SARNIA
ONTARIO - CANADA

The Rapids Parkway Extension / Nature Trail Environmental Assessment - Schedule 'C'

Environmental Study Report

IBI

Prepared for The City of Sarnia
by IBI Group
June 2020

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July 15, 2020

Alister Brown, P.Eng.
Manager, Transportation Division
The Corporation of the City of Sarnia
255 Christina Street North
SARNIA, ON N7T 7N2

Dear Mr. Brown:

THE RAPIDS PARKWAY EXTENSION / NATURE TRAIL ENVIRONMENTAL ASSESSMENT - SCHEDULE 'C'

Enclosed is a final copy of the Environmental Study Report (ESR) for the extension of The Rapids Parkway from Sandpiper Drive to Exmouth Street under Highway 402. This report provides a preferred design concept for the road extension, including evaluation criteria and recommendations for traffic management, trail design, stormwater management, noise attenuation and mitigation of natural impacts.

The Study was conducted in accordance with the requirements of the Municipal Class Environmental Assessment (EA) process as amended in 2015, including consultation opportunities with the general public, agencies and involved stakeholders.

The final draft was reviewed by the City of Sarnia on June 16, 2020; final amendments were made to the ESR and was then presented and accepted by Council, on July 13, 2020.

We would like to thank the City of Sarnia for the opportunity to work on this important transportation initiative. We value our working relationship and if you have any questions or require further consulting services please call.

Thank You,

IBI GROUP

Sandra Hayman, P.Eng.
Associate, Manager Civil Engineering

Encl.

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Executive Summary

Study Background

The City of Sarnia retained IBI Group to complete a Schedule "C" Municipal Class Environmental Assessment (Class EA) for the full extension of The Rapids Parkway in Sarnia from Michigan Avenue south under Provincial Highway 402 to Exmouth Street. This extension has been planned since the mid-1990's and represents an important link in the City's road and Active Transportation networks. The Rapids Parkway is shown in the City's Official Plan as the main arterial road servicing Development Area 1, which will have a total of 1,800 dwelling units once fully built out in approximately 2029.

The plan to extend The Rapids Parkway under the existing Highway 402 overpass was envisioned in the Development Area 1 Secondary Plan, committed to in the Official Plan and recommended in the Sarnia Transportation Master Plan.

The 2014 Sarnia Transportation Master Plan recommends that a Municipal Class Environmental Assessment (EA) for the extension be commenced to confirm the alignment, impact mitigation and preliminary design.

In April 2018, the City completed a Class EA for infrastructure in order to select a preferred sewer and water alignment along The Rapids Parkway right-of-way and the crossing of Highway 402. Due to various reasons, including funding timing, infrastructure deficiencies and separate structural concerns to construct under Highway 402, that infrastructure EA did not include the extension of the Rapids Parkway at that time.

The purpose of this Class EA study is to review The Rapids Parkway extension and the Howard Watson Nature Trail design alternatives based on the 2018 infrastructure EA. The study also focuses on mitigating the impact of the road extension on the Nature Trail, finding the optimal location to relocate the trail, and designing the new trail and related landscaping features to offset the impacts. The completed EA study will guide preparation of final designs, leading to project construction as required by the growth in Development Area 1 (see above). It will also allow the City to implement associated transportation improvements in the interim, such as at the Howard Watson Nature Trail crossing of Exmouth Street.

Municipal Class Environmental Assessment (EA) Process

Because this study involves the extension of an existing transportation facility with construction of new facilities and major expansions to existing facilities, this EA study has confirmed that Schedule 'C' requirements of the EA process should be followed. This process involves a five-phase planning procedure under the Ontario Environmental Assessment Act, which applies to public infrastructure projects as follows:

Phase 1: Identify the problem or opportunity;

Phase 2: Identify alternative solutions, evaluate and select preferred solution;

Phase 3: Identify alternative design concepts, evaluate and select the preferred concept;

Phase 4: Document in an Environmental Study Report the rationale, planning, design and consultation process and place it on public record; and,

Phase 5: Project implementation, complete contract drawings and tender documents and proceed to construction and operation of the project.

Problem / Opportunity Definition (Class EA Phase 1)

The City of Sarnia's Transportation Master Plan (TMP) has fulfilled the requirements for completion of Phases 1 and 2 of the Class EA process. The proposed extension will allow the existing Rapids Parkway, currently terminating at Sandpiper Drive, to continue south under Highway 402 and connect to Exmouth Street. A large section of the proposed route is currently the Howard Watson Nature Trail.

The transportation-related advantages of this extension are addressed in the TMP. It confirms that the existing part of The Rapids Parkway constructed north of Highway 402 currently provides access to new subdivision development in that area and operates at an acceptable Level-of-Service with current traffic volumes in the area.

The TMP concluded that as the planned Development Area 1 west of Modeland and north of Highway 402 is built out, expected by 2029, it will generate additional AM and PM peak hour trips. As a result, the Exmouth/Murphy and Exmouth/Barclay intersections are expected to be over capacity.

In 2017 the City retained WSP to conduct an updated Rapids Parkway Extension Traffic Study to reconfirm the TMP problem statement using a ten year planning horizon. This added area development traffic was assigned to the study road network for the 2027 ten year horizon under two future scenarios; 1) no Rapids Parkway Extension and 2) with The Rapids Parkway Extension. Assessment indicates that capacity deficiencies will occur under background conditions with no extension. As a result, the study recommends in part that:

> *The Rapids Parkway extension should be planned for implementation within the ten year horizon to coincide with the on-going area development to mitigate capacity deficiencies at study intersections.*

Additional recommendations are made for the design of new intersections along the extension as incorporated into this EA study's preliminary design.

The TMP found that The Rapids Parkway extension under Highway 402 to Exmouth Street using the existing highway tunnel provides the opportunity for a new direct link to/from the retail area south of the highway, while also preventing overloading of the Berger Road and Modeland Road intersections. This Parkway extension provides substantial relief to the existing road network and would adequately accommodate future development traffic within the study area that would otherwise overload the existing road network.

This study also provides the opportunity to preserve the Howard Watson Nature Trail along the new road as discussed further in this report. This Active Transportation extension is recommended in the City's Transportation Master Plan. This includes trail crossing improvements at strategic roads including Exmouth Street.

Alternative Solutions – Preferred Solution (Class EA Phase 2)

As noted in the Study Background, the City separated preparation of the infrastructure EA under Highway 402 from The Rapids Parkway / Nature Trail EA because these two projects are functionally separate and related only by geography.

For the road extension, minor offset alignments are not applicable for a road design that must follow strict engineering design standards when comparing to infrastructure design. Furthermore, since 1997 the Secondary Plan for Development Area 1 has been based on a land use pattern that incorporates The Rapids Parkway and associated trail system.

These statutory plan requirements mean that there are no alternative alignments for The Rapids Parkway extension other than the alignment in the Development Area 1 Secondary Plan. This alignment was made with full consultation with stakeholders and the public at formal and informal meetings, and through a public hearing required under the Planning Act.

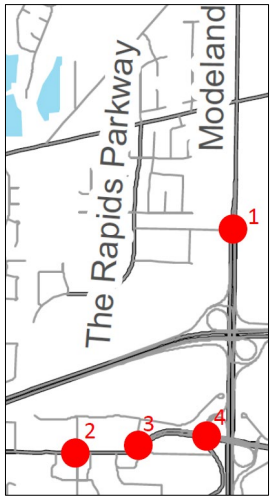
The only other alternative planning solution is the Do-Nothing alternative. Since no extension of The Rapids Parkway and Nature Trail would not address the problem and opportunity identified by this EA, it is not considered to be a reasonable alternative.

With the preferred planning solution identified, Phase 2 of the Class EA next inventories the social, natural and economic environments associated with the preferred alignment. This inventory, conducted in part through the previous infrastructure EA in 2018 and augmented with additional information in 2019 is described as follows:

Social Environment - Transportation Conditions

The City's Transportation Master Plan identifies existing and future Sarnia roadway network Level-of-Service at key intersections, future travel demands to 2029 and resulting major network improvement recommendations including extending The Rapids Parkway.

The subsequent Traffic Study conducted for the City in 2017 on The Rapids Parkway Extension is based on planned developments in east Sarnia adding newly projected trips to the area road network. This added traffic volume will result in some intersections operating over capacity and congested at the following key locations shown here:



1. Modeland Road and Berger Road
2. Lambton Mall Road and Exmouth Road
3. Exmouth Road & London Line and Barclay Drive
4. London Road/Southbound Highway 40 Off-Ramp and London Line

Adding traffic signals may also be an option at:

- The Rapids Parkway / Quinn Drive (with a roundabout option)
- Exmouth Street / The Rapids Parkway
- Quinn Drive / Lambton Mall Road

The 2017 Traffic Study concludes with the following recommendations that have been assessed in the design of the planned Rapids Parkway extension:[1]

[1] Rapids Parkway Extension Traffic Study, Final Report, WSP, October 2017

The Rapids Parkway extension provides substantial relief to existing network and would adequately accommodate future development traffic within the study area that would otherwise overload the existing road network.

Extension of Rapids Parkway should be planned for implementation within the ten year horizon to coincide with the on-going area development to mitigate capacity deficiencies at study intersections.

Provide a southbound left-turn lane and dedicated westbound and right-turn lanes at the intersection of Quinn Drive and Rapids Parkway extension.

Dedicated southbound left and right-turn lanes, dedicated eastbound left-turn and shared through right lane is recommended for the intersection of Exmouth Street and The Rapids Parkway.

The analysis shows that traffic signal is not warranted at the intersections of Quinn Drive and Rapids Parkway, Exmouth Street and Rapids Parkway and Quinn Drive and Lambton Mall Road. However, without signalization, these intersections and/or some of their movements are expected to operate over capacity and at poor LOS E or F under future traffic conditions. It is recommended that the operations of the above intersections be monitored and signal warrant to be re-evaluated before the full future buildout of the study area.

Owing to the need to monitor specific traffic conditions in the study area as recommended in the 2017 traffic study, an Addendum was prepared by WSP in the spring of 2019 to:

- Analyze impact of limiting extension of The Rapids Parkway to Quinn Drive and what impact that has on the network at Development Area Full Buildout;
- Identify trigger point for when The Rapids Parkway extension should be completed (i.e. when Rapids/Berger and Berger/Modeland become congested) and any other study area intersections;
- Review option of roundabouts at Rapids/Quinn and Quinn/Lambton Mall Road intersections;
- Review if the existing double left turn at Exmouth/Lambton Mall could be removed under current conditions; and
- Review warrant for crossing control (signal, PXO, other) at Exmouth Street / Howard Watson Nature Trail.

The 2019 Update concludes that:[2]

1. Reducing The Rapids Parkway extension to Quinn Drive would have the intersection of Lambton Mall Road & Exmouth Street operating above capacity. Also, with the reduced extension there are several other movements approaching capacity and with long delays. Overall, conditions at the intersection of Lambton Mall Road & Exmouth Street as well as along Quinn Drive are generally better with the full extension in place. As such, while the reduced extension is operationally feasible, it may pose problems for people

[2] Rapids Parkway Extension Traffic Study Update, WSP, October 11, 2019

seeking to access the existing and proposed retail establishments in the area along Quinn Drive.

2. The full extension of The Rapids Parkway to Exmouth Street does present significant benefits to accessing the commercial developments in the area;
3. Regardless of the status of the extension, the removal of the additional northbound left should be considered to reduce the lost time at the intersection; and
4. Based on an assumed 50% level of development, there are operational benefits associated with completing The Rapids Parkway by 2024.
5. An intersection of The Rapids Parkway and Quinn Drive could also be configured as a two-leg roundabout and would be functionally identical to an elbow curve. This design option is considered further in this report.

Natural Environmental Inventories

Phase 2 of the Class EA process requires that an inventory be conducted of existing natural environmental conditions.

The following inventory results were collected for the infrastructure Class Environmental Assessment (EA) conducted in 2018. It remains valid and relevant for the new road/trail extension EA study area.

Natural Heritage Environment:

Figure 2.5 of the infrastructure EA Screening Report shows the location of natural heritage features located in the general vicinity of the study area.

General Physiography:

The western part of the study area and near the CN rail line have clay type soils with imperfect drainage.

The northern portion of the study drains to a tributary of the Wawanosh Drain, which is part of the Perch Creek sub-basin

The 2013 Watershed Report Card, prepared by the St. Clair Region Conservation Authority, identified poor forest cover, riparian cover and forest interior conditions within the watershed. Surface water quality in the watershed was noted to have slightly elevated levels of phosphorus.

Tree Inventory

As part of the 2018 infrastructure Class EA, tree inventories were conducted in 2016 and again in 2018 within two main sections of The Rapids Parkway extension. In general, the reports concluded that no endangered species were found in the area, the removal of these trees to construct a roadway would not affect the sustainability of any of the endangered tree species in Ontario, and a tree management plan should be implemented to preserve as many trees as possible as well as to plant trees replacing any removed.

Natural Heritage Features: Areas of Natural and Scientific Interest (ANSI)

The 2018 infrastructure EA noted that there are no Areas of Natural and Scientific Interest (ANSI's) situated in the vicinity of the study area. It also concluded that "*the project will have no direct impacts to the natural heritage features located in proximity to the project study area given their distance and the scope of the project."*

Species at Risk Screening – Aquatic Habitat

From the 2018 Infrastructure ES it was noted that no aquatic species at risk are present in close proximity to the project location, given the lack of aquatic habitat present.

Species at Risk Screening – Birds

The 2018 Infrastructure EA noted that habitat opportunities may exist for breeding birds within the vegetated areas located adjacent to the existing Howard Watson Nature Trail or on the highway underpass. Also, two species of migratory birds were identified within the study area, however these species are not listed as endangered, threatened, or extirpated under the federal Species at Risk Act (SARA).

Work activities conducted during the breeding season, such as vegetation clearing, placement of fill and the modification of bridge structures may have the potential to destroy migratory birds and their nests. In order to comply with the Migratory Birds Convention Act, prior to conducting work with the potential to destroy migratory birds during the identified breeding season for migratory birds, a nest survey must be conducted by a qualified biologist prior to commencement of the works to locate and identify active nests of species covered under the Migratory Birds Convention Act.

As the vegetation clearing required to facilitate the planned road extension will be outside of the breeding season for these species, no impacts to active nesting habitat are expected to be associated with the project.

Socio-Cultural Environment

Adjacent Land Use

Land uses along the study area corridor are primarily residential and commercial activities with several remnant natural features along the verges of the nature trail. A vacant agricultural field (planned for residential development) is also located adjacent to the northerly extent of the study area, immediately north of the highway corridor. South of the corridor, the Home Depot parking lot is located immediately east of the corridor with a small wooded area separating the parking area from the granular trail surface. The west side of the corridor, at this location, abuts a small wooded area located immediately south of the highway.

A number of multi-unit residential developments are located adjacent to the corridor between Quinn Drive and Exmouth Street. Trees and shrubs line the existing trail.

Cultural Heritage Screening

The 2018 EA concluded that further assessment of built and cultural heritage resources is not required for The Rapids Parkway / Trail extension study area.

Stage 1 and 2 Archaeological Assessment

A Stage 1 and 2 Archaeological Assessment for The Rapids Parkway extension was prepared as part of the 2018 EA. In summary, no archaeological materials or sites were identified during the Stage 2 test pit survey of the subject property. Stage 2

concluded that "*the subject property should be considered free of archaeological concern… no further archaeological assessment is recommended*".

