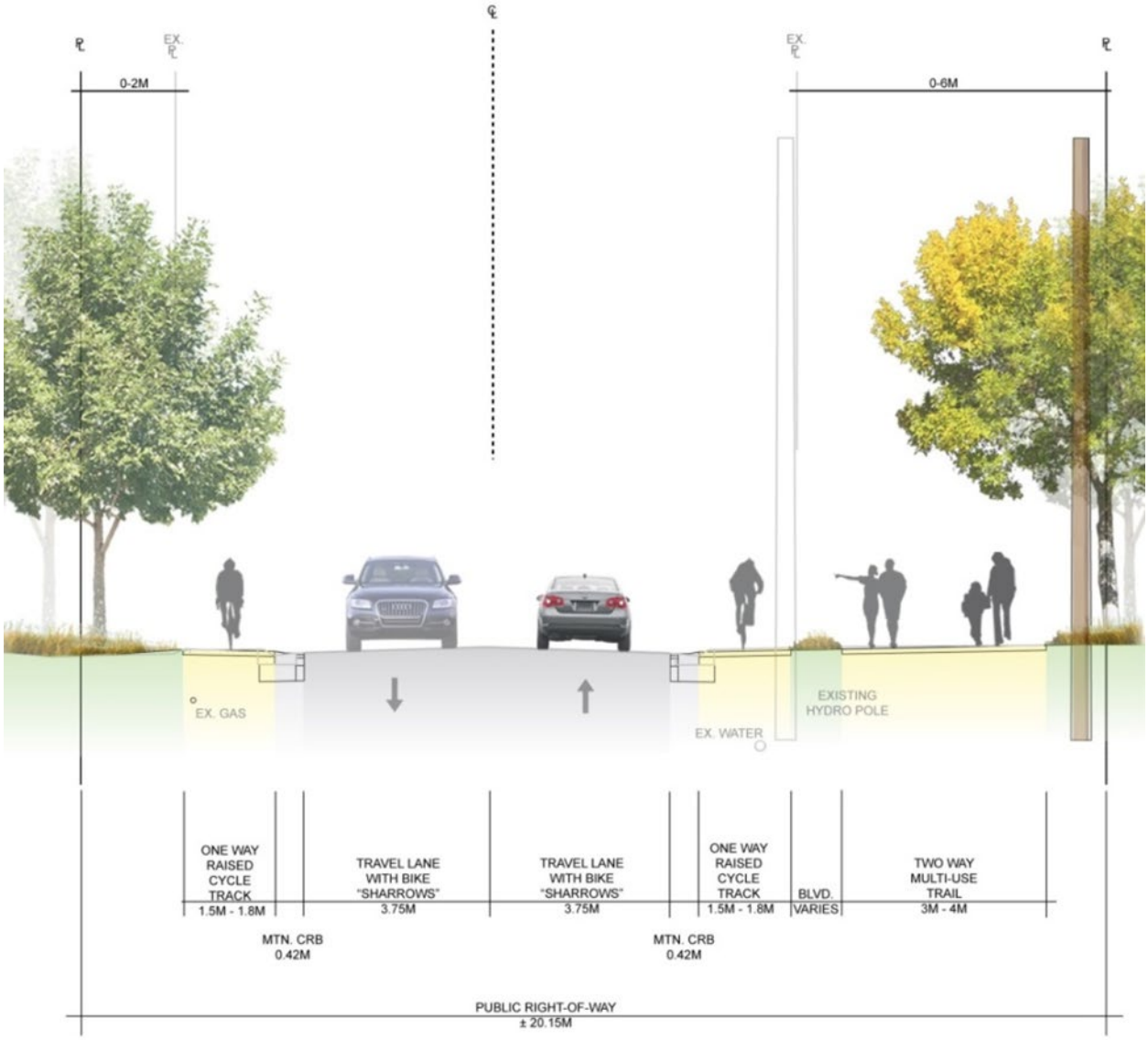


Figure 11: Alternative 5A

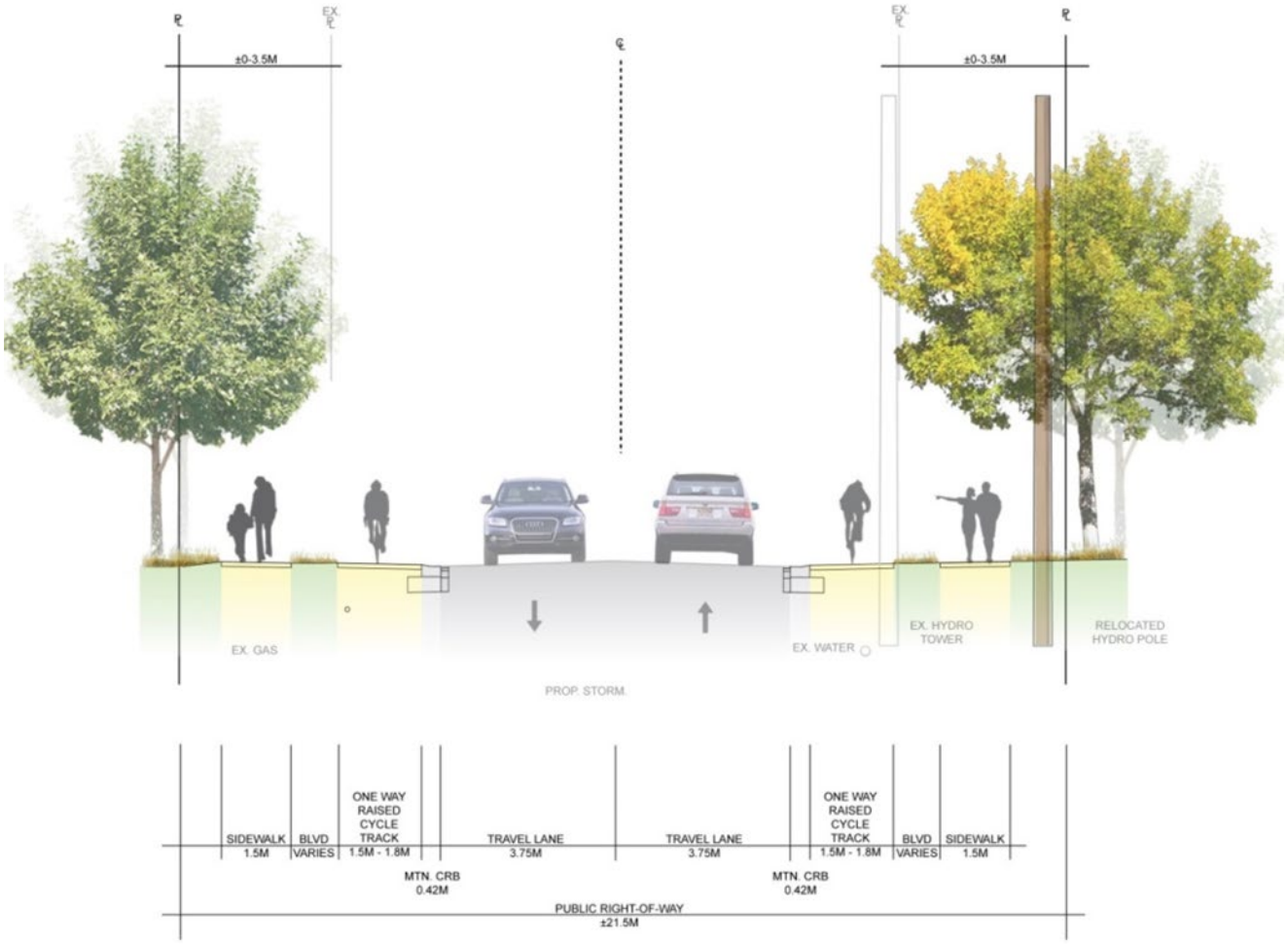


Figure 12: Alternative 5B

5.2.6 Alternative 6 – Widen Road for Two-Way Centre Turn Lane with Ultimate Active Transportation Facilities

This alternative includes the active transportation facilities (sidewalk or a multi-use path, separated from the cycle track with a buffer area) and intersection operational improvements as described in Alternative 5 plus the addition of a centre turn lane throughout the length of the corridor. The centre turn lane was assumed to be a 3.4 m wide lane (in addition to two 3.75 m travel lanes).

Two sub options were created - Alternative 6A and 6B which differ in the type of A/T facility provided. Under Alternative 6A, the ultimate A/T facility would include separated sidewalks (see **Figure 23**). The ultimate A/T facility for Alternative 6B would

include a multi-use pathway on one side of the street instead of a sidewalk (see **Figure 24**).

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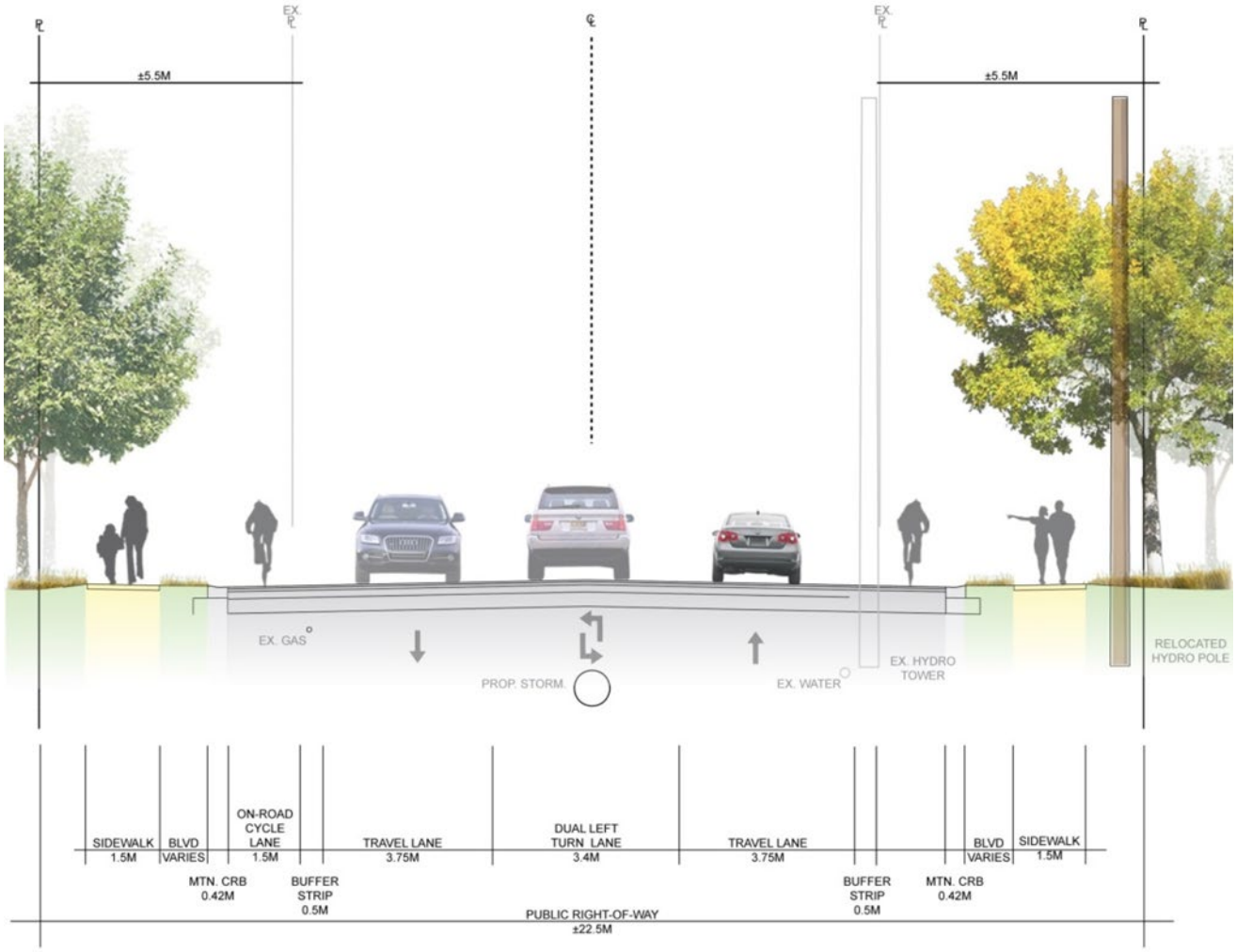

Figure 13: Alternative 6A

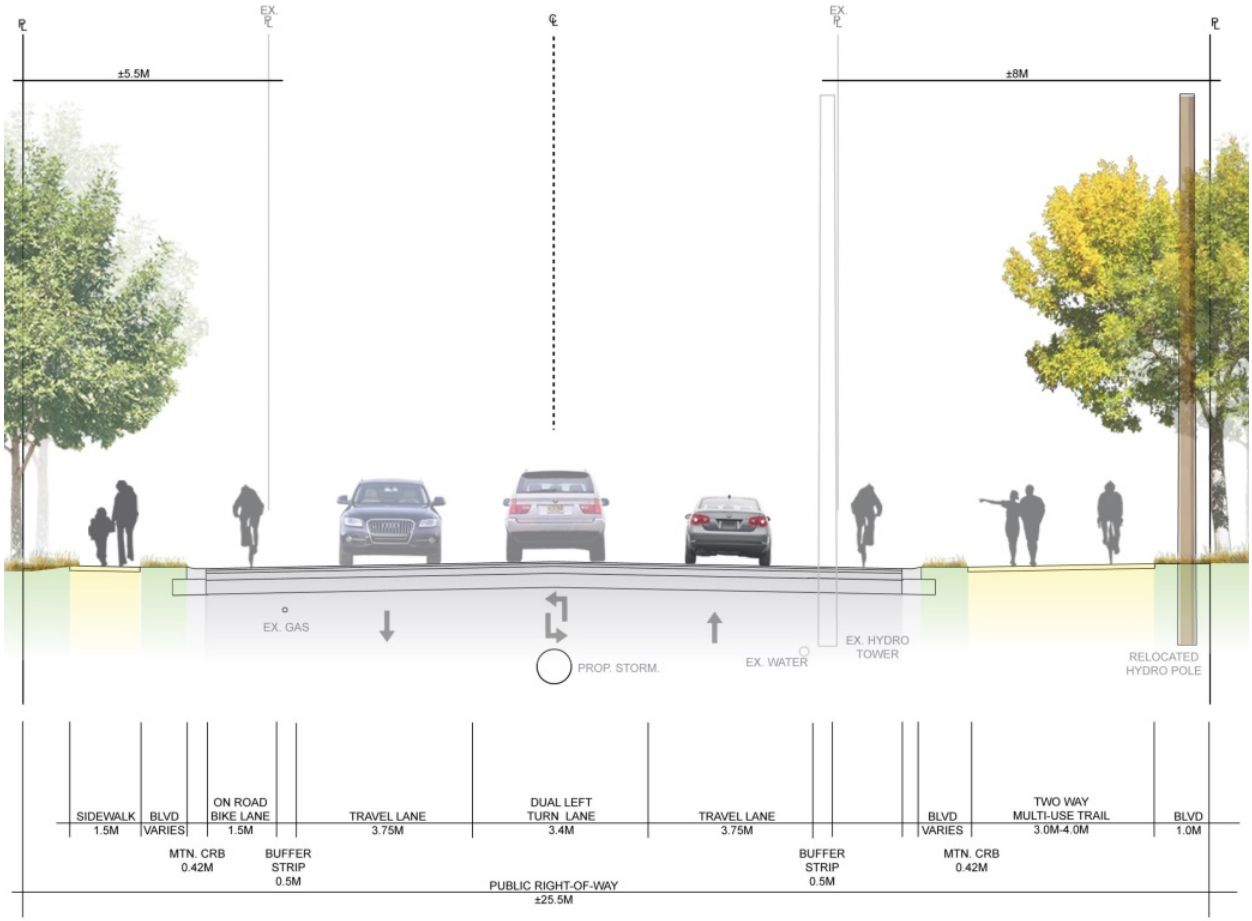

Figure 14: Alternative 6B

Some of the advantages of Alternative 6 A/B include the following:

- Improves traffic safety, left hand turn movements and emergency vehicle response times;
- Improves intersection operation for all modes of transportation;
- Provides a dedicated space for pedestrians and other active transportation activities; and
- Provides opportunity to improve character/vision of the roadway with a "complete street" solution and better connects Kingsville and Leamington with dedicated spaces for all modes of transportation.

The disadvantages of Alternative 6A/B include:

- Wider right-of-way results in greater impact to utilities, services and the natural and cultural environments, and requires the greatest number and the largest area of property acquisitions as compared to the other alternatives solutions;
- Wider roadway and ROW may encourage higher vehicular travel speeds;
- More drainage improvements potentially required;
- Higher construction costs;
- Potential for throw away costs with implementation/timing of interim solution; and
- Longer pedestrian crossings at intersections.

5.2.7 Alternative 7 – Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane and Interim Active Transportation Improvements

Alternatives 1 through 6 as described above were presented at PIC #1. As a result of public and stakeholder input received at and following PIC 1, including expressed concern regarding the extent of property acquisition that would result throughout the corridor to accommodate an ultimate A/T facility plus a continuous centre turn lane, two additional alternative solutions were developed that were identified as Alternatives 7 and 8.

Alternative 7 includes the Alternative 4 improvements (intersection operations improvements) plus:

- On-road pedestrian/cycling lanes on both sides of road; and
- Two 3.75 m travel lanes, plus a 3.4 m two-way centre left turn lane (TWLTL) at select locations within study area.

Alternative 7 is illustrated in **Figure 25 (**without the TWLTL) and **Figure 26** (with the TWLTL).

Regarding the TWLTL, the intent of adding one is to provide an opportunity for vehicles to safely pass a vehicle waiting to make a left turn, without having to drive onto the shoulder (and create safety risks to active transportation users).

Although no specific warrant thresholds exist for the installation of TWLTLs, certain geometric and operational factors can be potential indicators, particularly in combination:

- High frequency of driveways on both sides of the road, particularly involving offset driveways;
- A high volume of driveway traffic in combination with a high volume of traffic on the main street;
- Higher travel speeds on the main roadway; and/or
- A history of rear-end collisions involving motorists turning left into driveways.

The Project Team, through consultation with the Municipalities and local residents/public, two locations have been identified where there is potential for delay along County Road 20 due to vehicles waiting to make a left turn. The locations are just east of Kratz Side Road and just east of Union Avenue and are also shown in **Figure 46**.

As well, additional locations may be identified in the future should development or population growth exceed that used in this report.

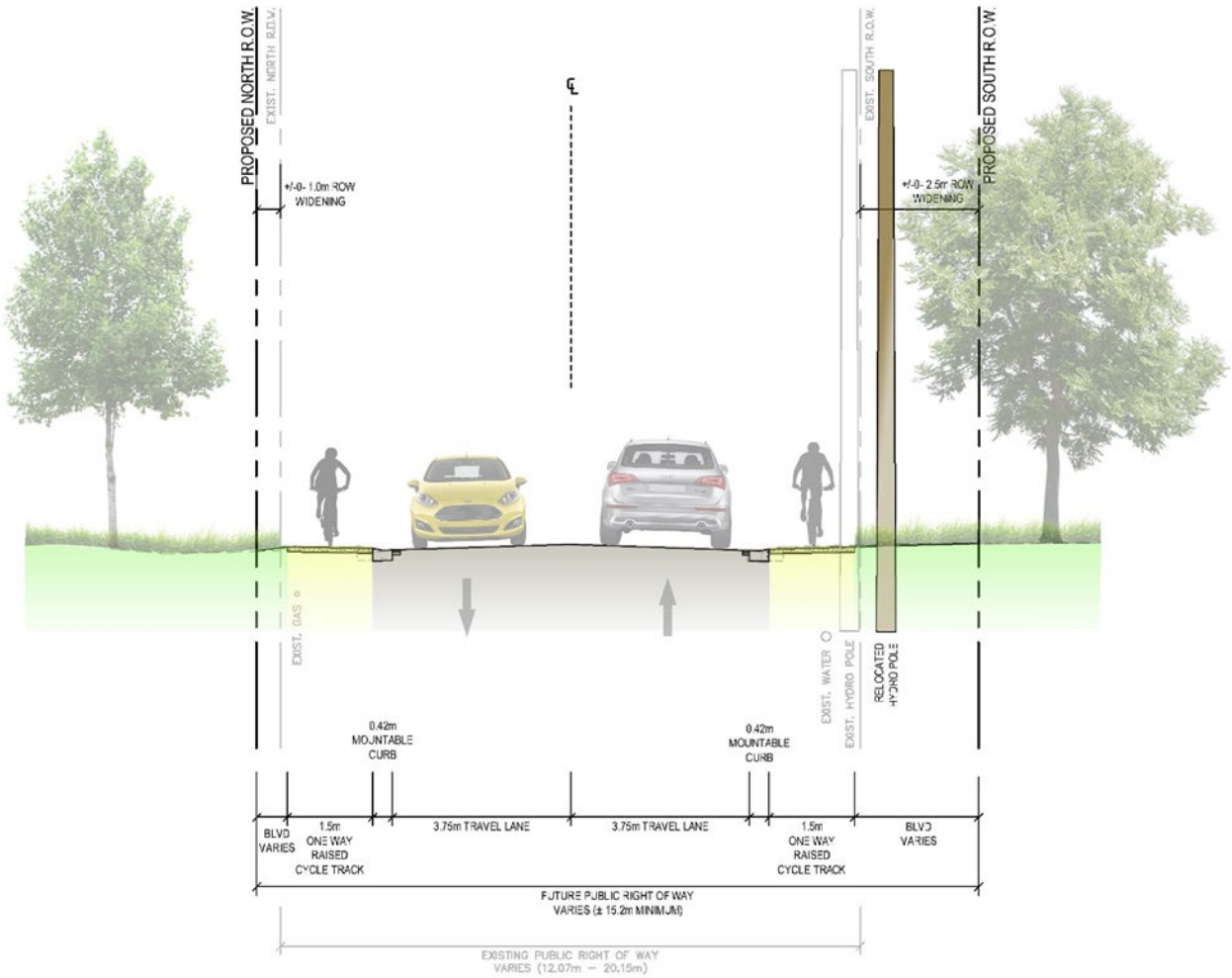

Figure 15: Alternative 7 (without TWLTL)

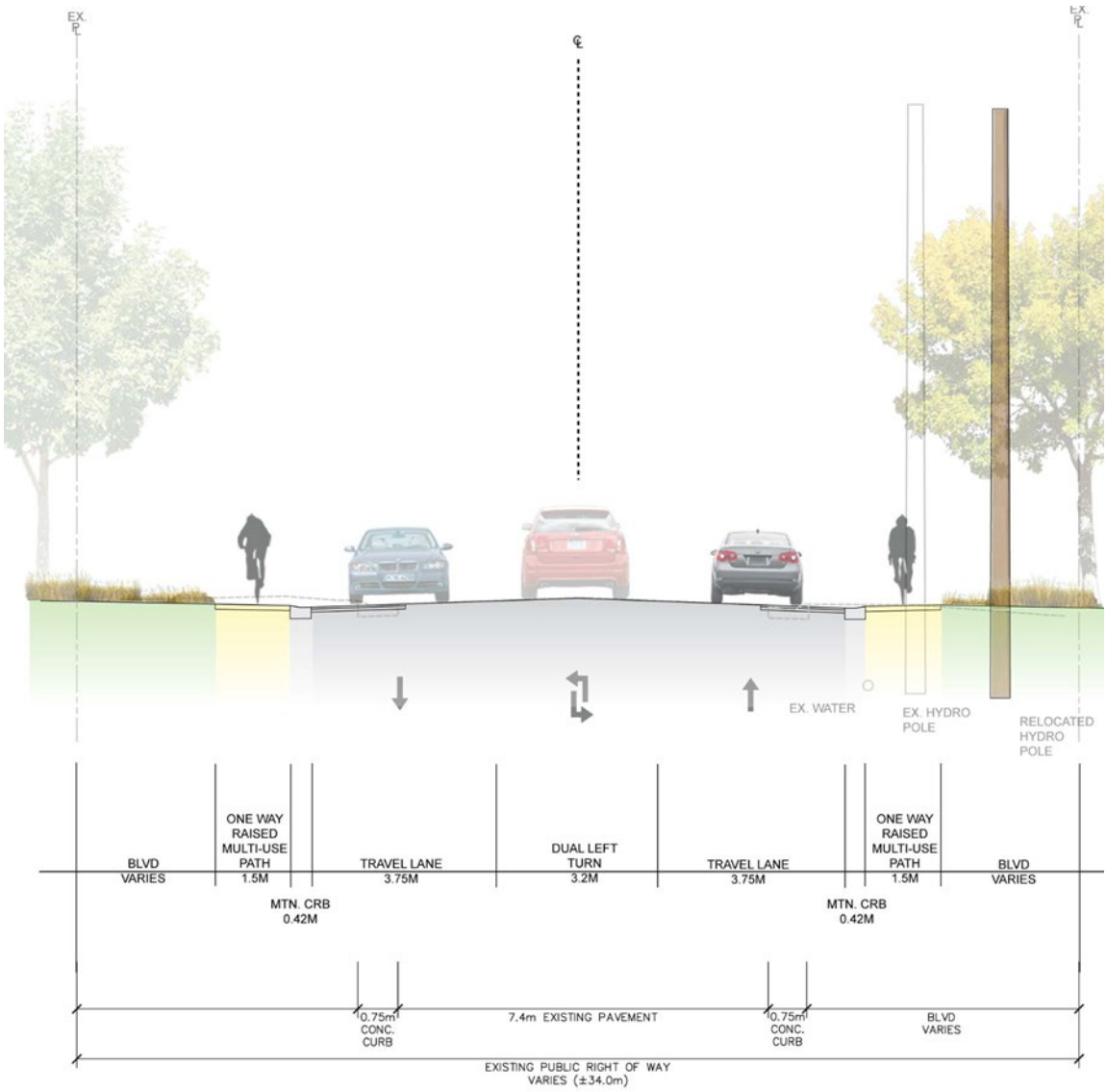

Figure 16: Alternative 7 (with TWLTL)

Advantages of Alternative 7 include:

- Long-term vehicular demands along County Road 20 can be accommodated;
- Improves traffic safety, left-hand turn movements and emergency vehicle response times;
- Additional ROW requirements are modest/less impact and property requirements and less cost; and
- Provides a cycling facility.

Some disadvantages of Alternative 7 include:

- No dedicated/separated pedestrian facility - opportunity to widen cycle path to accommodate pedestrians;
- Pedestrians and cyclists not well buffered from road lanes;
- Potential for property acquisition; and
- Potential for impacts to drains and natural heritage features.

5.2.8 Alternative 8 –Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane and Ultimate Active Transportation Facilities

Alternative 8 includes the Alternative 4 improvements (intersection operations improvements) plus:

- On-road dedicated cycling lanes on both sides of road;
- Two 3.75 m travel lanes, plus an intermittent 3.4 m two-way left turn lane; and
- Off-road multi-use pathway and/or sidewalk(s).

Alternative 8 is illustrated in **Figure 27** (showing sidewalks as the off-road A/T facility as an example, which could instead include a multi-use trail).

Key advantages of Alternative 8 include:

- Long-term vehicular demands along County Road 20 can be accommodated;
- Improves traffic safety, left hand turn movements and emergency vehicle response times;
- Multi-use path provides facility for recreation cyclists and children. Provides for greater separation from roadway lanes improving safety;
- Provides opportunity to improve character/vision of the roadway and better connects Kingsville and Leamington with dedicated spaces for all modes of transportation; and
- Better supports the Provincial Policy Statement including the support of a multi-modal transportation system.

Disadvantages of Alternative 8 include:

- Wider right-of-way results in greater impact to utilities, services and the natural and cultural environments;
- More drainage improvements required; and
- Higher overall construction costs.

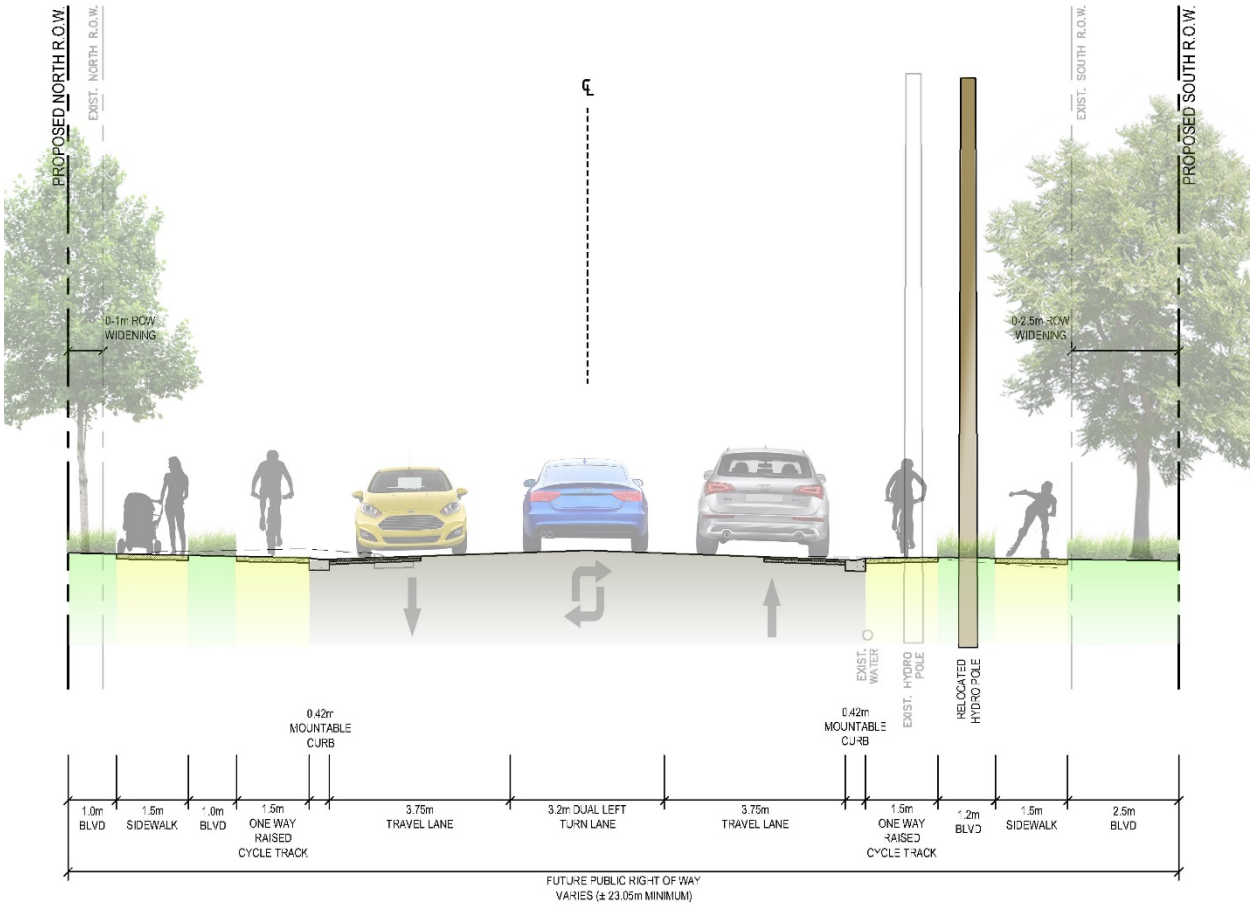

Figure 17: Alternative 8

5.3 Consultation Input on Alternative Solutions

Public input regarding the alternative solutions was primarily received at and following PIC #1 (see **Section 1.7** for a description of PIC #1). Key input received included the request to consider additional alternative solutions. As noted above, through the comments received from the public at PIC #1, two additional alternative solutions were developed (Alternatives 7 and 8) that include intersection improvements and two-way center turning lanes at select (intermittent) locations coupled with the interim A/T

facility or an ultimate A/T facility. These were developed as Alternatives 7 and 8 as previously described. Public comments and concerns received at the PICs were also considered in the assessment and evaluation of the alternative solutions as described in the sections below.