Source Water Protection

For the purposes of Source Water Protection, Sarnia is located within the Thames-Sydenham Source Protection Region.

Mapping shows that most of the road / trail extension corridor that is the subject of this current Class EA is located within the limits of Significant Groundwater Recharge Area (SGRA) "Vulnerability 2".

Consultation with SCRCA Source Protection staff occurred once a preferred alternative road / trail extension was selected to ensure that potential impacts to these sensitive areas and associated mitigation recommendations are given consideration. Also, from liaison with the Source Protection Coordinator at the Thames-Sydenham and Region Drinking Water Source Protection Region, it is noted that significant threats to drinking water do not exist in areas designated as SGRAs. Only moderate and low threats to drinking water may exist. These threats occur within all Sarnia road right-of-way corridors and do not apply solely to the subject road / trail extension. The City of Sarnia already maintains best practices and follows legislation in place to ensure that these items do not become a risk to drinking water sources.

Geotechnical Conditions – Contamination Overview

The geotechnical work conducted as part of the 2018 EA noted that the investigation "*did not test for contaminants that may be considered hazardous. This testing and a potential hazard study can be carried out prior to detailed design if so requested."*

The geotechnical investigation confirmed that no methane was detected in any of the boreholes.

Alternative Design Concepts for Preferred Solution (Class EA Phase 3)

Possible design concepts that may be used to implement the preferred Rapids Parkway / Trail Extension alignment are identified and evaluated in Phase 3 of the EA process. The following conceptual design alternatives were evaluated in terms of potential impacts.

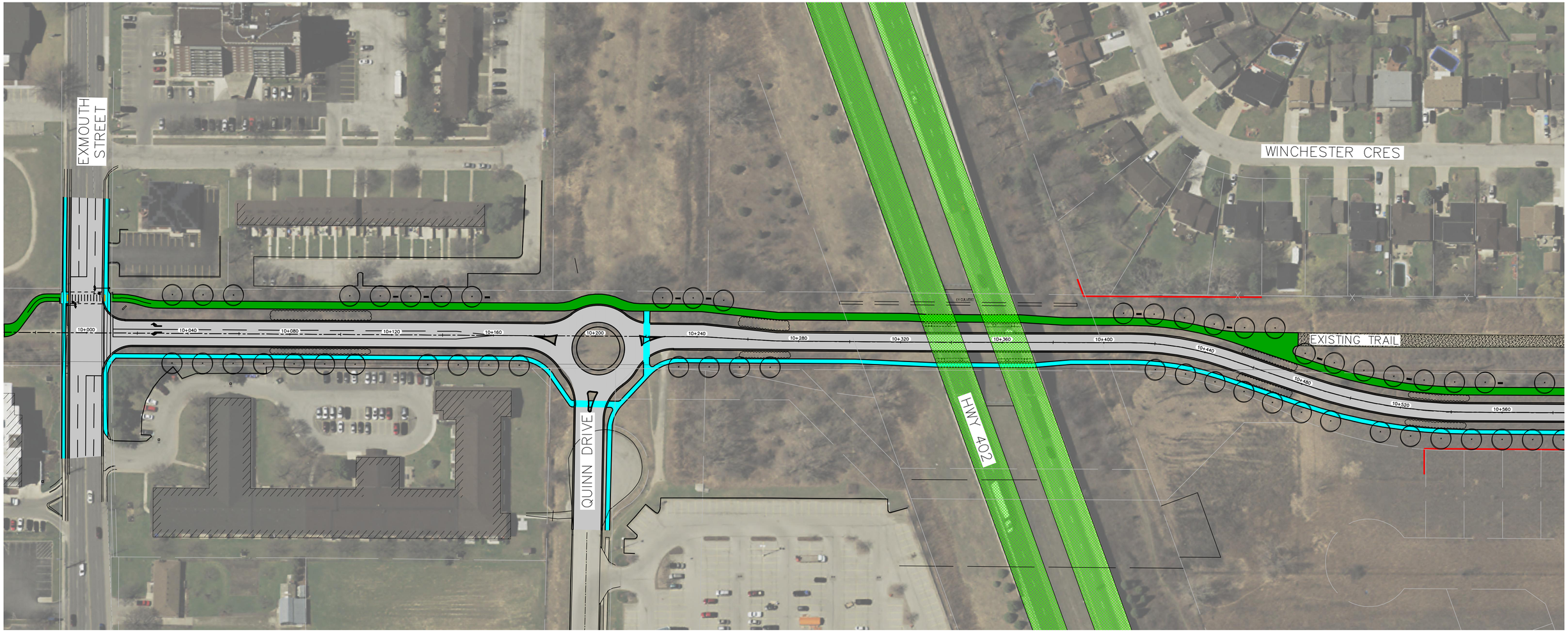
Design Alternative #1 – Road/Trail Alignment North/South of Highway 402

In the case of the planned Rapids Parkway Extension, the road and associated trail alignments are dictated by four associated alignment factors that restrict consideration of any alternative alignments north and south of the Highway 402 crossing:

- The approved Secondary Plan from the Sarnia Official Plan established the functional alignment of the Parkway / Trail Extension.
- This alignment was subsequently confirmed by the City's 2014 Transportation Master Plan;
- Existing residential development has been built along a northern portion of this alignment;
- Subdivision plans have been developed for the remaining lands abutting the planned alignment; and

- Alignment of the planned infrastructure crossing under Highway 402 is also based on the established road and trail alignment, except for the section immediately under the highway as described next.

Based on these conditions, the proposed alignment of The Rapids Parkway road and trail extension north and south of Highway 402 is shown on Exhibits 5.1A and 5.1B, and Exhibit 5.2.



LEGEND:

ROADWAY

MULTI-USE PATH

CURB & GUTTER

SIDEWALK

EX RIGHT OF WAY / PROPERTY LINE

EX HYDRO LINE / POLE

PROPOSED NOISE MITIGATION FEATURE

POTENTIAL LANDSCAPING/ TREE

SHRUBS/PERENNIALS/GRASSES

BENCH

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SARNIA ONTARIO·CANADA

SCALE
HORZ – 1 : 500
5,0 0 10m
VERT – 1 : 50
0,5 0 1m

TITLE
THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

PROPOSED ALIGNMENT

PROJECT No. 120368

SHEET No. EXHIBIT 5.1A

PLAN FILE No.

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LEGEND:

ROADWAY		CURB & GUTTER		EX RIGHT OF WAY / PROPERTY LINE	
MULTI-USE PATH		SIDEWALK		EX HYDRO LINE / POLE	
POTENTIAL LANDSCAPING/ TREE		SHRUBS/PERENNIALS/GRASSES		PROPOSED NOISE MITIGATION FEATURE	
BENCH					

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5.0 0 10m
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CONCEPTUAL DESIGN

PROPOSED ALIGNMENT

PROJECT No. 120368

SHEET No. EXHIBIT 5.1B

PLAN FILE No.

Design Alternative #2 – Corridor Alignment Under Highway 402

Initially a cross section alternative was submitted to the Ministry of Transportation (MTO) showing an elevated sidewalk and multi-use pathway with fill above the existing piers and a retaining wall between the pathways and the roadway. IBI revised the cross section to address their concerns.

The revised cross-section shows the proposed sidewalk and multi-use pathway on either side of the existing piers, roughly at the same elevation of the roadway. A retaining wall with a pedestrian railing is then located beyond this. This cross section addresses MTO concerns with the structural crossing under Highway 402, planning and design issues, geotechnical requirements and general concerns about drainage and possible impacts on existing piers and footings associated with a possible bridge replacement in the future.

The alignment under the highway minimizes the conflict between high-speed vehicular traffic and trail users. It also eliminates the need for traffic control that would be required to mitigate that conflict.

The existing trail currently connects under Highway 402, therefore users are accustomed to the concept of using an underpass.

While there are constraints to the width of the underpass, the corridor allows a full 3.0m multiuse path width on the west and a 1.5m sidewalk on the east.

Separation between vehicular traffic and multi-use path and sidewalk users will be maintained at the underpass.

As a result, this option is **recommended** and is shown in Exhibit 5.2.

Exhibit 5.2 – The Rapids Parkway Extension Corridor Alignment Under Highway 402

Design Alternative #3 – Extension to Quinn Drive vs. Exmouth Street

In The Rapids Parkway Extension Traffic Study Update (May 2019) a sensitivity analysis was conducted, extending the Parkway only to Quinn Drive. The Rapid Parkway / Exmouth Street intersection would not exist and The Rapids Parkway / Quinn Drive intersection would be an elbow curve instead of an intersection, with the option of a two-leg modern roundabout at this location (see Section 6.4).

Advantages: Terminating The Rapids Parkway Extension at Quinn Drive could remove the need to clear existing vegetation between that location and Exmouth Road, although this removal may still be required for stormwater management and drainage improvements. It would also remove the extension from proximity to the 20 townhouse units on Pontiac Court, although the rear of these units is separated from the extension right-of-way by approximately 25 metres of rear yard and parking space.

Disadvantages: The elimination of The Rapids Parkway & Exmouth Street intersection would result in the trips being redistributed to the two intersections to the east, at Lambton Mall Road and at Barclay Drive. From the analysis, it was found that the intersection of Exmouth Street & Lambton Mall Road would be operating above capacity during the Saturday peak hour. Under forecasted conditions, the reduced extension to Quinn Drive could be viable with no intersections operating over-capacity, however the high volume/capacity ratios suggest that there may be problems for motorists seeking to access the existing and future retail establishments in the area along Quinn Drive.

As a result, this alternative to terminate the extension at Quinn Drive was **not recommended.**

Design Alternative #4 – The Rapid Parkway / Quinn Drive Modern Roundabout

In The Rapids Parkway Extension Traffic Study Update (May 2019) a signalized intersection was recommended at the Quinn Drive/The Rapids Parkway in order to avoid significant delays for motorists. As an alternative, a one-lane, three leg modern roundabout was investigated.

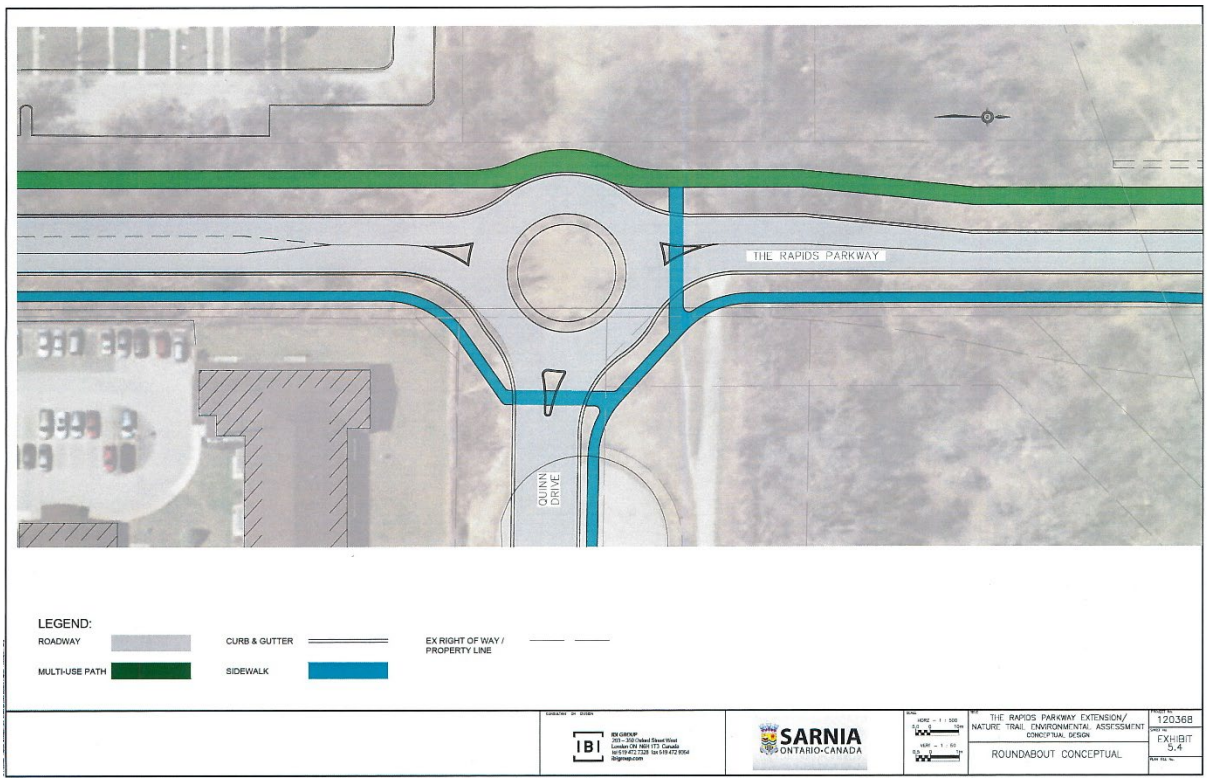
Advantages: Roundabouts are engineered to offer several potential advantages over signalized and stop controlled intersections, including improved safety performance, less delay, shorter queues, reduced speeds and improved aesthetics for community enhancement and they also act as effective traffic calming measures. Roundabouts also operate best at locations where intersecting traffic flows are relatively balanced so that each travel direction through the roundabout has equal or similar movement opportunities without undue delays to the any road which is the case at this intersection.

As shown on Exhibit 5.4, there is sufficient space at The Rapids Parkway / Quinn Drive intersection to construct a one-lane / direction roundabout with a truck apron to accommodate truck movement in this commercial area.

Disadvantages: If this is the first roundabout location in Sarnia, there will be an education and learning period for drivers, but this is common in any new application. Actual construction costs are somewhat less for a new signalized intersection, however, the 20 year lifecycle costs of a roundabout are similar.

Owing to the operational, traffic calming and comparative life cycle costs of these two alternatives, a single lane / direction (2 travel lanes), three leg roundabout at a new Rapids Parkway / Quinn intersection is **recommended**.

Exhibit 5.4 – The Rapids Parkway / Quinn Roundabout Concept



Design Alternative #5 - Exmouth Street Crossing

Rather than pedestrians and cyclists on the Howard Watson Nature Trail crossing Exmouth Street mid-block against traffic without right of way, there are two basic alternatives to improve the ease of the mid-block crossing: 1) a marked and signed pedestrian crossover (PXO); or 2) a midblock pedestrian signal.