The following provides a brief summary of the comments received on the alternative solutions presented at PIC# 1. (Also see **Appendix A** for full documentation of the received comments):

- Concern over the width of the proposed alternatives and resulting property, landscape and tree impacts along County Road 20;
- Requests more information about the project;
- Recognition that school bus delays can be lengthy but necessary;
- Recognition that trucks that service businesses on County Road 20 do not cause delay, although noted that trucks travelling to Harrow should be encouraged to find another route;
- Support for the need for a cycling facility along the corridor;
- Suggestion that cycling and pedestrian facilities should be combined to mitigate impacts;
- Some concern was noted about the travel speed along the corridor and suggested the project team consider traffic calming measures;
- Feedback on the evaluation criteria presented was received: include criteria to evaluate/determine whether a multi-use pathway is a safe facility in corridor (e.g. number of driveways, number of intersections); transportation criteria should include “Influencing choice for drivers” (design should encourage through-traffic to use Talbot or Highway 3); recreation/health promotion should be considered as a criterion for evaluation;
- The area on CR 20 (Main Street East) in Kingsville between Truax Lumber and Zehr’s is a major safety concern (note - outside of study area). This is a dangerous section of road with too many access points. Any initiatives to reroute traffic to access County Road 20 at an existing stop light would be welcome; and
- Some noted a preference for the Status Quo alternative (Alternative 1 – CWATS recommended A/T facility only) which serves the purpose of providing space for active transportation with the least overall impact.

These expressed public comments and concerns received at the PIC s were also considered in the assessment and evaluation of the alternative solutions as described in the sections below.

5.4 Screening of Alterative Solutions

Prior to the full evaluation of the alternative solutions an initial screening was undertaken to assess the extent to which the alternatives address the identified problem statement as previously described in **Section 4.0**.

Table 19 below provides a summary of the initial screening of alternative solutions that was presented in draft form to the public at PIC #1.

Table 19: Alternative Solutions Screening

Alternative Solution	How Does the Alternative Address the Problem/Opportunity?	Recommendation
Alternative 1: Status Quo/Do Nothing	This alternative does not fully address the safety, operational, and capacity issues within the study area. As the interim active transportation facility (paved shoulder) is to be used for all modes of A/T including pedestrians and cyclists, there is potential for user conflict. Further, does not address the long-term growth plan to support multi-modal modes of transportation as population and employment increases over the next 25 years in the County. The facility is also not as well buffered from road lanes as an off-road path would be and as such could be continued safety concerns.	Alternative 1 was reconfirmed as an interim solution. This CWATS interim facility is under construction as of 2016 and is not dependent on the outcome of this Class EA. All other Alternative Solutions/Designs are to enhance the corridor, beyond the interim CWATS facility. Not carried forward as a long-term solution.
Alternative 2: Improve Other Roads within the Network	This alternative was not identified for further consideration as it does not address the problem/opportunity statement and is inconsistent with the long-term goals and objectives of the County of Essex, Municipality of Leamington or Town of Kingsville and does not support the designated function of the County Road 20 corridor as well as the objectives of CWATS.	Do not carry forward.
Alternative 3: Implement Transportation Demand Management Measures (TDM)	This alternative does not provide a dedicated space for active transportation beyond what is included in the Do Nothing Alternative and does not fulfill the objectives of CWATS. Safety concerns and intersection operation issues are also not address through TDM. As a result, TDM measures as a standalone solution was not considered a viable option.	Do not carry forward on its own. TDM measures to be included as part of other alternatives where feasible.
Alternative 4: Intersection Operational Improvements with the Interim Active Transportation Facilities	This solution addresses the traffic safety and operational issues at intersections and also provides space for active transportation (although a separate space for pedestrians and cyclists is not provided). It is consistent with CWATS and would result in minimal impacts to surrounding lands/properties and minimal cost. Improving intersections (e.g. adding turning lanes) would improve traffic operations and through movement (less delay) as well as minimize potential for vehicles to travel onto the paved shoulder to go around vehicles waiting to turn. It is therefore recommended for further consideration.	Recommended for further consideration.

Alternative Solution	How Does the Alternative Address the Problem/Opportunity?	Recommendation
Alternative 5: Intersection Operational Improvements with Ultimate Active Transportation Facilities	While this solution only addresses the traffic safety and operational issues at intersections, it does provide a dedicated space for cyclists and a dedicated space for pedestrians and possibly for other active transportation activities (exceeds CWATS proposal for County Road 20). While this alternative would result in some additional impacts to surrounding lands/properties and higher cost as compared to Alternative 4 due to a wider footprint, due to the additional benefits it provides it is therefore recommended for further consideration.	Recommended for further consideration.
Alternative 6: Widen Road for Two-Way Centre Turn Lane with Ultimate Active Transportation Facilities	With the addition of the centre turn-lane to the improvements identified in Alternative 5, this solution addresses the traffic safety and operational issues and also provides a dedicated space for cyclists and a dedicated space for pedestrians and possibly for other active transportation activities. This alternative would have the widest footprint, results in some additional impacts to surrounding lands/properties and has the highest overall cost. However, due to the additional benefits it provides, it is recommended for further consideration.	Recommended for further consideration.
Alternative 7 Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane and Interim Active Transportation Improvements	The inclusion of the intersection operational improvements and intermittent two-way left turn lanes addresses the identified problems associated with vehicles. The identified interim A/T facility that is to serve both cyclists and pedestrians would become a long-term facility. While this would not fully fulfill the CWATS objectives, the configuration of this alternative does minimize property acquisition and other impacts. It is recommended for further consideration.	Recommended for further consideration.
Alternative 8 Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane and Ultimate Active Transportation Facilities	The inclusion of the intersection operational improvements and intermittent two-way left turn lanes addresses the identified problems associated with vehicles. The addition of an ultimate A/T facility including well separated pathways for separate use by pedestrians and cyclists would fulfill CWATS objectives. It is recommended for further consideration.	Recommended for further consideration.

5.5 Evaluation of Alterative Solutions and Selection of Preferred Solution

As identified above, Alternatives 4, 5, 6, 7 and 8 where carried forward for comparative evaluation to select a preferred alternative solution. The evaluation was based a set of evaluation criteria (22) structured on the basis of the following criteria groups:

- Transportation;
- Engineering;
- Cultural Environment;
- Socio-economic Environment; and
- Natural Environment.

Table 20 presents the evaluation results of the five alternative solutions. Relative preference rankings are provided by criterion and summarized at the criteria group level. At the end of this table is a summary table (**Table 21**) of the preference rankings. The following describes the results of the evaluation and rationalizes the selection of the preferred alternative solution.

Alternative 4 - Intersection Operational Improvements with the Interim Active Transportation Facilities

While this alternative generally has the least amount of environmental and socio-economic impact (due to no widened street footprint) and would have the least cost of the alternatives, it is considered to be least preferred from a Transportation perspective as it does not address mid-block roadway operational/capacity/safety issues and does not accommodate/promote active transportation beyond the interim A/T facility (paved shoulder) that is being implemented by the County. This alternative neither fully addresses the identified problems and opportunities of the corridor or fully supports the goals of CWATS and the Provincial Policy Statement. As a result, Alternative 4 is not recommended for further consideration.

Alternative 5 – Intersection Operational Improvements with Ultimate Active Transportation Facilities

Relative to Alternatives 6, 7 and 8, the additional footprint for this alternative is modest and so environmental and socio-economic impacts and costs are generally less. A key advantage of this alternative, as compared to Alternatives 4 and 7, is the inclusion of an

ultimate active transportation facility in the study area to fully meet if not exceed the goals of CWATS. This would address any user A/T conflicts potentially associated with the interim A/T facility. The main disadvantage of Alternative 5 is that the alternative does not address identified mid-block roadway operational/capacity/safety issues along the corridor (no provision for two-way centre turn lanes). As such, it does not fully address the identified problems of the corridor and is not recommended for further consideration.

Alternative 6 - Widen Road for Two-Way Centre Turn Lane with Ultimate Active Transportation Facilities

With the widest footprint, this alternative has the highest potential for environmental and socio-economic impacts, property acquisition, costs and greatest requirement for additional drainage infrastructure. Key advantage of this alternative is the provision of the ultimate active transportation facility that satisfies if not exceeds CWATS. As well, the continuous centre two-way left turn lane will help to address roadway safety issues and reduce traffic slowdowns. The centre turn lane would also assist emergency response vehicles to travel through the corridor during peak periods. A disadvantage of the continuous centre turn lane is that it may encourage vehicles to travel at higher speeds as there would be greater separation between the opposing vehicle lanes. In weighing the pros and cons of Alternative 6 relative to the other alternatives, it was determined that the benefits of the continuous left turn lane do not justify the impacts and costs that would result from it. As well, there was no significant public or stakeholder interest shown for this alternative. As such, the alternative is not recommended for further consideration.

Alternative 7 – Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane and Interim Active Transportation Improvements

From a Transportation perspective, Alternative 7 was considered to be moderately preferred as compared to the other alternatives. The inclusion of a two-way left turn lane at the two key problem areas in the corridor (Anna's Flowers and Cindy's Garden businesses) will improve traffic safety and help to address traffic slowdowns. The alternative was ranked lower than Alternatives 6 and 8 because it only includes the interim A/T facility and would not address the potential A/T user conflicts than could result from the combined facility once user volumes increase in the future.

As the additional roadway footprint is modest as compared to Alternative 6, the additional costs and natural environment and socio-economics are less (and similar to Alternatives 5 and 8).

The main disadvantage of this alternative is that it does not accommodate/promote active transportation beyond the minimal interim facility that is being implemented. As such, it does not fully support identified opportunities in the corridor in relation to active transportation or fully support the goals of CWATS. It would also not allow the transformation of the character of the corridor to the same extent that Alternative 8 would. As such, while Alternative 7 is not recommended for the long-term, it could serve as an interim design by adding intersection improvements (e.g. turn lanes) and the two-way centre turn lanes at two locations in combination with the interim A/T facility that is currently being implemented.

Alternative 8 - Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane and Ultimate Active Transportation Facilities

This alternative addresses the key vehicle operation and safety issues in the corridor through the provision of intersection improvements and a two-way left turn lane at high vehicle turn demand locations (2 locations assumed). As well it also includes an ultimate active transportation facility in the study area which fully supports the goals of CWATS. As such, it is considered to be preferred from the perspective of the Transportation criteria group.

The main disadvantage of this alternative is that with a wider footprint than Alternatives 4, 5, and 7, impacts (natural and socio-economic environment), property acquisition, and costs will also be greater. It is expected that with appropriate mitigation and project design that most of the impacts can be minimized. While depending on its final design, it is expected that this alternative would result in minimal loss to natural features and has low likelihood for removal of homes or businesses. While there would be some loss of frontage property, most (not all) residences are well set back from the roadway and thus impacts to landowners should be modest to minimal. Where homes are closer to the road it is expected that the facility design can be adjusted to minimize effects on home owners.

The higher impacts and costs are considered justifiable given the transportation benefits associated with this alternative and that this alternative meets if not exceeds County of

Essex and local Municipal Plans and objectives including those outlined in Official Plans, the County TMP, CWATS as well as the Leamington and Kingsville A/T plans. As a result, **Alternative 8 is considered to be the preferred alternative solution** and recommended for further consideration as part of alternative design development and evaluation process as described in **Section 6.0** of this report. Comments received from the public at both PIC #1 and #2 were generally supportive of this concept including the development of separate cycling and pedestrian facility with the expectation that property acquisition, tree removal, and potential conflicts with driveways/access roads can be minimized through facility design.

Table 20: Alternative Solutions Evaluation

	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Evaluation Criteria and Sub-Factors	**Intersection Operational Improvements and Interim Active Transportation Improvements**	**Intersection Operational Improvements and Ultimate Active Transportation Facilities**	**Intersection Operational Improvements with a Continuous Two Way Left Turning Lane and Ultimate Active Transportation Facilities**	**Intersection Operational Improvements, with Intermittent Two Way Centre Turning Lane and Interim Active Transportation Improvements**	**Intersection Operational Improvements, with Intermittent Two Way Centre Turning Lane and Ultimate Active Transportation Facilities**
TRANSPORTATION					
Traffic Operations and Accommodation of Future Travel Demand- Potential to provide sufficient capacity and level of service (LOS) to accommodate projected traffic volumes	**Less Preferred:** Long term vehicular demands at CR 20 intersections can be accommodated with operational improvements at key intersections. - Does not help to address potential traffic slow downs at other locations along corridor.	**Less Preferred:** Long term vehicular demands at CR 20 intersections can be accommodated with operational improvements at key intersections. - Does not help to address potential traffic slow downs at other locations along corridor.	**Preferred:** TWLTL and improved intersection operations will help to reduce traffic slow downs for east and west bound vehicles throughout the study area.	**Moderately Preferred:** Select TWLTL and improved intersection operations will help to reduce traffic slow downs for east and west bound vehicles at key locations.	**Moderately Preferred:** Select TWLTL and improved intersection operations will help to reduce traffic slow downs for east and west bound vehicles at key locations.
Traffic Speed Control- Relative ability to encourage appropriate traffic speed for the road classification taking into account adjacent land uses	**Preferred:** Potential to encourage appropriate travel speed along CR 20 corridor due to closer interactions between opposing traffic.	**Preferred:** Potential to encourage appropriate travel speed along CR 20 corridor due to closer interactions between opposing traffic.	**Less Preferred** - Less potential to encourage appropriate travel speed due more space between opposing vehicles along CR 20 corridor as a result of the continuous two-way centre turn lane.	**Preferred:** Potential to encourage appropriate travel speed along CR 20 corridor due to closer interactions between opposing traffic.	**Preferred:** Potential to encourage appropriate travel speed along CR 20 corridor due to closer interactions between opposing traffic.
Safety- Potential to improve traffic safety based on the opportunity to reduce congestion and potential for collisions	**Less Preferred:** Potential to reduce collisions by improving traffic flow at intersections but no improvements at mid-block locations - Interim AT improvements will help to decrease potential for vehicle/AT user conflicts although not to the same extent as the other alternatives with additional AT facilities	**Moderately Preferred:** Potential to reduce collisions by improving traffic flow at intersections but no improvements at mid block locations - Providing dedicated off road area for AT users will decrease potential for vehicle/AT user conflicts	**Preferred:** Highest potential to improve traffic safety due to addition of turning lane throughout corridor - potential for decreased rear end collisions. - Providing dedicated off road area for AT users will decrease potential for vehicle/AT user conflicts.	**Preferred:** Higher potential to improve traffic safety due to addition of TWLTL at key locations, to allow for safer turning movements in high traffic areas - Providing dedicated off road area for AT users will decrease potential for vehicle/AT user conflicts	**Preferred**: Higher potential to improve traffic safety due to addition of TWLTL at key locations, to allow for safer turning movements in high traffic areas - Providing dedicated off road area for AT users will decrease potential for vehicle/AT user conflicts
Road Network Compatibility/Connectivity- Potential to be consistent with the proposed transportation system and function of CR 20 in the long term (i.e. EWTMP)	**Moderately Preferred:** The intersection improvements will allow CR 20 to function better as a regional roadway but to a less extent than under Alternatives 6, 7 & 8.	**Moderately Preferred:** The intersection improvements will allow CR 20 to function better as a regional roadway but to a less extent than under Alternatives 6, 7 & 8.	**Preferred:** Intersection improvements and addition of two-way left centre turn lane will allow CR20 to better function as a regional roadway as supported in EWTMP.	**Preferred:** Intersection improvements and addition of two-way left centre turn lane will allow CR20 to better function as a regional roadway as supported in EWTMP.	**Preferred:** Intersection improvements and addition of two-way left centre turn lane will allow CR20 to better function as a regional roadway as supported in EWTMP.
Accommodation of Active Transportation- Ability to provide safe, connected, effective, attractive and convenient cycling and pedestrian facilities	**Less Preferred**: AT improvements provide a designated continuous pedestrian/cycling facility but does not provide separated/buffered facilities for cyclists and pedestrians. - Consistent with the interim improvement plans outlined in CWATS but not long term goals to promote active transportation activity in the corridor - Provides for a LOS of E for pedestrians. - Provides for a LOS of B or D for cyclists.	**Preferred:** Can provide continuous dedicated/separated area for cyclists and pedestrians. - Improved facilities may promote increased use by pedestrians and cyclists - consistent with the long term goals outlined in CWATS to promote active transportation activity in the corridor. - Can provide for a LOS of A to C for pedestrians depending on chosen AT facility. - Can provides for a LOS of A to C for cyclists depending on chosen AT facility and road section.	**Preferred:** Can provide continuous dedicated/separated area for cyclists and pedestrians. - Improved facilities may promote increased use by pedestrians and cyclists - consistent with the long term goals outlined in CWATS to promote active transportation activity in the corridor. - Can provide for a LOS of A to C for pedestrians depending on chosen AT facility. - Can provides for a LOS of A to C for cyclists depending on chosen AT facility and road section.	**Moderately Preferred:** AT improvements provide a designated continuous pedestrian/cycling facility but does not provide separated/buffered facilities for cyclists and pedestrians. - Consistent with the interim improvement plans outlined in CWATS but not long term goals to promote active transportation activity in the corridor - Provides for a LOS of E for pedestrians. - Provides for a LOS of B or D for cyclists.	**Preferred:** Can provide continuous dedicated/separated area for cyclists and pedestrians. - Improved facilities may promote increased use by pedestrians and cyclists - consistent with the long term goals outlined in CWATS to promote active transportation activity in the corridor. - Can provide for a LOS of A to C for pedestrians depending on chosen AT facility. - Can provides for a LOS of A to C for cyclists depending on chosen AT facility and road section.
Accommodation of Public Transit - Ability to accommodate future transit stops (Note that CR 20 is not part of Leamington Transit Route therefore no foreseeable impact to Leamington transit operation for any of the alternatives.)	**Moderately Preferred:** While there no operating bus service in the corridor, a future bus service may operate less efficiently than under Alternatives 6, 7 & 8.	**Moderately Preferred:** While there no operating bus service in the corridor, a future bus service may operate less efficiently than under Alternatives 6, 7 & 8.	**Preferred:** While there no operating bus service in the corridor, a future bus service may operate more efficiently with a two way centre lane than under Alternatives 4 & 5.	**Preferred:** While there no operating bus service in the corridor, a future bus service may operate more efficiently with a two way centre lane than under Alternatives 4 & 5.	**Preferred:** While there no operating bus service in the corridor, a future bus service may operate more efficiently with a two way centre lane than under Alternatives 4 & 5.
Accommodation of School Buses - Potential to increase the safety of school buses and riders	**Moderately Preferred:** With minimal separation from road lanes, the interim A/T facility is considered to be less preferred than alternatives that include an ultimate A/T facility that would be better separated from road lanes.	**Preferred:** An ultimate A/T facility would have more separation from road lanes than the interim facility and thus would provide a safer facility for students walking to or from school bus stops and waiting for the school bus.	**Preferred:** An ultimate A/T facility would have more separation from road lanes than the interim facility and thus would provide a safer facility for students walking to or from school bus stops and waiting for the school bus.	**Moderately Preferred** - With minimal separation from road lanes, the interim A/T facility is considered to be less preferred than alternatives that include an ultimate A/T facility that would be better separated from road lanes.	**Preferred:** An ultimate A/T facility would have more separation from road lanes than the interim facility and thus would provide a safer facility for students walking to or from school bus stops and waiting for the school bus.

	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Evaluation Criteria and Sub-Factors	**Intersection Operational Improvements and Interim Active Transportation Improvements**	**Intersection Operational Improvements and Ultimate Active Transportation Facilities**	**Intersection Operational Improvements with a Continuous Two Way Left Turning Lane and Ultimate Active Transportation Facilities**	**Intersection Operational Improvements, with Intermittent Two Way Centre Turning Lane and Interim Active Transportation Improvements**	**Intersection Operational Improvements, with Intermittent Two Way Centre Turning Lane and Ultimate Active Transportation Facilities**
Response Time/Access for Emergency Vehicles- Potential to improve response time/accessibility for emergency vehicles due to changes in travel time	**Less Preferred:** Potential improvements to response time along CR 20 due to intersection improvements than existing situation but less preferred than alternatives that include a two way centre turn lane.	**Less Preferred:** Potential improvements to response time along CR 20 due to intersection improvements than existing situation but less preferred than alternatives that include a two way centre turn lane.	**Preferred:** Greatest potential to improve response time along CR 20 as full corridor TWLTL will provide better ability for EMS to pass motorists.	**Moderately Preferred:** Compared to Alternatives 4 & 5 has greater potential to improve response time along CR 20 as intermittent TWLTL will provide EMS some ability to pass motorists.	**Moderately Preferred:** Compared to Alternatives 4 & 5 has greater potential to improve response time along CR 20 as intermittent TWLTL will provide EMS some ability to pass motorists.
SUMMARY OF TRANSPORTATION CONSIDERATIONS	**LESS PREFERRED**	**MODERATELY PREFERRED**	**MOST PREFERRED**	**MODERATELY PREFERRED**	**MOST PREFERRED**
ENGINEERING CONSIDERATIONS					
Services/Utilities- Potential impact to services or utilities (hydro poles) within the corridor - Accommodation of planned services/utilities	**Preferred:** Minimal relocations required to install AT facilities along corridor - In areas of narrower ROW, interim facility (without pole relocations) will require narrowed pathway and/or limited clear zone from poles - Potential for aerial pole (hydro and/or traffic signal) relocations required in/around intersections	**Preferred:** Higher potential than Alternative 4 due to impact to existing aerial services/utilities along the corridor but less than the other alternatives - Aerial utilities (Hydro/Tel/TV) and traffic signals will require relocation at intersections - Path alignment could be tailored to minimize potential conflicts	**Less Preferred:** Widest infrastructure footprint with the highest associated utility relocation costs - Relocations of aerial utilities (Hydro/Tel/TV) will be required along majority of corridor - Aerial utilities (Hydro/Tel/TV) and traffic signals will require relation at intersections - Widened ROW would permit the future improvements to services/utilities within the corridor to be completed during road construction	**Moderately Preferred:** Higher potential than Alternative 4 due to impact on existing aerial services/utilities along the corridor - Aerial utilities (Hydro/Tel/TV) and traffic signals will require relocation at intersections - Path alignment could be tailored to minimize potential conflicts - Widened ROW would allow the future improvements to services/utilities within the corridor to be completed during road construction	**Moderately Preferred:** Second widest infrastructure footprint has higher potential than Alternatives 4 & 7 due to impact to existing services/utilities along CR 20 and/or intersecting roads along the corridor - Aerial utilities (Hydro/Tel/TV) and traffic signals will require relocation at intersections - Widened ROW would allow the future improvements to services/utilities within the corridor to be completed during road construction
Construction & Operations Costs- Relative costs in terms of capital, property and maintenance	**Preferred:** Lowest construction costs - Lowest drain improvement costs - Lowest additional operational costs (snow removal and maintenance of additional asphalt)	**Preferred:** Construction costs greater than Alternative 4 - Higher drain improvement costs - Potential throw away costs depending on timing of interim active transportation improvements and other listed works - Low additional operational costs (snow removal and maintenance of additional asphalt)	**Less Preferred**: Highest relative construction costs including drainage improvements - Installation of continuous centre turn lane may require rebuilding of the interim A/T facility - Highest operational costs (snow removal and maintenance of additional asphalt)	**Moderately Preferred:** Construction costs greater than Alternatives 4 and 5, but less than Alternative 6 and 8 - Additional drain improvements at road widening locations - Installation of centre turn lanes may require rebuilding of sections of the interim A/T facility - potential for mitigation through project phasing. - Operational costs (snow removal and maintenance of additional asphalt) less than Alt 6	**Moderately Preferred:** - Construction costs greater than Alternatives 4, 5 and 7 but less than Alternative 6 - Installation of centre turn lanes may require rebuilding of sections of the interim A/T facility - potential for mitigation through project phasing. - Operational costs (snow removal and maintenance of additional asphalt) less than Alt 6
Construction Staging- Impact to existing traffic operations during construction	**Preferred:** - Some impacts on corridor traffic operations as interim A/T facility is constructed - Potential major impacts at affected intersections - A traffic management plan would be required	**Preferred:** Some impacts on corridor traffic operations as ultimate A/T facility is constructed - Potential major impacts at affected intersections - A traffic management plan would be required	**Less Preferred:** Highest potential to temporarily impact existing traffic operations throughout the CR 20 corridor as a result of the continuous centre left turn lane and potentially other intersection roads along the corridor - A traffic management plan would be required	**Moderately Preferred:** Higher potential to temporarily impact existing traffic operations at CR 20 widening locations and potentially other intersection roads along the corridor - A traffic management plan would be required	**Moderately Preferred:** High potential to temporarily impact existing traffic operations at CR 20 widening locations and potentially other intersection roads along the corridor - A traffic management plan would be required
Stormwater Runoff/Stormwater Management - Potential to increase stormwater run-off (water quantity) - Increase in pollutants to receiving watercourses (water quality)	**Preferred:** Relatively minor increase to ROW imperviousness and associate runoff (5.5% in Kingsville / 12% in Leamington). Minor impact to overall corridor 2,000 Hectare drainage area. - Improvements to existing drainage system required at intersection improvements.	**Moderately Preferred:** Additional AT facilities will increase ROW imperviousness and associated runoff (7% in Kingsville / 33% in Leamington). Minor impact to overall corridor 2,000 Hectare drainage area. - Buffered path may require yard catch basins to be installed to maintain existing drainage patterns - Buffered path would require new or extended culverts at existing drain crossing locations.	**Less Preferred:** Additional AT facilities will increase ROW imperviousness and associated runoff (8.5% in Kingsville / 52% in Leamington). Minor impact to overall corridor 2,000 Hectare drainage area. - Widened roadway would require a new drainage system along CR 20 (new sewers, catch basins and manholes). - Buffered path may require yard catch basins to be installed to maintain existing drainage patterns - Widened road would require new or extended culverts at existing drain crossing locations (+/- 4 drain crossing would require. extension/replacement, however up to 16 crossings would require drain bank reshaping or potentially adding a concrete headwall and railing to provide safe and adequate grade drop from AT facility to drain). - Water quality systems may be required as existing drainage systems would be replaced.	**Less Preferred:** Additional AT facilities will increase ROW imperviousness and associated runoff (6.5% in Kingsville / 17% in Leamington). Minor impact to overall corridor 2,000 Hectare drainage area. - Greatest potential for increase to runoff at TWLTL locations and intersection improvements due to widened roadway and path. - TWLTL widened road areas would require a new drainage system along CR 20 (new sewers, catch basins and manholes). - TWLTL widened road sections may require new or extended culverts at +/- 1 existing drain crossing location. - Water quality systems may be required in areas where existing drainage systems are replaced.	**Less Preferred:** Additional AT facilities will increase ROW imperviousness and associated runoff (8% in Kingsville / 40% in Leamington). Minor impact to overall corridor 2,000 Hectare drainage area. - Potential increase to runoff at TWLTL locations and intersection improvements due to widened roadway and path. - TWLTL widened road areas would require a new drainage system along CR 20 (new sewers, catch basins and manholes). - Buffered path may require yard catch basins to be installed to maintain existing drainage patterns. - TWLTL widened road sections would require new or extended culverts at existing drain crossing locations (+/- 1 drain crossing would require extension/replacement). - Water quality systems may be required in areas where existing drainage systems are replaced.
SUMMARY OF ENGINEERING CONSIDERATIONS	**MOST PREFERRED**	**MOST PREFERRED**	**LESS PREFERRED**	**MODERATELY PREFERRED**	**MODERATELY PREFERRED**

	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Evaluation Criteria and Sub-Factors	**Intersection Operational Improvements and Interim Active Transportation Improvements**	**Intersection Operational Improvements and Ultimate Active Transportation Facilities**	**Intersection Operational Improvements with a Continuous Two Way Left Turning Lane and Ultimate Active Transportation Facilities**	**Intersection Operational Improvements, with Intermittent Two Way Centre Turning Lane and Interim Active Transportation Improvements**	**Intersection Operational Improvements, with Intermittent Two Way Centre Turning Lane and Ultimate Active Transportation Facilities**
CULTURAL ENVIRONMENT					
Archaeological Resources- Potential for impacts to registered archaeological sites and undisturbed lands	**Preferred:** Potential to impact undisturbed lands due to localized widening and resulting impacts to agricultural land/undeveloped portions of properties (i.e. lawns/landscaped areas) along the CR 20 corridor.	**Moderately Preferred:** Will impact undisturbed lands due to localized road widening and wider/relocated pathway and resulting impacts to agricultural land/undeveloped portions of properties (i.e. lawns/landscaped areas) along the CR 20 corridor	**Less Preferred:** Will impact undisturbed lands due to extensive road widening and resulting impacts to agricultural land/undeveloped portions of properties (i.e. lawns/landscaped areas) along the CR 20 corridor	**Moderately Preferred:** Will impact undisturbed lands due to localized road widening and wider/relocated pathway and resulting impacts to agricultural/undeveloped portions of properties (i.e. lawns/landscaped areas) along the CR 20 corridor	**Moderately Preferred:** Will impact undisturbed lands due to localized road widening and wider/relocated pathway and resulting impacts to agricultural land/undeveloped portions of properties (i.e. lawns/landscaped areas) along the CR 20 corridor
Built Heritage Resources- Potential to impact known built heritage resources (i.e. listed/designated under Part IV or Part V of the Ontario Heritage Act and/or identified as culturally significant	**Preferred:** No impact	**Moderately Preferred:** May impact property frontages along the CR 20 corridor with built heritage resources - 30 properties along CR 20 within the study area are identified as culturally significant	**Less Preferred:** Will impact the most property frontages along the CR 20 corridor with built heritage resources - 30 properties along CR 20 within the study area are identified as culturally significant	**Moderately Preferred:** Will impact some property frontages along the CR 20 corridor at TWLTL road widening locations with built heritage resources - 30 properties along CR 20 within the study area are identified as culturally significant	**Less Preferred:** Will impact the most property frontages along the CR 20 corridor with built heritage resources although to a less extent than Alternative 6 - 30 properties along CR 20 within the study area are identified as culturally significant
SUMMARY OF CULTURAL ENVIRONMENT CONSIDERATIONS	**MOST PREFERRED**	**MODERATELY PREFERRED**	**LEAST PREFERRED**	**MODERATELY PREFERRED**	**MODERATELY PREFERRED**
SOCIO-ECONOMIC ENVIRONMENT					
Compatibility with Provincial Policy Statement - Compatibility with Sections 1.6.7 and 1.6.8 of the Provincial Policy Statement (PPS) - Transportation Systems and Transportation and Infrastructure Corridors	**Equally Preferred:** Transportation and AT improvements to the CR 20 corridor are compatible with Provincial policies as outlined in Sections 1.6.7 and 1.6.8 of the PPS	**Equally Preferred:** Transportation and AT improvements to the CR 20 corridor are compatible with Provincial policies as outlined in Sections 1.6.7 and 1.6.8 of the PPS	**Equally Preferred:** Transportation and AT improvements to the CR 20 corridor are compatible with Provincial policies as outlined in Sections 1.6.7 and 1.6.8 of the PPS	**Equally Preferred:** Transportation and AT improvements to the CR 20 corridor are compatible with Provincial policies as outlined in Sections 1.6.7 and 1.6.8 of the PPS	**Equally Preferred:** Transportation and AT improvements to the CR 20 corridor are compatible with Provincial policies as outlined in Sections 1.6.7 and 1.6.8 of the PPS
Compatibility with County Planning Policies- Compatibility with County policies, goals and objectives (i.e. CWATS, TMP, Official Plan)	**Less Preferred:** Less consistent with proposed system and function of CR 20 recommended in the County TMP, as stated in Transportation above - Less consistent with long term goals of CWATS to promote walking and cycling though the corridor	**Moderately Preferred:** Less consistent with proposed system and function of CR 20 recommended in the TMP, as stated in Transportation above - Consistent with the long term goals of CWATS; CR 20 identified as highly desirable active transportation route	**Preferred:** Consistent with proposed system and function of CR 20 recommended in the TMP, as stated in Transportation above - Consistent with the long term goals of CWATS; CR 20 identified as highly desirable active transportation route	**Moderately Preferred:** Consistent with proposed system and function of CR 20 recommended in the TMP, as stated in Transportation above - Less consistent with long term goals of CWATS to promote walking and cycling though the corridor	**Preferred:** Consistent with proposed system and function of CR 20 recommended in the TMP, as stated in Transportation above - Consistent with the long term goals of CWATS; CR 20 identified as highly desirable active transportation route
Compatibility with Local Municipality Planning Policies- Compatibility with Town of Leamington and Town of Kingsville Official Plans and other policies, goals and objectives - Appropriateness of alternative solution for existing and planned future land uses/developments along the corridor - support of agri-tourism industry	**Moderately Preferred:** - Compatible with existing land uses; less compatible for future land use/growth - Provides less support long term goals for active transportation and support of agri-tourism industry - Lower potential to improve transportation connection of communities.	**Preferred:** Compatible with existing and planned land uses - Supports long term goals for active transportation and support of agri-tourism industry - High potential to improve transportation connection of communities - Separated active transportation facilities better accommodates potential increase in pedestrian and cyclist use with planned land use in Leamington and Kingsville.	**Preferred:** Compatible with existing and planned land uses - Supports long term goals for active transportation and support of agri-tourism industry - High potential to improve transportation connection of communities - Separated active transportation facilities better accommodates potential increase in pedestrian and cyclist use with planned land use in Leamington and Kingsville.	**Moderately Preferred:** Compatible with existing and planned land uses - Provides less support to long term goals for active transportation and support of agri-tourism industry - Lower potential to improve transportation connection of communities.	**Preferred:** Compatible with existing and planned land uses - Supports long term goals for active transportation and support of agri-tourism industry - High potential to improve transportation connection of communities - Separated active transportation facilities better accommodates potential increase in pedestrian and cyclist use with planned land use in Leamington and Kingsville.
Street Character and Aesthetics Ability to enhance the character of the roadway corridor	**Moderately Preferred:** Provides less opportunity to improve character/vision of the roadway with a complete street vision.	**Preferred:** Provides opportunity to improve character/vision of the roadway with a "complete street" solution and better connects Kingsville and Leamington with dedicated spaces for all modes of transportation.	**Preferred:** Provides opportunity to improve character/vision of the roadway with a "complete street" solution and better connects Kingsville and Leamington with dedicated spaces for all modes of transportation.	**Moderately Preferred:** Provides less opportunity to improve character/vision of the roadway with a complete street vision.	**Preferred**: Provides opportunity to improve character/vision of the roadway with a "complete street" solution and better connects Kingsville and Leamington with dedicated spaces for all modes of transportation.
Accessibility Ability to improve accessibility along the corridor to all users including those with disabilities	**Moderately Preferred**: Provides for less AODA support as only includes a paved shoulder/back of curb 1.5 m pathway.	**Preferred:** With separated AT facilities, provides for greater AODA support and can meet AODA standards.	**Preferred:** With separated AT facilities, provides for greater AODA support and can meet AODA standards.	**Moderately Preferred:** Provides for less AODA support as only includes a paved shoulder/back of curb 1.5 m pathway.	**Preferred:** With separated AT facilities, provides for greater AODA support and can meet AODA standards.
Property Requirements- Requirement for property and/or easement acquisition(s)	**Preferred:** Approximately 30 property acquisitions required, maximum +/-1m of frontage per side - Potential for property to be required at intersections for intersection improvements and daylight corners	**Moderately Preferred:** Approximately 100 property acquisitions required, maximum +/-3m of frontage per side - Additional utility easements may be required	**Less Preferred:** Approximately 140 property acquisitions, maximum +/-5m of frontage per side, required - Additional utility easements may be required	**Preferred:** Approximately 50 property acquisitions, maximum +/-1m of frontage per side, required - Additional utility easements may be required	**Less Preferred:** Approximately 140 property acquisitions, maximum +/-3m of frontage per side, required - Additional utility easements may be required

	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Evaluation Criteria and Sub-Factors	**Intersection Operational Improvements and Interim Active Transportation Improvements**	**Intersection Operational Improvements and Ultimate Active Transportation Facilities**	**Intersection Operational Improvements with a Continuous Two Way Left Turning Lane and Ultimate Active Transportation Facilities**	**Intersection Operational Improvements, with Intermittent Two Way Centre Turning Lane and Interim Active Transportation Improvements**	**Intersection Operational Improvements, with Intermittent Two Way Centre Turning Lane and Ultimate Active Transportation Facilities**
Property Access/Impacts to Local Businesses- Disruption of property owners and local businesses	**Preferred:** Least potential for impacts to property access points - New raised cycle track will require relocation of some roadside vendors/parking - Access points/driveways near intersections may be impacted	**Moderately Preferred:** Greater potential for impacts to property access points than Alternative 4 - New raised AT facilities will have greater impact to roadside vendors/parking - Access points/driveways near intersections may be impacted	**Less Preferred:** Greatest potential for impacts to property access points - Changes to existing property access points required to accommodate wider corridor. Existing driveways where property is required will be shortened/altered - Greatest impact to properties near intersections	**Moderately Preferred:** Greater potential for impacts to property access points than Alternatives 4, or 5 but less than Alternative 6 - Changes to existing property access points required to accommodate wider corridor. Existing driveways where property is required will be shortened/altered - Greater impact to properties near intersections	**Moderately Preferred:** Greater potential for impacts to property access points than Alternative 4, 5 or 7, but less than Alternative 6 - Changes to existing property access points required to accommodate wider corridor. Existing driveways where property is required will be shortened/altered - Greatest impact to properties near intersections
SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT CONSIDERATIONS	**MODERATELY PREFERRED**	**MOST PREFERRED**	**MODERATELY PREFERRED**	**MODERATELY PREFERRED**	**MODERATELY PREFERRED**
NATURAL ENVIRONMENT					
Vegetation and Wildlife- Potential impacts to woodlots and vegetation communities - Potential to impact plant or animal Species at Risk	**Preferred:** Least potential to impact vegetation communities/terrestrial habitat from corridor improvements	**Moderately Preferred:** Greater potential to impact vegetation communities/terrestrial habitat than Alternative 4	**Less Preferred:** Highest potential to impact vegetation communities/terrestrial habitat due to widest corridor - Habitat removal largely restricted to trees along roadside and habitat associated with drain crossings - no designated natural features to be impacted	**Moderately Preferred:** Greater potential to impact vegetation communities/terrestrial habitat than Alternative 4	**Moderately Preferred:** Higher potential to impact vegetation communities/terrestrial habitat from wider corridor than Alternatives 4, 5 and 7, but less than Alternative 6 - Habitat removal largely restricted to trees along roadside and habitat associated with drain crossings - no designated natural features to be impacted
Water Resources and Fisheries- Potential impact to watercourses and fisheries habitat	**Preferred**: Low potential for impacts to water resources/aquatic habitat	**Moderately Preferred:** Greater potential to impact watercourses/aquatic habitat than Alternative 4 due to wider corridor with increased runoff and potential for additional pollutants	**Less Preferred**: Highest potential to impact watercourses/aquatic habitat due to wider corridor resulting in need for numerous drain improvements and culvert extensions and increased road runoff	**Moderately Preferred:** Greater potential to impact watercourses/aquatic habitat than Alternative 4 due to wider corridor with increased runoff and potential for additional pollutants	**Moderately Preferred:** Higher potential to impact watercourses/aquatic habitat than Alternatives 4, 5 and 7 due to wider corridor
SUMMARY OF NATURAL ENVIRONMENT CONSIDERATIONS	**MOST PREFERRED**	**MODERATELY PREFERRED**	**LEAST PREFERRED**	**MODERATELY PREFERRED**	**MODERATELY PREFERRED**
OVERALL PREFERENCE RANKING	**NOT PREFERRED**	**NOT PREFERRED**	**NOT PREFERRED**	**NOT PREFERRED**	**PREFERRED**

Table 21: Alternative Solutions Summary Rankings Matrix

TRANSPORTATION CONSIDERATIONS

Objectives and Criteria	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Traffic Operations and Accommodation of Future Travel Demand- Potential to provide sufficient capacity and level of service (LOS) to accommodate projected traffic volumes.	○	○	●	◑	◑
Traffic Speed Control- Relative ability to encourage appropriate traffic speed for the road classification taking into account adjacent land uses.	●	●	○	●	●
Safety- Potential to improve traffic safety based on the opportunity to reduce congestion and potential for collisions.	○	◑	●	●	●
Road Network Compatibility/Connectivity- Potential to be consistent with the proposed transportation system and function of CR 20 in the long-term (i.e. EWTMP).	◑	◑	●	●	●
Accommodation of Active Transportation- Ability to provide safe, connected, effective, attractive and convenient cycling and pedestrian facilities.	○	●	●	◑	●
Accommodation of Public Transit - Ability to accommodate future transit stops (Note that CR 20 is not part of Leamington Transit Route therefore no foreseeable impact to Leamington transit operation for any of the alternatives).	◑	◑	●	●	●
Accommodation of School Buses - Potential to increase the safety of school buses and riders.	◑	●	●	◑	●
Response Time/Access for Emergency Vehicles- Potential to improve response time/accessibility for emergency vehicles due to changes in travel time.	○	○	●	◑	◑
Transportation Preference	○	◑	●	◑	●

ENGINEERING CONSIDERATIONS

Objectives and Criteria	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Services/Utilities - Potential impact to services or utilities (hydro poles) within the corridor - Accommodation of planned services/utilities.	●	●	○	◐	◐
Construction & Operations Costs- Relative costs in terms of capital, property and maintenance.	●	●	○	◐	◐
Construction Staging- Impact to existing traffic operations during construction.	●	●	○	◐	◐
Stormwater Runoff/Stormwater Management - Potential to increase stormwater run-off (water quantity). - Increase in pollutants to receiving watercourses (water quality).	●	◐	○	○	○
Engineering Preference	●	●	○	◐	◐

CULTURAL ENVIRONMENT CONSIDERATIONS

Objectives and Criteria	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Archaeological Resources- Potential for impacts to registered archaeological sites and undisturbed lands.	●	◐	○	◐	◐
Built Heritage Resources- Potential to impact known built heritage resources (i.e. listed/designated under Part IV or Part V of the Ontario Heritage Act and/or identified as culturally significant.	●	◐	○	◐	○
Cultural Environment Preference	●	◐	○	◐	◐

SOCIO-ECONOMIC ENVIRONMENT CONSIDERATIONS

Objectives and Criteria	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Compatibility with Provincial Policy Statement- Compatibility with Sections 1.6.7 and 1.6.8 of the Provincial Policy Statement (PPS) - Transportation Systems and Transportation and Infrastructure Corridors.	●	●	●	●	●
Compatibility with County Planning Policies- Compatibility with County policies, goals and objectives (i.e. CWATS, TMP, Official Plan).	○	◐	●	◐	●
Compatibility with Local Municipality Planning Policies- Compatibility with Municipality of Leamington and Town of Kingsville Official Plans and other policies, goals and objectives. - Appropriateness of alternative solution for existing and planned future land uses/developments along the corridor. - Support of agri-tourism industry.	◐	●	●	◐	●
Street Character and Aesthetics- Ability to enhance the character of the roadway corridor.	◐	●	●	◐	●
Accessibility- Ability to improve accessibility along the corridor to all users including those with disabilities.	◐	●	●	◐	●
Property Requirements- Requirement for property and/or easement acquisition(s).	●	◐	○	●	○
Property Access/Impacts to Local Businesses- Disruption of property owners and local businesses.	●	◐	○	◐	◐
Socio-Economic Preference	◐	●	◐	◐	◐

NATURAL ENVIRONMENT CONSIDERATIONS

Objectives and Criteria	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Vegetation and Wildlife- Potential impacts to woodlots and vegetation communities - Potential to impact plant or animal Species at Risk.	●	◐	○	◐	◐
Water Resources and Fisheries- Potential impact to watercourses and fisheries Habitat.	●	◐	○	◐	◐
Natural Environment Preference	●	◐	○	◐	◐

Overall Preference Rankings

Objectives and Criteria	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Overall Preference					●

Less Preferred	○	Moderately Preferred	◐	Preferred	●

6.0 Design Alternatives

6.1 Development of Design Alternative

Design alternatives were developed to confirm the appropriate ultimate (long-term) active transportation facilities for Alternative 8, which is the preferred alternative solution as previously documented in **Chapter 5.0**. This preferred solution includes intersection improvements, dedicated A/T facilities, and intermittent Two-Way Left Turn Lanes (TWLTLs).

6.1.1 Design Issues and Constraints

During the evaluation of alternative solutions, the follow design issues and constraints were noted regarding Alternative 8:

- User safety;
- Property impacts and utility easements;
- Impacts to property access;
- Impacts to drainage; and
- Impacts to natural heritage features, in particular the street trees location along the corridor.

6.1.2 Rationale for the Generation of Alternative Designs

Design alternatives were developed considering: the identified problems and opportunities described in **Section 2.4**, design issues and constraints associated with the preferred alternative solution, and feedback received during the public and stakeholder consultation process. Based on these considerations, the project team developed and evaluated three design alternatives, which are described in the sections below. The design options generally varied with respect to the design of the A/T facilities.

6.1.3 Design Alternative 8A

Alternative 8A includes intersection operational improvements with intermittent two-way left turning lanes (2 locations), one-way cycle tracks (1.5 m – 1.8 m) and sidewalks (1.5 m) on both sides of the roadway, as shown in **Figures 28** and **29**. The sidewalk

would be separated from the edge of the cycle track by a 1.0 m to 1.2 m buffer or boulevard.

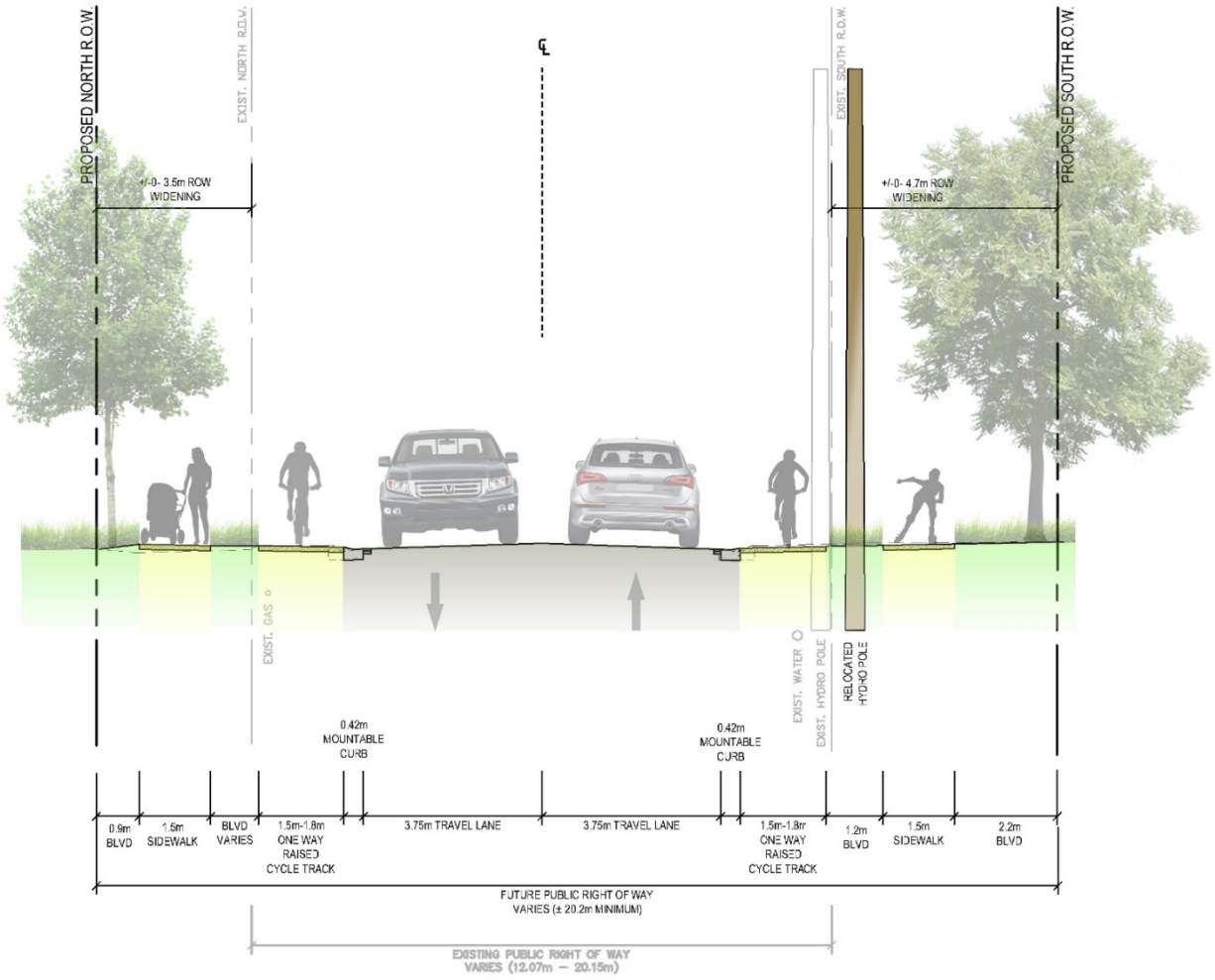

Figure 18: Design Alternative 8A

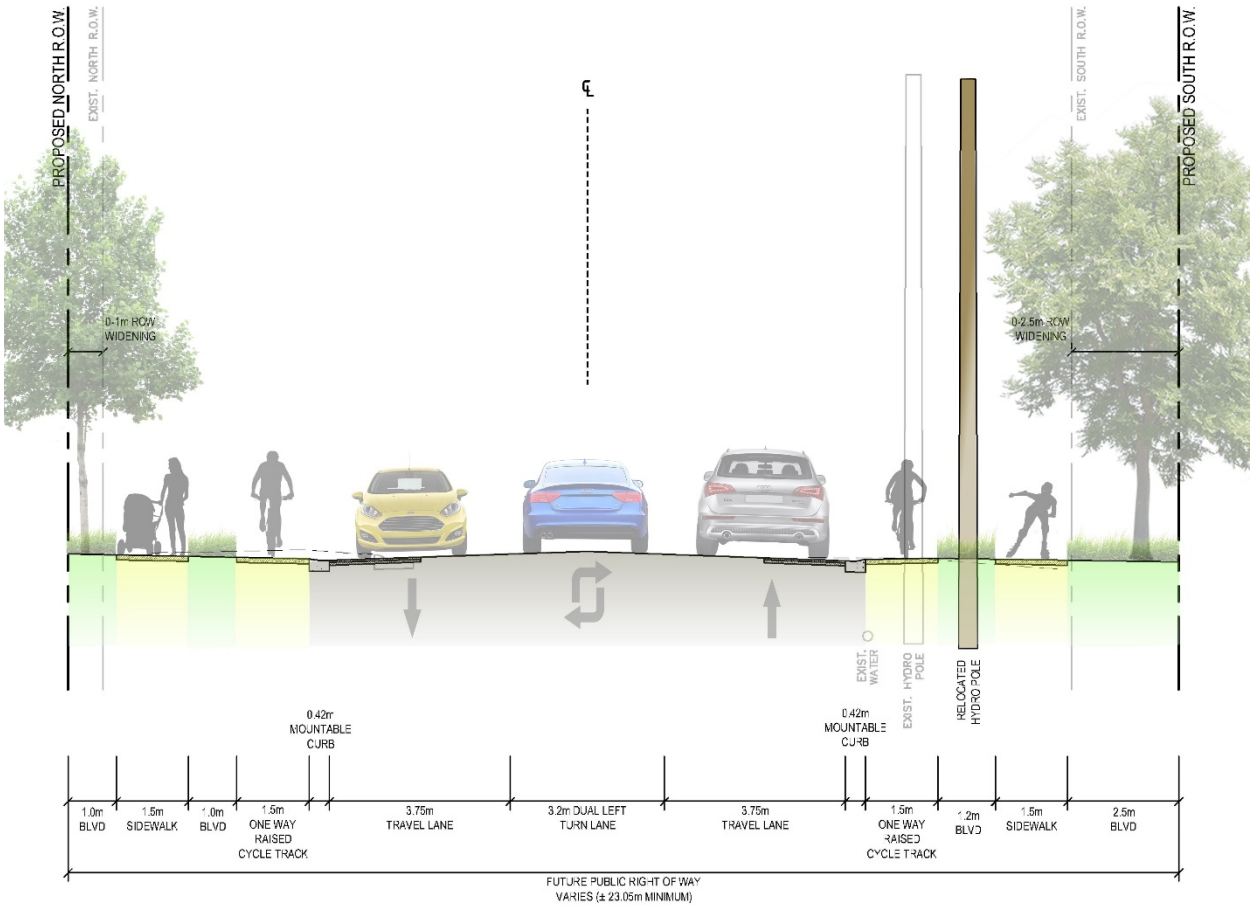

Figure 19: Design Alternative 8A with Two-Way Left Turn Lane

6.1.4 Design Alternative 8B

Alternative 8B includes intersection operational improvements with intermittent two-way left turning lane (at 2 locations), one-way cycle tracks (1.5 m – 1.8 m), and multi-use path (3.5 m) located on the south side of the road corridor, as shown on **Figures 30** and **31**. The south side of the corridor was selected for the multi-use path as there is more residential development on the south side and thus has potential to draw more users to the path. A south side path would also provide a safer environment as it would avoid the need for users of all ages to cross the roadway to access the A/T facilities. The south side pathway would also be of benefit to students to access their school bus stop along the corridor. Most of the students along the corridor live along the south side of the roadway. The multi-use path would be separated from the edge of the cycle track by a 1.0 m to 1.2 m buffer or boulevard resulting in a buffer distance from edge of road lane of 2.5 m to 3.0 m.

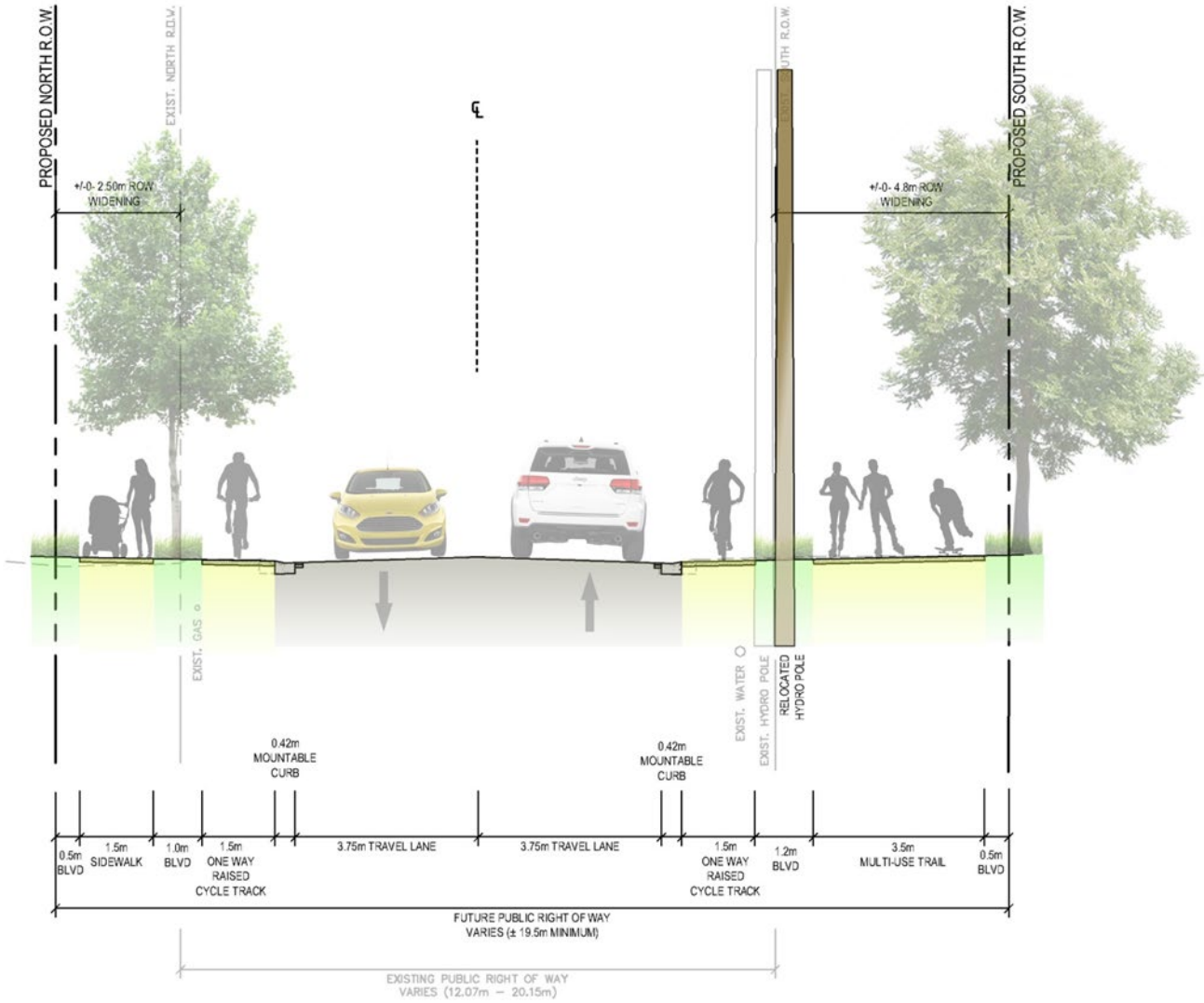

Figure 20: Design Alternative 8B

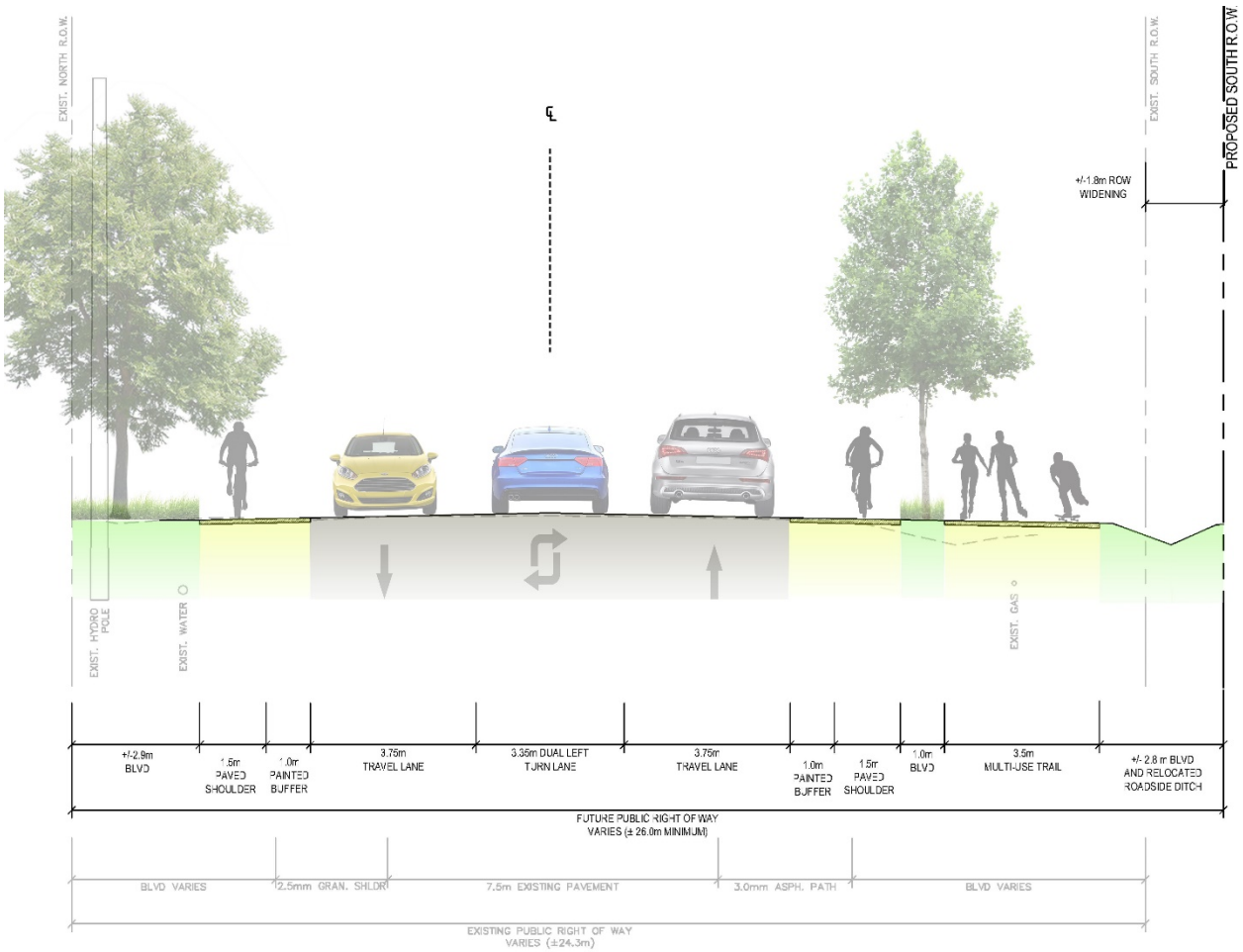

Figure 21: Design Alternative 8B with Two-Way Left Turn Lane

6.1.5 Design Alternative 8C

Alternative 8C includes intersection operational improvements with intermittent two-way centre turning lane (at 2 locations), one-way cycle tracks (1.5 m to 1.8 m), one sidewalk (1.5 m on north side) and multi-use path (3.5 m - south side), as shown in **Figures 32** and **Figure 33**.