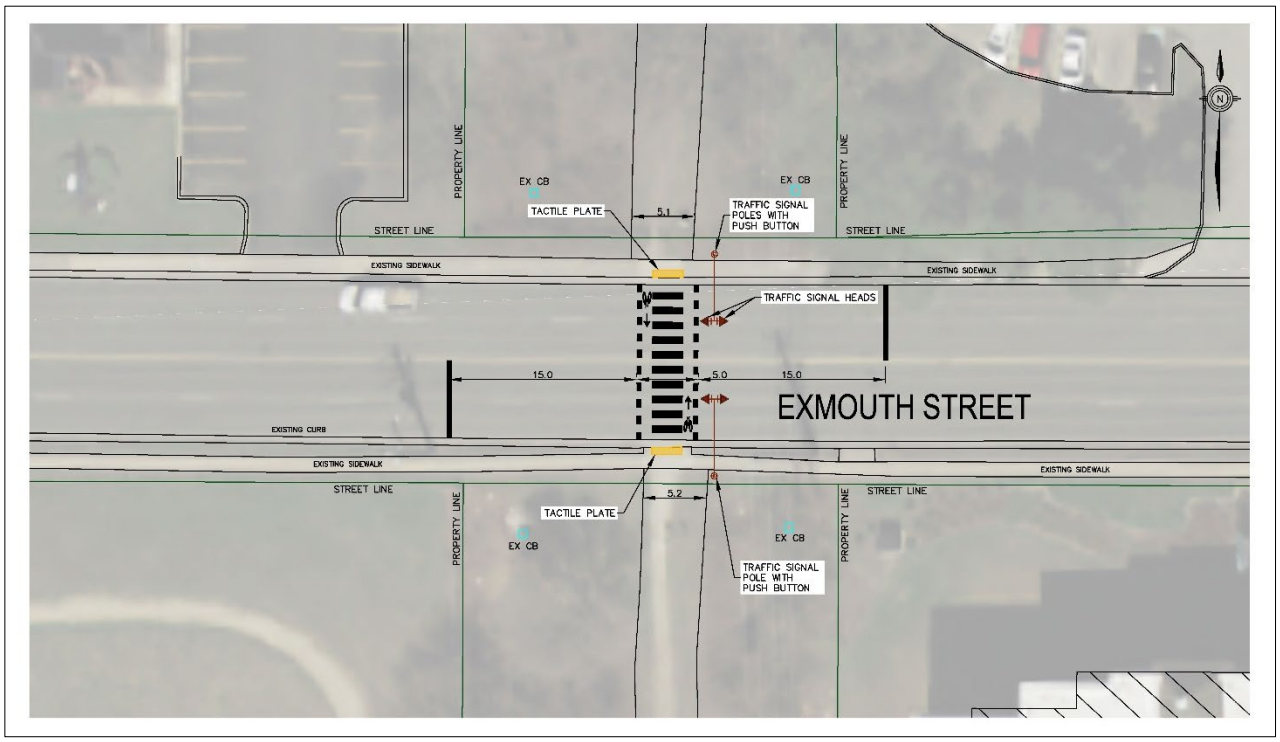
In July, 2017, Sarnia City Council directed staff to explore the financial implications of installing a midblock PXO on Exmouth Street at the Nature Trail crossing in advance of full signalization of this intersection and integrating its function into the existing coordinated traffic network along Exmouth Street.

Due to traffic volumes, City staff recommended that to provide pedestrians and cyclists with an improved crossing facility on Exmouth Street at the Trail, then a midblock pedestrian signal is appropriate (per OTM Book 15) and **is recommended**. Phased conceptual designs of this new Exmouth Street crossing before and after The Rapids Parkway Extension is shown on Exhibit 5.5.

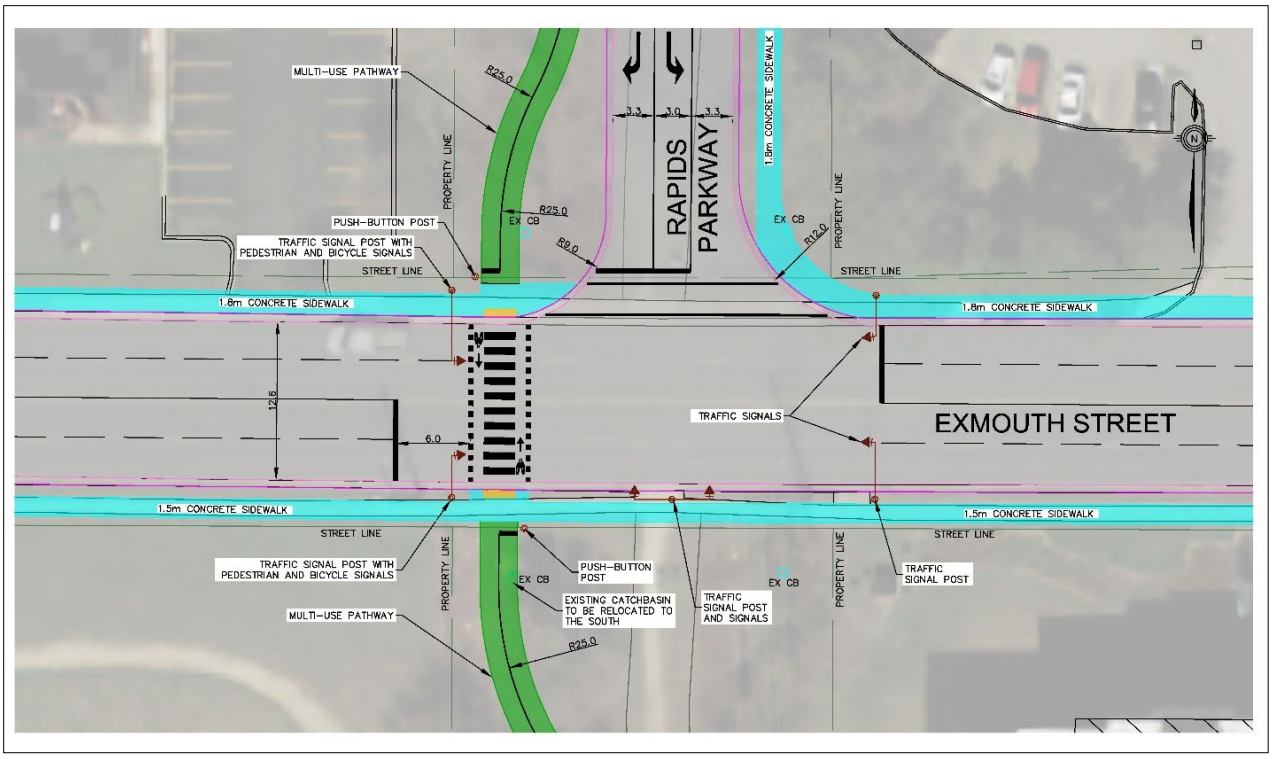
In the ultimate configuration, the design will evolve to a full traffic signal, as recommended through the The Rapids Parkway Extension Traffic Study Update.

Exhibit 5.5 – Recommended Mid-Block Pedestrian Signal

INTERIM TREATMENT CONCEPT



ULTIMATE TREATMENT CONCEPT



Public and Agency Consultation

As public input is a vital part of the Class EA process, the study included a number of contact points with the public, Indigenous communities, technical agencies, and stakeholder interest groups. The key consultation milestones include:

CONSULTATION EVENT	DATE
Notice of Commencement	April 4, 2019
Public Information Centre No. 1	June 18, 2019
Public Information Centre No. 2	Online Format: May 15, 2020 (for 3 week period)
Notice of Completion	July 20, 2020

Public outreach and advertisements of these milestone events included local newspapers, direct mailing and email. Indigenous communities were also contacted at key milestones.

Project Description

This section of the Environmental Study Report (ESR) summarizes the preferred design and includes recommendations where appropriate regarding its implementation.

Typical Cross-Sections

Typical cross-sections of The Rapids Parkway extension are provided in Exhibit 7-5. Some shifts in pathway locations may be required in detailed design in order to accommodate stormwater management features such as swales and landscaped features accommodating storm runoff.

The cross-section generally includes:

- Two-lane roadway with 3.3m travel lanes, with 3.0m left turn lane approaching Exmouth Street
- Wide boulevards (generally >3.0m)
- 3.0m multi-use path (west/north side) and 1.5m sidewalk (east/south side) – refer to Section 7.3
- Wide bio-swales / ditches

Active Transportation Facilities

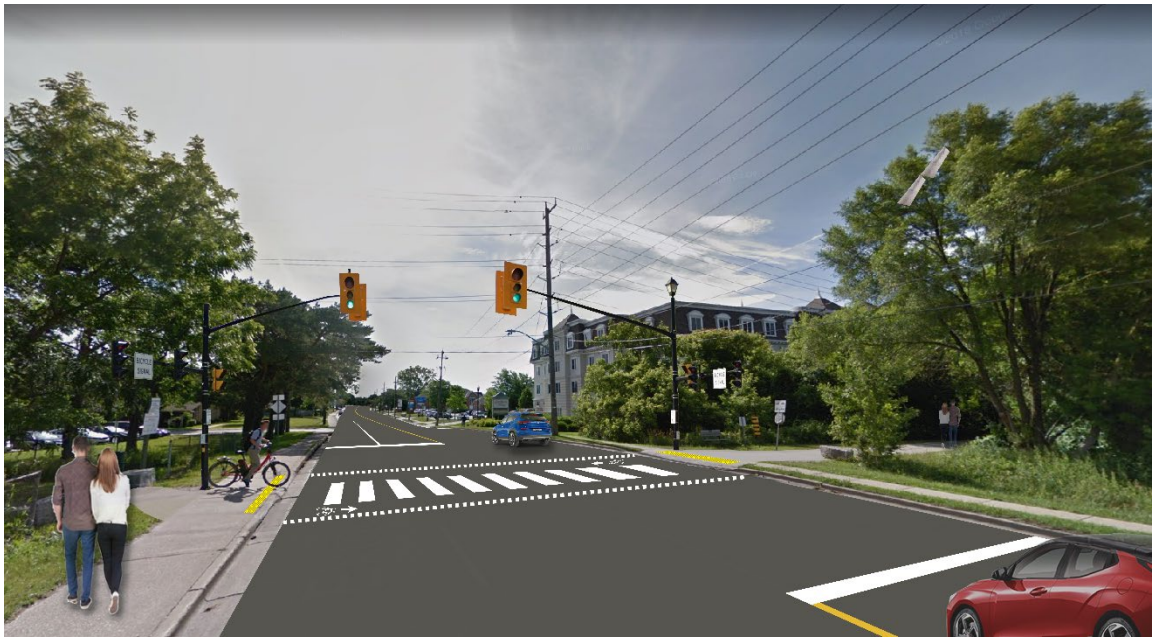
A variety of elements will be incorporated in the design to maintain and enhance the Howard Watson Nature Trail through the study area:

- Upgrading the surface of the trail to improve accessibility – an asphalt surface is proposed for the multi-use path where the roadway runs adjacent to the trail (Exmouth Street to north of Highway 402) which will provide a smoother and more easily maintained surface for safe, year-round access;
- Introducing a variety of trail amenities such as benches, trees and wayfinding signage;

- Shifting the road alignment away from the trail north of Highway 402 to maintain the trail in a naturalized state; and
- Buffering the trail with separation, vegetation and landscaping where the roadway runs adjacent to the trail.

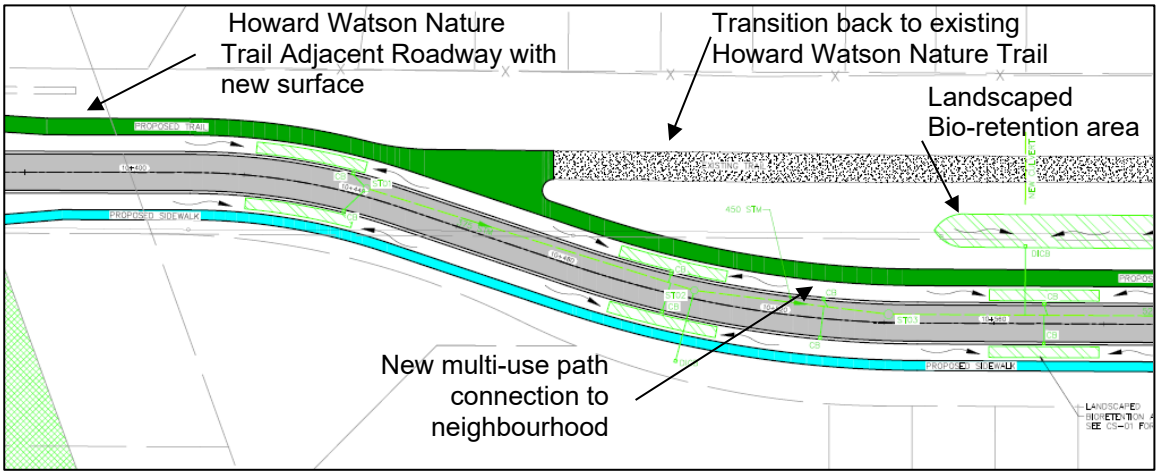
In addition the trail crossing at Exmouth Street will also be improved with a signalized crossing and crossride (See Exhibit 7.3). This will be implemented as an interim improvement prior to the road construction and reinstated as a fully signalized intersection when the road is built.

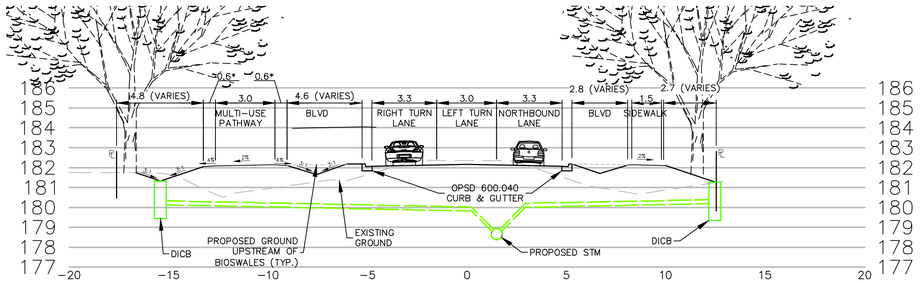
Exhibit 7.3 - Conceptual Rendering of Interim Midblock Pedestrian Signal at Exmouth Street



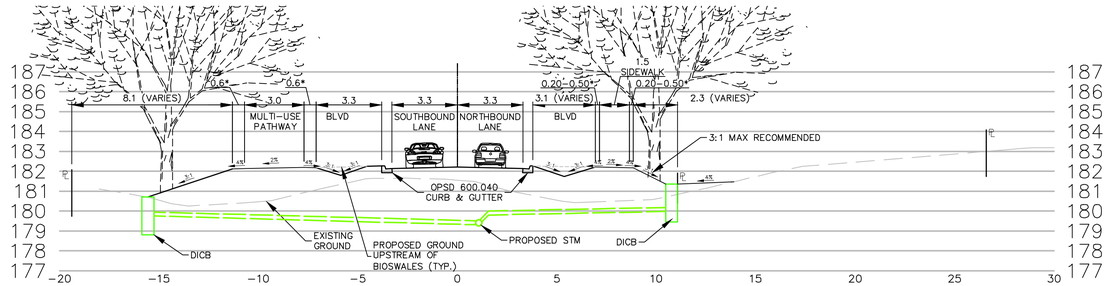
The proposed roadway will shift away from the Howard Watson Nature Trail alignment directly north of the Highway 402 underpass and a landscaped bioretention swale will be introduced to further preserve the existing trail experience. This minimizes the impact on the section of the Howard Watson Nature Trail north of Highway 402 (See Exhibit 7.4). To improve connectivity into the Rapids Parkway neighbourhood, an asphalt multi-use path will continue along the full roadway extension, terminating at Sandpiper Drive. Refer to Exhibits 7.6, 7.7 and 7.8.