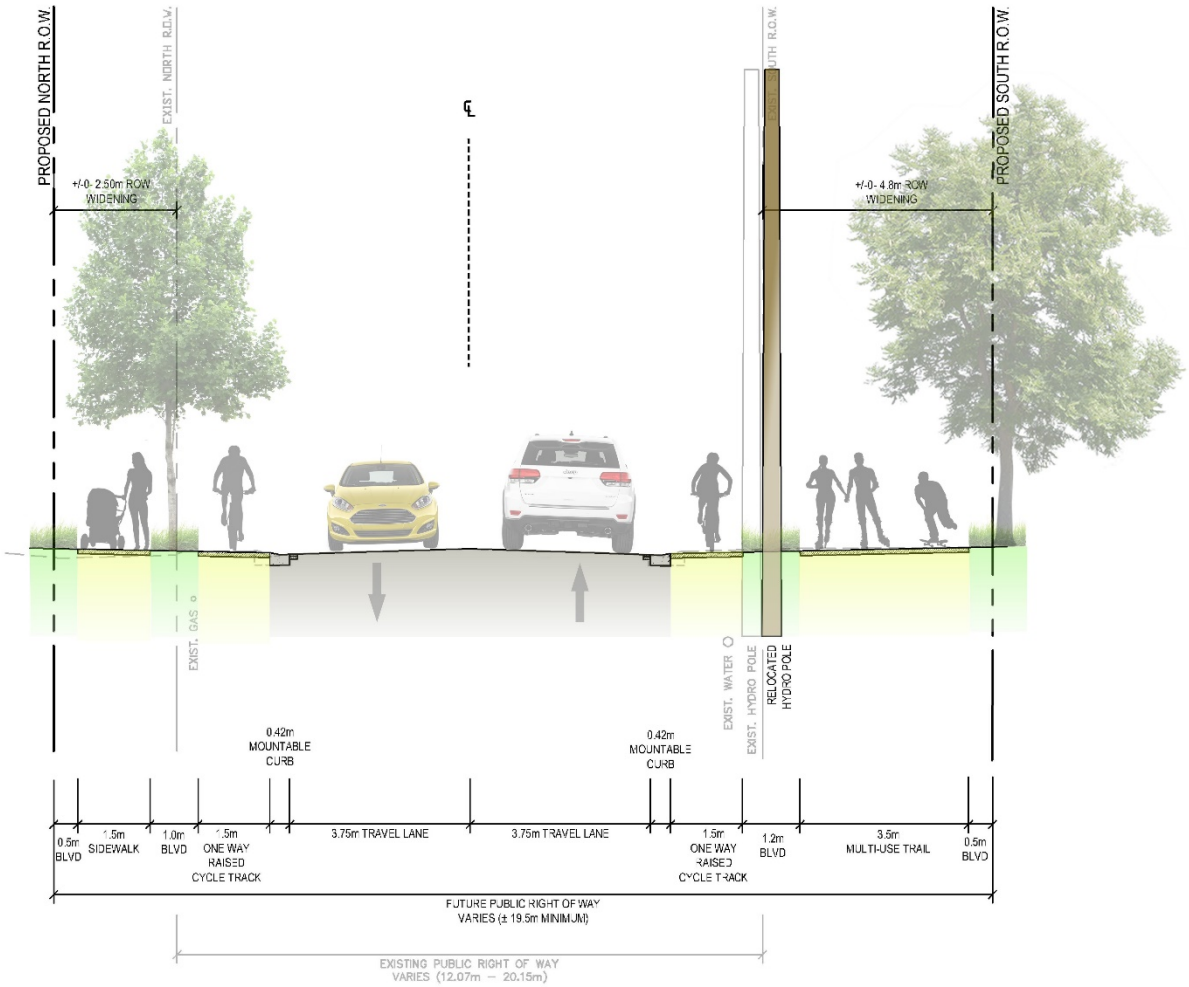

Figure 22: Design Alternative 8C

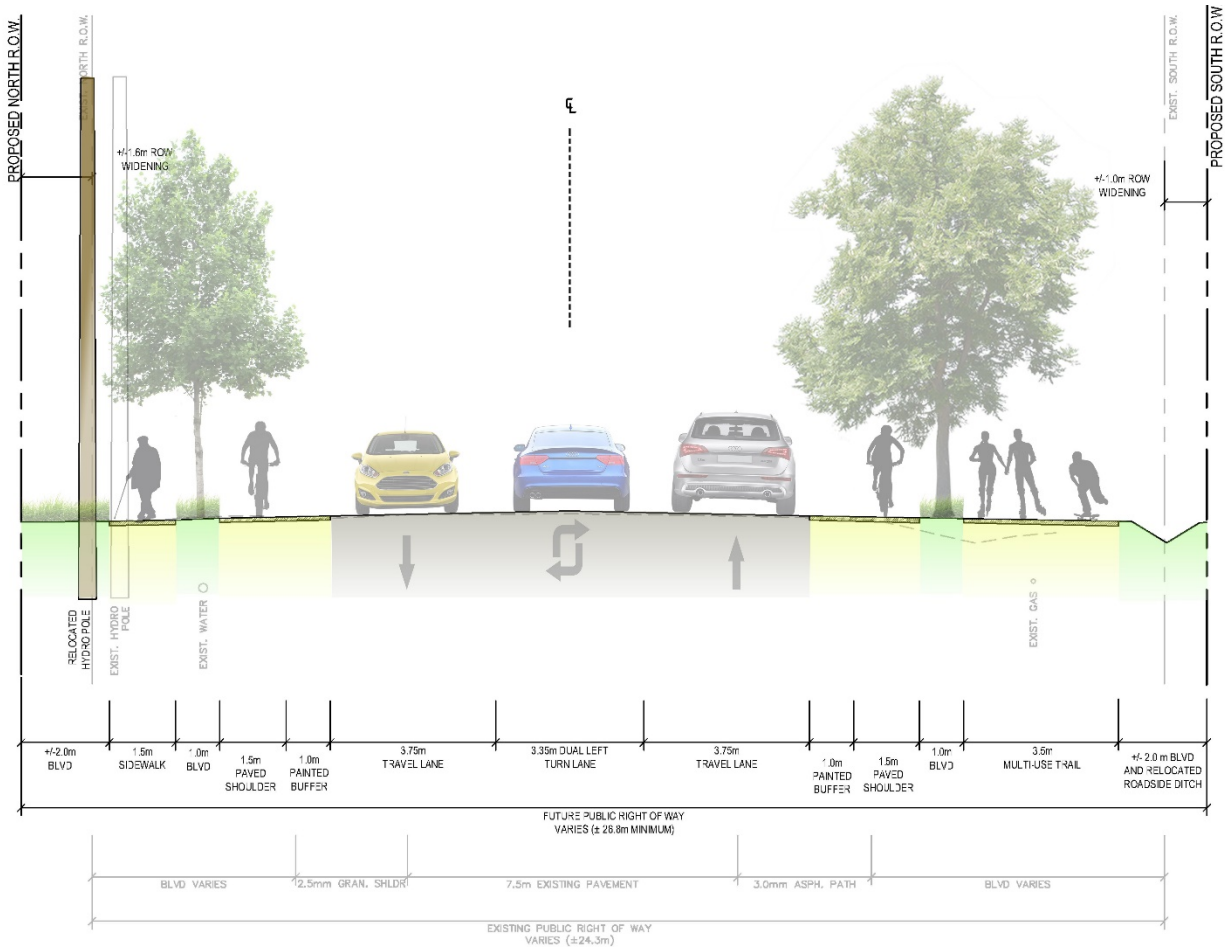

Figure 23: Design Alternative 8C with Two-Way Left Turn Lane

6.2 Consultation Input on Alternative Designs

The design alternatives were presented to the public at PIC #2 and public input was requested on the identified preferred design alternative, Alternative 8C. In general, comments received indicated that safety is a priority for residents. Respondents indicated that they liked the following aspects of Alternative 8C:

- Improved curbs, walkways;
- Space for potential benches, garbage cans, etc.;
- Provides the best opportunity for active transportation and encourages a safe and active lifestyle;
- Provides a link between neighbours and businesses; and
- Provides separation between the multi-purpose path and the road (safety).

A few who attended the PIC were in favour of other alternatives (i.e. Alternatives 8A and 8B). The key themes for those that preferred other alternatives included lower cost, quicker construction, lesser impacts to property/natural heritage and the perception that cyclists and pedestrians can share the same path.

Several suggestions were received related to Alternative 8C, which generally related to safety, cost, impacts on natural heritage and design suggestions. Respondents provided the following input regarding the alternative (also see **Appendix A** for a full list):

- Intersection improvements are needed to reduce congestion and delays and improve safety (e.g. traffic signals are needed at Graham Sideroad, need for left turn lanes, etc.);
- Appropriate barriers between cars and cyclists are required;
- The potential for conflict of a multi-use path with driveways and intersections particularly at the eastern end of the study area needs to be addressed. User safety should be a consideration in the design and evaluation of the alternatives;
- Tree planting is recommended;
- Speed limits should be reduced;
- An additional (to the cycle track) active transportation facility on the south side of the road should be constructed first;
- The proposed centre turning lane at the west end of the project limit should be extended further to the east to accommodate other nearby businesses;
- Students waiting for the school bus need to be accommodated in the design; and

- School bus stopping bays are to be considered to allow traffic to pass.

6.2.1 PIC 2 Follow-up Meetings

As follow-up to correspondence received after PIC 2, meetings were held with the Greater Essex District School Board/Windsor-Essex Students Transportation Services (WESTS) and with representatives from Share the Road – Essex County who are residents in the study area and involved with the Share the Road interest group. Response letters to their comments were also sent following the meetings which are contained in **Appendix A.**

Key issues raised and discussed with the School Board/WESTS related to the potential provisions of school bus stop student waiting areas and school bus bays. It was noted that the future installation of pedestrian facilities could reduce the number of bus stops, as students would have a facility to walk along the road corridor to access bus stop locations. The School Board expressed some concern regarding potential conflict between students waiting for school buses on CR 20 and users of future A/T facilities. It is noted that under the current situation, students wait on the edge of the road/road shoulder. And while the location of school bus stops can change on annual basis, as follow-up to the meeting the location of "long –term" stops was provided to the County. An assessment of the ability to provide designated waiting areas at these locations is presented in **Section 7.3** of this report. The second key issue raised by the School Board/WESTS relates to the delays to traffic that school buses can cause and the request for the County to explore the potential to develop bus bays to allow buses to pull over to allow cars to pass. The results of this assessment are presented in **Section 7.3** of this report.

A follow-up meeting was also held with representatives from Share the Road – Essex County who expressed concern relating to the potential for conflict of users of a south side multi-use path and the large number of driveways/entrances along the eastern end of the study corridor. It was noted at the meeting, the multi-use trail would be intended for use by pedestrians, cyclists travelling at slower speeds and other active transportation users. Higher speed cyclists would be attracted to the one-way cycle path that will run along the edge of the road lanes (the current/in construction interim pathway). A number of potential mitigation measures were suggested for consideration including:

- Signage to indicate that cyclists have a choice of what pathway to take depending on their use/interest/intended travel speed;
- Share the road signage;
- Provision of different path surfaces when crossing driveways (i.e. coloured concrete);
- Posted speed limits on MUT; and
- Information releases/education for residents with driveways that cross the MUT as well as for trail users.

Section 7.0 provides further description of the recommended design and **Section 8.0** of this report describes the mitigation measures recommended for inclusion as part of the project design/undertaking.

Agency Comments

Comments were received from the Ministry of Tourism, Culture and Sport (MTCS) during the comment period. Comments are summarized below:

- An archaeological assessment is being conducted under PIF # P359-0030-2016 by an archaeologist, who is responsible for submitting the report directly to the MTCS for review;
- The MTCS Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes should be completed to help determine whether the EA may impact additional heritage resources. If potential or known heritage resources exist, MTCS recommends that a Heritage Impact Assessment, prepared by a qualified consultant, should be completed to assess potential project impacts; and
- All technical heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MTCS whether any technical heritage studies will be completed for your EA project, and provide them to MTCS before issuing a Notice of Completion.

The results of the archaeological and cultural heritage baseline assessments are previously described in Section 3.6. Effects on any features are described in Section 8.4. The results of this work are being submitted to MTCS in advance of issuing the NOC.

6.3 Evaluation of Design Alternatives

The evaluation of the design alternatives was based a set of evaluation criteria (22) structured on the basis of the following criteria groups:

- Transportation;
- Engineering;
- Cultural Environment;
- Socio-economic Environment; and
- Natural Environment.

Table 22 presents the results of the evaluation of the alternative designs. Relative preference rankings are provided by criterion and summarized at the criteria group level. At the end of this table is a summary table (Table 22) of the preference rankings.

Rationalization of Preferred Design

Based on the assessment and evaluation of design alternatives and the 'best-fit' approach, the technically preferred solution is Alternative 8C which encompassed the following key aspects:

1) The completion of the interim CWATS facility (paved shoulder/back of curb pathway) being constructed in the interim (within 5 years).
2) The implementation of the intersection operations improvements within the next 5 years.
3) The implementation of TWLTLs at the two identified locations when surrounding A/T facilities are constructed or when other road maintenance/improvement works are planned.
4) The implementation of the ultimate A/T facility (MUT on the south side of the corridor and sidewalk on the north side of the corridor) within 15 -20 years or earlier considering facility demand.

This alternative is recommended as preferred for the following reasons:

- The alternative best achieves the goals and objectives of CWATS and the A/T plans of Kingsville and Leamington by providing active transportation facilities to meet the needs of a wide variety of users including: residents, cyclists of varying skills and abilities, tourists, migrant farm workers, and vulnerable groups such as children. It

provides an "A" level of service for pedestrians and cyclists (See **Table 12** in **Section 3.1.6** for LOS criteria).

- Significant benefits are expected to be achieved through the implementation of the facilities including an increase in use of active transportation modes, connects the communities of Kingsville and Leamington and provides the potential for economic benefits by attracting tourist to the area by increasing the growing network of cycle facilities throughout the County.
- Alternative 8C best fulfills the goals of the Provincial Policy Statement, regarding the support of a multi-modal transportation system and the promotion of active transportation between residential and employment.
- Both the multi-use path and the sidewalk are generously separated from the roadway thus increasing user safety and providing space for additional landscaping and trees to help fulfil the creation of a complete street.
- The additional intersection operational improvements including new turning lanes at key intersections and the provision of a centre 2-way left turn lane at two locations in the corridor will improve the movement of through traffic in the corridor.
- The higher cost of this alternative is justifiable considering the numerous number of benefits.
- The acquisition of property frontage (up to 5 m of depth) from 274 properties is the most significant impact of this alternative (although all alternatives will require property). In most cases as residences and buildings are well set from the existing ROW, the impact is considered to be minimal. Landowners will be compensated for the loss of land. In a few instances the edge of new A/T facilities will be in the range of 4 m from buildings. While this impact is mitigated by the fact that the edge of the existing roadway lanes are not substantially being altered through most of the corridor and as such, roadway lanes are not being brought closer to residences, it is recommended that ways to increase the separation distance between buildings and pathways be explored during detailed design.
- No building of cultural interest will be directly impacted.

Similarly, the wider footprint of Alternative 8C will result in a greater number of trees to be removed. Studies completed to date did not identify significant or sensitive habitat to be present. Measures to mitigate/compensate this loss are described in **Section 8.5** of this ESR.

Design Alternative 8A

Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane, Cycle Track and Sidewalks on Both Sides

Design Alternative 8B

Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane, Cycle Track, and Multi-Use Path

Design Alternative 8C

Intersection Operational Improvements, with Intermittent Two-Way Centre Turning Lane, Cycle Track, One Side Sidewalk and Multi-Use Path.

Table 22: Alternative Designs Evaluation

TRANSPORTATION

Evaluation Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Traffic Operations and Accommodation of Future Travel Demand - Potential to provide sufficient capacity and level of service (LOS) to accommodate projected traffic volumes.	**Equally Ranked** - TWLTL and improved intersection operations will help to reduce traffic slow-downs for east and west bound vehicles.	**Equally Ranked** - TWLTL and improved intersection operations will help to reduce traffic slow-downs for east and west bound vehicles.	**Equally Ranked** - TWLTL and improved intersection operations will help to reduce traffic slow-downs for east and west bound vehicles.
Traffic Speed Control - Relative ability to encourage appropriate traffic speed for the road classification taking into account adjacent land uses.	**Equally Ranked** - TWLTL may encourage higher speeds through the sections that it is to be located.	**Equally Ranked** - TWLTL may encourage higher speeds through the sections that it is to be located.	**Equally Ranked** - TWLTL may encourage higher speeds through the sections that it is to be located.
Safety - Potential to improve traffic safety based on the opportunity to reduce congestion and potential for collisions.	**Equally Ranked** - higher potential to improve traffic safety due to addition of TWLTL at key locations, to allow for safer turning movements in high traffic areas. Providing dedicated off road area for A/T users will decrease potential for vehicle/AT user conflicts.	**Equally Ranked** - higher potential to improve traffic safety due to addition of TWLTL at key locations, to allow for safer turning movements in high traffic areas. Providing dedicated off road area for A/T users will decrease potential for vehicle/AT user conflicts.	**Equally Ranked** - higher potential to improve traffic safety due to addition of TWLTL at key locations, to allow for safer turning movements in high traffic areas. Providing dedicated off road area for A/T users will decrease potential for vehicle/AT user conflicts.

Evaluation Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Road Network Compatibility/Connectivity - Potential to be consistent with the proposed transportation system and function of CR 20 in the long-term (i.e. TMP).	**Equally Ranked** - alternative is consistent with proposed system and function of CR 20 recommended in the County TMP (predominately a Regional Road). Leamington A/T plan proposes a signed cycle route along Frazer St. and at bottom of Sherk St. that would connect with CR 20. There are no existing or planned separated cycle facilities in Leamington identified to connect with the section of CR 20 under study in this EA (other than the continuation of a bike lane east along Seacliff Drive). Sidewalks also continue along CR 20 east of Sherk Street which would be connected to existing sidewalks. There are no connecting trails into CR 20 identified in the Kingsville A/T plan other than the continuation of a multiuse paved trail on the south side west of Kratz Sideroad to the Greenway.	**Equally Ranked** - alternative is consistent with proposed system and function of CR 20 recommended in the County TMP (predominately a Regional Road). Leamington A/T plan proposes a signed cycle route along Frazer St. and at bottom of Sherk St. that would connect with CR 20. There are no existing or planned separated cycle facilities in Leamington identified to connect with the section of CR 20 under study in this EA (other than the continuation of a bike lane east along Seacliff Drive). There are no connecting trails into CR 20 identified in the Kingsville A/T Plan other than the continuation of a multiuse paved trail on the south side west of Kratz Sideroad to the Greenway.	**Equally Ranked** - alternative is consistent with proposed system and function of CR 20 recommended in the County TMP (predominately a Regional Road). Leamington A/T plan proposes a signed cycle route along Frazer St. and at bottom of Sherk St. that would connect with CR 20. There are no existing or planned separated cycle facilities in Leamington identified to connect with the section of CR 20 under study in this EA (other than the continuation of a bike lane east along Seacliff Drive). Sidewalks also continue along CR 20 east of Sherk Street which would be connected to existing sidewalks. There are no connecting trails into CR 20 identified in the Kingsville A/T plan other than the continuation of a multiuse paved trail on the south side west of Kratz Sideroad to the Greenway.

Evaluation Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Accommodation of Active Transportation - Ability to provide safe, connected, effective, attractive and convenient cycling and pedestrian facilities.	**Less preferred** than Alternative 8C as does not provide a recreation specific cycling facility. Provide continuous dedicated/separated area for cyclists and pedestrians on both sides of the road. Improved facilities may promote increased use by pedestrians and cyclists - consistent with the long-term goals outlined in CWATS to promote active transportation activity in the corridor. Provides a "B to C" Level of Service (LOS) for pedestrians and cyclists (See **Table 12**).	**Less preferred** than Alternative 8C as provides a dedicated pedestrian facility on one side of street only. Provide continuous dedicated/separated area for cyclists and pedestrians - provides pedestrian facility on one side of road only. Improved facilities may promote increased use by pedestrians and cyclists - consistent with the long-term goals outlined in CWATS to promote active transportation activity in the corridor. Through the multi-use pathway, provides better accommodation of recreational cyclists than Alternative 8A. Provides a "A" Level of Service (LOS) for pedestrians and cyclists (See **Table 12**).	**Preferred** over Alternatives 8A & 8B as provides A/T facilities on both sides of the street and provides a cycling facility more suitable for all levels of cyclists including recreationalists and children. Provide continuous dedicated/separated area for cyclists and pedestrians. Provides pedestrian facility on both sides of road. Improved facilities may promote increased use by pedestrians and cyclists - consistent with the long-term goals outlined in CWATS to promote active transportation activity in the corridor. Provides a "A" Level of Service (LOS) for pedestrians and cyclists (See **Table 12**). Through the multi-use pathway, provides better accommodation of recreational cyclists than Alternative 8A. Potential for economic benefit from this.
SUMMARY OF TRANSPORTATION CONSIDERATIONS	**LESS PREFERRED**	**LESS PREFERRED**	**MOST PREFERRED**

ENGINEERING CONSIDERATIONS

Evaluation Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Services/Utilities - Potential impact to services or utilities (hydro poles) within the corridor. - Accommodation of planned services/utilities.	**Preferred** over Alternative 8C as: Slightly less infrastructure footprint than Alternative 8C resulting in less potential impact to existing services/utilities along CR 20 and/or intersecting roads along the corridor. Aerial utilities (Hydro/Tel/TV) and traffic signals will require relocation at intersections, may require relocations at various points along corridor. Widened ROW would permit the future improvements to services/utilities within the corridor to be completed during road construction.	**Preferred** over Alternative 8C as: Slightly less infrastructure footprint than Alternative 8C resulting in less potential impact to existing services/utilities along CR 20 and/or intersecting roads along the corridor. Aerial utilities (Hydro/Tel/TV) and traffic signals will require relocation at intersections, and will likely require relocation at other locations along the corridor. Widened ROW would permit the future improvements to services/utilities within the corridor to be completed during road construction.	**Less preferred** than Alternatives 8A & 8B as: Slightly greater (+1.5 m) infrastructure footprint than Alternative 8A & 8B resulting in greater potential for impact to existing services/utilities along CR 20 and/or intersecting roads along the corridor - potential for greater impact to hydro poles if multi-use path is placed along south side of corridor. Aerial utilities (Hydro/Tel/TV) and traffic signals will require relocation at intersections. Widened ROW would permit the future improvements to services/utilities within the corridor to be completed during road construction.
Construction and Operations Costs - Relative costs in terms of capital, property and maintenance.	**Preferred** due to slightly less construction cost than Alternative 8B. Potential for some "throw away" construction costs due to timing of installation of interim A/T facility. Costs expected to be minimized through appropriate phasing of the interim active transportation improvements and preferred alternative. Operational costs (snow removal and maintenance of A/T facilities) are greater than Alternative 8B & similar Alternative 8C due to having one more A/T facility.	**Less preferred** due to slightly higher construction cost than Alternative 8A. Potential for some "throw away" construction costs due to timing of installation of interim A/T facility. Costs expected to be minimized through appropriate phasing of the interim active transportation improvements and preferred alternative. Operational costs (snow removal and maintenance of A/T facilities) are lower than Alternatives 8A and 8C due to having one less A/T facility.	**Least preferred** due to higher construction cost than Alternative 8A or 8B. Potential for some "throw away" construction costs due to timing of installation of interim A/T facility. Costs expected to be minimized through appropriate phasing of the interim active transportation improvements and preferred alternative. Operational costs (snow removal and maintenance of A/T facilities) are greater than Alternative 8B & similar to Alternative 8A due to having one more A/T facility.

Evaluation Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Construction Staging - Impact to existing traffic operations during construction.	**Equally Ranked** - all alternatives have potential to temporarily impact existing traffic operations at CR 20 widening locations and potentially other intersection roads along the corridor. A traffic management plan would be required.	**Equally Ranked** - all alternatives have potential to temporarily impact existing traffic operations at CR 20 widening locations and potentially other intersection roads along the corridor. A traffic management plan would be required.	**Equally Ranked** - all alternatives have potential to temporarily impact existing traffic operations at CR 20 widening locations and potentially other intersection roads along the corridor. A traffic management plan would be required.
Stormwater Runoff/Stormwater Management - Potential to increase stormwater run-off (water quantity). - Increase in pollutants to receiving watercourses (water quality).	**Preferred** over Alternative 8C due to slightly less impervious area to be added. Additional A/T facilities will increase ROW imperviousness and associated runoff (8% in Kingsville/40% in Leamington). Minor impact to overall corridor 2,000 Hectare drainage area. Potential increase to runoff at TWLTL locations and intersection improvements due to widened roadway and path. TWLTL widened road areas would require a new drainage system along CR 20 (new sewers, catchbasins and manholes). Buffered path may require yard catchbasins to be installed to maintain existing drainage patterns. TWLTL widened road sections would require new or extended culverts at existing drain crossing locations (+/- 5 drain crossing would require extension/replacement). Water quality systems may be required in areas where existing drainage systems are replaced.	**Preferred** over Alternative 8C due to slightly less impervious area to be added. Additional A/T facilities will increase ROW imperviousness and associated runoff (8% in Kingsville/40% in Leamington). Minor impact to overall corridor 2,000 Hectare drainage area. Potential increase to runoff at TWLTL locations and intersection improvements due to widened roadway and path. TWLTL widened road areas would require a new drainage system along CR 20 (new sewers, catchbasins and manholes). Buffered path may require yard catchbasins to be installed to maintain existing drainage patterns. TWLTL widened road sections would require new or extended culverts at existing drain crossing locations (+/- 5 drain crossing would require extension/replacement). Water quality systems may be required in areas where existing drainage systems are replaced.	**Less Preferred** than Alternatives 8A and 8B due to slightly greater amount of impervious area to be added. Additional A/T facilities will increase ROW imperviousness and associated runoff (8% in Kingsville/40% in Leamington). Minor impact to overall corridor 2,000 Hectare drainage area. Potential increase to runoff at TWLTL locations and intersection improvements due to widened roadway and path. TWLTL widened road areas would require a new drainage system along CR 20 (new sewers, catchbasins and manholes). Buffered path may require yard catchbasins to be installed to maintain existing drainage patterns. TWLTL widened road sections would require new or extended culverts at existing drain crossing locations (+/- 5 drain crossing would require extension/replacement). Water quality systems may be required in areas where existing drainage systems are replaced.

Evaluation Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
SUMMARY OF ENGINEERING CONSIDERATIONS	**MOST PREFERRED**	**MOST PREFERRED**	**LESS PREFERRED**

CULTURAL ENVIRONMENT

Evaluation Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Archaeological Resources - Potential for impacts to registered archaeological sites and undisturbed lands.	**Preferred** due to slightly narrower footprint than Alternative 8C. Will impact undisturbed lands due to localized road widening and wider/relocated pathway and resulting impacts to agricultural land/undeveloped portions of properties (i.e. lawns/landscaped areas) along the CR 20 corridor.	**Preferred** due to slightly narrower footprint than Alternative 8C. Will impact undisturbed lands due to localized road widening and wider/relocated pathway and resulting impacts to agricultural land/undeveloped portions of properties (i.e. lawns/landscaped areas) along the CR 20 corridor.	**Less preferred** due to slightly wider footprint than Alternatives 8A and 8B. Will impact undisturbed lands due to localized road widening and wider/relocated pathway and resulting impacts to agricultural land/undeveloped portions of properties (i.e. lawns/landscaped areas) along the CR 20 corridor.
Built Heritage Resources - Potential to impact known built heritage resources (i.e. listed/designated under Part IV or Part V of the Ontario Heritage Act and/or identified as culturally significant.	**Preferred** – No direct impact to heritage buildings. Will impact some frontages along the CR 20 corridor with built heritage value/interest. Less impact that Alternative 8C. 1 property (608 Seacliff Drive is designated under the Ontario heritage Act). 37 properties along CR 20 within the study area are identified as having cultural interest.	**Preferred** – No direct impact to heritage buildings. Will impact some frontages along the CR 20 corridor with built heritage value/interest. Less impact that Alternative 8C. 1 property (608 Seacliff Drive is designated under the Ontario heritage Act). 37 properties along CR 20 within the study area are identified as having cultural interest.	**Less Preferred** — No direct impact to heritage buildings. Will impact frontages along the CR 20 corridor with built heritage value/interest. Slightly wider footprint than Alternatives 8A and 8B. 1 property (608 Seacliff Drive is designated under the Ontario heritage Act). 37 properties along CR 20 within the study area are identified as having cultural interest.
SUMMARY OF CULTURAL ENVIRONMENT CONSIDERATIONS	**MOST PREFERRED**	**MOST PREFERRED**	**MODERATELY PREFERRED**

SOCIO ECONOMIC ENVIRONMENT

Evaluation Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Compatibility with Provincial Policy Statement - Compatibility with Sections 1.6.7 and 1.6.8 of the Provincial Policy Statement (PPS) - Transportation Systems and Transportation and Infrastructure Corridors.	**Equally Ranked** - Transportation and A/T improvements to the CR 20 corridor are compatible with Provincial policies as outlined in Sections 1.6.7 and 1.6.8 of the PPS.	**Equally Ranked** - Transportation and A/T improvements to the CR 20 corridor are compatible with Provincial policies as outlined in Sections 1.6.7 and 1.6.8 of the PPS.	**Equally Ranked** - Transportation and A/T improvements to the CR 20 corridor are compatible with Provincial policies as outlined in Sections 1.6.7 and 1.6.8 of the PPS.
Compatibility with County Planning Policies - Compatibility with County policies, goals and objectives (i.e. CWATS, TMP, Official Plan).	**Equally Ranked** - Consistent with proposed system and function of CR 20 recommended in the TMP, as stated in Transportation above Consistent with the long-term goals of CWATS; CR 20 identified as highly desirable active transportation route.	**Equally Ranked** - Consistent with proposed system and function of CR 20 recommended in the TMP, as stated in Transportation above Consistent with the long-term goals of CWATS; CR 20 identified as highly desirable active transportation route.	**Equally Ranked** - Consistent with proposed system and function of CR 20 recommended in the TMP, as stated in Transportation above Consistent with the long-term goals of CWATS; CR 20 identified as highly desirable active transportation route.
Compatibility with Local Municipality Planning Policies - Compatibility with Municipality of Leamington and Town of Kingsville Official Plans and other policies, goals and objectives. - Appropriateness of alternative solution for existing and planned future land uses/developments along the corridor. - Support of agri-tourism industry.	**Equally Ranked** - Compatible with existing and planned land uses Supports long-term goals for active transportation and support of agri-tourism industry. High potential to improve transportation connection of communities. Separated active transportation facilities accommodate potential increase in pedestrian and cyclist use with planned land use in Leamington and Kingsville.	**Equally Ranked** - Compatible with existing and planned land uses Supports long-term goals for active transportation and support of agri-tourism industry. High potential to improve transportation connection of communities. Separated active transportation facilities accommodate potential increase in pedestrian and cyclist use with planned land use in Leamington and Kingsville.	**Equally Ranked** - Compatible with existing and planned land uses Supports long-term goals for active transportation and support of agri-tourism industry. High potential to improve transportation connection of communities. Separated active transportation facilities accommodates potential increase in pedestrian and cyclist use with planned land use in Leamington and Kingsville.