Exhibit 7.4 - Trail Connectivity

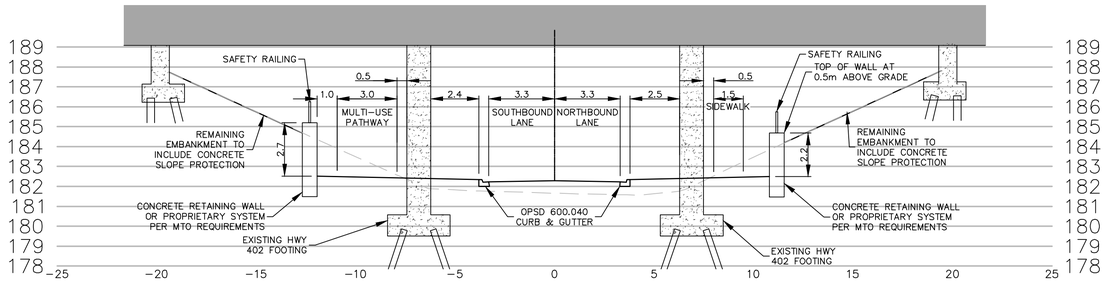




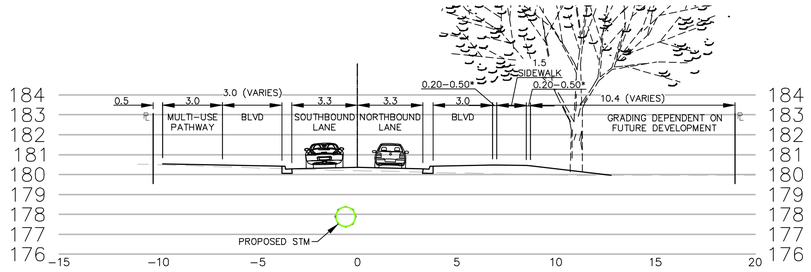
EXMOUTH STREET TO QUINN DRIVE



QUINN DRIVE TO 402 UNDERPASS

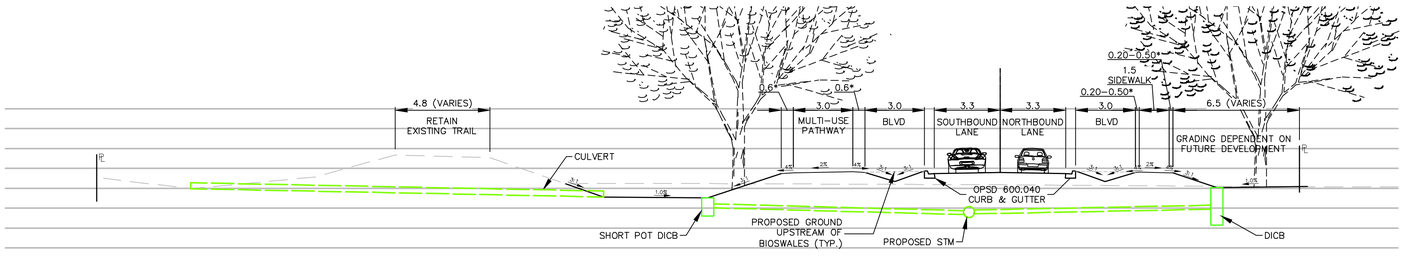


402 UNDERPASS



MEADOWLARK LANE TO SANDPIPER DRIVE

NOTE: * TO DENOTE DIMENSIONS TO BE ACCOMMODATED WHERE POSSIBLE



402 UNDERPASS TO MEADOWLARK LANE

CONSULTANT OR DIVISION

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SARNIA ONTARIO•CANADA

SCALE
HORZ – 1 : 150
1.5 0 3m
VERT – 1 : 30
0.3 0 0.6m

TITLE
THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

TYPICAL CROSS SECTIONS
THE RAPIDS PARKWAY

PROJECT No. 120368
SHEET No. EXHIBIT 7.5
PLAN FILE No.

J:\120368-RapidsParkway\EA\5.9 Drawings\Civil\current\120368_Sections.dwg

Structural Impact Review

The Ministry of Transportation (MTO) confirmed that placing the trail between the bridge abutment and pier required a structural assessment. In this case, the stability of the abutment slopes would have to be ensured, including investigation of any new or unbalanced loading exerted onto the piers, pile caps or piles. MTO approval will be required for the proposed design under Highway 402.

The originally designed overpass structure spanned two rail tracks. This new approach places the trail between the piers and abutments and as such adds no additional loading to the existing piers. Traffic protection for the piers can be added if required by the Ministry.

The placement and grading of the trail behind the piers removes the need for any additional fill influencing the pier foundations (deep piled foundations). Furthermore, the addition of a low modular block retaining wall will not add additional load to the foundations and can be easily removed for structure replacement. A safety railing can also be added along the top of the wall. The retaining wall can be constructed without impact on the existing bridge structure while maintaining lateral support to the existing piles of the abutment foundations.

Utilities

There are no known utility conflicts within the corridor. During detailed design, utilities are to be circulated to determine any requirements.

Stormwater and Drainage

The proposed Rapids Parkway profile will be designed to maintain the north-south drainage break at approximately the location of the overpass. This will avoid the need to construct sewers beneath the overpass.

With a full road extension to Exmouth Street a new storm sewer system will be installed south of the bridge to collect the runoff from The Rapids Parkway corridor and outlet to the existing Exmouth Street trunk storm sewer.

The Rapids Parkway corridor north of the bridge will be serviced by a new storm sewer system which will drain north to Sandpiper Drive and connect to an existing trunk storm sewer.

Catchbasins are proposed within the roadway to pick up road drainage as well as any overflow from boulevard areas/landscaped areas. Stormwater quality and quantity control for the area north of Highway 402 is already provided for within an existing downstream stormwater management facility. Stormwater quality control for the right-of-way drainage area south of Highway 402 will include the installation of an oil/grit separator. Shallow roadside swales are designed throughout the project length where feasible to allow for the filtration of sediment in stormwater runoff prior to entering the storm sewer system. In addition, directing stormwater to suitably landscaped bioretention areas at the low points in the profile, where feasible, will allow for some infiltration and the settlement of sediment prior to entering the storm sewer.

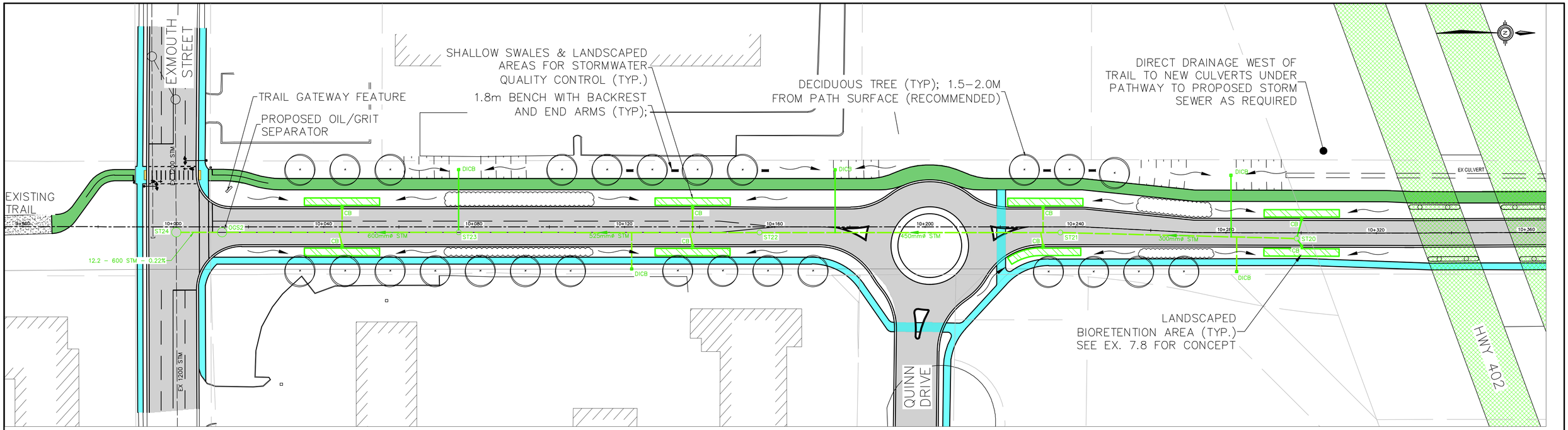
Comments received from the public noted that there are some drainage issues between the existing pathway and the rear of the lots along the west side. These drainage issues can be accommodated with some minor grading along here to direct the storm flows through culverts under this pathway and into the proposed storm sewer.

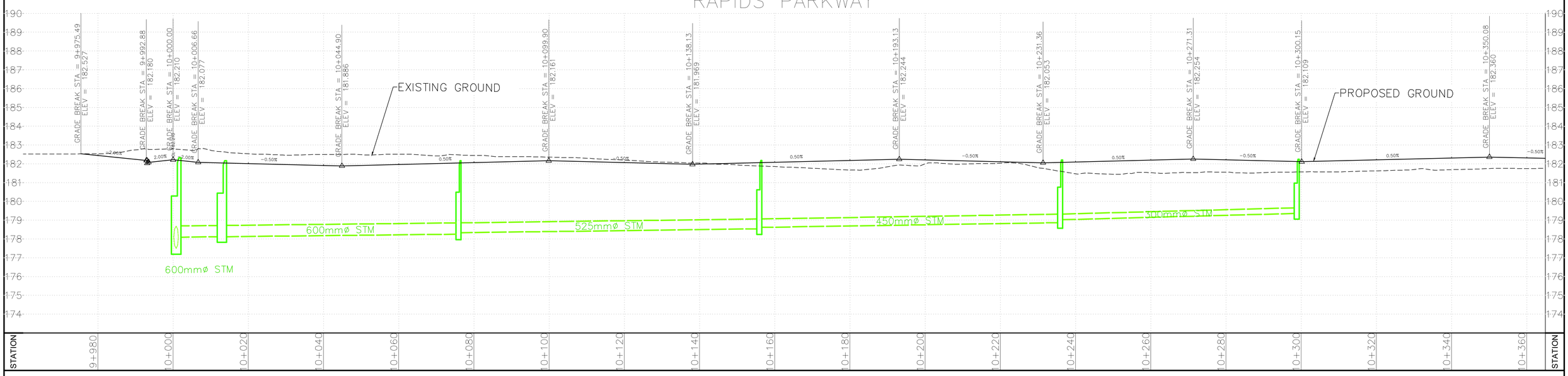
The following exhibits show a conceptual design of the drainage and stormwater features of the proposed The Rapids Parkway Extension.

Exhibit 7.6 – Exmouth to Highway 402

Exhibit 7.7 – Highway 402 to Nicolina Way (Future ROW)

Exhibit 7.8 - Meadowlark Lane to Sandpiper Drive





LEGEND:

ROADWAY | CURB & GUTTER | EX RIGHT OF WAY / PROPERTY LINE | PROPOSED NOISE MITIGATION FEATURE | FLOW DIRECTION | BIORENTION AREA SEE EXHIBIT 7.8 FOR CONCEPT | POTENTIAL LANDSCAPING/ TREE | BENCH

MULTI-USE PATH | SIDEWALK | EX HYDRO LINE / POLE | DICB/CATCHBASIN & LEAD | PROPOSED STORM SEWER (CONCEPTUAL) | SHRUBS/PERENNIALS/GRASSES

CONSULTANT OR DIVISION

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SCALE
HORZ – 1 : 500
5.0 0 10m
VERT – 1 : 50
0.5 0 1m

TITLE
THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

PLAN & PROFILE
EXMOUTH TO HIGHWAY 402

PROJECT No. 120368
SHEET No. EXHIBIT 7.6
PLAN FILE No.

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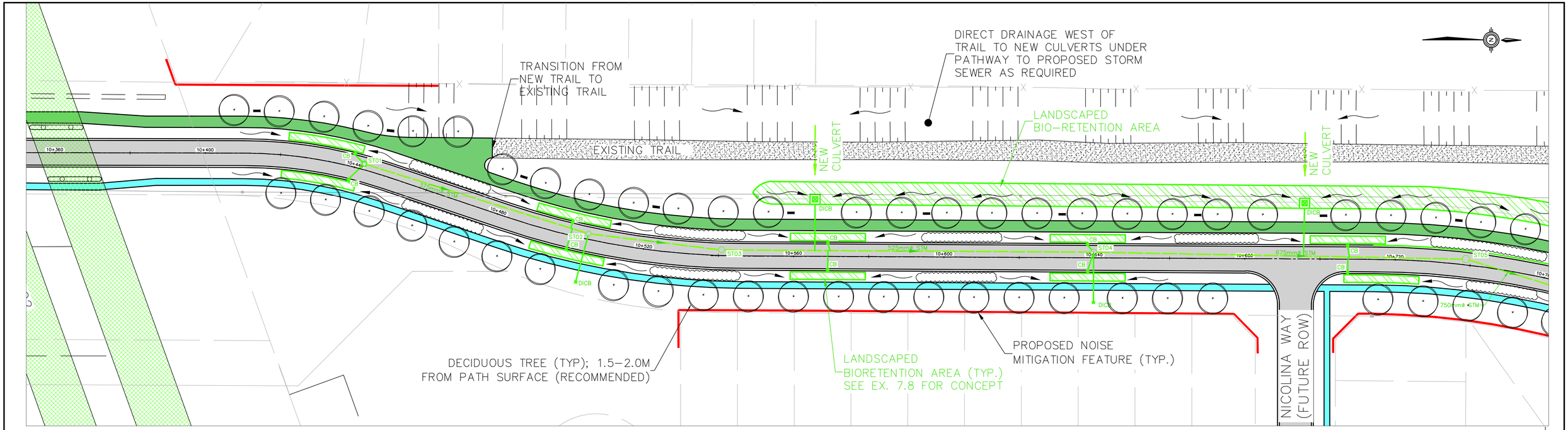

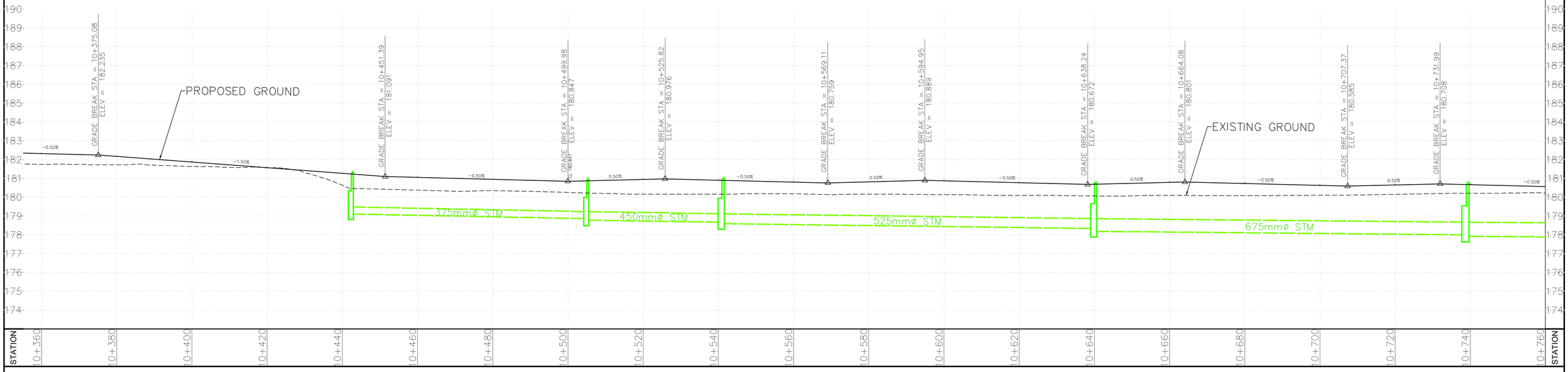

LEGEND:

ROADWAY | CURB & GUTTER | EX RIGHT OF WAY / PROPERTY LINE | PROPOSED NOISE MITIGATION FEATURE | FLOW DIRECTION | BIORENTION AREA SEE EXHIBIT 7.8 FOR CONCEPT | POTENTIAL LANDSCAPING/ TREE | BENCH

MULTI-USE PATH | SIDEWALK | EX HYDRO LINE / POLE | DICB/CATCHBASIN & LEAD | PROPOSED STORM SEWER (CONCEPTUAL) | SHRUBS/PERENNIALS/GRASSES

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HORZ – 1 : 500
5,0 0 10m
VERT – 1 : 50
0,5 0 1m

THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

PLAN & PROFILE
HIGHWAY 402 TO NICOLINA WAY (FUTURE R.O.W.)

120368

EXHIBIT 7.7

DIRECT DRAINAGE WEST OF TRAIL TO NEW CULVERTS UNDER PATHWAY TO PROPOSED STORM SEWER AS REQUIRED

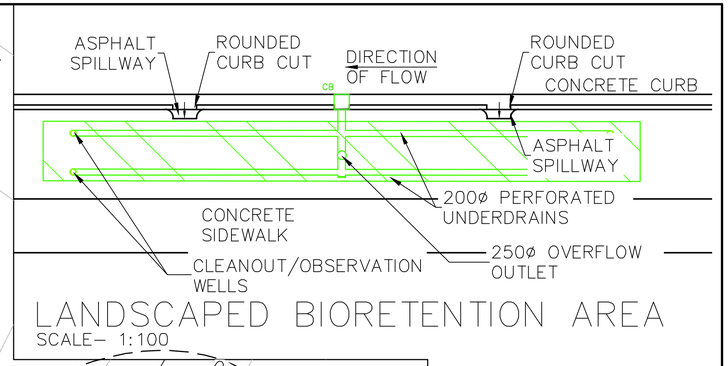
MEADOWLARK LANE

BLUEBIRD COURT

LANDSCAPED BIORETENTION AREA (TYP.)
SEE EX. 7.8 FOR CONCEPT

DECIDUOUS TREE (TYP); 1.5–2.0M FROM PATH SURFACE (RECOMMENDED)

PROPOSED NOISE MITIGATION FEATURE (TYP.)

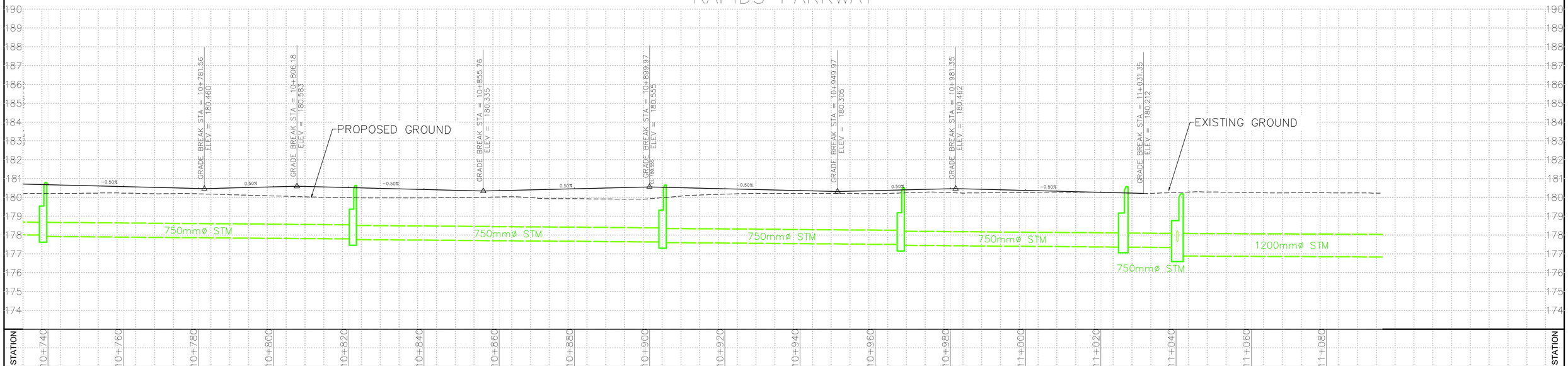


LANDSCAPED BIORETENTION AREA
SCALE– 1:100

SANDPIPER DRIVE

TRAIL CONNECTION TO NEIGHBOURHOOD TO BE FURTHER DEFINED IN FUTURE BY CITY OF SARNIA

RAPIDS PARKWAY



LEGEND:

ROADWAY | CURB & GUTTER | EX RIGHT OF WAY / PROPERTY LINE | PROPOSED NOISE MITIGATION FEATURE | FLOW DIRECTION | BIORENTION AREA SEE EXHIBIT 7.8 FOR CONCEPT | POTENTIAL LANDSCAPING/ TREE | BENCH

MULTI-USE PATH | SIDEWALK | EX HYDRO LINE / POLE | DICB/CATCHBASIN & LEAD | PROPOSED STORM SEWER (CONCEPTUAL) | SHRUBS/PERENNIALS/GRASSES

CONSULTANT OR DIVISION

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SCALE
HORZ – 1 : 500
5.0 0 10m
VERT – 1 : 50
0.5 0 1m

TITLE
THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

PLAN & PROFILE
MEADOWLARK LANE TO SANDPIPER DRIVE

PROJECT No. 120368
SHEET No. EXHIBIT 7.8
PLAN FILE No.

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Right-of-Way and Property Requirements

The only requirement for property on this project is the need for additional land at the daylight corners for the northeast and southeast quadrants of the Quinn Drive / The Rapids Parkway roundabout.

Capital Cost Estimate

The total capital cost estimate to construct the planned The Rapids Parkway / Howard Watson Trail Extension is $6.52 Million in 2020 dollars as summarized below.

Exhibit 7.9 - The Rapids Parkway Extension Capital Cost Estimate Summary (2020)

Feature	Cost2	Notes
Civil Engineering	$2.80 M	Cut/fill, stormwater management, surface works
Street Lighting	$0.11 M	
Signalization (Exmouth)	$0.25 M	
Roundabout	$0.30 M	
Noise Mitigation	$0.43 M	
Landscaping	$0.43 M	
Misc.	$0.22 M	
Sub-Total	*$4.54 M*	
Contingency (25%)	$1.13 M	
Total Cost	**$5.67 M**	Property acquisition not included
Engineering (15%)	$0.85 M	
Estimated Total Capital Cost	**$6.52 M**	2020 $

Construction Staging

The City of Sarnia plans to construct The Rapids Parkway / Howard Watson Trail extension in two (2) phases summarized below:

Exhibit 7.10 – The Rapids Parkway Extension Construction Staging

Phase	Works	Schedule *
1	Exmouth Street interim crossing improvement (see Section 5.5 and Exhibit 5.5). Detailed design of road and trail extension.	2020
2	Grading, stormwater management, noise attenuation, landscaping, The Rapids Parkway extension and Howard Watson Trail extension construction from Sandpiper Drive to Exmouth Street.	2021

* Tentative based on City Council funding approval and MTO design approval under Highway 402

Pre-Planting of New Vegetation

Based on the more detailed route planning and design conducted as part of this new Environmental Assessment, "pre-planting" of new vegetation along the road and trail

extension should not be included as envisioned in the Official Plan. This study has concluded that such staging would not be "practical" since doing so would involve constructing road extension features such as drainage features, curbs, vegetation placement and other street and trail extension, except the street pavement. Construction of the final street extension pavement could then impact any pre-planted features. This would require new mitigation of vegetation impacts, or worse the replanting and cost of replanting new street and trail vegetation features.

Environmental Impacts and Mitigation Commitments

Noise Impact and Mitigation

An Environmental Noise Study prepared in late 2019 for this EA forecasts future noise levels with the planned extension of Rapids Parkway in order to identify if noise mitigation measures are required, and if so, to recommend these measures.

The noise forecasting demonstrated that noise mitigation is warranted. North of Highway 402 along the east / south side of The Rapids Parkway extension, installation by the developer of a noise wall along the road right-of-way is recommended at the time of development. It is recommended that the developer prepare a noise study as part of the development approval process to confirm noise levels at that time and confirm the type of noise attenuation measure.

On the west / north side of the road extension north of Highway 402, suitable noise mitigation measures will be included in the detailed design of the road extension.

The abutting Wiltshire Park requires no noise mitigation from the road extension. South of Highway 402, no mitigation is required for the Pineview Apartments along Pontiac Court owing to their distance from the new road and for the non-residential land uses in this area.

The locations for the proposed noise mitigation features are shown on Figure N1 to N3 in attached Appendix 4.

Temporary impacts are likely to occur during construction and specific mitigation measures should be included into the construction contract.

Landscaping

The use of vegetation and street trees will serve several purposes along the Rapids Parkway extension:

- Providing a visual naturalized buffer between the roadway and reinstated Howard Watson Nature Trail
- Where no noise walls are recommended, providing a buffer between residential properties and the trail and roadway

As this is a naturalized area, consideration for existing vegetation should be included in the design and construction phase. Recommendations for vegetation removal/replacement and streetscaping are described as follows:

<u>Vegetation Removal / Replacement</u>

A tree inventory is to be conducted as part of the detailed design. The information from the inventory is to be included in a chart on the Tree Management Plan and will also be shown a map at an appropriate scale to identify the trees that will be preserved, transplanted or removed, including the rationale for removal.

Tree protection should be bound, at minimum, by Tree By-Law 34 (1992) and arboricultural practices outlined in this report. For new trees, species are to be approved by the city and identified in a Landscape or Streetscape Plan.

Streetscape Design

Plant Material: Planting strips are recommended along the curb and within boulevards. Planting material is to be selected depending upon the amount of area available.

Site Furniture: Benches are envisioned to be placed along the trail at intervals to provide adequate rest stops for all abilities of trail users and at trail gateways. Waste receptacles are recommended to be placed adjacent to benches on the concrete pad.

Signage: Wayfinding signage is recommended to be placed along the trail. A gateway feature is to be established at the Exmouth Drive location.

Source Water Protection

As noted above, consultation with St. Clair Region Conservation Authority (SCRCA) Source Protection staff will occur prior to detailed design of the road / trail extension in order to ensure that potential impacts to these sensitive areas, and associated mitigation recommendations are given consideration.

It is also recognized that the extension project is within the Thames-Sydenham & Region Source Protection Region and falls under the Thames-Sydenham & Region Source Protection Plan. There are only 3 policies in the Thames-Sydenham and Region Source Protection Plan (SPP) that apply to moderate and low drinking water threats. Of these, only one applies to the road / trail extension project, which notes that new terms and conditions in existing and proposed legislation/regulations are to be considered and used to manage activities such that they reduce and/or do not become a Significant Drinking Water Threat.

Climate Change

Climate change has been considered in this EA in the context of mitigation and adaptation. Regarding mitigation, the Municipal Class EA (Appendix 2) includes mitigation measures such as managing increased surface water runoff by directing it to grassed swales as planned for The Rapids Parkway extension.

Climate adaptation is addressed in the Sarnia Official Plan (Section 6.1.1) with policies that favour environmental designs that are resilient to stresses of climate change. In the case of The Rapids Parkway extension, this involves stormwater management, improving tree cover and ecological restoration.

Furthermore, the City is currently preparing a Climate Change Adaptation Plan for its water resource, infrastructure and transportation systems which, when completed in 2021, this Plan can be referenced in developing the detailed design for the road / trail extension.

Permits and Agreements

Applications for permits and agreements will be required during the detailed design stage as follows:

- Ministry of the Environment, Conservation and Parks (MECP): an Environmental Compliance Approval (ECA) will be required for the construction of the storm sewer.

- St. Clair Region Conservation Authority (SCRCA): The southern portion of The Rapids Parkway extension, between Highway 402 and Exmouth Street is within a Regulated Area. A permit will be required from the SCRCA under the Conservation Authorities Act - Ontario Regulation 171/06 as amended (Application for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses).
- Ministry of Transportation (MTO): Approvals will be required from the MTO for construction of the roadway and pathway under the Highway 402 overpass.

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The Rapids Parkway Extension / Nature Trail Environmental Assessment - Schedule 'C'

Environmental Study Report

IBI

Prepared for The City of Sarnia
by IBI Group
June 2020

1 Introduction

1.1 Study Background

The full extension of The Rapids Parkway in Sarnia from Michigan Avenue south under Provincial Highway 402 to Exmouth Street has been planned since the mid-1990's. The Rapids Parkway is shown in the City's Official Plan as the main arterial road servicing Development Area 1, which will have a total of 1,800 dwelling units once fully built out in approximately 2029.

As shown on Exhibit 1.1, Development Area 1 is bordered by Highway 402 which limits the opportunity for road network connections to the south. The one opportunity available is to utilize the former CN Rail corridor under an existing Highway 402 overpass. This plan was envisioned in the Development Area 1 Secondary Plan, committed to in the Official Plan and recommended in the Sarnia Transportation Master Plan.

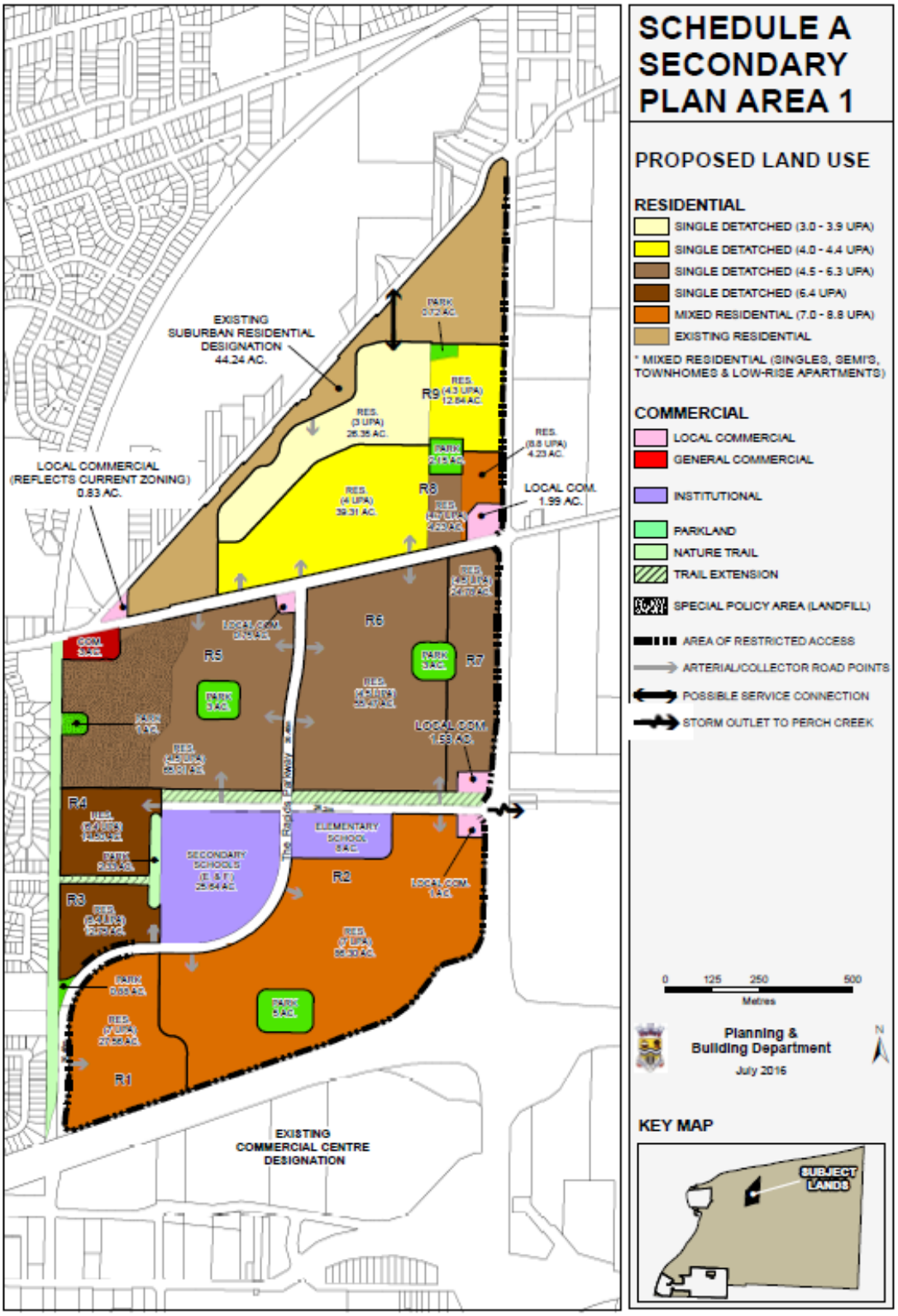
As explained further in this section, the extension represents an important link in the City's road and Active Transportation networks. The 2014 Sarnia Transportation Master Plan recommends that a Municipal Class Environmental Assessment (EA) for the extension be commenced to confirm the alignment, impact mitigation and preliminary design.