Evaluation Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Street Character and Aesthetics - Ability to enhance the character of the roadway corridor.	**Equally Ranked** - Provides opportunity to improve character/vision of the roadway with a "complete street" solution and improves connection to Kingsville and Leamington with dedicated spaces for all modes of transportation.	**Equally Ranked** - Provides opportunity to improve character/vision of the roadway with a "complete street" solution and improves connection to Kingsville and Leamington with dedicated spaces for all modes of transportation.	**Equally Ranked** - Provides opportunity to improve character/vision of the roadway with a "complete street" solution and improves connection to Kingsville and Leamington with dedicated spaces for all modes of transportation.
Accessibility - Ability to improve accessibility along the corridor to all users including those with disabilities.	**Preferred** over Alternative 8B. With separated A/T facilities, provides improved AODA support and can meet AODA standards. Preferred over Alternative 8B as A/T facilities are located on both sides of the street and thus offers greater accessibility.	**Less preferred** than Alternatives 8A and 8C. With separated A/T facilities, provides improved AODA support and can meet AODA standards. Less preferred over Alternatives 8A and 8B as A/T facilities are located on both sides of the street and thus offers greater accessibility.	**Preferred** over Alternative 8B. With separated A/T facilities, provides improved AODA support and can meet AODA standards. Preferred over Alternative 8B as A/T facilities are located on both sides of the street and thus offers greater accessibility.
Property Requirements - Requirement for property and/or easement acquisition(s).	**Preferred** over Alternative 8C due to slightly less property potentially required than Alternative 8C due to slightly smaller footprint. Approximately 130 property acquisitions required ranging from +/- 0.5 m to a maximum +/-3 m of frontage per property.	**Preferred** over Alternative 8C due to slightly less property potentially required than Alternative 8C due to slightly smaller footprint. Approximately 110 property acquisitions required ranging from +/- 0.5 m to a maximum +/-5 m of frontage per property.	**Less preferred** as slightly more property required than Alternatives 8A and 8B due to slightly greater footprint. Approximately 160 property acquisitions required ranging from +/- 0.5 m to a maximum +/-5 m of frontage per property.
Property Access/Impacts to Local Businesses - Disruption of property owners and local businesses.	**Less Preferred** as potential for greater property access disruption than Alternative 8B due to two A/T facilities being developed on both sides of street.	**Preferred** as potential for less property access impacts with multiuse facility to be located on one side of street only, and no sidewalk on opposite side of street.	**Less preferred** as potential for greater property access disruption than Alternative 8B due to two A/T facilities being developed on both sides of street.
SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT CONSIDERATIONS	**MOST PREFERRED**	**MOST PREFERRED**	**MODERATELY PREFERRED**

NATURAL ENVIRONMENT

Evaluation Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Vegetation and Wildlife - Potential impacts to woodlots and vegetation communities. - Potential to impact plant or animal Species at Risk.	**Preferred** due to slightly smaller footprint that Alternative 8C Removed habitat largely restricted to trees along roadside and habitat associated with drain crossings - no designated natural features to be impacted.	**Preferred** due to slightly smaller footprint that Alternative 8C Removed habitat largely restricted to trees along roadside and habitat associated with drain crossings - no designated natural features to be impacted.	**Less preferred** than Alternatives 8A and 8B due to slightly larger footprint. Removed habitat largely restricted to trees along roadside and habitat associated with drain crossings - no designated natural features to be impacted. Note placement of multiuse-use path along south side of roadway would lessen impact to trees.
Water Resources and Fisheries - Potential impact to watercourses and fisheries habitat.	Equally Ranked - minimal impact to aquatic habitat as TWLTL widened road sections would require only one (1) new or extended culvert.	Equally Ranked - minimal impact to aquatic habitat as TWLTL widened road sections would require only one (1) new or extended culvert.	Equally Ranked - minimal impact to aquatic habitat as TWLTL widened road sections would require only one (1) new or extended culvert.
SUMMARY OF NATURAL ENVIRONMENT CONSIDERATIONS	**MOST PREFERRED**	**MOST PREFERRED**	**MODERATELY PREFERRED**

Table 23: Design Alternative Evaluation Summary Matrix

TRANSPORTATION CONSIDERATIONS

Objectives and Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Traffic Operations and Accommodation of Future Travel Demand - Potential to provide sufficient capacity and level of service (LOS) to accommodate projected traffic volumes	●	●	●
Traffic Speed Control - Relative ability to encourage appropriate traffic speed for the road classification taking into account adjacent land uses	●	●	●
Safety - Potential to improve traffic safety based on the opportunity to reduce congestion and potential for collisions	●	●	●
Road Network Compatibility/Connectivity - Potential to be consistent with the proposed transportation system and function of CR 20 in the long-term (i.e. TMP)	●	●	●
Accommodation of Active Transportation - Ability to provide safe, connected, effective, attractive and convenient cycling and pedestrian facilities	○	○	●
Transportation Preference	○	○	●

ENGINEERING CONSIDERATIONS

Objectives and Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Services/Utilities- Potential impact to services or utilities (hydro poles) within the corridor - Accommodation of planned services/utilities	●	●	○
Construction and Operations Costs- Relative costs in terms of capital, property and maintenance	●	◐	○
Construction Staging- Impact to existing traffic operations during construction	●	●	●
Stormwater Runoff/Stormwater Management - Potential to increase stormwater run-off (water quantity) - Increase in pollutants to receiving watercourses (water quality)	●	●	○
Engineering Preference	●	◐	○

CULTURAL ENVIRONMENT CONSIDERATIONS

Objectives and Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Archaeological Resources - Potential for impacts to registered archaeological sites and undisturbed lands	●	●	○
Built Heritage Resources - Potential to impact known built heritage resources (i.e. listed/designated under Part IV or Part V of the Ontario Heritage Act and/or identified as culturally significant	●	●	○
Cultural Environment Preference	●	●	○

SOCIO-ECONOMIC ENVIRONMENT CONSIDERATIONS

Objectives and Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Compatibility with Provincial Policy Statement - Compatibility with Sections 1.6.7 and 1.6.8 of the Provincial Policy Statement (PPS) - Transportation Systems and Transportation and Infrastructure Corridors	●	●	●
Compatibility with County Planning Policies - Compatibility with County policies, goals and objectives (i.e. CWATS, TMP, Official Plan)	●	●	●
Compatibility with Local Municipality Planning Policies - Compatibility with Municipality of Leamington and Town of Kingsville Official Plans and other policies, goals and objectives - Appropriateness of alternative solution for existing and planned future land uses/developments along the corridor - Support of agri-tourism industry	●	●	●
Street Character and Aesthetics Ability to enhance the character of the roadway corridor	●	●	●
Accessibility - Ability to improve accessibility along the corridor to all users including those with disabilities	●	○	●
Property Requirements- Requirement for property and/or easement acquisition(s)	●	●	○
Property Access/Impacts to Local Businesses - Disruption of property owners and local businesses	○	●	○
Socio-Economic Preference	●	●	○

NATURAL ENVIRONMENT CONSIDERATIONS

Objectives and Criteria	Design Alternative 8A	Design Alternative 8B	Design Alternative 8C
Vegetation and Wildlife - Potential impacts to woodlots and vegetation communities - Potential to impact plant or animal Species at Risk	●	●	○
Water Resources and Fisheries - Potential impact to watercourses and fisheries habitat	●	●	●
Natural Environment Preference	●	●	◐

6.4 School Bus Considerations

As noted in **Section 3.3.5**, CR 20 is school bus route with numerous stops along the corridor. There is a recognition that there is a need to balance the desired characteristics of a school bus stop with the realities of available amenities within the corridor to allow for safe student pickup/drop off.

The project team has reviewed corridor issues such as design, construction, and signage for school buses and stops. Activities included analyzing the route to determine locations to load/unload, potential pull over bus laybys and researching changes to the bus or system that would make it more visible/safe. The following potential improvements/design options were discussed with the Windsor Essex Student Transportation Services (WESTS):

- The Manual of Uniform Traffic Code Devices MUTCD describes use of “Bus Stop Ahead” signs based on sight distance. According to the MUTCD, the sign should be installed in advance of locations where a stopped school bus, picking up or discharging passengers, is not visible to road users for an adequate distance. Due to the flat and relatively straight nature of the corridor, it was determined that advance signage would not provide any added benefit.
- WESTS identified that the inclusion of laybys could provide added benefit to the roadway as bus drivers could pull over to permit groups of vehicles “stuck” behind the bus to pass. Bus laybys are discussed further in the following section.
- To provide the safest environment for students to walk between home and the bus stop, the following considerations form the interim/ultimate solution:
- Reduction in traffic speed from 80 km/hr. to 60 km/hr; and

- Maintain the 2-lane roadway for the majority of the corridor (i.e. avoid multi lane roads where pedestrians have a higher risk of injury).
- Interim solution of a designated path for cyclists and/or pedestrians, separate from roadway and traffic. Intersection improvements and TWLTL in select areas will calm motorized traffic.
- Ultimate solution to separate cyclists and pedestrians when warranted (i.e. number of conflicts).
- No on-street parking proposed to provide sufficient visibility for crossing children.

Layby Considerations

Generally a bus layby is a designated pull over area to provide a safer environment for passengers to load/unload from a stopped vehicle. However, during consultation, the Windsor Essex Transportation Services (WESTS) requested that the use of laybys be reviewed on CR 20 to alleviate car stacking behind school buses as a result of frequent bus stops along the corridor. In absence of any bus bay design standards from Windsor Essex Student Transportation Services (WESTS), available design standard information from other sources were reviewed to generate the following:

For a 60 km/hr. road, the minimum length for a bus bay, including tapers, is 125 m. A desirable length is 200 m which is not feasible along the CR 20 corridor.

As the layby should be located such that it does not intersect any driveways or side streets, there are very limited opportunities to include a bus bay of a minimum 125 m length. There appears to be only one feasible location in each direction. In the eastbound direction, the location would be 600 m west of Union Street (CR 45), just west of Dimena Drive (see **Figure 34**). In the westbound direction, the location could be just west of Ravine Line Road, at the Fleming Wigle Drain Crossing (see **Figure 35**).

Due to the overall length of the corridor, it was concluded that the addition of laybys would not add a benefit to the safety of children or the level of service on CR 20. As such, they were not included in the preferred design.

Figure 24: Bus Laybay - West of Dimenna Drive

Figure 25: Bus Laybay at the Fleming Wigle Drain Crossing

7.0 Preferred/Recommended Preliminary Design

The following section provides a description of the recommended design considering the results of the alternative design evaluation, stakeholder input and applicable roadway and active transportation facility design standards. The Plan drawings (**Figure 46**) located at the end of this section) are to be referred to for a full delineation of the preferred design.

The proposed corridor improvements are to be designed to accommodate multi-modal transportation. Roadway and intersection improvements will permit improved operations for vehicular users, while the A/T improvements will provide safer means of travel for pedestrians and cyclists. As the vehicular and A/T users share the road corridor, the facilities are to be developed in a manner that minimizes potential vehicular and A/T user interactions. However, where interactions are to occur, they are to be designed to current design standards and best practices to allow for safe environment for all. In the interim, the 1.5m wide cycle track will provide a dedicated area for A/T users compared to the existing conditions. This will serve the need until growth triggers the need for separated facilities, which will better accommodate the more vulnerable and recreational users. Proposed improvements to major intersections, including separate bike and pedestrian crossing areas, increased queuing areas, barrier curbs with curb ramps, detectable warning surfaces, and pedestrian signal actuation (at signalized intersections only) will also allow for safer waiting and road crossings for non-vehicular users. Queuing areas at all minor intersections will allow for a safe refuge for all non-vehicular users to wait to cross side streets.

The existing corridor has a mixture of posted speed limits ranging from 50 km/hr. to 80 km/hr. As a part of corridor improvements, it is recommended to reduce the posted speed limit between Kratz Sideroad and Union Avenue (CR 45) from 80 km/hr. to 60 km/hr. This reduction will match the existing conditions to the east and provide a more harmonious speed limit creating a safer environment for non-vehicular road users.

7.1 Roadway

7.1.1 Road Design

The preferred design for CR 20 includes maintaining the existing two-lane road cross-section for the majority of the 9.4 km corridor. The typical lane widths for east and west bound lanes are 3.75 m. As shown on the typical cross-sections, the existing asphalt surface will generally remain, and the road corridor will be widened to facilitate the installation of the A/T facilities. There are two locations where

It was identified that the inclusion of two-way left turn lanes (TWLTL) would be beneficial to improve the traffic flow and safety in the corridor. The TWLTL's will be 3.35 m wide and are located as follows:

- Extending an existing TWLTL at the western most 220 m of the project; and
- From Fuller Drive to west of Ravine Line Road, approximately 800 m.

Existing curbing will be replaced. The existing curb is an approximate 0.75 m wide mountable curb and is in generally poor condition. The curb will be replaced with a narrower, 0.45 m wide mountable curb. The front edge of curb will generally remain in the same location, and the narrower curb section will provide additional area behind the curb for A/T facilities.

At major intersections, barrier curb will be installed to discourage vehicles from mounting the A/T facility to bypass a waiting vehicle. Curb ramps with tactile warning surfaces will be installed to allow for barrier free access confirming to AODA standards.

Refer to **Figure 36** for a summary of planned improvements along the corridor, proposed intersection improvements at the four main intersections along the CR 20 corridor can be found on **Figures 41 to 44**.

Table 24: Road Design Criteria/Geometrics

Roadway Element	Existing	Proposed
Road Classification	Arterial	Arterial
Right of Way Width	12.07m (minimum)	N/A
34.33m (maximum)	24.4m (minimum)	N/A
34.95m (maximum)	N/A	N/A
Posted Speed	60 km/hr to 80 km/hr	60 km/hr
Through Lane Width	3.75m	3.75m
Turning Lane Width	3.35m	3.35m
TWLTL Lane Width	N/A	3.35m
Paved Shoulder	+/-2.50m	2.50m
Boulevard Width	Varies	2.50m
Multi-Use Trail	N/A	3.50m
Raised Cycle Track	+/-1.50m	1.50m
Concrete Sidewalk	N/A	1.50m

Figure 26: Proposed Improvements

NOTE:
- The proposed road classification extents are approximate.
- All imagery courtesy of the County of Essex mapping. Copyright 2015.

LEGEND
- SEMI-URBAN ROAD
- RURAL ROAD
- TWO-WAY LEFT TURN LANE
- INTERSECTION IMPROVEMENTS

COUNTY ROAD 20
Proposed Improvements
Kratz Sideroad to Sherk Street
in the Town of Kingsville and the Municipality of Learnington

DILLON CONSULTING | County of Essex | Kingsville ONTARIO | MUNICIPALITY OF LEAMINGTON

PROJECT No. 15-2971 DATE: MARCH 2018

FIGURE 36

7.1.2 Typical Cross-Sections

Due to the overall length of the project, there are several different cross-sections included as a part of the preferred design. The cross-sections can be defined as follows:

- Two-lane rural road with buffers, paved shoulders, a MUT trail and a sidewalk;
- Three-lane rural road (two travel lanes and a TWLTL) with buffers, paved shoulders, a MUT trail and a sidewalk;
- Two-lane semi-urban road with new mountable curb, raised cycle tracks, a MUT trail and a sidewalk; and
- Three-lane semi-urban road (two travel lanes and a TWLTL) with new mountable curb, raised cycle tracks, a MUT trail and a sidewalk.

Typical cross-sections in the corridor are presented in **Figure 37 to 40**. The Plan drawings (**Figure 46** located at the end of this section) are to be referred to for a full delineation of the preferred design.

7.1.3 Linear Illumination

The County does not typically provide linear illumination along County Roads. Intersections with proposed improvements that presently have illumination may require relocations of the light poles to not be in conflict with the road and A/T facility improvement works. In general, existing intersection illumination is accomplished with a mast arm on an existing utility pole. Thus if utility poles are relocated at an intersection, new lighting can easily be accommodated.

Linear lighting warrant analyses for the CR 20 corridor were not completed during the CR 20 EA. Due to the existing traffic conditions (AADT, collision history) identified in the Transportation Report, lighting warrants were not expected to yield results recommending linear lighting. It is recommended that linear lighting warrants be completed during the detailed design stage for the MUT and/or the TWLTLs. If linear illumination is requested by a local Municipality, a request must be made to the County of Essex including a completed lighting warrant analysis confirming that linear lighting is recommended.

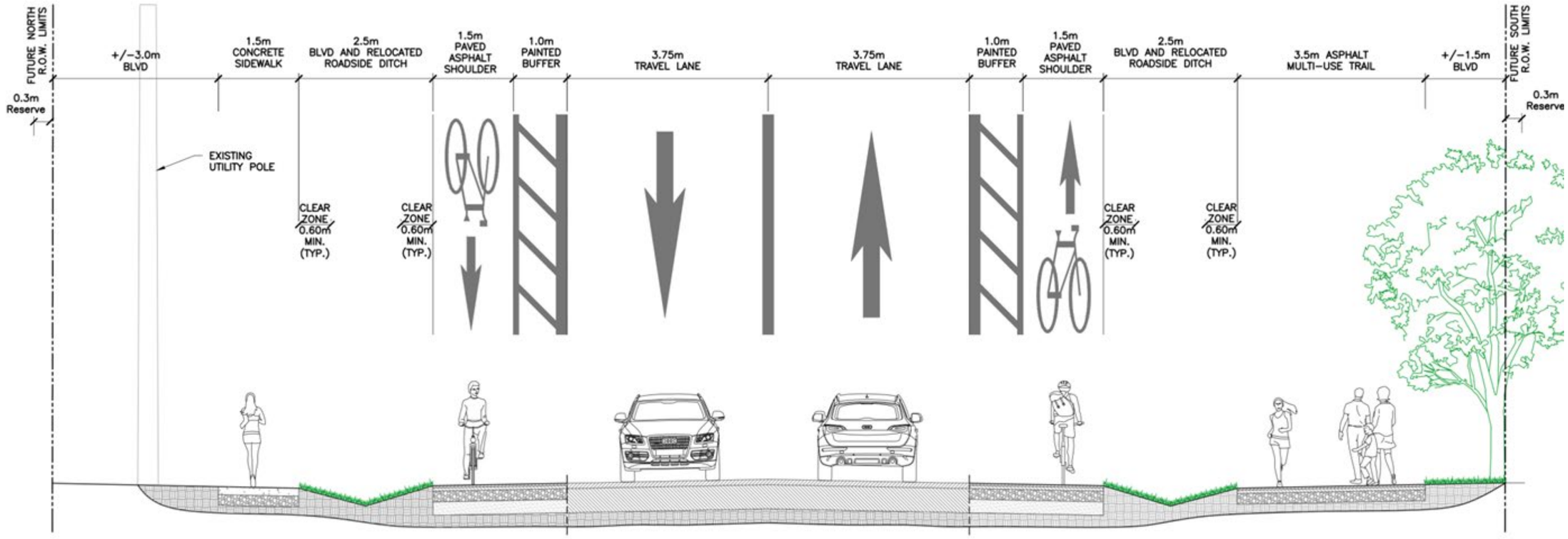

Figure 27: Rural Section with no TWLTL

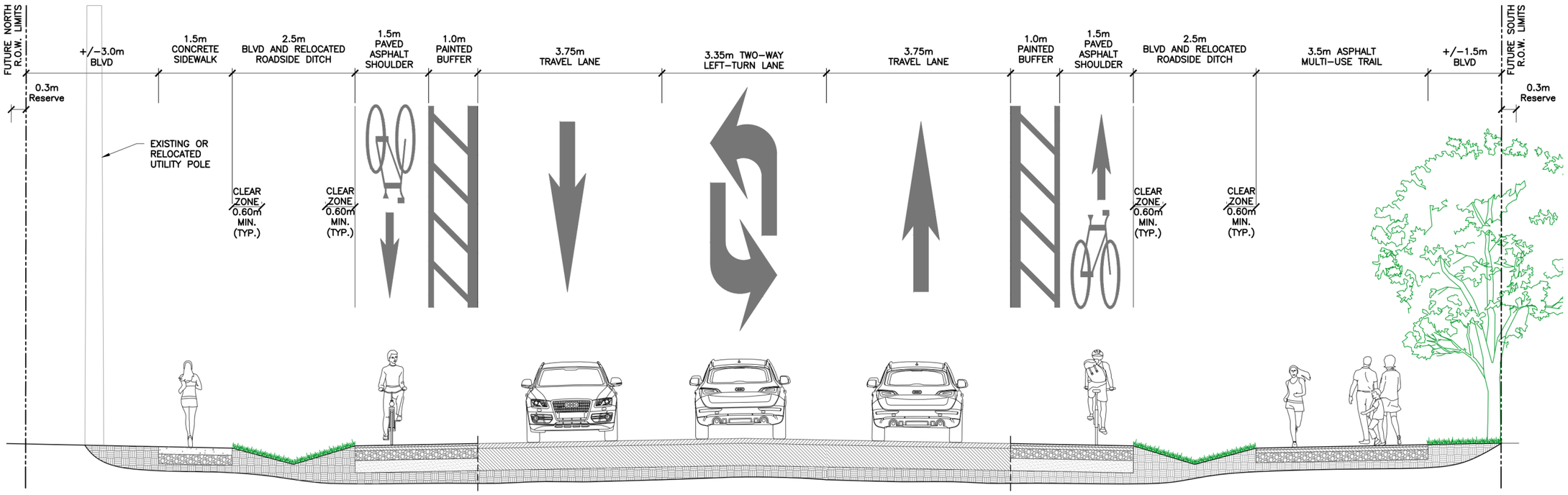

Figure 28: Rural Section with TWLTL

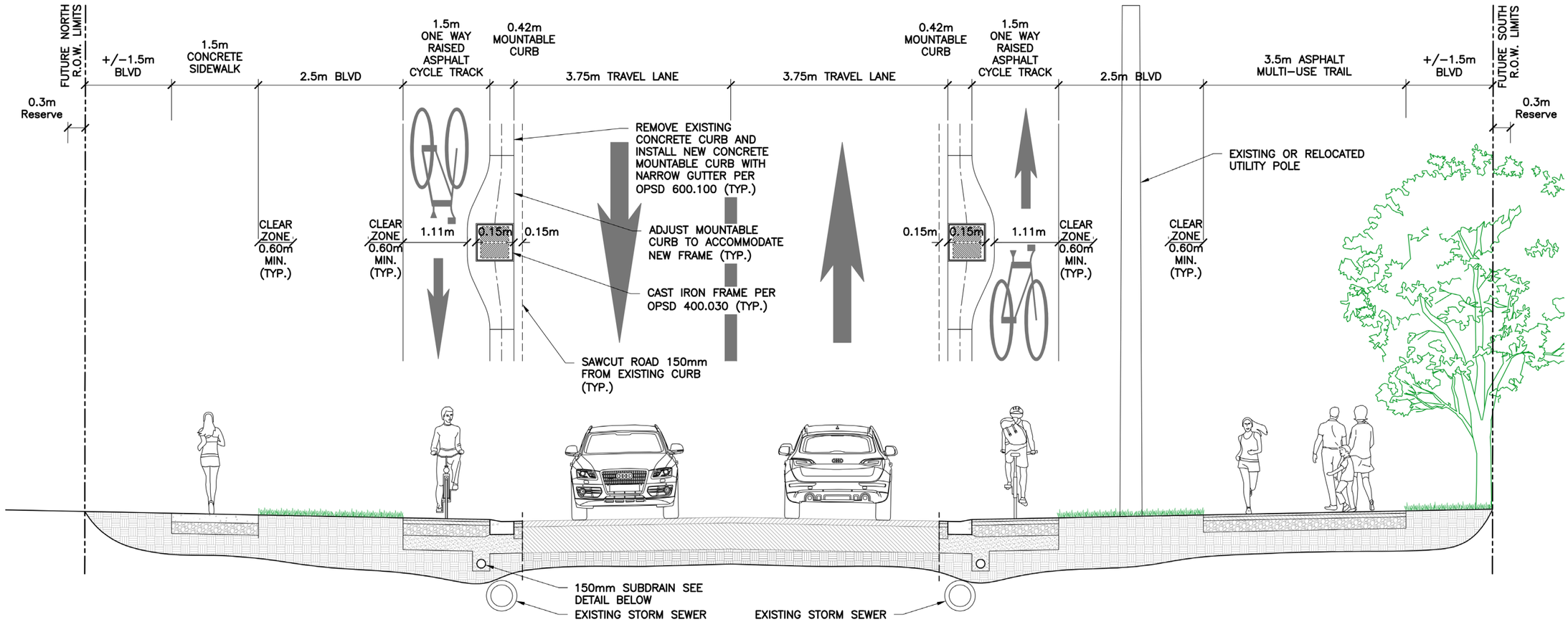

Figure 29: Semi-Urban Section with no TWLTL

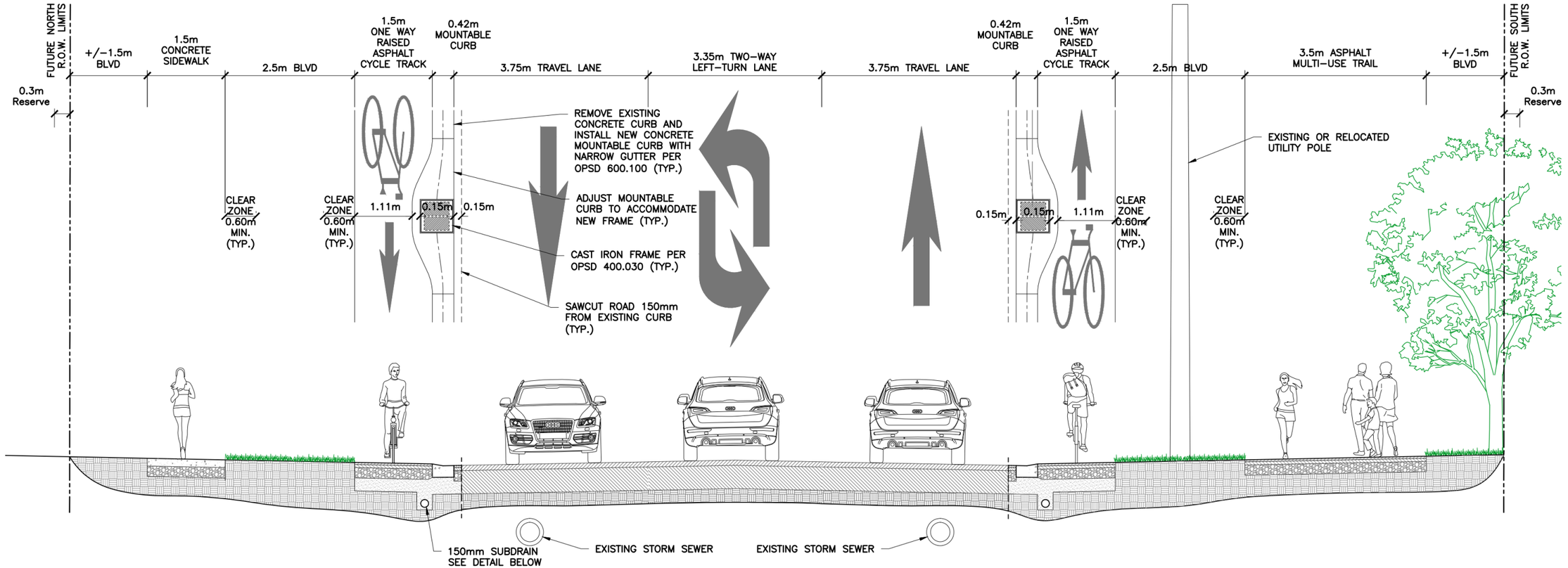

Figure 30: Semi-Urban Section with TWLTL

All future lighting designs shall adhere to the policies and illumination standards (fixture type, lighting levels, etc.) that are current for street or pedestrian lighting at the time of installation. All construction and future maintenance costs associated with linear lighting will be the responsibility of the local Municipality.

7.2 Intersection Improvements

The Transportation Assessment Report has identified several intersection upgrades along CR 20 to improve intersection performance, turning movements, and increase traffic flow along the corridor.

CR 20 is a designated truck route. As such, major intersections must accommodate truck turning movements. All major intersection have been reviewed to assess if curb radii or pavement marking updates are recommended in order to permit the turning movements of a WB-20 transport vehicle. Any recommended improvements to facilitate truck turning movements are identified on the proposed plans drawings.

County policy dictates that an assessment of the feasibility/warrant for a roundabout is to be conducted for all County road intersections where traffic signal improvements are planned. Roundabout assessments were completed for all the major intersections, and it was identified that a roundabout would not operate any more efficiently than a standard intersection. See the Transportation Assessment Report (**Appendix B**) for the roundabout assessment.

No new traffic signals are planned for the corridor. Existing signalized intersections at CR 45 and CR 31 will require relocated/upgraded signals to permit the installation of the A/T facilities and/or intersection improvements. The newly installed signals at Sherk Street may not require any modifications.

The following intersections improvements are included in the preferred design:

County Road 20/Graham Sideroad

- CR 20 eastbound left-hand turn lane.
- CR 20 westbound right-hand turn lane.
- Graham Sideroad southbound left-hand turn lane.
- East and westbound pedestrian crossings.
- Barrier curbs installed with AODA compliant curb ramps and detectable warning surfaces.

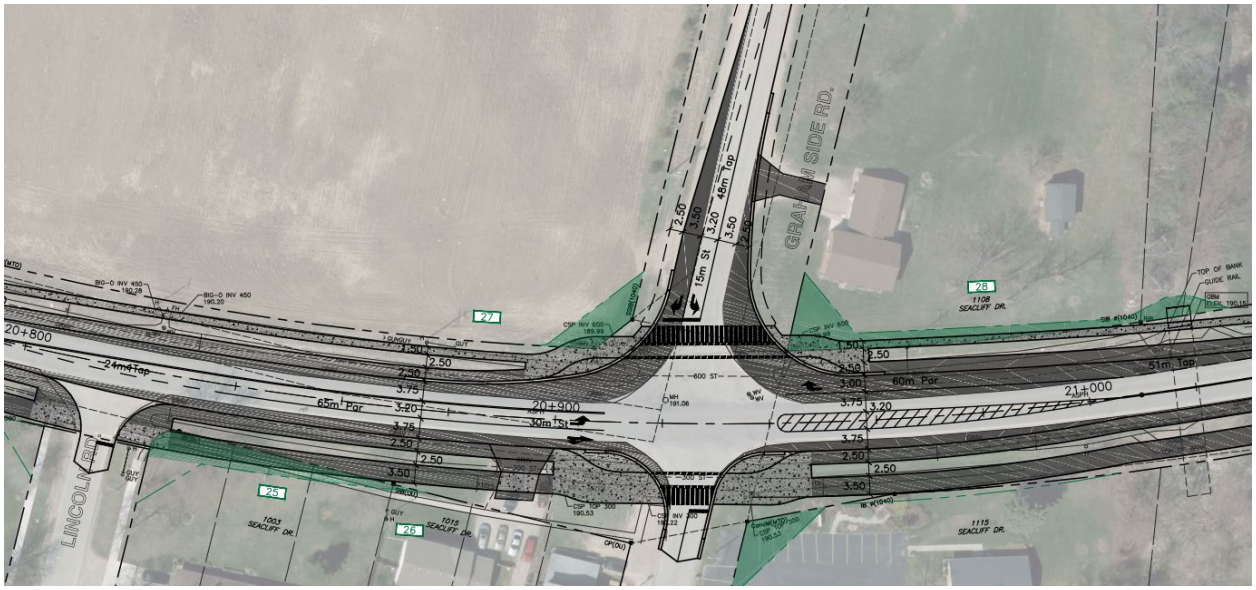

Figure 31: CR 20/Graham Sideroad Improvements

County Road 20/County Road 45 (Union Avenue)

- Westbound left-hand turn lane widened to match opposing eastbound left-hand turn lane.
- Slightly increased curb radii to improve truck turning.
- Barrier curbs installed with AODA compliant curb ramps and detectable warning surfaces.
- Install pedestrian activated signals.