In April 2018, the City initiated a Class EA process to consider routing options associated with a proposed infrastructure crossing of Highway 402. Sewage and water infrastructure are to be extended south along The Rapids Parkway existing right-of-way, beneath Highway 402, connecting to existing water main and sanitary sewer to the south. That infrastructure EA did not include the extension of The Rapids Parkway at that time for four (4) main reasons:

1. The infrastructure extensions were a priority of the City to address deficiencies with existing sewage and water facilities located north and south of Highway 402;
2. The City felt that the infrastructure EA study should proceed in advance of the road / trail EA because time sensitive federal grant funding for that work had been received, and it was determined that the final design of the road / trail extension would not be impacted by the results of the infrastructure EA.
3. A new route would be required for the underground infrastructure crossing under Highway 402 since the Ministry of Transportation (MTO) was concerned about structural impacts to the underpass. MTO did not have similar concerns about a surface roadway / trail extension based on MTO conditions; and
4. The City was of the opinion that the infrastructure and roadway/trail projects were functionally separate related only by geography, and therefore could be conducted as separate studies without constituting piecemealing of the EA process.

As a result, the infrastructure EA selected a preferred sewer and water alignment along The Rapids Parkway right-of-way. The Notice of Study Completion for that EA was first issued on November 21, 2018 without any Part II Orders being received.

Exhibit 1.1 – Development Area 1, Sarnia Official Plan



1.2 Study Purpose

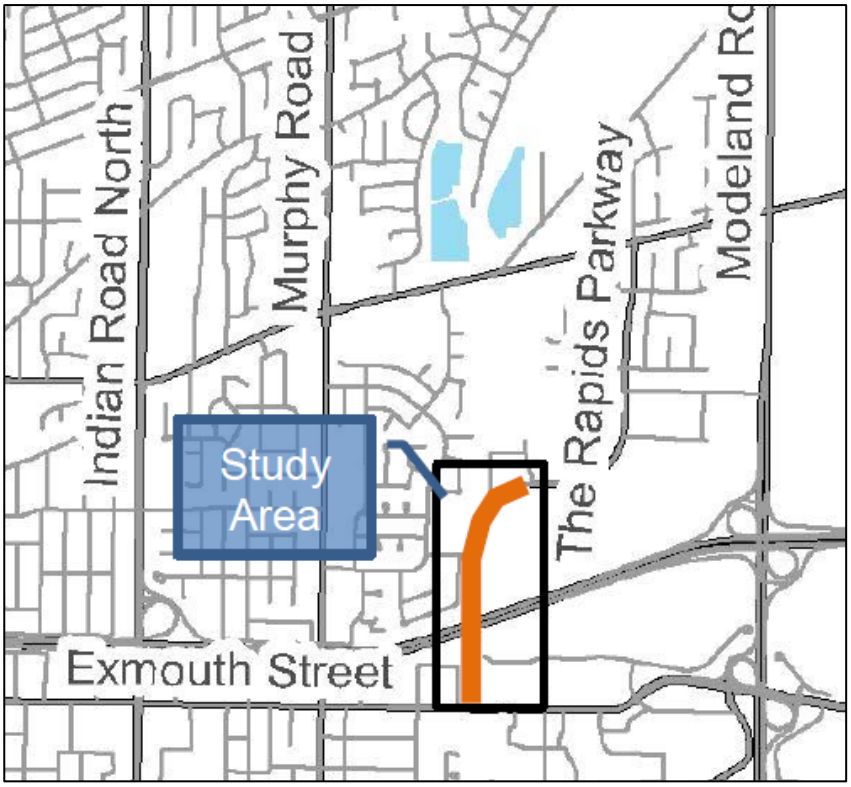
The purpose of this Class EA study is to review The Rapids Parkway extension and Howard Watson Nature Trail design alternatives based on the 2018 infrastructure EA. The study also focuses on mitigating the impact of the road extension on the Nature Trail, finding the optimal location to relocate the trail, and designing the new trail and related landscaping features to offset the impacts. The completed EA study will guide preparation of final designs, leading to project construction as required by the growth in Development Area 1 (see above). It will also allow the City to implement associated transportation improvements in the interim, such as at the Howard Watson Nature Trail crossing of Exmouth Street.

1.3 Study Area

Based on existing underground infrastructure, the 2018 infrastructure Class EA study area encompassed The Rapids Parkway road allowance from its current point of termination north of Highway 402, south to London Road. The roadway / trail EA study area does not require this study area extent, and so extends along The Parkway right-of-way between Sandpiper Drive and Exmouth Street as shown on Exhibit 1.2.

Note that the study area does not extend further south to London Road as the City does not expect such a connection to be required within the 10-15 year timeframe of this EA.

Exhibit 1.2 – The Rapids Parkway / Nature Trail Extension Study Area



1.4 Study Team

David Jackson	City, Director of Engineering (2020)
Alister Brown	City, Manager of Development & Transportation
Pratt Rawat	City, Manager of Design and Infrastructure
Patti Ross	City, Manager of Parks, Forestry & Horticulture
Mike Berkvens	City, Director of Engineering (2019)
Rob Cascaden	IBI Group, Project Manager (2019)
Sandra Hayman	IBI Group, Project Manager, (2020)
Don Drackley	IBI Group, Project Manager, EA Process
Zibby Petch	IBI Group, Active Transportation
Tim O' Brien	IBI Group, Landscape Architecture
Zara Brown	IBI Group, Landscape Architecture
Ted Brumfitt	IBI Group, Structural Engineering

1.5 Related Policy and Plan Conformance

1.5.1 City of Sarnia Official Plan

The City of Sarnia Official Plan (2014 as amended) designates land along the study area as 'Urban Residential' and 'Apartment Residential' north of Highway 402, and 'Commercial centre' to the south. Site specific land uses in the City's Zoning Bylaw in and around the study area also include:

- UR4-24 – For lands north of the Highway and east of the Nature Trail;
- OS1 – Open Space for the trail itself,
- CC1 – Commercial Centre for the large commercial properties near trail south of the Highway (Walmart, Leon's, Lowe's, Princess Auto); and
- UR1, UR2 and UR5 for existing abutting residential uses that include townhouses, a senior's residence and a number of single family homes.

These existing land uses represent property types that are either dependent on roadway access, and/or are generally compatible with road and trail development with appropriate noise and visual mitigation.

General Policies Section 6.4.1 of the Official Plan provides the following transportation system objectives that are addressed by the planned Parkway / Trail extension:

> *The City seeks to maximize the efficient use of land through urban development and mobility alternatives by:*
>
> *a) promoting policies and practices for moving goods and people that boosts the economic competitiveness and social cohesion of the City and County;*
>
> *b) developing an integrated multi-modal transportation system that is efficient and sustainable based on good planning, traffic engineering, and street design;*
>
> *c) promoting development and urban form that leads to fewer and shorter trips;*
>
> *d) improving access to affordable public transit and encouraging active transportation; and*
>
> *e) incorporating safeguards for the protection of the natural environment.*

Section 6.4.2 Road Network states:

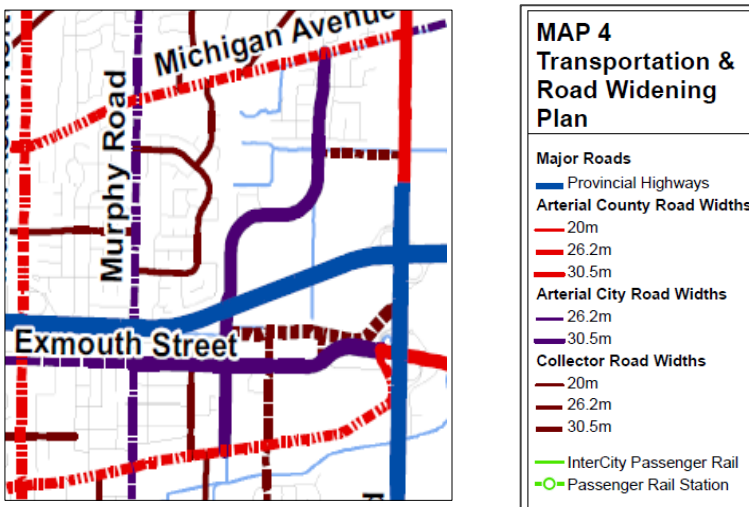
> ***Future/New Road Alignments***
>
> *The City may protect land for new alignments and additional right-of-way requirements. Final rights-of-way and alignments will be determined through detailed transportation studies, environmental assessments where required, and the planning approval process. Alignments may be secured which may differ from those shown on* ***Map 4*** (see Exhibit 1.3).

Section 6.4.5 Active Transportation states:

> ***1. Active Transportation Routes***
>
> *The location of active transportation routes shall generally conform to the approved Transportation Master Plan and consist of the following elements:*
>
> *a) on-road bicycle routes;*
>
> *b) multi-use trails;*
>
> *c) pedestrian walkways and sidewalks; and*
>
> *d) pedestrian and bicycle facilities.*

It is important to note that Map 4: Transportation of the Official Plan, with an excerpt shown next in Exhibit 1.3, includes The Rapids Parkway Extension.

Exhibit 1.3 - Excerpt from Map 4 Transportation: Sarnia Official Plan



1.5.2 Development Area 1 Secondary Plan

As previously shown in Exhibit 1.1, the Development Area 1 Secondary Plan part of the Official Plan includes the planned Parkway and Trail extension to serve transportation demands of 1,800 new dwelling units once fully built out by approximately 2029. This need and justification is further described in Sections 3 and 4.1 of this report.

1.5.3 Transportation Master Plan

The transportation system impacts of Development Area 1 full buildout was addressed in the City's 2014 Transportation Master Plan. It concludes that the portion of The

Rapids Parkway constructed north of Highway 402 currently provides access to new subdivision development in that area and operates at an acceptable Level-of-Service (LOS) except during peak high school drop-off-pick-up times.

However, as Development Area 1 is built out, and generates additional AM and PM peak hour trips, the Exmouth/Murphy and Exmouth/Barclay intersections are expected to be over capacity. The Rapids Parkway extension under Highway 402 to Exmouth Street using the existing highway tunnel will provide a new direct link to/from the retail area south of the highway, while also preventing overloading of the Berger Road and Modeland Road intersections. Therefore, the road extension is recommended by the Transportation Master Plan. An update of the study area traffic analysis is provided in Section 4.2 of this ESR.

1.5.4 Provincial Policy Statement – 2014

Policies of the 2014 Provincial Policy Statement that support this study are *highlighted* as follows:

1.0 Building Strong and Healthy Communities

1.1 Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns

1.1.1.g. ensuring that necessary infrastructure and public service facilities are or will be available to meet current and projected needs;

1.6.7 Transportation Systems

1.6.7.1 Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods and are appropriate to address projected needs.

1.6.8 Transportation and Infrastructure Corridors

1.6.8.1 Planning authorities shall plan for and protect corridors and rights-of-way for infrastructure, including transportation, transit and electricity generation facilities and transmission systems to meet current and projected needs.

1.7 Long term Economic Prosperity

1.7.1 Long-term economic prosperity shall be supported by:

f) providing for an efficient, cost-effective, reliable multi-modal transportation system that is integrated with adjacent systems and those of other jurisdictions, and is appropriate to address projected needs.

1.5.5 Ministry of Transportation Class Environmental Assessment for Provincial Transportation Facilities

Typically, where a Municipal Class EA involves Ministry of Transportation (MTO) property or infrastructure such as the planned crossing under Highway 402 in Sarnia, the municipal proponent is expected to address MTO EA requirements. In doing this, the 2018 infrastructure EA extending under the highway reviewed the current MTO Class EA document as amended July 14, 2000, and concluded that it would be classified by MTO as a Group D Activity because it involves miscellaneous works for a provincial transportation facility, namely the planned road/trail extension within an

existing bridged corridor under Highway 402.[3] It further indicated that MTO environmental assessment requirements for a Group D undertaking are minimal.

The current road / trail extension involves a type of corridor control included in the following MTO Group D activities:

> *- Proactive and reactive "corridor control" on and adjacent to provincial transportation facilities (under the Public Transportation and Highways Improvement Act), which may include the issuance of permits and licenses and the levy of charges and fees, for the facilities and undertakings of other proponents, in their own right and under their own responsibility, such as road access, entrances, drainage, grading, excavation, utilities, ..; and*
>
> *- Other analogous facility management activities."*
>
> *"Environmental impacts are not typically associated with facility administration activities; therefore screening for environmental assessment purposes is not undertaken"*.

Based upon this information and all of the MTO EA requirements for a Group D Activity have been addressed by this Schedule 'C' Municipal Class EA and the preceding 2018 EA for infrastructure crossing of Highway 402.

[3] Memo to Jodie Lucente, MTO from Kelly Vader, BM Ross, December 10, 2018

2 Municipal Class Environmental Assessment (EA) Process

The Municipal Class EA process is proponent-driven, so the City of Sarnia as the proponent determines how best to comply with and complete the EA process. In doing this, the City has followed the following basic EA principles:

- **Objective** – conduct the EA study with no pre-conceived solution preferences;
- **Reasonable** - consider only reasonable, meaning "feasible" alternatives;
- **Consultative** – contact all affected parties and the general public;
- **Systematic** - in how impacts on all aspects of the environment are evaluated; and
- **Traceable** - in how this decision-making process is documented.

2.1 Schedule 'C' Requirements

Because this study involves the extension of an existing transportation facility with construction of new facilities and major expansions to existing facilities, this EA study has confirmed that Schedule 'C' requirements of the EA process should be followed. This process involves a five-phase planning procedure under the Ontario Environmental Assessment Act, which applies to public infrastructure projects. Projects undertaken through this planning process are classified as one of four "Schedule" types, Schedule 'A' , 'A+', 'B" or 'C' in accordance with their degree of anticipated environmental impact and magnitude.

The Schedule 'C' Class EA process is broken down into five phases:

Phase 1: Identify the problem or opportunity;

Phase 2: Identify alternative solutions, evaluate and select preferred solution;

Phase 3: Identify alternative design concepts, evaluate and select the preferred concept;

Phase 4: Document in an Environmental Study Report the rationale, planning, design and consultation process and place it on public record; and,

Phase 5: Project implementation, complete contract drawings and tender documents and proceed to construction and operation of the project.

2.2 Part II Order Process

As part of the Class EA process, it is preferred that all interested parties work together to determine the preferred means of dealing with the subject problem or opportunity. If concerns regarding any substantial omissions within a study cannot be resolved in discussion with the proponent, in this case the City of Sarnia, then members of the public, interest groups or technical review agencies may write to the Ontario Minister of the Environment, Conservation and Parks requesting that the study be required to comply with Part II of the *Environmental Assessment Act* before proceeding with the proposed undertaking. The Ministry then decides whether to deny the request, refer the matter to

mediation or require the proponent to comply with Part II of the Environmental Assessment Act.

The procedures for dealing with concerns are outlined as follows:

1. For Schedule 'C' projects a person or party with a concern should bring it to the attention of the City of Sarnia (the proponent) in Phase 4 of the planning process.
2. If a concern is not resolved through discussion with the proponent, the person or party raising the objection may request the City of Sarnia to voluntarily elevate the Schedule 'C' project to an Individual Environmental Assessment.

If the City of Sarnia declines such a request, and the person or party with the concern wishes to pursue the matter, they may write the Minister or delegate to request a Part II Order. Any such request must use the Ministry's request form and be copied by the requestor to the City of Sarnia at the same time they are submitted to the Minister, or delegate. For a Schedule 'C' project, a written request form must be submitted to the Minister or delegate within the 30 day review period after the Notice of Study Completion has been issued.

3 Problem / Opportunity Definition (Class EA Phase 1)

3.1 Transportation Master Plan Findings

The City of Sarnia's Transportation Master Plan (TMP) has fulfilled the requirements for completion of Phases 1 and 2 of the Class EA process. Phase 1 confirms the problem and/or opportunity that the proposed road and trail extension is intended to resolve. The proposed extension will allow the existing Rapids Parkway, currently terminating at Sandpiper Drive, to continue south under Highway 402 and connect to Exmouth Street. A large section of the proposed route is currently the Howard Watson Nature Trail.

The transportation-related advantages of this extension are addressed in the TMP. It confirms that the existing part of The Rapids Parkway constructed north of Highway 402 currently provides access to new subdivision development in that area and operates at an acceptable Level-of-Service with current traffic volumes in the area.

3.2 Problem Definition

The TMP concluded that as the planned Development Area 1 west of Modeland and north of Highway 402 is built out, expected by 2029, it will generate additional AM and PM peak hour trips. As a result, the Exmouth/Murphy and Exmouth/Barclay intersections are expected to be over capacity.

In 2017 the City retained WSP to conduct an updated Rapids Parkway Extension Traffic Study to reconfirm the TMP problem statement. The study used a ten year planning horizon to 2027 for Development Area 1 with 1,133 residential units and commercial densities of approximately 660,000sq.ft. According to the WSP study, this future development is expected to generate additional area traffic in the order of 1,506 AM peak hour trips (653 inbound and 853 outbound), 2,890 PM peak hour trips (1,486 inbound and 1,404 outbound) and 4,131 Saturday peak hour trips (2,188 inbound and 1,943 outbound).

This added area development traffic was assigned to the study road network for the 2027 ten year horizon under two future scenarios; 1) no Rapids Parkway Extension and 2) with The Rapids Parkway Extension. Assessment indicates that capacity deficiencies will occur under background conditions with no extension. As a result, the study recommends in part that:

> *The Rapids Parkway extension should be planned for implementation within the ten year horizon to coincide with the on-going area development to mitigate capacity deficiencies at study intersections.*

Additional recommendations are made for the design of new intersections along the extension as incorporated into this EA study's preliminary design.

3.3 Opportunity Definition

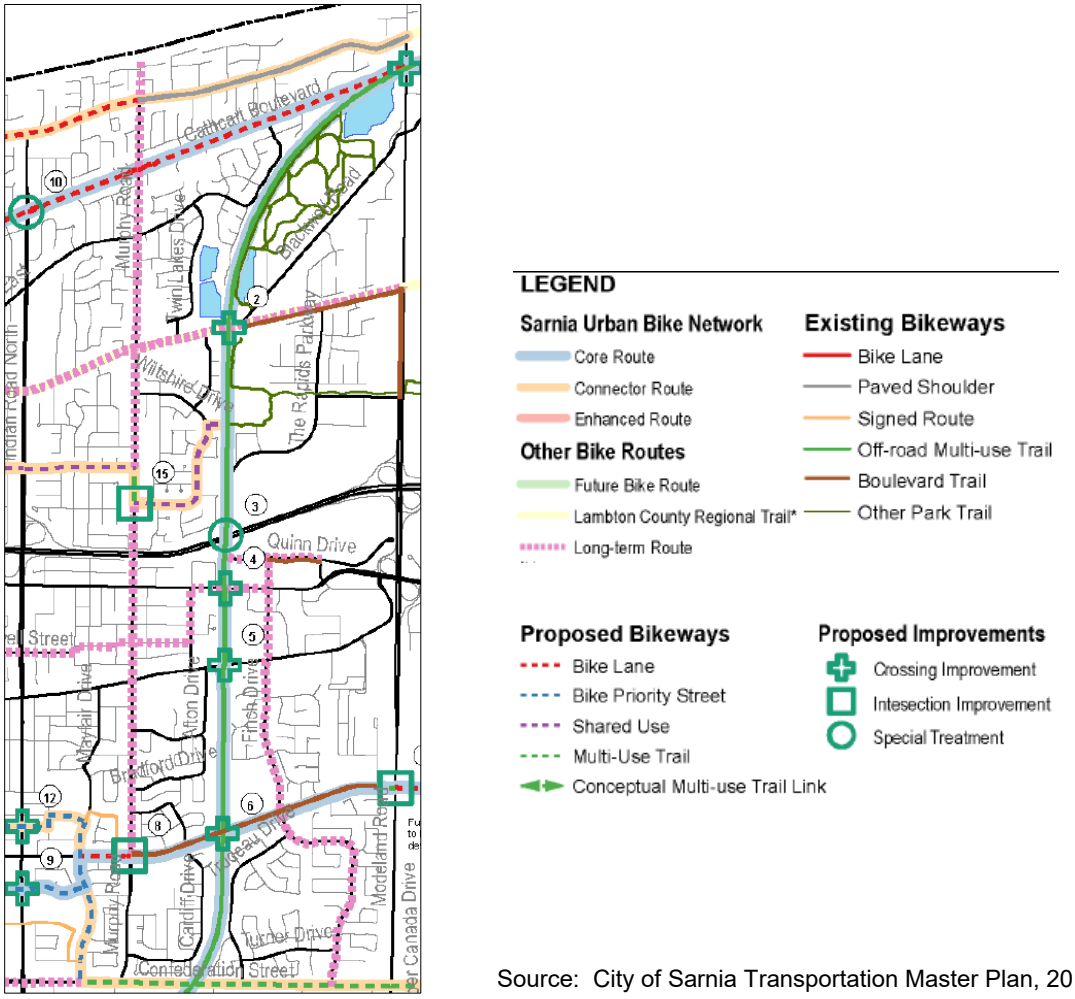
The TMP found that The Rapids Parkway extension under Highway 402 to Exmouth Street using the existing highway tunnel provides the opportunity for a new direct link to/from the retail area south of the highway, while also preventing overloading of the

Berger Road and Modeland Road intersections. This Parkway extension provides substantial relief to the existing road network and would adequately accommodate future development traffic within the study area that would otherwise overload the existing road network. Also, further Parkway extension south from Exmouth Street to London Road is found to not be required with full buildout of Development Area 1, and so is not part of this current EA study.

Furthermore, the TMP and subsequent 2017 Traffic Study both used a Rapids Parkway extension configuration of one travel lane per direction. This provides sufficient capacity for the 2027 planning horizon during all study peak hours. Refer to Section 4.2 and **Appendix 1 – Traffic Study** for further information on traffic analysis supporting this study.

This study also provides the opportunity to preserve the Howard Watson Nature Trail along the new road as discussed further in this report. This Active Transportation extension is recommended in the City's Transportation Master Plan as shown on Exhibit 3.1. This includes trail crossing improvements at strategic roads including Exmouth Street.

Exhibit 3.1 – Howard Watson Nature Trail in the Planned Urban Bikeway Network



Source: City of Sarnia Transportation Master Plan, 2014

4 Alternative Solutions – Preferred Solution (Class EA Phase 2)

4.1 Alternative Planning Solutions and Preferred Solution

As noted in the Section 1.1 introduction to this report, the City separated preparation of the infrastructure EA under Highway 402 from The Rapids Parkway / Nature Trail EA because these two projects are functionally separate and related only by geography.

This functional difference is seen clearly in the identification of alternative planning solutions. Phase 2 of the EA process requires that reasonable, feasible alternative solutions to the identified problem (see previous Section 4) be evaluated. For the previous infrastructure EA for sewage and water infrastructure extensions under Highway 402[4], the nature of buried alignments allowed the City to evaluate five (5) different alternative alignments for The Rapids Parkway Extension road allowance, including major and minor offset alignments west and east of this allowance and a Do Nothing alternative. That EA selected a minor 50 metre offset east of the road alignment under Highway 402 for the buried infrastructure.

However, for the road extension, minor offset alignments are not applicable for a road design that must follow strict engineering design standards. Furthermore, since 1997 the Secondary Plan for Development Area 1 has been based on a land use pattern that incorporates The Rapids Parkway and associated trail system, as shown previously in Exhibit 1.1.[5] Specifically the Secondary Plan states:

> *Section 3.4.3 – A pedestrian trail extension to the extended Howard Watson Nature Trail shall be provided in the west half of the right-of-way and share with an arterial roadway that portion of the existing former C.N.R right of way in Development Area 1 extending from a point south of the south limit of Wiltshire Park to London Road…*
>
> *Section 3.7.2 – Access to the development area shall be provided by an internal road system comprised of:*
>
> *(i) The phased extension of The Rapids Parkway (a north/south arterial located both in the Development and part of the former C.N.R right-of-way from London Road to Michigan Avenue…*

NOTE: The study area for this EA does not extend to London Road, but terminates at Exmouth Street.

These statutory plan requirements mean that there are no alternative alignments for The Rapids Parkway extension other than the alignment in the Development Area 1 Secondary Plan. This alignment was made with full consultation with stakeholders and the public at formal and informal meetings, and through a public hearing required under the Planning Act.

The only other alternative planning solution is the Do-Nothing alternative. Since no extension of The Rapids Parkway and Nature Trail would not address the problem and

[4] B.M. Ross & Associates Ltd., February 23, 2019
[5] Development Area 1 Secondary Plan, City of Sarnia, March 3, 1997

opportunity identified by this EA (Section 4), it is not considered to be a reasonable alternative.

With the preferred planning solution identified, Phase 2 of the Class EA next inventories the social, natural and economic environments associated with the preferred alignment. This inventory, conducted in part through the previous infrastructure EA in 2018 and augmented with additional information in 2019 is described as follows.

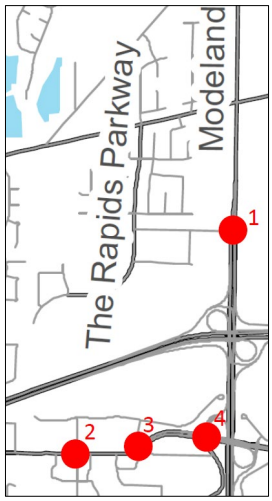
4.2 Social Environment - Transportation Conditions

As previously reported in Section 3.1 of this report, the City's Transportation Master Plan identifies existing and future Sarnia roadway network Level-of-Service at key intersections, future travel demands to 2029 and resulting major network improvement recommendations including extending The Rapids Parkway.

The subsequent Traffic Study conducted for the City in 2017 on The Rapids Parkway Extension is based on planned developments in east Sarnia adding the following new trips to the area road network:

New Traffic Period	**Total New Trips**
Weekday AM Peak Hour	1506
Weekday PM Peak Hour	2890
Typical Saturday Peak Hour	4130

The 2017 Traffic Study found that this added traffic volume will result in some intersections operating over capacity and congested at the following key locations shown here:



5. Modeland Road and Berger Road
6. Lambton Mall Road and Exmouth Road
7. Exmouth Road & London Line and Barclay Drive
8. London Road/Southbound Highway 40 Off-Ramp and London Line

Adding traffic signals may also be an option at:

- The Rapids Parkway / Quinn Drive (with a roundabout option)
- Exmouth Street / The Rapids Parkway
- Quinn Drive / Lambton Mall Road

The 2017 Traffic Study also notes that:

> *If traffic volumes increase beyond the projected full build out, the potential for further extension of Rapids Parkway to London Road could be investigated at that time to improve overall network capacity.*

As a result, this current Class EA does not extend south of Exmouth Street to London Road within the 10 year timeframe of this EA.

The 2017 Traffic Study concludes with the following recommendations that have been assessed in the design of the planned Rapids Parkway extension:[6]

> *The Rapids Parkway extension provides substantial relief to existing network and would adequately accommodate future development traffic within the study area that would otherwise overload the existing road network.*
>
> *Extension of Rapids Parkway should be planned for implementation within the ten year horizon to coincide with the on-going area development to mitigate capacity deficiencies at study intersections.*
>
> *Provide a southbound left-turn lane and northbound right-turn lane at the intersection of Rapids Parkway and Berger Road. Building a roundabout as an alternative solution to the addition of turn lanes could also be investigated to improve the operations at this location.*
>
> *Provide a southbound left-turn lane and dedicated westbound and right-turn* lanes at the intersection of Quinn Drive and Rapids Parkway extension.
>
> *Dedicated southbound left and right-turn lanes, dedicated eastbound left-turn and shared through right lane is recommended for the intersection of Exmouth Street and The Rapids Parkway.*
>
> *The analysis shows that traffic signal is not warranted at the intersections of Quinn Drive and Rapids Parkway, Exmouth Street and Rapids Parkway and Quinn Drive and Lambton Mall Road. However, without signalization, these intersections and/or some of their movements are expected to operate over capacity and at poor LOS E or F under future traffic conditions. It is recommended that the operations of the above intersections be monitored and signal warrant to be re-evaluated before the full future buildout of the study area.*

4.2.1 Traffic Study Update 2019

Owing to the need to monitor specific traffic conditions in the study area as recommended in the 2017 traffic study, an Addendum was prepared by WSP in the spring of 2019 to:

- Analyze impact of limiting extension of The Rapids Parkway to Quinn Drive and what impact that has on the network at Development Area Full Buildout;
- Identify trigger point for when The Rapids Parkway extension should be completed (i.e. when Rapids/Berger and Berger/Modeland become congested) and any other study area intersections;
- Review option of roundabouts at Rapids/Quinn and Quinn/Lambton Mall Road intersections;
- Review if the existing double left turn at Exmouth/Lambton Mall could be removed under current conditions; and
- Review warrant for crossing control (signal, PXO, other) at Exmouth Street / Howard Watson Nature Trail.