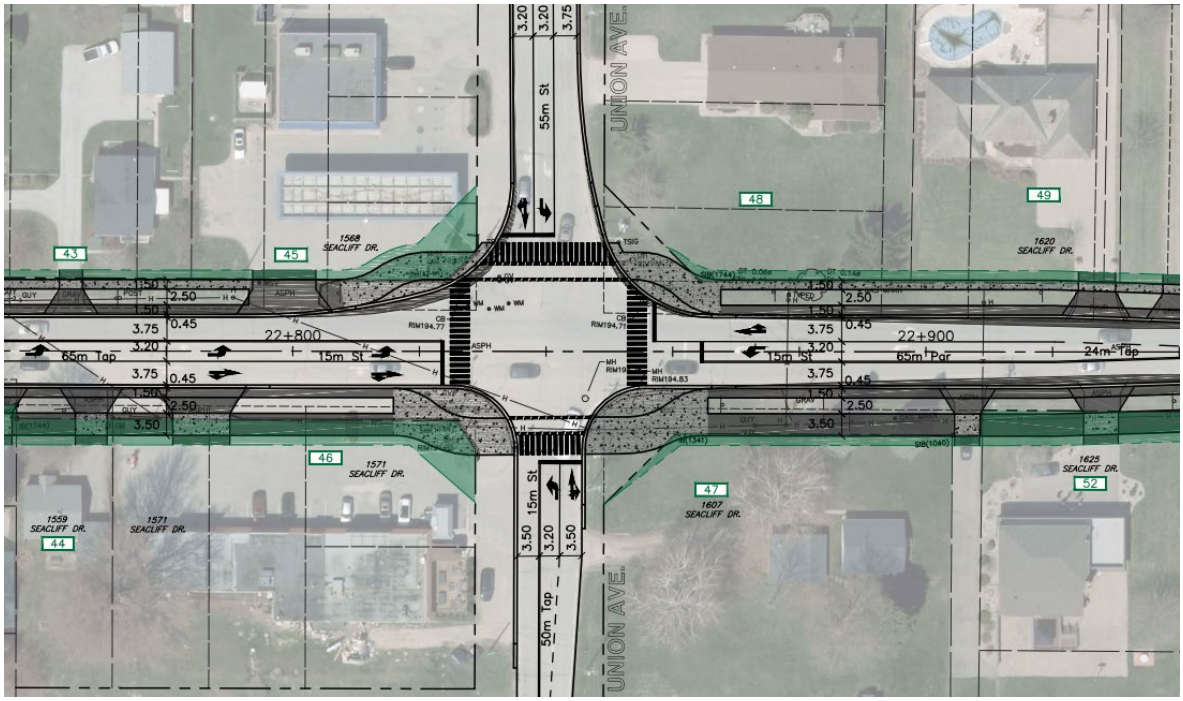

Figure 32: CR 20/CR 45 Improvements

County Road 20/County Road 31 (Albuna Townline)

- Increase the southbound CR 31 taper length by 36 m.
- CR 20 eastbound left-hand turn lane.
- CR 20 westbound left-hand turn lane.
- Barrier curbs installed with AODA compliant curb ramps and detectable warning surfaces.
- Install pedestrian activated signals.

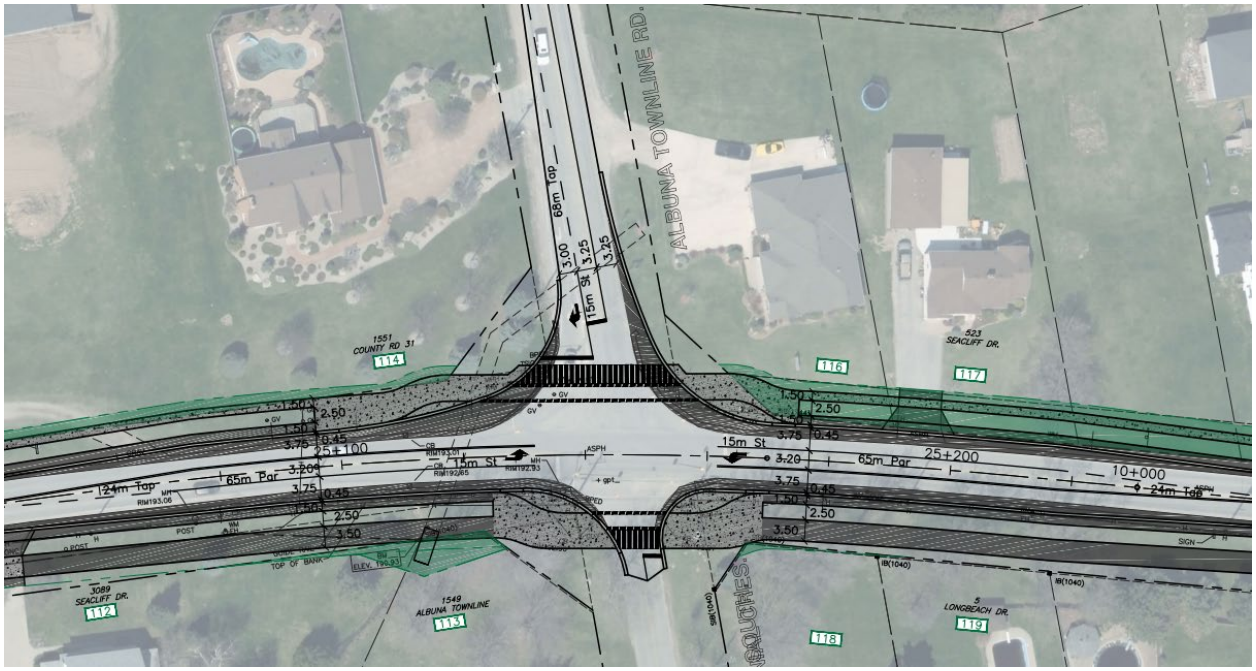

Figure 33: CR 20/CR 31 Improvements

County Road 20/Fraser Road

- CR 20 eastbound left-hand turn lane.
- Fraser Road southbound left-hand turn lane.
- Barrier curbs installed with AODA compliant curb ramps and detectable warning surfaces.

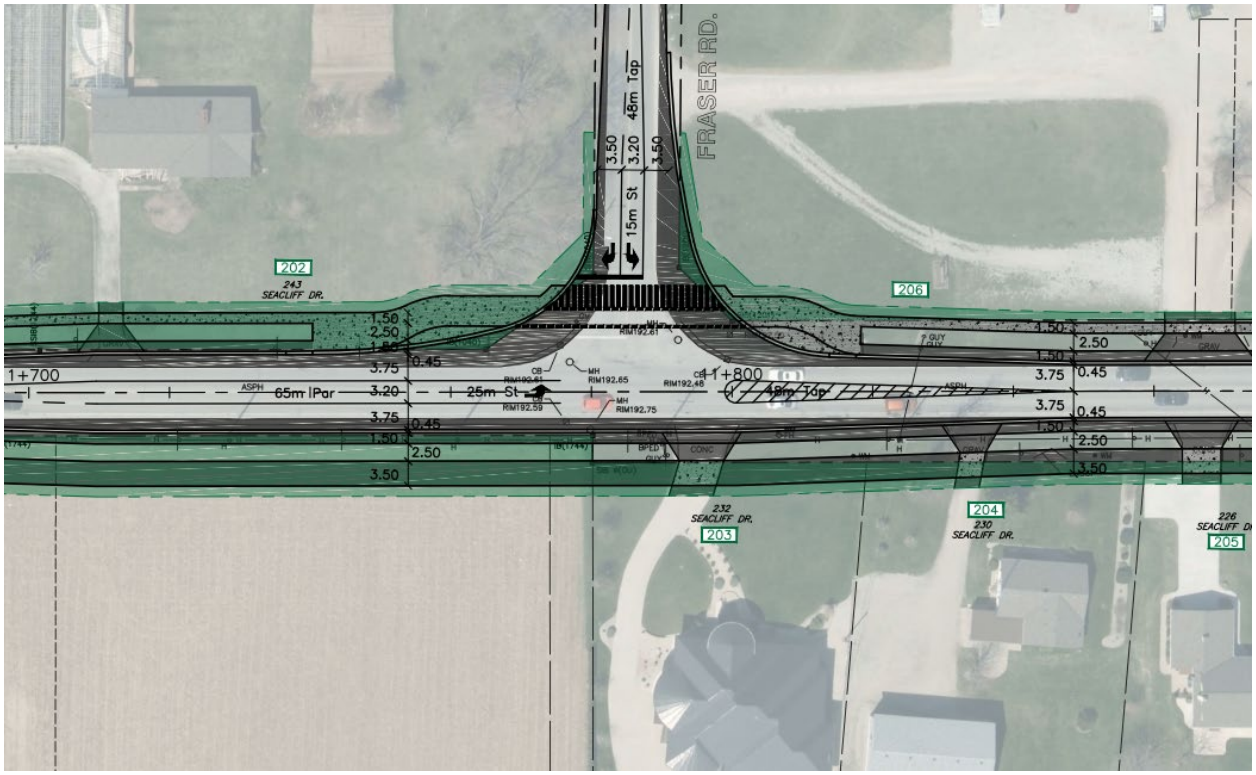

Figure 34: CR 20/Fraser Road Improvements

All minor intersections will be reconstructed to accommodate the new A/T facilities. The interim paved shoulders and back of curb cycle path can be accommodated.

The Transportation Assessment Report (**Appendix B**) identifies that improvements for different legs of the same intersection may be required at varying horizon years due to anticipated traffic demands (i.e. a westbound left turn lane may be projected to be required in 5 years, whereas the south bound left lane of the same intersection may be projected to be required in 15 years). However, it is recommended that when an intersection is reconstructed, that all identified improvements required to the 2035 horizon year are constructed at one time.

7.3 Active Transportation/Transportation Demand Management

As noted in the sections above, A/T facilities are planned along the length of the corridor on both sides of the road and include: a raised cycle tracks/paved shoulder along both sides of the roadway (building on the CWATS interim facility that is under construction), a 3.5 m paved multi-use trail on the south side of the corridor and a 1.5 m concrete sidewalk on the north side of the corridor. Both the multi-use trail and the sidewalk would be separated from the raised cycle track/paved shoulder with a 2.5 m planted boulevard that will provide a safe and attractive facility for users of the A/T facility. **Figures 37 to 40** illustrate the facility through a cross-section view of the street corridor.

The facility will serve the needs of the community in the foreseeable future and long-term. The planned ultimate facility (including the MUT and sidewalk) will significantly improving the walking and cycling experience and safety level through the corridor. The A/T facility will connect with the larger cycling network in the County including with the Chrysler Greenway at the west end of the corridor and the existing north-south facility along Sherk Street in Leamington. It will also be possible to connect the A/T facility with the future continuation of the A/T facility along CR 20 through and east of Leamington as identified in the CWATS plan.

Pedestrians presently have no safe area to travel along CR 20. While the planned CWATS improvements will construct an A/T facility sufficient for use, the sharing of the facility with cyclists and the proximity to the road do not create the safest environment for all A/T users. The inclusion of separated facilities (MUT and sidewalk) allow for separated areas for vulnerable users to safely travel along the corridor. The planned width of the MUT will allow for a comfortable user experience that provides sufficient room for differing user types to pass one another without conflict.

Pedestrian crossings of side streets (crossings parallel to CR 20) are to be provided at all intersections. However, pedestrian crossings of CR 20 (crossings perpendicular to CR 20) are only available at the three signalized intersections along the corridor (CR 45, CR 31, and Sherk Street), and only the Sherk Street intersection has designated areas for pedestrian crossings of CR 20. While the un-signalized intersections do not warrant pedestrian crossover facilities, there is still a need to ensure pedestrian connectivity in the corridor. The Transportation Assessment Report (**Appendix B**) provided a review of

the existing pedestrian routes which indicated that Cindy's Home and Garden (585 Seacliff Drive) may generate pedestrian traffic along the south side of County Road 20. People who choose to walk from the retail plaza along the north side of County Road 20, west of Kratz Sideroad, are likely to cross County Road 20 at one of the crosswalks along the way (at the Chrysler Greenway or the entrance to the retail plaza). Consequently, a pedestrian crossover near Cindy's Home and Garden is not necessary in order to maintain pedestrian system connectivity between the north side and south side of County Road 20. As the A/T facilities are installed, reviews of pedestrian crossings of CR 20 should be undertaken to identify if there is a need to add additional crossing location(s).

Active transportation upgrades to the corridor are proposed as follows:

Phase 1

- All major intersection improvements including required AODA crossing upgrades; and
- TWLTL at west end of project, east of Kratz Sideroad.

Phase 2

- 3.5 m wide Multi-Use Trail on south side of CR 20 throughout the entire project limits; and
- TWLTL east of Union Avenue, and associated replacement of back of curb raised cycle track from Whitewood Road to end of TWLTL.

Phase 3

- If identified as a need through pedestrian counting or other means, a 1.5 m wide concrete sidewalk is to be installed on north side of CR 20.

Due to the nature of the corridor, all A/T facilities will be built "through" property access driveways. In order to provide a safe interaction zone between motor vehicles and active transportation users, all driveways are to be constructed to meet County design standards for minimum/maximum width and minimum/maximum slope. Additionally, when the asphalt multi-use trail is constructed, all driveway crossings are to be constructed with coloured concrete to provide a visual cue to drivers to be aware of trail users, and vice versa. **Figure 45** depicts the improvements for the typical driveway on

the south side of the road, where a MUT is proposed. Concrete sidewalks will also be constructed "through" driveways, but will not be coloured concrete.

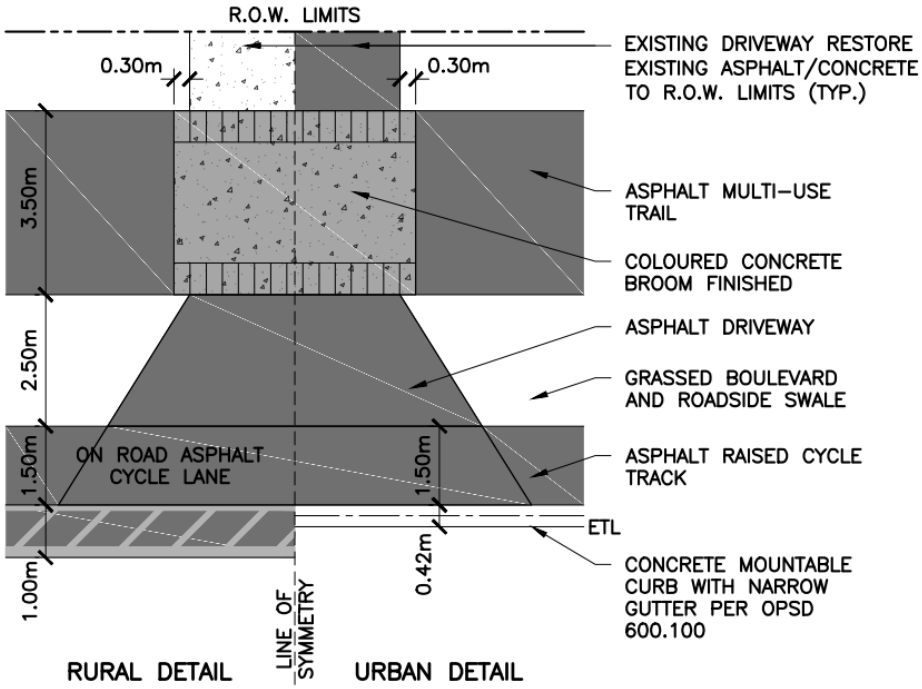

Figure 35: Typical Driveway Detail (South Side of CR 20)

Additional TDM Opportunities

The additional active transportation facilities describe above are the main transportation demand management (TDM) measure proposed for the corridor. As public transit is presently not run along the corridor, and there is no intention to provide transit in the foreseeable future, transit is not an available TDM measure for the corridor. Furthermore, considering the corridor and the role that it plays for both local and regional travel, additional TDM options are limited. As noted in the County's TMP, low density rural areas limit the realistic application of many TDM measures. Local Municipalities need to assess what is possible/achievable in their own communities to reduce car dependencies. The County is encouraged to work with Leamington and Kingsville to explore development of other TDM measure as supported in the County Transportation Master Plan such as ride sharing and supporting land use intensification at appropriate locations.

7.4 Drainage and Stormwater Management

7.4.1 Roadside Collection Systems

Stormwater in the right-of-way is collected through either roadside swales in the rural areas, or storm sewers in the urban areas and flows by gravity to drains or municipal drains that outlet to Lake Erie.

Roadside swales in the rural areas will generally require realignment to accommodate the A/T facilities (i.e. the swales will be relocated to be situated in the 2.5m boulevard between the raised cycle track/paved shoulder and the MUT/sidewalk). In general, the relocated swales will be located in the boulevards between the A/T facilities on either side of the road. Driveway crossing culverts will require replacement to be in alignment with the new swale location.

In general, roadside sewers (sewers parallel to CR 20) are located in areas where existing curbs are present. Based on information available from existing MTO as-built drawings, the sewers are located approximately under the curb(s) and range in size from 300mm to 450mm in diameter. The roadside sewers outlet to the drains crossing CR 20 and the outlet sewers range in size from 200mm to 900mm diameter.

The existing invert information for the roadside sewers is not known. As such, the existing capacities of the sewers cannot be determined. During detailed design, the existing sewer inverts and pipe sizes are to be confirmed. As criteria for design storm intensity and associated required sewer sizing is ever evolving, and ultimate improvements along the corridor may be 15 to 20 years in the future, any required sewer sizing or upsizing is to be confirmed during the detailed design stage. Storm sewers along the corridor will require review during detailed design to confirm if they have sufficient capacity to accommodate any increase flows due to the increase in impervious area. If improvements are required, the new sewers will be designed to meet the governing Municipality (Town of Kingsville or Municipality of Leamington) design standards.

7.4.2 Road Crossing Culverts

The design criteria for the road crossing structure were developed from the following sources:

- The Ministry of Transportation of Ontario (MTO) Highway Drainage Design Standards (MTO, 2008);
- The MTO Drainage Management Manual (MTO, 1997); and
- Canadian Highway Bridge Design Code (CHBDC, 2014).

County Road 20 is classified as a rural arterial road. The MTO (2008) design flow return period for this roadway classification is identified as a 1:25 year event. Depending on the type of structure, both the MTO Bridge and Culvert structure design criteria were reviewed. Two of the crossings are defined as bridges, #3 and #7, as they provide a roadway for the passage of vehicles, pedestrians or cyclists across an obstruction, gap or facility and are greater than 3.0 m in span. All the crossings are defined as culverts, being structures that form an opening through soil.

The crossings assessed are characterized as being under a rural arterial road with a structure span less than or equal to 6.0 m, which has a 1:25 year return period design requirement. The design flows for the study reaches were estimated using two different tools:

- PCSWMM; and
- Hydrologic Regional Model (HRM).

PCSWMM is a software program that provides a graphic user interface for developing input and analyzing output for the U.S. Environmental Protection Agency Storm Water Management Model (EPA SWMM) Version 5.1. EPA SWMM is a dynamic rainfall-runoff-routing simulation model used for single event or long-term (continuous) simulation of runoff quantity.

Based upon the findings of this preliminary hydrologic and hydraulic analysis it was found that 10 of the 16 crossing under County Road 20 would not be negatively impacted by the recommended improvements to the roadway right-of-way. The remaining 6 culvert structures were found to have the potential to be negatively impacted by the roadway improvements.

It is recommended that during detailed design a detailed hydrologic and hydraulic analysis be completed for each culvert structure under the road proposed for construction area. This would include further refining the upstream hydrologic estimates to include the benefits of existing stormwater management infrastructure, and developing hydraulic models which include the upstream reaches to identify the distance potential increase in the hydraulic grade line profile. Additionally, the downstream profile should be assessed to quantify the impact to the downstream system.

7.4.3 Stormwater Quantity and Quality

The ultimate outlet for all drainage within the study area is Lake Erie. Road crossings of County Road 20 are in close proximity to the lake, varying in distance from the road to shoreline of between 180m and 540m. In order to minimize impacts to the upstream areas, roadway runoff should be delivered to the lake undetained. The larger upstream areas are mainly agricultural, and flows from these areas will take significantly longer to travel to Lake Erie. As such, it is a preferred practice to allow road flows to travel unrestricted to drain to the lake in advance of the agricultural lands reaching their peak at the County Road 20 corridor. If the road runoff were to be detained, there is greater chance that the detained flows will create additional surcharge on the upstream system.

Due to the age of the existing roadway infrastructure, there is no stormwater quality infrastructure presently in place along the corridor. The areas with a rural road section (Kratz Side Road to west of County Road 45) that includes roadside ditches, will provide some level of water quality. The roadside ditches will act as bioswales that will settle out a portion of any suspended solids and pollutants.

It is anticipated that the preferred alternative will generally maintain the current roadway runoff systems (ditches vs. sewers), and that a normal level of water quality protection will be required. This could include catchbasins installed with goss gully traps to prevent oils and pollutants from entering the watercourse, or oil and grit separator unit(s).

As stormwater requirements evolve and change over time, the final requirements for stormwater quantity and quality are to be confirmed during final design. The requirements are to be determined in conjunction with the County of Essex, ERCA and

Kingsville/Leamington. The intent for future design is to meet the current applicable standards for water quality treatment.

7.5 Landscaping and Urban Design

Where feasible, existing street trees are to be preserved along the corridor. However, when construction or road widening activities necessitate the removal of existing street trees, the trees should be replaced. The County, in conjunction with the local Municipalities, will investigate opportunities to enhance the urban canopy and urban design features within the Study Area as part of the detail design process.

The use of non-invasive, native trees and vegetation species will be utilized in the development of the landscaping plan for the corridor. Kingsville and Leamington have street tree planting objectives, and preferred planting species. In general, preferred street trees will not encroach onto the roadway, and be a more ornamental species that require less maintenance.

Placement of trees must be carefully selected to ensure with they are not planted within a drainage swale, under aerial utility lines, or too placed closely to the road.

In more urban areas of the project, opportunities are available to include additional urban design amenities such as street furniture. The locations and quantity/style of site furnishings, including benches and waste/recycling receptacles, will be determined during detailed design in coordination with the local municipalities. All costs associated with the purchase, installation and maintenance of any street furniture will be the responsibility of the local municipality (Kingsville/Leamington).

7.6 Utilities

No improvements are planned at this time for the Town of Kingsville watermains or sanitary sewers. Only minor modifications, such as relocation of fire hydrants or service valves, are required to accommodate the preferred alternatives. At the time of detailed design, it should be confirmed that no additional works are planned by the Town.

No improvements are planned at this time for Municipality of Leamington watermains. Only minor modifications, such as relocation of fire hydrants or service valves, are

required. At the time of detailed design, it should be confirmed that no additional works are planned by the Municipality.

Leamington is commencing the process to extend a sanitary sewer along CR 20, from Sherk Street easterly to service additional areas to the east. At the time of this EA, the Municipality had just commenced the feasibility study for the extension, and as such, no designs or construction timeframes are available. At the time of detailed design, the status and planned alignment(s) of the extension is to be reviewed with Leamington. Any existing A/T facility infrastructure that is disturbed, removed or altered by sewer improvement activities must be replaced to equal or better condition during the course of construction. All costs associated with the replacement/repair of existing A/T facilities will be at the expense of the Municipality of Leamington.

Natural gas mains will remain in their current location. Due to the ultimate corridor improvements, minor alterations to valve elevations will be required to be adjusted to the final grade. Any existing gas meters located within the right-of-way may require relocation to not be in conflict with the AT/roadway improvements.

Electrical, phone and cable television aerial lines will require realignment to a new pole line intermittently throughout the improved corridor. The new pole lines, guy wires or ground mounted pedestals are to be placed so that they provide a minimum of 300 mm clear separation from any A/T facility. Any ground mounted pedestals (Bell/Cogeco) may also require relocation to not be in conflict with any proposed A/T facilities.

7.7 Access Management Plan

As previously described, due to the older nature of the area, and the previously uncontrolled approach to access monitoring, there are numerous locations along the corridor where properties have access points that do not adhere to the current County of Essex Access Management best practices. Noted access management issues along the corridor include:

- Multiple access points to a single property (2 or more);
- Driveway width exceeds recommended maximum;
- Driveways located in close proximity to an intersection or within an intersection sight triangle;

- Seasonal vendor roadside stands and patron parking located in/or in close proximity to the road right-of-way;
- Private property parking located within public right-of-way; and
- Intersection daylight corner property reserves are smaller than County preferred minimum.

To address current and potential future access issues, the following access management plan is proposed.

7.7.1 Corridor Management Considerations

Ensuring that roadway corridors best serve their intended functions is complex and needs to be an on-going process. The key activities in corridor management can be categorized as follows:

Land Use and Transportation Planning

- Ensures that the future intended functions and expected operation of road networks are considered in the planning process and if necessary, plans are adjusted to accommodate transportation system considerations:
  - Accommodations for all modes of transportation (vehicle, cyclists, pedestrian, other) that permit the roadway to function as intended while providing a safe environment for all users; and
  - Policies usually include: Official Plans, Zoning By-Laws, Transportation Master Plans, Secondary Plans, other applicable development regulations and the Ontario Provincial Policy Statement.

Road Design

- Ensures that roads are designed to accommodate intended traffic demands and that design elements give an accurate indication of the road purpose to drivers;
- The number of roadway lanes and the posted speed limits are reviewed to efficiently move vehicles while being cognisant of how motorist speeds may reduce the overall safety of the corridor;
- Intersections minimize delays, while providing sufficient and dedicated area for safe user movements (vehicle, truck turning, A/T users). Traffic signals are provided where warranted by operational LOS; and

- Relevant design elements include lane configurations, pavement widths, the use of curbs and gutters, inclusion of sidewalks, the use of traffic calming features, line painting including road crossings and the inclusion of A/T facilities.

Property Access

- Establishes criteria for locations and numbers of accesses approved for new development, in order to minimize conflicts between through traffic and access functions along corridors; Due to the road classification of CR 20, the number of access points on the road are to be minimized;
- Evaluation of roadway access locations to be assessed against specific operational criteria to determine whether full or partial movements are feasible;
- Guidelines for minimum permitted proximity of access points to intersections are developed to minimize intersection conflict points;
- Property reserves (300mm) on both sides of the right-of-way are put in place to permit the County review and approval rights over any planned access improvements along the corridor; and
- New developments are to adhere to adopted access management guidelines. The County shall review any new development submissions to confirm conformance.

Parking

- Reviews and updates the criteria for vehicle parking along the corridor, both existing and future.

Active Transportation

- Provides guidance for measures to be implemented at conflict points; and
- Reviews and identifies opportunities to improve the safety of active transportation users.

Operational Monitoring

- Reviews and identifies the known or potential user conflict points to reduce and manage user interactions to improve corridor safety;
- Identifies and evaluates existing problems and develops short and long-term solutions; and
- Provides feedback into policies affecting future access design and approvals.

The County of Essex Highways Best Practices Manual (BMP) includes a section on Access Management that took effect in 2009. This BMP for Corridor Access is intended to be consistent with existing and emerging policies and to provide more corridor specific, detailed guidance as needed on the above noted areas.

The following documents can also be referenced for additional information:

- County Wide Active Transportation Study (CWATS) Master Plan;
- Essex County Highways Best Management Practices – Access Management;
- MTO Geometric Design Standards for Ontario Highways;
- TAC Canadian Guide to Traffic Calming;
- MTO Corridor Management and Permit Procedures Manual;
- MTO Building and Land Use Policy;
- Ontario Traffic Manual;
- Essex-Windsor Regional Transportation Master Plan;
- County Road 42 Corridor Protection Strategy;
- County of Essex By-Law 2480; and
- County of Essex By-Law 2481.

7.7.2 Corridor Management Strategies

7.7.2.1 Road Design

To promote better access management, improve traffic flow, and provide a safer environment, several roadway improvement strategies were reviewed as a part of the EA process.

As a part of the CR 20 EA, the volumes of turning vehicles and turning movement operations at intersections were reviewed. Refer to the Transportation Assessment

Report (**Appendix B**) for additional information. Several improvements are proposed to the major intersections to provide for increased traffic movement and minimized delays.

The transportation analysis for the CR 20 corridor has identified that additional vehicular travel lanes are not required. However, certain sections of road providing agricultural, commercial or residential access functions may benefit from the inclusion of a centre two-way left-turn lane (TWLTL) treatment would provide operational benefits. Candidate road sections for centre two-way left-turn lanes will have frequent, relatively low volume access points on both sides of the road. Due to higher volumes of traffic along certain sections of CR 20, the TWLTL will permit the through traffic stream to remain consistent with the intended function of these road classifications.

The potential addition of school bus laybys was reviewed. The laybys would provide an area for busses to pull aside to allow queued traffic to pass the slower moving and frequently stopping bus. Ultimately it was decided that the inclusion of laybys would not provide sufficient benefit to be included in the preferred design.

The preferred CR 20 EA alternative identified two locations where TWLTLs are recommended:

- At the far west side of the project, which extends an existing TWLTL at Kratz Sideroad approximately 200 m easterly past Woodbridge Lane. The TWLTL is intended to improve traffic operations to a local business (Cindy's Home and Garden).
- East of Union Avenue, from Fuller Drive to west of Ravine Line Road. The main function of this TWLTL was to improve access to local commercial and agri-businesses in the area. However, due to the number of residential access roads in that area, the TWLTL has been extended to improve residential turning movements/access as well.

7.7.2.2 Property Access

Managing the spacing between driveways/access points is a critical factor in a road authority's ability to maintain arterial road capacity. Prior to the CR 20 corridor being transferred to the County of Essex, there were no regulations governing the number, locations, or size of property driveway access points. As such, there are numerous

driveways along the corridor that do not comply with the County of Essex corridor management by-laws. The Access Management Report (**Appendix G**) summarizes the current conditions along the corridor where properties that have access points that are not in compliance.

The County's Entrance Classifications are shown in **Table 25**.

Table 25: Entrance Classification

Entrance Class	Criteria
Commercial	Access to businesses where good or services are manufactured or sold to the public. Includes residential facilities of 5 or more units.
Farm	Access to farm buildings and agricultural fields.
Emergency	Access to subdivision developments for emergency vehicles only in the event that the main entrance to the development is not passable.
Private Road	Access to residential facilities of 5 or more units, public facilities (landfill sites and parks), resort areas, providing access to a number of lots.
Public Road	Access to registered subdivisions by means of a public street.
Residential	Access to residential facilities with less than 5 units.
Temporary	Access to properties for a limited period of time (not more than 1 year) for the purpose of construction, repairs, or improvements on that property, or to facilitate a staged development.

Due to the nature of the road network in the area, a minimum of one (1) access point for each property along the corridor is permitted. Per County recommendations, the following are the number of allowable driveways for each entrance class:

Table 26: Maximum Allowable Driveways per Lot

Entrance Class	Number of Entrances
Commercial	Maximum of 2 with a minimum spacing of 30 m.
Farm	1 per farm (for farm buildings and agricultural fields, additional entrances may be added where natural obstructions prevent reasonable access).
Emergency	1 per subdivision.
Residential	1 per lot.
Temporary	1

Driveways must be placed outside of all property sight triangles at intersecting roadways. Refer to the *Essex County Highways Best Management Practices - Access Management* by-law for minimum spacing requirements for driveways from

intersections. In general, if the CR 20 speed limit is reduced to 60 km/hr., the minimum driveway spacing shall be 14 m.

As there are no barrier curbs along CR 20, there is no ability to control property access from the roadway. A barrier curb would provide better access management, but is not preferred for site grading/stormwater reasons, by the County for snow removal or by the cycling community. It is recommended that any road improvements to CR 20 in existing curbed areas, be reinstated with new mountable curbs.

There are many properties along CR 20 where residential and agri-business uses are mixed on a single property. Typically, more than one entrance is currently provided for the various uses on the single site. As segments of roadway are improved, the County should review the access points along that section of road to identify any opportunities to improve or consolidate access points to better meet the intent/guidelines in this report. Before direct access to CR 20 is permitted, alternate access opportunities must be explored and the need for access to CR 20 must be demonstrated. The following may be valid criteria to consider direct access:

1) Land parcels are otherwise landlocked;
2) Unique constraints which negate any other access opportunities; and
3) Alternate access creates unacceptable traffic conditions or is in close proximity to the County Road.

A Transportation Impact Study may be required to support all proposed direct access locations.

Any future CR 20 access driveways for all entrance classes shall meet the design guidelines (width, slopes, material) as developed in the Essex County Highways Best Management Practices - Access Management.

7.7.2.3 Parking

At present, on-street parking is not permitted along County Road 20. The capacity and safety of an arterial road can be compromised by the introduction of on-street parking. As the EA improvements are implemented, parking will continue to be prohibited. However, due to the planned paved shoulder and the raised cycle track that will be directly adjacent to the road, motorists may be inclined to use the A/T facilities for

roadside parking. The planned mountable curb in the semi-urban areas will do little to discourage pathway vehicle parking.

Due to the paved shoulder or mountable curb abutting the A/T facilities, it may be enticing for vehicular users to park on the proposed A/T facilities. In order to discourage this activity, the following measures should be included in the final design:

- "No Parking" signage to be placed adjacent to roadside A/T facilities;
- Provide communications to residents regarding the new facilities, their intended functions, and parking restrictions; and
- Pavement markings on the A/T facilities would also assist in informing drivers that the paths are not for vehicle parking. This is not an immediate recommendation, but may be implemented if certain areas are having issues with vehicular parking.

Ultimately prohibiting cars/vehicles from parking on the A/T facilities is a policing issue. However, the above noted measures can be utilized to inform and discourage vehicle parking.

Due to the proposed improvements along CR 20, the majority of the right-of-way will be covered by roadway, A/T facilities or A/T buffers. As such, and to be in compliance with County standards, all parking for residential, commercial and agricultural lots along the corridor must be contained outside of the CR 20 right-of-way (i.e. on private property). As A/T facilities are installed, any existing parking encroachments into the right-of-way will require relocations onto private properties. The exception to this is existing residential parking/driveways. Due to the more residential nature of the area with shorter driveways, vehicles are permitted to encroach into the County ROW but may not park on/over an A/T facility.

Parking for commercial and agricultural lots shall provide onsite facilities such that vehicles can manoeuver sufficiently to enter and exit the private properties in a forward facing manner. This is not feasible for all residential properties.

Roadside Vendors

There are numerous roadside stands/vendors along CR 20 that are generally seasonal operations that sell agricultural goods. Presently, these uses do not have, or require, a permit for operation but are considered a local tourist attraction. However, the stands

may be encroaching into the County right-of-way, and may interfere with any proposed road improvements. Parking for these facilities is generally accomplished by cars pulling off to the side of the road within the County right-of-way.

As A/T facilities are installed, the parking and access for these stands will require detailed review on a case-by-case basis. The roadside stands are an important feature of the area and the future intent is not to prohibit the use, but to better manage the vehicle interactions from the road to the stand so that users of the A/T facility are not compromised or subject to undue risk.

There is no present or planned roadside parking on CR 20. As such, any parking for the stands must be provided beyond the furthest proposed A/T facility. Absolutely no parking will be permitted on, or within 600 mm, of the A/T facility. Signage may be necessary at the stand locations to direct vehicle users to appropriate locations for parking, and the penalties for parking on/over the A/T facility. Due to the nature of the roadway, any car temporarily parking to access a roadside stand will have to drive over the A/T facility to reach the parking area(s). This is similar to any resident using their driveway that would cross the A/T facility. It is recommended to encourage access to the roadside stands from existing driveway locations. Utilizing an existing driveway to access the stands will provide a safer vehicle crossing location for A/T users.

Due to the overall footprint of the planned A/T facilities, it is recommended to prohibit locating vending stands and associated stand parking within the CR 20 right-of-way, and require all fruit stand operators to provide sufficient off-street parking. Prior to the A/T facilities being constructed, meetings with County staff may be required with each stand owner to identify the impacts to the roadside stand location and operations and what operational changes may be required in order for the operation to continue.

7.7.2.4 Active Transportation

The proposed improvements to CR 20 will include the expansion of the existing CWATS A/T facilities. The preferred alternative of the CR 20 EA also include a 3.5 m multi-use trail (MUT) on the south side of the road, and a 1.5 m wide concrete sidewalk on the north side of the road.

As CR 20 is an arterial road, the safety of all A/T users requires special attention due to potentially higher traffic volumes and speeds. As noted, the speed limits for the road will be reduced/harmonized as a recommendation of this EA. Providing lower and consistent speed limits will provide a safer environment for A/T users, specifically cyclists who will likely have closer interaction with on-road vehicles.

As intersection collisions are common for A/T users, facility designs at and approaching intersections are to provide a safe area that maximizes user visibility and clearly identifies A/T user crossing areas. CWATS provides details and preferred designs for Multi-Use Trail crossings at intersections. However, A/T designs, specifically at conflict points at intersections, are an evolving field. Current Ontario Traffic Manual standards, or other best practices, should be reviewed and implemented where practical during detailed design.

Vehicle interactions with the A/T facilities will be important to manage. Presently, the volume of pedestrians/cyclists along CR 20 is not significant, and as such, motorists may not be expecting A/T users along the corridor. As the facilities are constructed, the following parameters should be implemented:

- A/T facilities will be constructed "through" all driveways. Existing driveways will be reconstructed as required so that A/T facilities are visible crossing all driveway locations. It is suggested that where the MUT crosses driveways, that the MUT material be changed from asphalt to concrete. The concrete could be a coloured concrete to enhance the visual contrast and appearance. This will provide a visual cue for both A/T and driveway users of the conflict point.
- Provide signage to identify the A/T facility and conflict points, and MUT speed limit.
- Develop intersection approaches, landing areas, and road crossings using current standards and best practices to provide safe intersection crossings for all corridor users.
- A corridor-wide approach for raising driver awareness at these conflict points is to be developed, such as painting pavement green (North American standard) to highlight potential conflict points (e.g. intersection crossings) for cyclists and pedestrians.
- Provide communications to residents regarding the new facilities and the A/T user right-of-way.

7.7.2.5 Property Requirements

As a part of the CR 20 EA, 15 m x 15 m daylight corners are recommended at all major intersections. At present, unless otherwise recommended, no additional daylight corners are recommended for acquisitions at minor intersections or side streets.

As lands along CR 20 develop, the dedication of daylight triangles may be required. These daylight triangles provide land for sight distance, possible right turn channelization and location for potential future traffic control devices. In built-up areas, consideration of reducing the size of the sight triangle to (10 m) may be given if there is no demonstrated collision history and the land is not needed for utility or traffic signal equipment.

In order to protect the right-of-way from development of unwanted access points, the County of Essex will be registering a 0.3 m wide reserve crossing all private properties, on both sides of the road. The reserve will be an extension of the existing or planned right-of-way, and will protect CR 20 by preventing unpermitted new access points to the roadway.

Refer to the preferred plan drawings (**Figure 46**) for the locations of anticipated property requirements.

7.7.2.6 Landscaping and Urban Design

In order to minimize potential conflicts and sight obstructions, it is recommended that landscaping inside the road right-of-way be regulated. There are a number of older trees along the corridor that are not viewed as visual obstructions. However, lower growth trees or hedges can provide visual obstructions and potentially increase the risk to the A/T facility users, particularly cyclists who may be travelling at a higher rate of speed.

Landscaped buffers, a feature that can separate land uses, can be important access management tools as they can define commercial driveway points or separate parking facilities and help make them safer. The width of the buffer can vary, depending upon the building setback and the function the buffer serves. Any provided buffer shall not interfere with sight distances.

As the CR 20 corridor is improved, additional street furniture may be introduced. Street furniture is defined as objects placed within a road right-of-way for public use. This can include features such as regulatory signage, mail boxes, hydrants, traffic signals, benches and refuse receptacles.

The placement of all street furniture within the corridor is to be reviewed to provide, if feasible, a minimum of 300 mm clear separation from the edge of A/T facility to any street furniture. Street furniture shall be placed to minimize any potential for obstructing sight lines for drivers, cyclists and pedestrian users.

At present, the County has no plans to provide amenities such as benches or refuse containers along the CR 20 corridor. Should these be implemented in the future, placement shall meet the above noted separation requirements.

7.7.2.7 Traffic Impact Studies

As development occurs along the corridor, an important measure to protect the corridor is the requirement for a Traffic Impact Study (TIS). A TIS requirement by the County can be an integral part of a Municipality's development review process. A pre-development TIS review can assist in the following areas:

- Provides pre-construction guidance on proposed driveway location and on-site circulation plan, thus avoiding potential unwanted vehicle movements and minimizing costly corrective action;
- Result in better access management;
- Places the responsibly for congestion mitigation on the Developer;
- Prevents the community and/or County from future costly roadway improvements; and
- It offers an opportunity for the Municipality and developer to work together to jointly determine an optimal traffic management design.

7.8 Potential Phasing and Preliminary Cost Estimates

7.8.1 Project Phasing

There are numerous infrastructure improvement elements recommended along the CR 20 corridor. Due to the length of the study area, implementation of all the recommended improvements in one phase is not practical.

The recommendation improvements provided in the EA area based on traffic, collision, and development data available at the time. It is recommended that the County undertake a review of updated traffic data (AADT, collision data, turning movements etc.) if the corridor improvements are delayed beyond the five (5) year timeframe. Additionally, the County should review the approved developments and the current development applications with the local municipalities. This will permit the confirmation of assumptions and design criteria used to design the CR 20 EA recommended improvements. If local factors have increased or significantly altered from those used in this report, the recommendations provided herein may require adjustment to meet the needs of the County for the 20 year horizon.

The below phasing breakdown assumes that all recommended CWATS raised cycle tracks in Kingsville and Leamington have been installed. The following is a summary of the potential phasing for implementation of the new works:

Phase 1

- Reduce the corridor posted speed limit from east of Kratz Sideroad to CR 45 (Union Avenue) to a harmonious 60 km/hr;
- All major improvements at the Graham Sideroad, CR 45 (Union Avenue), CR 31 (Albuna Townline), and Fraser Road intersections with CR 20; and
- Extension of TWLTL from east of Kratz Sideroad to east of Woodbridge Lane.

Phase 2

- 3.5 m wide Multi-Use Trail on south side of CR 20; and
- TWLTL east of Union Avenue and replacement of back of curb raised cycle track from Whitewood Road to end of TWLTL.

Phase 3

- 1.5 m wide concrete sidewalk on north side of CR 20.

Once the CR 20 EA is completed and adopted, planning for the Phase 1 improvements should commence. Recommendations for the sequencing of construction of the works are as follows:

Phase 1

The Phase 1 works are either recommended or considered to be required in the "NOW" timeframe. It is recommended to reduce the speed limit east of Kratz Sideroad to CR 45 (Union Avenue) to a harmonious 60 km/hr. As previously mentioned, some intersection improvements are noted as immediately required at four intersections along the corridor, while others are not anticipated until further in the horizon period. In order to provide the most benefit for road users, and economy of scale construction costing, it is recommended that all proposed improvements for a specific intersection are to be constructed at the same time. The intersection improvements may be phased over several construction seasons to spread out the construction costs and impacts to the local residents.

Phase 2

The main component of the Phase 2 of the works is the installation of the multi-use trail on the south side of the road. The timing for construction of this phase will be difficult of assess. Presently, the corridor has limited non-vehicular users as there is no area for them to safely utilize. Once the interim CWATS facility is fully built out, the County will be better able to assess the level of use of the new trail system. It is recommended that A/T user counts be conducted to assess the number and type of users of the CWATS trail system. While the A/T user counts may help to justify the need for the construction of the additional MUT, the need for the MUT should also reflect the CWATS objectives and the desire for improved A/T facility along the corridor by the community. Typically A/T user volumes increase when improvements are made to facilities that appeal to a wider user group. As such, Phase 2 of the works will likely be triggered by road/pathway lifecycle improvements, local requests, political needs or through available funding.

The TWLTL from Fuller Drive to west of Ravine Line Road is to be installed when one of the following triggers occurs:

Rehabilitation to County Road 20 is required in the TWLTL area:

1. If CR 20 is to be reconstructed or rehabilitated from Fuller Drive to Ravine Line Road by the County of Essex, a TWLTL and relocated A/T facilities are to be included in the works.
2. The existing CWATS active transportation facility has reached the end of its life cycle (expected to be approximately 15 years) and requires replacement.

If the installed CWATS raised cycle track required improvements or rehabilitation, the TWLTL and other associated improvements will be installed at that time.

Phase 3

The timing for Phase 3 of the works (1.5 sidewalk on the north side), as with Phase 2, may be difficult to ascertain through user counts. As previously noted, A/T user volumes typically increase when improvements are made to facilities that appeal to a wider user group. The construction of the north side sidewalk will be determined in conjunction with local municipalities or by mutual desires to complete the CWATS objectives.

7.8.2 Cost Estimates

Preliminary construction cost estimates for the CR 20 improvements are provided in the table below. As noted in **Section 2.3**, any cost sharing with local municipalities will be in accordance with existing CWATS Master Plan or other County policy's as applicable.

All costs are in 2018 dollars and exclude the costs for third party utility relocations, property acquisitions, and engineering costs.

Table 27: Preliminary Construction Cost Estimates

Phase	Works	Estimated Cost
Phase 1	All intersection improvements (except CR 45), including traffic signal improvements and intersection street lighting replacements.	$1.6 mil
Phase 2	3.5 m wide MUT on south side of road.	$4.0 mil
Phase 3	County Road 45 intersection improvements.	$1.0 mil
Total	TWLTL east of Union Avenue.	$1.8 mil

7.9 Plans/Profile Plates

Preliminary plans identifying the preferred designs for the corridor are provided in **Figures 46**.

Plans and Profiles Figure 46 is included as a separate link on the County website. Figure is not AODA compliant.

8.0 Anticipated Impacts, Proposed Mitigation and Benefits

8.1 Introduction

The mitigation of potential negative effects was considered throughout the EA process. Avoiding important features in the study area was included in the development of the alternatives and in the selection of the preferred alternative design – which was identified as Alternative 8C as previously described in **Section 6.0**. Despite efforts to reduce effects, not all negative effects can be avoided and as such, additional mitigation measures are recommended for inclusion as part of the development of the project detailed design, during construction, and operations and maintenance activities.

This section describes the potential effects of the preferred design and recommended mitigation measures to reduce the effects. Also described are the anticipated project benefits. It is expected that the recommended mitigation measures would be further refined during project detailed design. The description of net effects is based on a similar set of environmental and technical considerations used to evaluate the alternatives including:

- Socio-economic;
- Natural Environment;
- Cultural;
- Transportation; and
- Engineering

Section 8.3 to 8.6 provides descriptions of the identified potential adverse effects and recommendations for mitigation.

Table 28 provides a summary of the projected negative effects, recommended mitigation and net effects.

Table 28: Summary of Projected Negative Effects

TRANSPORTATION

Environmental Consideration	Description of Potential Impact	Mitigation[3]	Net Effect
Potential for impact on traffic operations during construction.	Project construction could lead to traffic delays through the corridor particularly for the construction of the left turning lanes and intersection improvements.	As part of detailed design, prepare a construction phasing plan/detour plan as required to minimize delays to through movement of traffic.	Some temporary delays to traffic movement through the corridor.
Potential for conflicts with users of multi-use trail and driveway entrances along the corridor.	Due to the presence of many driveways along the corridor there is potential for conflict with users of the multi-use trail (primarily cyclists).	Install signage and use of different pathway surface material (e.g. coloured concrete) to differentiate driveway crossing areas.	Limited potential for conflict between multi-use pathway users and driveways.
Potential to accommodate school buses and waiting students.	Students waiting for school buses could be in conflict with users of the multi-use trail – primarily cyclists. Noted that pedestrians are permitted users of the multi-use trail.	Provided signage warning cyclists that students could be waiting on the trail. For long-term school bus stops, provide designated waiting areas.	Minimal potential for conflict between waiting students and cyclists using multi-use trail.
Potential for impact on response Times/access for Emergency Vehicles during construction.	Project construction could lead to delays in response times of emergency access vehicles particularly for the construction of the left turning lanes and intersection improvements.	Consult with emergency service providers during detailed design and construction to keep them informed and to seek their input.	Minimal delay to emergency response times.

ENGINEERING CONSIDERATIONS

Environmental Consideration	Description of Potential Impact	Mitigation	Net Effect
Impact to existing and planned servicing and utilities (e.g. hydro poles) within the corridor.	The relocation of above ground utilities (power, communications, TV) will be required as a result of project implementation.	A preliminary design for utility relocation has been developed. Consultation with utilities companies to be undertaken as part of detailed design to confirm relocations.	Some short-term service interruption possible during construction. No long-term effects to utilities or service levels.
Impact on existing drainage related infrastructure.	The project will required alteration to drainage infrastructure to accommodate the widened footprint of the roadway corridor including: • Modification to existing road crossing culverts; • Relocation of swales in rural areas or new sewers, catchbasins and manholes in urban areas; and • Existing culverts at driveway crossings will require relocation and replacement.	Finalize drainage improvements recommended in the preliminary design as part of detailed design: • Any proposed works or alterations to a Municipal Drain will require a Municipal Drain Report be completed in accordance with the Municipal Drainage Act.	With implementation of recommended drainage infrastructure and improvements, corridor drainage system(s) will function more efficiently.

Environmental Consideration	Description of Potential Impact	Mitigation	Net Effect
Increase in stormwater run-off (water quantity).	The additional impervious areas to be created from the project will increase the ROW imperviousness and associated runoff. The total increase in impervious area is approximately 8.2 hectares. This is considered to be a minor impact given that it equates to an approximate 0.5% increase in the impervious area for the entire CR 20 drainage area. Impacts to downstream drains (between CR 20 and Lake Erie) are to be reviewed during detailed design.	Finalize drainage improvements recommended in the preliminary design as part of detailed design. No onsite detention is recommended due to the proximity of CR 20 to Lake Erie.	With implementation of recommended drainage infrastructure and improvements, impacts to existing storm systems are anticipated to be minor.

CULTURAL ENVIRONMENT

Environmental Consideration	Description of Potential Impact	Mitigation[4]	Net Effect
TRANSPORTATION			
Potential for impact on traffic operations during construction.	Project construction could lead to traffic delays through the corridor particularly for the construction of the left turning lanes and intersection improvements.	As part of detailed design, prepare a construction phasing plan/detour plan as required to minimize delays to through movement of traffic.	Some temporary delays to traffic movement through the corridor.
Potential for conflicts with users of multi-use trail and driveway entrances along the corridor.	Due to the presence of many driveways along the corridor there is potential for conflict with users of the multi-use trail (primarily cyclists).	Install signage and use of different pathway surface material (e.g. coloured concrete) to differentiate driveway crossing areas.	Limited potential for conflict between multi-use pathway users and driveways.
Potential to accommodate school buses and waiting students.	Students waiting for school buses could be in conflict with users of the multi-use trail – primarily cyclists. Noted that pedestrians are permitted users of the multi-use trail.	Provided signage warning cyclists that students could be waiting on the trail. For long-term school bus stops, provide designated waiting areas.	Minimal potential for conflict between waiting students and cyclists using multi-use trail.
Potential for impact on response Times/access for Emergency Vehicles during construction.	Project construction could lead to delays in response times of emergency access vehicles particularly for the construction of the left turning lanes and intersection improvements.	Consult with emergency service providers during detailed design and construction to keep them informed and to seek their input.	Minimal delay to emergency response times.
ENGINEERING CONSIDERATIONS			
Impact to existing and planned servicing and utilities (e.g. hydro poles) within the corridor.	The relocation of above ground utilities (power, communications, TV) will be required as a result of project implementation.	A preliminary design for utility relocation has been developed. Consultation with utilities companies to be undertaken as part of detailed design to confirm relocations.	Some short-term service interruption possible during construction. No long-term effects to utilities or service levels.

Environmental Consideration	Description of Potential Impact	Mitigation[4]	Net Effect
Impact on existing drainage related infrastructure.	The project will required alteration to drainage infrastructure to accommodate the widened footprint of the roadway corridor including: • Modification to existing road crossing culverts; • Relocation of swales in rural areas or new sewers, catchbasins and manholes in urban areas; and • Existing culverts at driveway crossings will require relocation and replacement.	• Finalize drainage improvements recommended in the preliminary design as part of detailed design. • Any proposed works or alterations to a Municipal Drain will require a Municipal Drain Report be completed in accordance with the Municipal Drainage Act.	With implementation of recommended drainage infrastructure and improvements, corridor drainage system(s) will function more efficiently.
Increase in stormwater run-off (water quantity).	The additional impervious areas to be created from the project will increase the ROW imperviousness and associated runoff. The total increase in impervious area is approximately 8.2 hectares. This is considered to be a minor impact given that it equates to an approximate 0.5% increase in the impervious area for the entire CR 20 drainage area. Impacts to downstream drains (between CR 20 and Lake Erie) are to be reviewed during detailed design.	Finalize drainage improvements recommended in the preliminary design as part of detailed design. No onsite detention is recommended due to the proximity of CR 20 to Lake Erie.	With implementation of recommended drainage infrastructure and improvements, impacts to existing storm systems are anticipated to be minor.
CULTURAL ENVIRONMENT			
Potential for impacts to registered archaeological sites and undisturbed lands.	As a result of road widening and wider/relocated pathway, there could be some impact to undisturbed lands with archaeological potential.	Conduct Stage 2 archaeological investigations on applicable lands. Pending results of Stage 2 work, additional archaeological investigations may be warranted.	No net adverse effects anticipated through following of provincial archaeological assessment protocol.
Potential to impact known built heritage resources (i.e. listed/designated under Part IV or Part V of the Ontario Heritage Act and/or identified as culturally significant.	Land (3 m of frontage) will be required from a property designated under the Ontario Heritage Act. The heritage building will be located about 9 m away from the new edge of road and 5 m from edge of sidewalk. No direct impacts to the building will occur. No impacts to the other buildings of heritage interest will occur, although frontage will be required from some of them. The closest the new edge of RoW will be from a building is about 4 m.	• Make project constructor aware of designated heritage building and other heritage buildings of interest located along the corridor. • To protect the cultural heritage resource (located at 608 Seacliff Drive) that is designated under Part IV of the Ontario Heritage Act, a qualified engineer is to determine the maximum allowable vibration level and conduct vibration monitoring during construction in the proximity of the designated property. The engineer is also to provide commentary on any construction equipment that should or should not be used, and/or appropriate buffer distances between the project activities and the subject property. • Prior to construction it is recommended that the Municipality of Kingsville and the Municipality of Leamington are consulted with to determine if further properties within the Study Area have been designated under Part IV of the Ontario Heritage Act.	No net adverse effects to cultural heritage resources.

Environmental Consideration	Description of Potential Impact	Mitigation[a]	Net Effect
SOCIO-ECONOMIC ENVIRONMENT			
Requirement for property and/or easement acquisition(s) and impacts to buildings.	To widen the ROW to accommodate the project, property frontages (up to 5 m) will need to be acquired from 274 parcels. The total area of property that will need to be acquired is approximately 3.9 ha. Buildings are generally well set back from the edge of roadway/right-of-way. In a few instances the new ROW will be within approximately 4 m of residential buildings. The project will also require the acquisition of: • Removal of a portion of a parking lot on the south side at Woodbridge Lane. • Removal of a portion of a parking lot on the south side at Union Avenue. • Removal of a small vegetable stand located on the north side of the corridor just east of Fraser Road.	• Landowners will be compensated at fair market value for the required property. • During detailed design, investigate potential to increase separation distance between residences that are located closer to the roadway and the new edge of right-of-way.	With provision of compensation to property owners for required property, not adverse net effects are anticipated.
Air emission/quality effects to residents and business during construction.	Temporary air emission effects to residents and businesses from construction equipment operation and soil disturbance.	• Develop and implement a dust control plan. • Apply water and dust suppressants during construction to protect air quality due to dust. • Contractors are required to keep idling of construction equipment to a minimum and maintain equipment in good working order to reduce emissions from the construction activities. • Air quality related complaints received by the public (e.g. dust) will be monitored by the proponent and/or the project constructor. Follow up action will be taken were appropriate.	Some short-term air quality nuisance effects (e.g. dust) may occur for some receptors during construction. With mitigation and the monitoring and follow-up to any received complaints, the effects should be minimized.
Noise disturbance effects to residents and business during construction.	Temporary noise effects to residents and businesses from construction equipment operation and soil disturbance.	• Develop and implement noise control plan. • Contractor operational constraints related to construction noise will be incorporated into the contract documents. • Construction activities throughout the project will conform to current Municipal noise by-laws giving due consideration to such factors as the time of day, proximity and size of equipment and type of operation. • Contractors are required to keep idling of construction equipment to a minimum and maintain equipment in good working order to reduce noise from the construction activities. • Noise related complaints received by the public (e.g. dust) will be monitored by the proponent and/or the project constructor. Follow-up action will be taken where appropriate.	Some short-term noise effects may occur for some receptors during construction. With mitigation and the monitoring and follow-up to any received complaints, the effects should be minimized.
Disruption in access to residential property and local businesses.	Potential for temporary access restrictions to property during construction. No long-term access restrictions.	• Contractor to minimize access restrictions as much as possible. Landowners to be notified of any access restrictions in advance.	Minimal to no restrictions to/from property access are expected.

Environmental Consideration	Description of Potential Impact	Mitigation[4]	Net Effect
Impacts on farm operations/Removal of agricultural land.	Removal of about 0.5 Ha of agricultural zoned land as a result of the planned road corridor improvements. As only a minimal amount of frontage property will be required from any one property, the viability of farming the property is not expected to be affected.	• Landowners will be compensated for their loss of land.	With provision of compensation to property owners for required property, no adverse net effects are anticipated on agricultural activity.
NATURAL ENVIRONMENT			
Potential impacts to terrestrial vegetation and wildlife habitat.	The proposed work will include the need to remove terrestrial vegetation (including trees) as well as some wildlife habitat. A total of 17 treed features will be affected resulting in a total area of 0.6 Ha being removed. Potential impacts associated with this work include: • Loss of and/or damage of terrestrial vegetation and wildlife habitat (including candidate SWH). • Loss of and/or damage to natural heritage corridors and connectivity (including Significant Valleylands). • Localized temporary displacement of wildlife. • Decreased shade and cover for fish and wildlife. • Increased vulnerability of the areas cleared of vegetation to introduction/invasion of non-native to invasive species. • Social/aesthetic impacts due to loss of vegetation. • Increased erosion and sedimentation of lands adjacent to construction area. • Potential for disturbance to wildlife during construction. • Decrease in ecosystem services such as air quality regulation and stormwater control.	• Minimize the amount of area of vegetation removal to the extent possible. • Delineate vegetation clearing zones and vegetation retention prior to construction. • Where there are culverts, take into account animal movement corridors. • Develop a tree compensation/re-planting plan during detailed design to compensate for removals, address social/aesthetic values and provide ecosystem services and natural diversity. • Establish Tree Protection Zones (TPZs) during Detailed Design and show the TPZs on the contract drawings adjacent to proposed work areas in the study area to protect vegetation to be retained. Tree protection fences/barriers demarcate TPZs and protect existing trees along cut lines from equipment damage. • Avoid vegetation clearing during sensitive timing windows for nesting birds. • Plant replacement trees during/following construction. Areas to be planted to be determined with input from landowners, local Municipalities and ERCA.	With the implementation of the mitigation measures and re-planting of replacement trees and/or habitat, net impact will be minimal.
Potential to impact to Species at Risk (SAR).	Potential for SAR and SAR habitat has been identified within the study area. Detailed studies are required to confirm habitat and regulatory approach. Potential impacts to SAR include: • Potential removal of habitat. • Potential encroachment of SAR habitat. • Potential to kill harm or harass the species during construction.	• If necessary, develop species specific mitigation plans. • Review species specific seasonal timing windows to avoid sensitive periods for species. • If necessary, conduct wildlife sweeps prior to the commencement of work activities to determine if SAR (or other wildlife) are present at the site and engaged in critical life processes (e.g. nesting, etc.). • Following the wildlife sweep, the area of activity is to be isolated with silt fencing to keep SAR and other wildlife from entering the work space area.	With implementation of the mitigation measures, impacts to SAR are anticipated to be minimal.
Potential for wildlife disturbance during construction.	There is the potential for temporary disturbance to wildlife due to noise, dust and habitat encroachment during construction.	• Conduct wildlife sweeps prior to the commencement of work activities to determine if or other wildlife are present at the site and engaged in critical life processes (e.g. nesting, etc.). • Following the wildlife sweep, the area of activity is to be isolated to wildlife from entering the work space area. • Develop and implement a dust control plan.	Some temporary disturbance to wildlife is possible although species are likely habituated to road noise etc. With mitigation effects expected to be minimal.

Environmental Consideration	Description of Potential Impact	Mitigation[4]	Net Effect
Potential for alteration to surface water quality during construction.	During construction there is the potential for alterations to surface water quality due to the introduction of deleterious substances to watercourses. Sources may include fuel leaks from construction equipment, entry of sediment or stockpiled materials into the watercourses. Potential impacts from alterations to surface water quality include: • Potential harm to fish and fish habitat. • Potential harm to wildlife using watercourses as corridors or water source. • Potential for Social/aesthetic impacts.	• Develop and implement an effective erosion and sediment control plan to prevent migration of loose soils and accumulated sediment downstream or to adjacent areas. • Include measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering the drain. • Handling of fuel, excess materials and debris will be properly managed on-site and removed as per standard construction practices necessary to protect watercourses. • Develop a spills response plan. • All materials used or generated (e.g. organics, soils, woody debris, temporary stockpiles, construction debris, etc.) will be temporarily stored, handled and disposed of during site preparation, construction and clean-up in a manner that prevents entry into watercourses. • Erosion and sediment control measures are inspected and maintained on a regular basis during drainage works. • Any damages to erosion and control measures are to be repaired immediately. • Removal of non-biodegradable erosion and sediment control materials once site has been stabilized.	During construction some increase in sedimentation levels in local watercourses may occur. With the implementation mitigation, adverse effects are anticipated to be temporary and minimal.
Potential for impact to ground water resources.	During construction, uncontrolled runoff could potentially result in contamination of groundwater through infiltration of potential contaminants, and/or infiltration of contaminated surface water.	• Implement BMPs as noted above in regards to potential impacts on surface water quality. • If groundwater dewatering is required during construction, then dewatering should be conducted in accordance with applicable procedures including determination of the needed for a Permit to Take Water (PTTW) from MOECC. • Where dewatering is anticipated, conduct a well water survey within 300 m of these areas to determine the presence and condition of any shallow wells. • Give regard to and implement measures required to meet source water protection policies – to be defined during detailed design.	During construction there is some potential for effects to ground water resources in the local area (primarily in the vicinity of lands requiring dewatering). With the implementation mitigation, adverse effects are anticipated to be temporary and minimal.

Environmental Consideration	Description of Potential Impact	Mitigation[4]	Net Effect
Potential for harm to fish and fish habitat.	• The project will require modifications or extensions to approximately 6 existing culvert crossings. • Potential removal of riparian vegetation resulting in an increase in erosion potential, change in shade cover and loss of external nutrient and energy inputs. • Potential removal of aquatic vegetation, if present, resulting in a loss of habitat structure and cover, including changed sediment concentrations, water temperature, food supply, nutrient concentration and dissolved oxygen levels. • Potential to negatively affect native substrates and cause fish passage reduction or blockage. • Potential mortality, entrapment or entrainment of fish in machinery (e.g. by-pass pumps, screens) or materials (e.g. dams, barriers) used during construction. • Potential disruption of fish passage and interruption of critical life stages (e.g. spawning, migration). • Potential partial constriction of flow through the placement of materials or structures in the water. • Siltation at the site and sedimentation to downstream fish habitat. • Introduction of deleterious substances to the watercourse, including concrete/other construction debris and petroleum products from heavy machinery.	• Prior to work near water, consult with DFO's Measures to Avoid Harm. • To protect sensitive life stages/processes of resident fish, avoid in-water work during sensitive periods. • If necessary, conduct a fish salvage under a license from the MNRF during dewatering. • Maintain flow and fish passage downstream of work areas during construction. • If required, size pumping system to accommodate high flows of the waterbody during the construction period. • Install fish screens on water intakes and outlets to prevent entrainment or impingement of fish. • Pump sediment laden dewatering discharge into a vegetated area or settling basin to prevent sediment and other deleterious substances from entering any waterbody. • Restore disturbed terrestrial riparian areas with a native grass seed mix to stabilized and prevent erosion. • Install effective erosion and sediment control measures around the work area to prevent migration of loose soils and accumulated sediment downstream or to adjacent areas. • Properly manage the handling of fuel, excess materials and debris to protect migration of substances to watercourses. • Materials used or generated during construction (e.g. organics, soils, woody debris, temporary stockpiles, construction debris, etc.) should be temporarily stored, handled and disposed of during site preparation, construction and clean-up in a manner that prevents entry into the creek.	With the implementation of the recommended mitigation measures during construction, impact to fish and fish habitat are expected to be minimal.

8.2 Consultation Input

The public and stakeholders provided input on the project, effects and mitigation as part of PIC #2 and during the comment period that followed it. Comments received and responses to these comments are presented in **Appendix A**. The comments received were considered in the development of the project design (see Chapter 7.0) and also considered in the development of an impact mitigation plan. Some of the key comments made include:

- Minimize residential property acquisition;
- Minimize removal of street trees;
- Multi-use path needs to be designed to minimize conflict with driveways/entrances;
- Property access impact from new turning lanes;
- Impacts to drainage system; and
- Safety concerns to users of the interim pathway along sections.

8.3 Socio-Economic Environment

A description of baseline or existing socio-economic conditions is previously provided in **Section 4.2**. These conditions were considered in the assessment of potential project effects as described in the following sub-sections.

8.3.1 Land Use/Direct Property Impacts

Land use along the corridor includes a mixture of residential, commercial (agri-business) and agriculture. At the time of preparing this ESR, the study area is not expected to experience significant future development. As such, the existing socio-economic conditions are expected to be similar to the future conditions.

To implement the project, the roadway corridor right-of-way will need to be widened and the frontages of 274 properties will be required. The total area of private property that is required is approximately 3.9 ha. A summary of the land acquisition requirements by property are presented in **Appendix H.** Project plan drawings presented in **Section 7.0** include property ID numbers to show location of the affected properties. Based on the preliminary design, the project will not require the displacement of any residences or commercial buildings.

The expansion of the ROW to accommodate the proposed corridor improvements brings the ROW edge closer to existing buildings/residences. In a few cases residences would be within approximately 3-4 m of the edge of the proposed ROW. It some specific cases where a residence is within say 4 m of the proposed ROW edge, it is recommended that the potential to increase the separation distance between buildings and the edge of ROW be explored (e.g. through consolidations of the cycle track and multiuse path through short sections).

Other identified land use impact impacts of note include:

- Removal of a portion of a parking lot on the south side at Woodbridge Lane.
- Removal of a portion of a parking lot on the south side at Union Avenue.
- Removal of a small vegetable stand located on the north side of the corridor just west of Fraser Road. It is anticipated that the stand can be moved north and outside of the new ROW.

There are no community features that would be negatively affected by the project.

8.3.2 Noise and Air Quality

During the construction phase of the project, noise and air quality effects to local residents and businesses may occur as a result of machinery operation and/or excavation activities. Effects will be temporary in nature and will be variable, depending on the activity and its location. Depending on how the project is phased it is expected that noise and air quality effects could occur in the study area for over a 1-2 year period although the duration of effect for a particular receptor is expected to be much less.

Standard construction practices will be employed to minimize air and noise emissions as outlined in **Table 28**.

As the project does not involve the provision of additional roadway lanes, which the exception of turning lanes, there will not be additional vehicles attracted to the roadway because of the project. As such, the project will not result in additional vehicle operations related negative effects (e.g. additional noise from additional road traffic volumes).

8.3.3 Property Access/Entrances

Access to residential and business properties will be maintained as much as possible during construction. However, there could be short-term restrictions in property access. These effects are expected to be very temporary. Landowners would be notified in advance of any periods when access restrictions are in place. In particular, access disruption to retail business operations and greenhouse operations will be minimized as much as possible.

A property access management plan has been developed for the long-term operations period which is described in **Section 7.7** and can be found in **Appendix G**.

8.3.4 Emergency Access

The implementation of the intersection improvements and addition of left turn lanes could affect traffic flow including emergency access vehicles. Effects to emergency vehicles will be minimized as much as possible and will be temporary. The County will consult with emergency service providers during detailed design to determine appropriate mitigation measures to minimize disruption during construction. And during the construction period, the project constructor will engage with emergency service providers to ensure that they are aware of construction plans and timing and seek their input where appropriate.

8.3.5 Agricultural Land and Farm Operations

The project will result in the loss of about 0.5 Ha of agricultural zoned land. As only frontage property will be required, and the amount required for any one parcel is minimal, impacts to agricultural activity are not significant. Generally there is little active crop production occurring on these properties that lie alongside County Road 20. The main agricultural activity that Direct impacts to agricultural lands and related impacts to production will be mitigated/compensated through the property acquisition process.

During construction, there could be some temporary disruption to the movement of farm equipment through the corridor. Contractors will be required to allow farm equipment movement as much as possible. Access to farm properties will be maintained during and after construction.

During detailed design, any tile drains within and adjacent to the proposed new ROW will be identified in consultation with property owners. Tile drains will be avoided where possible and the tile drain network will be modified, as required, to ensure that impacted tiles are removed/closed and that remaining tiles continue to function. Applicable landowners will be engaged with to ensure that any concerns are addressed.

8.4 Cultural Environment

8.4.1 Built and Cultural Heritage Resources

As described previously in **Section 3.6.1**, within the study area, there are 30 heritage properties of interest along County Road 20 in the Town of Kingsville, and 7 heritage properties of interest along County Road 20 in the Municipality of Leamington (see **Appendix K** for a list of properties and their addresses). There is one property designated under Part IV or V of the *Ontario Heritage Act* (608 Seacliff Dr.). About 3 m of frontage will be required from this property. The heritage building will be about 9 m away from the new edge of road or 5 m away from the planned edge of sidewalk. The building will not be impacted by the project.

The expansion of the ROW is generally limited with a maximum extension onto property of no more than about 5 m into any land parcel. The project will have no direct impact on any of the other buildings identified to have heritage interest in the study area.

No bridge structures were identified along the corridor to have heritage value.

In order to protect the cultural heritage resource (located at 608 Seacliff Drive) that is designated under Part IV of the *Ontario Heritage Act* from potential adverse construction impacts, it is recommended that a qualified engineer determine the maximum allowable vibration levels and conduct vibration monitoring during construction in the proximity of the designated property. The engineer can also provide commentary on any construction equipment that should or should not be used, and/or appropriate buffer distances between the project activities and the subject property.

As well, prior to construction it is recommended that the Municipality of Kingsville and the Municipality of Leamington are consulted with to determine if further properties within the Study Area have been designated under Part IV of the *Ontario Heritage Act.*

8.4.2 Archaeological Resources

As previously reported in **Section 4.4.2**, a Stage 1 Background Study was completed by Fisher Archaeological Consulting for the entire study area and is included as part of **Appendix C**. Background research indicated that the majority of the study area has high archaeological potential for Indigenous and Euro-Canadian history. Areas that have been extensively disturbed in modern times, including the current CR 20/Seacliff Drive footprint were identified as having low archaeological potential.

Based on the Stage 1 Background Study, the following work is recommended as the project design progresses:

- A Stage 2 Assessment is conducted in sections of the CR 20/Seacliff Drive right-of-way (ROW) that are identified as having have high potential; and
- Locations that are deemed to be of low potential require no further archaeological work.

8.5 Natural Environment

The preferred alternative (Alternative 8C), will include removal of existing terrestrial and aquatic habitat to accommodate the proposed turning lane, cycle tracks, sidewalk and multi-use path (see figures in **Appendix D** that show the ROW expansion footprint overlaid on the areas of natural features).

8.5.1 Fisheries and Aquatic Habitat

The majority of the waterbody features within the study area are Municipal drains that have been classified as Class F drains. An “F” classification indicates that the features are known to have an intermittent flow. Two waterbodies in the study area are classified as Class C Municipal drains. A “C” classification indicates that the feature is a permanent watercourse with no sensitive fish species present. The two Class C features are Lane Drain, located between Graham Sideroad and Oxford Avenue and Esseltine

Drain, which is located between Whitewood Road and Brookview Drive. **Figure 13 (in Section 3)** illustrates the locations of the watercourse crossings.

It is anticipated that the preferred alternative will require work both in and near watercourses. Culverts for about 6 drains/watercourses will require modifications or extensions. **Section 7.4** provides a description of these works.

This work has the potential to impact fish and fish habitat in the following ways:

- Potential removal of riparian vegetation resulting in an increase in erosion potential, change in shade cover and loss of external nutrient and energy inputs;
- Potential removal of aquatic vegetation, if present, resulting in a loss of habitat structure and cover, including changed sediment concentrations, water temperature, food supply, nutrient concentration and dissolved oxygen levels;
- Potential to negatively affect native substrates and cause fish passage reduction or blockage;
- Potential mortality, entrapment or entrainment of fish in machinery (e.g. by-pass pumps, screens) or materials (e.g. dams, barriers) used during construction;
- Disruption of fish passage and interruption of critical life stages (e.g. spawning, migration);
- Potential partial constriction of flow through the placement of materials or structures in the water;
- Siltation at the site and sedimentation to downstream fish habitat; and
- Introduction of deleterious substances to the watercourse, including concrete/other construction debris and petroleum products from heavy machinery.

These impacts as well as proposed mitigation have been summarized in **Table 28**.

8.5.2 Terrestrial Resources

Within the study area, 10 ELC community types were observed. Of which, 17 are considered “treed features” (i.e. woodland, hedgerow and shrub agriculture/plantation). **Figure 18** (**Section 3.0**) depicts these natural heritage features. The preferred alternative will require the removal of a portion of 12 of these features (see figures in **Appendix D** that illustrate project footprint overlay on the identified features). With the exception of Feature 7, the area removed is anticipated to be 10%

or less of the total feature (see **Table 29** below). More detailed vegetation removal estimated will be completed during the detailed design phase.

One significant vegetation community was identified as potentially occurring in the eastern portion of the study area during background review, as this vegetation community is associated with features that would be located closer to Lake Erie and it is not anticipated to be impacted by the proposed project.

ERCA online mapping indicates that nine (9) Significant Valleyland features are located within the study area. These predominately align with the Deciduous Forest and watercourse features identified within the study area. Based on size criteria, one treed feature (tree feature #14) has the potential to be considered a Significant Woodland, as it meets the minimum size criteria (>2ha) as defined under Section 3.4.4 (a) of the Essex County Official Plan. Lastly, seven (7) candidate Significant Wildlife Habitat Features were identified to potentially occur within the study area.

The natural heritage features outlined above may be impacted by the project. Detailed field work under appropriate timing windows is required to confirm presence or absence of these features.

Table 29: Summary of Impacts to Treed Features

Treed Feature ID	ELC Type	Total Area of Feature (m2)	Area of Feature to be Removed (m2)	% of Feature to be Removed
1	FOD: Deciduous Forest	1,524	0	0%
2	FOD: Deciduous Forest	18,876	102	1%
3	TAGM5: Fencerow/hedgerow	691	0	0%
4	FOD: Deciduous Forest	2,311	0	0%
5	FOD: Deciduous Forest	522	0	0%
6	FOD: Deciduous Forest	12,949	387	3%
7	TAGM5: Fencerow/hedgerow	5,334	2,012	38%
8	TAGM5: Fencerow/hedgerow	5,065	520	10%
9	SAG: Shrub Agriculture	3,738	0	0%

Treed Feature ID	ELC Type	Total Area of Feature (m2)	Area of Feature to be Removed (m2)	% of Feature to be Removed
10	FOD: Deciduous Forest	44,824	0	0%
11	FOD: Deciduous Forest	7,051	320	5%
12	FOD: Deciduous Forest	13,089	710	5%
13	FOD: Deciduous Forest	11,833	575	5%
14	FOD: Deciduous Forest	22,766	708	3%
15	FOD: Deciduous Forest	6,091	428	7%
16	FOD: Deciduous Forest	6,343	161	3%
17	FOD: Deciduous Forest	5,657	72	1%

Potential impacts associated with the removal of the above noted terrestrial vegetation include:

- Loss of and/or damage of terrestrial vegetation and wildlife habitat (including candidate SWH);
- Loss of and/or damage to natural heritage corridors and connectivity (including Significant Valleylands);
- Localized temporary displacement of wildlife;
- Decreased shade and cover for fish and wildlife;
- Increased vulnerability of the areas cleared of vegetation to introduction/invasion of non-native to invasive species;
- Social/aesthetic impacts due to loss of vegetation;
- Increased erosion and sedimentation of lands adjacent to construction area;
- Potential for disturbance to wildlife during construction; and
- Decrease in ecosystem services such as air quality regulation and stormwater control.

These impacts as well as proposed mitigation have been summarized in **Table 28**.

8.5.3 Species at Risk

A review of secondary source information indicated that 33 SAR have the potential to occur within 1 km of the study area. Based on a SAR Habitat Screening Assessment, there is potential habitat for 16 of these 33 species within the study area. Of these 16 species with potential habitat within the study area three (3) have regulated habitat under Ontario Regulation 242/08, and may apply to the study area.

Detailed studies are required to confirm habitat and regulatory approach during detailed design. Potential impacts to SAR include:

- Potential removal of habitat;
- Potential encroachment of SAR habitat; and
- Potential to kill harm or harass the species during construction.

These impacts as well as proposed mitigation have been summarized in **Table 28.**

8.5.4 Surface Water/Erosion Control

Drainage along County Road 20 is accomplished along the corridor through a combination of roadside swales, storm sewers and road crossing culverts. In general, all lands along the corridor drain southerly to Lake Erie. Details regarding the existing drainage system have been previously described in **Section 3.2** and in **Appendix F**. Responsible management of stormwater is considered as part of the potential environmental impacts of the preferred alternative. Improperly managed stormwater runoff can lead to the deterioration of natural resources due to poor water quality, increases in runoff volumes due to lack of appropriate controls and adverse impacts to the built landform and adjacent lands.

The project has the potential to impact surface water resources in the study area in the following ways:

- Increase in storm water flows as a result of increase in impervious area due to the additional active transportation facilities and proposed road improvement works;
- Alteration to drainage infrastructure to accommodate the widened footprint of the roadway corridor; and
- Erosion and sedimentation effects during construction.

The following describes each of the above potential effects on surface water resources.

The additional impervious areas created from the project including the proposed active-transportation facilities will increase the ROW imperviousness and associated runoff. The total increase in impervious area, approximately 8.2 hectares, is considered to be a minor impact given that the drainage area for the overall corridor is approximately 1,922 hectares. This equates to an approximate 0.4% increase in the impervious area for the drainage area.

Require alternations to the existing drainage system will include:

- Installing the interim and/or the ultimate A/T facilities will require modifications or extensions to approximately 6 existing culvert crossings.
- TWLTL widened road areas will require a new drainage system along CR 20 (relocated swales in rural areas or new sewers, catchbasins and manholes in urban areas) and will require a new or extended culvert at one existing drain crossing location.

- The buffered path may require yard catchbasins to be installed to maintain existing drainage patterns.
- In non-curbed areas, existing roadside ditches/swales will require realignment to permit the installation of the ultimate A/T facilities. New swales will be placed in the boulevard areas between bicycle and walking facilities. Existing culverts at driveway crossings will require relocation and replacement (if the existing culvert is in poor condition). Additional culverts may be required to enclose the drain where utility poles are located in the boulevard.
- In curbed areas with no widenings, the existing roadside sewer system will require review during detailed design to confirm if they have capacity to accommodate the increase in flows.

Section 7.5 provides a more detailed description of the required changes to the drainage infrastructure in the study area.

Construction activities such as excavation, re-grading and the replacement/extension of drain culverts that cross the road corridor have the potential to result in erosion and sedimentation effects. Run-off with increase sedimentation levels that enters watercourses can potentially negatively impact fish and wildlife habitat. Erosion and sedimentation control BMPs will be developed during project detailed design. All relevant erosion and sediment control measures will be identified on the contract drawings and the implementation of the sediment and erosion control measures during construction will be monitored.

ESC measures that are expected to be employed during construction include:

- Use of erosion control blankets, silt fence barriers, rock flow checks and use of stabilizing cover material (seed and mulch, sod, etc.). Exposed soils are to be minimized as much as possible. The silt fencing and other containment measures will be regularly inspected and maintained as necessary.
- Vegetation removal will be limited to only what is required for ROW expansion and will be clearly defined in the drawings.
- Erosion and sediment control BMPs will be implemented throughout construction to prevent migration of sediment to the watercourses/Municipal drains.

- Required works in watercourses will be isolated from the main flow and conducted 'in the dry' using flow passage systems including cofferdams. Any dewatering operations will be directed onto a suitable vegetated area away from watercourses, or into a sediment settling basin or filter bag which will allow sediments to settle out prior to discharging to the watercourse.
- All appropriate temporary erosion and sediment control measures (such as silt fence barriers, erosion control blanket, and rock flow checks) will be used to contain the construction area and prevent any migration of sediment.
- Erosion and sediment control measures are to be inspected frequently to ensure they are functioning appropriately.

8.5.5 Soil Contamination

A soil contamination review for the study area was not included in scope for the CR 20 EA.

In order to determine if the proposed areas of construction may be subject to actual or potential environmental contamination, a pre-construction environmental review is recommended. The review should consist of the following tasks:

Environmental Records Review

- Obtain and review available environmental records (database search) through Environmental Risk Information Services (ERIS) for properties located along the corridor, including a buffer of approximately 100 m from the right-of-way. These records will include items like spill records, waste disposal sites, etc.
- Obtain and review historical aerial photographs for the corridor representative of the 1970s-2000s.
- Complete a review of available fire insurance maps.

Cursory Site Inspections

- Complete high level inspections of properties located along the corridor from publically accessible space (i.e. public right-of-way) to identify the presence of items of potential environmental concern, including fuel storage tanks, hazardous waste storage areas, etc.
- Document the findings of the site inspections.

Identification of Areas of Potential Environmental Concern (APECs)

- Based on the findings of the environmental records review and site inspections, areas of potential environmental concern (APECs) are to be identified, including potential depths for each APEC (if available).

Recommendation of Next Steps

- In order to assist with the design and construction phases of the project, guidance will be provided on how to manage each identified APEC. Recommendations may include visual screening of removed materials and/or the completion of pre-construction sampling programs.

This type of review will help identify APECs which have the potential to impact project construction costs and/or delay project schedules.

8.6 Technical Environment

8.6.1 Utilities

There are below grade and above grade utilities (excluding storm sewers) along the CR 20 corridor. The following provides a summary of the anticipated impacts to existing utilities within the project corridor.

Below Grade:

- Sanitary Sewer (Town of Kingsville)
  - No impacts to existing sanitary sewers. There is potential for future expansion of the Town system easterly along the corridor. Timing of potential expansion should be confirmed with the Town during detailed design and prior to any roadworks (such as installing TWLTL) along the corridor.
- Sanitary Sewer (Municipality of Leamington)
  - No impacts to existing sanitary sewers. There is a high potential for future expansion of the Town system westerly from Sherk Street along the corridor. Timing of potential expansion should be confirmed with the Municipality during detailed design, and prior to the installation of any A/T facilities along the corridor.

- Watermains (Town of Kingsville)
  - No improvements to the underground mainlines are anticipated or required by the Town. Minor improvements such as relocating fire hydrants, service shutoff valves, or water meters will be required.
- Watermains (Municipality of Leamington)
  - No improvements to the underground mainlines are anticipated or required by the Town. Minor improvements such as relocating fire hydrants, service shutoff valves, or water meters will be required.
- Gas Main (Union Gas/Spectra Energy)
- No improvements to the underground mainlines are anticipated or required by the utility owner. Minor improvements such as adjusting shutoff valves may be required.

Above Grade:

- Electricity (Hydro One).
- Telephone (Bell Canada).
- Television (Cogeco Connexion).

All the above-mentioned above grade utilities are generally aerial along the corridor, and share a common pole line generally owned by Bell Canada. In certain areas along the corridor, the existing pole location will require realignment/relocation so as to not be an obstruction to the proposed A/T facilities. Additionally, some Bell and Cogeco at grade pedestals will also require relocation.

Infrastructure requiring relocation are noted on the Preliminary Design Plans (see **Figure 46**).

8.7 Project Benefits

In addition to a description of the potential negative effects of the project it is also important to describe the expected benefits considering the proposed design of the undertaking as presented in **Section 7.0:**

- Additional turning lanes are proposed at the intersections of Graham Sideroad, County Road 31 (Albuna Townline), and Fraser Road. At County Road 45 (Union Avenue), improvements to the curb radii are proposed. These upgrades will improve traffic flow through the corridor resulting in less delay for through traffic flow.

- Two-Way Left Turn Lanes (TWLTL) are proposed at two locations. This includes an extension at an existing TWLTL at Kratz Sideroad approximately 200 m easterly past Woodbridge Lane and at the East of Union Avenue, from Fuller Drive to west of Ravine Line Road. These TWLT will improve access to local agri-businesses and result in less delay to through traffic as a result of left turning vehicles.
- The development of the ultimate A/T facility (separated multi-use pathway on the south side and sidewalk on the north side) will provide a number of benefits including:
  - Provide a safe pedestrian facility for migrant farm workers to access the agri businesses along the corridor;
  - Provide local residents with the opportunity to use an alternate mode of transportation (walking or cycling) along the corridor and/or to access Leamington or Kingsville;
  - Provide a safe recreation facility for residents and children as well as attracting cycle tourists through the area that may provide economic benefit to local agri-businesses;
  - Improves road crossing conditions at major intersections making them ADOA compliant; and
  - Provides opportunity to develop CR 20 as a landscaped corridor (in the urban sections at either end of the corridor) that will improve the character and attractiveness of the street.

8.8 Permits and Approvals

The project may require various permits and approvals following completion of the EA process. These permits would typically be confirmed and obtained as part of detailed design. Potential permits to be acquired include:

- Authorization under the federal Fisheries Act;
- Authorization under the provincial Drainage Act;
- A Permit to Take Water (PTTW) from the Ontario Ministry of Environment and Climate Change if the amount of water taken exceeds 50,000 L/day as per the Ontario's Water Taking Regulation (O. Reg. 387/04 made under the Ontario Water Resources Act);
- Archeological clearance from the Ontario Ministry of Culture and Sport; and

- Authorization for utility relocations from various utility companies.

8.9 Effects Monitoring

An effects monitoring strategy was developed based on the impact assessments carried out for the project to ensure that the predicted net negative effects are not exceeded, that unexpected negative effects are addressed, and that the predicted benefits are realized.

Table 30 summarizes the construction period environment effects monitoring to be carried out in relation to the mitigation measures that have been developed to address the potential adverse environmental effects of the project.

Operations period monitoring of the project is limited to routine condition inspection of the new A/T facilities and ensuring the safe operation of the A/T facility including monitoring and follow-up of reported A/T facility use incidents. Some adjustments may be required (e.g. additional signage) once the facility is operational.

Table 30: Environmental Monitoring Commitments

Comments	Actions
During construction, there could be delays to vehicle users, particularly during peak travel periods.	Monitor traffic vehicle delay and adjust the Construction Phasing Plan/Traffic Management Plan, where possible, to minimize delays.
Traffic flow may not be fully optimized/potential for traffic incidents.	During operations period, City to monitor traffic operations and make adjustments as required (e.g. traffic signal timing) to optimize the flow of traffic through corridor as well as monitor vehicle incident rates to ensure that the roadway is operating at a safe level of service.

SOCIAL AND HEALTH

Comments	Actions
Construction activities could result in local noise and dust disturbances.	Monitor public noise and dust complaints and take follow-up action as necessary.

CULTURAL RESOURCES

Comments	Actions
Potential for impact to archaeological resources.	Monitoring may be required during construction subject to detailed archaeological assessment of excavated areas.

NATURAL ENVIRONMENT

Comments	Actions
Direct loss of aquatic habitat from culvert works is minimized.	Monitoring during construction will be conducted by a Qualified Environmental Inspector and/or a Fisheries Specialist where a Fisheries Act Authorization is required.
During construction, there could be an increase in sedimentation into local water ways from exposed soil surfaces.	Monitor effectiveness of surface water run-off mitigation measures after major storms and implement corrective action measures if there is visible evidence of sedimentation in receiving water bodies (Don River/Keating Channel).

GENERAL

Comments	Actions
The undertaking will be constructed according to the final detailed design that will be developed.	The County, or its agent, will monitor the construction of the undertaking to ensure that it is consistent with the final detailed design.
Continue to consult with the key landowners, the public and other stakeholders to ensure awareness of project construction.	Communication with the public and stakeholders will continue through detailed design and construction. This will include the posting of notifications and as required, direct contact with affected landowners including for property acquisition.

9.0 Future Considerations

9.1 Permits and Approvals

The project may require various permits and approvals following completion of the EA process. These permits would typically be confirmed and obtained as part of detailed design. Potential permits to be acquired include:

- Authorization under the federal Fisheries Act;
- Authorization under the provincial Drainage Act;
- Potential need for permit under the Ontario Species at Risk Act;
- Potential permitting from the Essex Region Conservation Authority for works within regulated water ways;
- A Permit to Take Water (PTTW) from the Ontario Ministry of Environment and Climate Change if the amount of water taken exceeds 50,000 L/day as per the Ontario's Water Taking Regulation (O. Reg. 387/04 made under the Ontario Water Resources Act);
- Archaeological clearance from the Ontario Ministry of Culture and Sport (need to complete Stage 2 survey); and
- Authorization for utility relocations from various utility companies.

9.2 Class EA "Shelf Life"

The MEA Class EA process requires the review of ESRs if construction has not commenced within 10 years of the EA completion date. This is to reconfirm the need for the undertaking and to confirm that there has not been changes to the baseline conditions in the study area that might result in different impacts and associated required mitigation and impact monitoring procedures.

It is also possible that the recommended undertaking and/or potential effects/mitigation may require minor modifications as the project proceeds to the next phase of design; however, these changes are not anticipated to alter the intent of the undertaking and that any additional potential effects would be addressed through standard mitigating measures. In the event that significant modifications to the

undertaking are required and alter the intent of the undertaking, that these would be addressed through an Addendum to the ESR and notification to the public would occur.

9.3 Implementing Policies/By-laws

The following outlines recommendations made in this ESR for which by-laws should be enacted to provide the County with a mechanism to facilitate their implementation:

- Create a by-law to allow for the recommended speed reduction/consistent speed through the corridor.
- Create a by-law to allow the implementation of the recommended Access Management policies.
- Create a by-law to allow the County to acquire an access management easement along the corridor.
- Create a by-law to allow necessary parking control along the CR 20 corridor.

9.4 Official Plan Integration

Recommendations identified as a part of this EA Study are to be incorporated into the Official Plans of the County of Essex, the Town of Kingsville and Municipality of Leamington. This should be done as part of future Official Plan update activities. Specific changes or amendments to County and local Municipal Plans are:

- Update Section 2.8.1.1 of County of Essex Official Plan to reference the required CR 20 right-of-way widening required to accommodate the planned roadway and A/T facility improvements recommended in this ESR.
- Update CWATS to change the recommended context-sensitive solution for the corridor to reflect the ultimate A/T facilities recommended in this ESR (multi-use trail and sidewalk).
- Update the Town of Kingsville Official Plan (Table 26) to reflect the land acquisition requirements required for the implementation of the recommended corridor improvements in this ESR.
- Update Section 4.8 of the Municipality of Leamington Official Plan to reflect the land acquisition requirements and proposed intersection improvements required for the implementation of the recommended corridor improvements in this ESR.

9.5 Detailed Design Commitments

The following tasks, at a minimum, were identified during the EA planning process as required and are recommended to be undertaken prior to the implementation or construction of the works:

- Speed limit adjustment along the CR 20 corridor to more harmonious 60 km/hr;
- Completion of Stage 2 archaeological assessments in accordance with the Stage 1 archaeological report;
- Complete a pre-construction environmental review to assist in identifying areas of known of potential soil/environmental contamination (APECs);
- Develop detailed design plans for each phase as necessary including, but not limited to:
  - Road and A/T facility final layout and grading;
  - Drainage and SWM improvements (conveyance, quantity and quality);
  - Utility relocations;
  - Landscaping improvements; and
  - Traffic signal and street lighting improvements (including linear lighting warrants).
- Prepare individual property plans to widen the CR 20 right-of-way to facilitate infrastructure improvements or to acquire intersection daylight corners;
- Confirmation from the Town of Kingsville and Municipality of Leamington regarding the timing and location(s) of potential sanitary sewer extensions on CR 20;
- Apply a 0.3 m wide property reserve to both sides of the CR 20 right-of-way;
- Complete any required updates as required by the Municipal Drainage Act to Municipal Drains impacted by the works; and
- Following completion of Phase 2 (multi-use trail) of construction, it is recommended that updated A/T user counts be completed by the County to better identify potential timing/need for the installation of Phase 3 (concrete sidewalk).