[6] Rapids Parkway Extension Traffic Study, Final Report, WSP, October 2017

The 2019 Update is included as **Appendix 1** of this report and concludes that:[7]

6. Reducing The Rapids Parkway extension to Quinn Drive would have the intersection of Lambton Mall Road & Exmouth Street operating above capacity during the Saturday peak hour due to a substantial amount of left-turning traffic being redirected there. Also, with the reduced extension there are several other movements approaching capacity and with long delays. Overall, conditions at the intersection of Lambton Mall Road & Exmouth Street as well as along Quinn Drive are generally better with the full extension in place. As such, while the reduced extension is operationally feasible, it may pose problems for people seeking to access the existing and proposed retail establishments in the area along Quinn Drive.
7. The full extension of The Rapids Parkway to Exmouth Street does present significant benefits to accessing the commercial developments in the area;
8. Regardless of the status of the extension, the removal of the additional northbound left should be considered to reduce the lost time at the intersection; and
9. Based on an assumed 50% level of development, there are operational benefits associated with completing The Rapids Parkway by 2024. This is primarily due to the lack of alternatives associated with an access to the developments in the area. Continued monitoring of traffic volumes should be done as developments in the area become occupied to improve the trip generation estimates.
10. An intersection of The Rapids Parkway and Quinn Drive could also be configured as a two-leg roundabout and would be functionally identical to an elbow curve. This design option is considered further in subsection 5.3 and 5.4 of this report.

4.3 Natural Environmental Inventories

Phase 2 of the Class EA process requires that an inventory be conducted of existing natural environmental conditions.

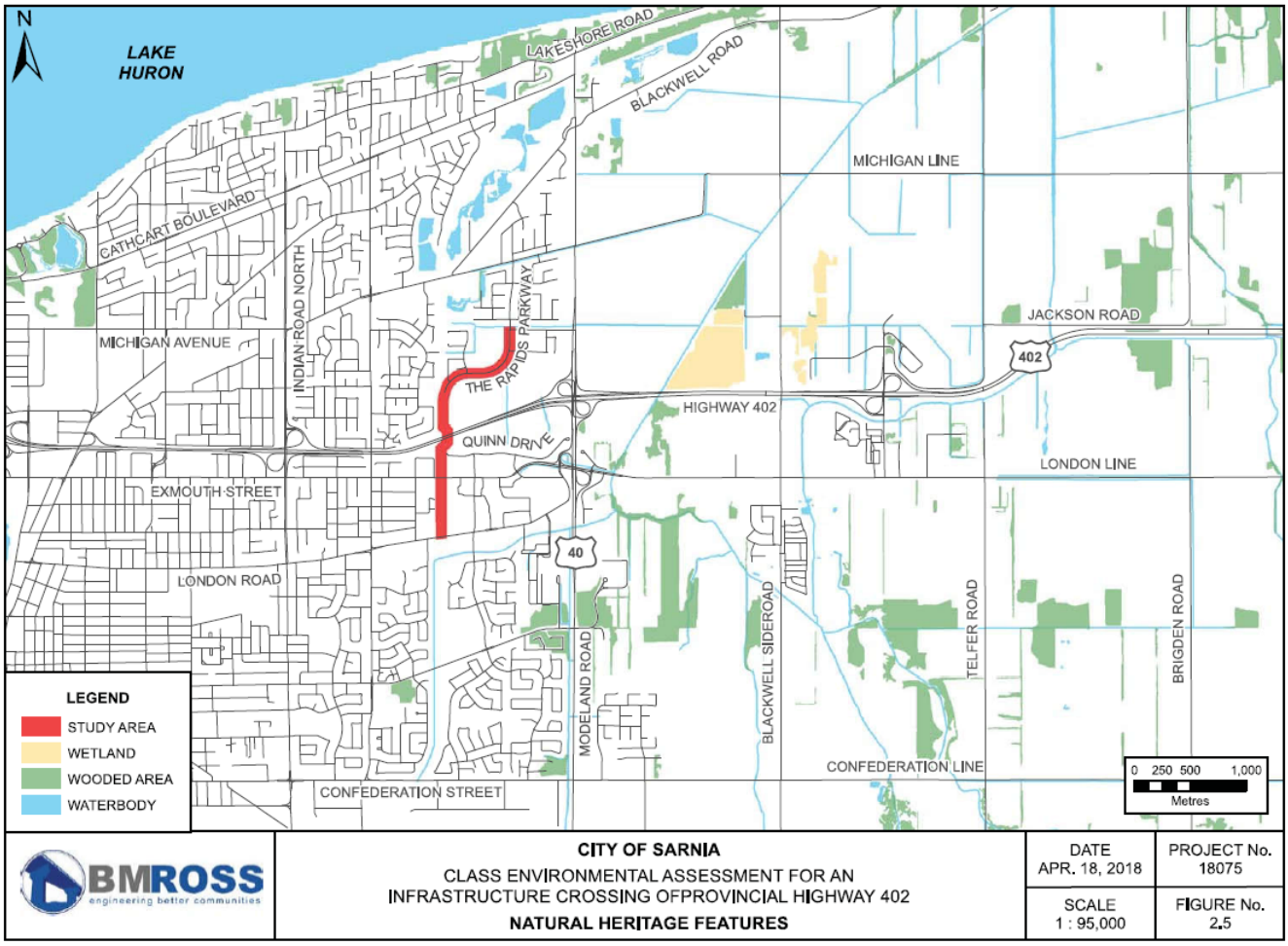
The following inventory results were collected for the infrastructure Class Environmental Assessment (EA) conducted in 2018. It remains valid and relevant for the new road/trail extension EA study area.[8] *Italics* text denotes information summarized directly from the February 23, 2019 EA Screening Report. Reference should be made to the 2019 report for complete inventory information.

4.3.1 Natural Heritage Environment

The following Exhibit 4.1 – Natural Heritage Environment is taken from Figure 2.5 of the infrastructure EA Screening Report and shows the location of natural heritage features located in the general vicinity of the study area.[9]

Exhibit 4.1 – Natural Heritage Environment

[7] Rapids Parkway Extension Traffic Study Update, WSP, October 11, 2019
[8] Municipal Class Environmental Assessment Infrastructure Crossing of Provincial Highway 402 Corridor, B.M. Ross and Associates Limited, February 23, 2019
[9] Ibid



Source: infrastructure EA Screening Report, 2019

4.3.2 General Physiography

The study area is within the physiographic region known as the St. Clair Clay Plains extending over an area of approximately 5,200 square kilometers east of the St. Clair River and south of Lake Huron. The clay plain in Lambton County consists of a shallow layer of clay that overlays a till plain. Soils in Lambton County are generally not well drained. The western part of the study area has soils known as Perth Clay, a grey-brown podzol with imperfect drainage. Near the CN rail line, soils are classified as Caistor Clay, a grey-brown podzol also with imperfect drainage.

The northern portion of the study drains to a tributary of the Wawanosh Drain, which is part of the Perch Creek sub-basin. Perch Creek and Cow Creek watersheds are located in the east portion of the City of Sarnia, ultimately discharging to Lake Huron near Bright's Grove. The Perch and Cow Creek watershed covers 266 km2 and is comprised of a number of smaller tributaries.

The 2013 Watershed Report Card, prepared by the St. Clair Region Conservation Authority, identified poor forest cover, riparian cover and forest interior conditions within the watershed. Surface water quality in the watershed was also assessed and slightly elevated levels of phosphorus were identified. A copy of the Watershed Report Card is included in Appendix A of the February 23, 2019 infrastructure EA Screening Report.

4.3.3 Tree Inventory

A basic tree inventory was conducted in two main sections of The Rapids Parkway extension corridor in 2016 and again in 2018 by Wyoming Tree Service for Pollutech. Both reports are included as appendices to the B.M. Ross infrastructure screening report.

The 2016 report concludes that a predominantly healthy stand of common tree varieties were identified. Some trees are many years old and have attained extensive growth. The report states that removal of these trees to construct a roadway "*would not affect the sustainability of any of the endangered tree species in Ontario,*[10] *it could have a negative impact on the economy and environment of the local community. If construction proceeds, a tree management plan should be implemented to preserve as many trees as possible as well as to plant trees replacing any removed."*

Another tree inventory by Wyoming Tree Service was conducted in 2018. Two hundred and twenty-one (221) mature trees were identified in the survey area along the nature trail. The tree density varies in the survey area but an average of 110 trees per hectare was estimated. The survey concluded that *"No endangered species were found in the area surveyed. The overall health of the trees was found to be normative for local forest habitats. The majority of trees were found to be in fair health."*

The 2018 survey concluded with the same recommendation for a tree management plan noted above from the 2016 survey.

4.3.4 Natural Heritage Features: Areas of Natural and Scientific Interest (ANSI)

For the infrastructure EA in 2018, a search of the NHIC database revealed that there are no Areas of Natural and Scientific Interest (ANSI's) situated in the vicinity of the study area. The 2018 EA study concluded that "*the project will have no direct impacts to the natural heritage features located in proximity to the project study area given their distance and the scope of the project."*

4.3.5 Species at Risk Screening – Aquatic Habitat

Aquatic Species at Risk are aquatic based species that either live in, or rely on, an aquatic habitat for a significant portion of their life cycles. In conjunction with information collected from MNRF and Environment Canada Species at Risk Registry, a publically available aquatic species at risk mapping tool was utilized in determining the potential presence of aquatic species at risk and their associated critical habitat within the vicinity of the proposed project.

A number of constructed drains (open and closed) exist within the project area which provide stormwater control and ultimately connect to the Perch Creek sub-basin. Based on a review of screening maps, provided by the Department of Fisheries and Oceans (DFO), no aquatic species at risk are present in close proximity to the project location, given the lack of aquatic habitat present.

[10] The province has identified eight tree species in Lambton County as endangered, threatened of special concern under the Endangered Species Act (2007). None of these endangered species are found in the study area surveyed.

4.3.6 Species at Risk Screening – Birds

Breeding Bird Habitat

The Atlas of Breeding Birds of Ontario (2001-2005) was used to identify the bird species with confirmed, probable and possible breeding habitat in proximity to the study area (Bird Studies Canada, 2009). The study area lies within the 100 km2 area identified by the Atlas as Square 17LH96, in Region 3: Lambton County. Within the squares, a total of 46 bird species are confirmed to be breeding, including at risk species such as the Bank Swallow and Barn Swallow. An additional 5 species were categorized as having probable breeding status and 11 are considered to have possible breeding status in the area (Bird Studies Canada, 2009).

The survey area includes key habitat for the identified species, such as forests (in all stages of growth), riverine areas, agricultural areas, wetlands and shoreline areas. The project area forms a relatively small portion of this region and habitat opportunities. Habitat opportunities may exist for breeding birds within the vegetated areas located adjacent to the existing Howard Watson Nature Trail or on the highway underpass.

Migratory Birds[11]

Two (2) species of migratory birds appearing on the List of Birds Protected in Canada Under the Migratory Bird Convention Act, 1994, were identified within the study area during the field assessment. These were the American Robin and the Hairy Woodpecker.

As these species are not listed as endangered, threatened, or extirpated under the federal Species at Risk Act (SARA), a federal SARA permit is not required in relation to their presence. Permitting is also not required under the Migratory Birds Convention Act, 1994; however, the proponent is responsible to conduct the work to avert the "incidental take" of migratory birds and the disturbance, destruction or taking of the nest of a migratory bird are prohibited under Section 6 of the Migratory Bird Regulations of the federal Migratory Birds Convention Act, 1994.

"Incidental take" is the killing or harming of migratory birds due to "economic" activities not primarily focused on taking migratory birds, such as the construction and maintenance of road infrastructure. Environment Canada (Canadian Wildlife Service) will not issue a Damage or Danger Permit for such economic activities. It is the proponent's responsibility to avoid activities that would result in incidental take or otherwise contravene the Migratory Bird Regulations.

Work activities conducted during the breeding season, such as vegetation clearing, placement of fill and the modification of bridge structures may have the potential to destroy migratory birds and their nests. In order to comply with the Migratory Birds Convention Act, prior to conducting work with the potential to destroy migratory birds during the identified breeding season for migratory birds, a nest survey must be conducted by a qualified biologist prior to commencement of the works to locate and identify active nests of species covered under the Migratory Birds Convention Act.

As the vegetation clearing required to facilitate the planned road extension will be outside of the breeding season for these species, no impacts to active nesting habitat are expected to be associated with the project.

[11] B.M. Ross Infrastructure Crossing Screening Report, February 23, 2019, Appendix B Species At Risk Screening Report and MNRF Clearance Letter, Pollutech Enviroquatics Ltd, July 5, 2016

4.4 Socio-Cultural Environment

4.4.1 Adjacent Land Use

Land uses along the study area corridor are primarily residential and commercial activities with several remnant natural features along the verges of the nature trail. A vacant agricultural field (planned for residential development) is also located adjacent to the northerly extent of the study area, immediately north of the highway corridor. South of the corridor, the Home Depot parking lot is located immediately east of the corridor with a small wooded area separating the parking area from the granular trail surface. The west side of the corridor, at this location, abuts a small wooded area located immediately south of the highway.

A number of multi-unit residential developments are located adjacent to the corridor between Quinn Drive and Exmouth Street, including several senior-oriented retirement facilities. Trees and shrubs line the trail for the entire length of the corridor, providing screening for trail activities from adjacent properties.

4.4.2 Cultural Heritage Screening

At the request of the Ministry of Tourism, Culture and Sport (MTCS) as part of the 2018 B.M. Ross infrastructure Class EA, the ministry's Built Heritage Resources and Cultural Heritage Landscapes Checklist was completed, submitted to the ministry and included in Appendix E of that EA Screening Report. They concluded that further assessment of built and cultural heritage resources is not required for The Rapids Parkway / Trail extension study area.

4.4.3 Stage 1 and 2 Archaeological Assessment

As part of the 2019 EA, MTCS also requested that their Criteria for Evaluating Archaeological Potential be completed as part of the 2018 infrastructure Class EA. It concluded that an archaeological assessment was required. A Stage 1 and 2 Archaeological Assessment for The Rapids Parkway extension was prepared by Timmins Martelle Heritage Consultants Inc. dated August 2018 and submitted to MTCS. The report is included as Appendix E of the B.M. Ross infrastructure EA Screening Report.

Stage 1 of the study concluded that "*the subject property is in proximity (i.e., within 300 metres) to several features that signal archaeological potential, namely: 1) well-drained sandy soil (Brady Sandy Loam); and 2) two 19th century travel routes (Exmouth Street and London Road).*"

Because the inventory area demonstrates potential for the discovery of archaeological resources, a Stage 2 archaeological assessment was recommended. In summary, all of the inventory area property was considered to have archaeological potential pending the Stage 2 field inspection.

No archaeological materials or sites were identified during the Stage 2 test pit survey of the subject property. Stage 2 concluded that "*the subject property should be considered free of archaeological concern… no further archaeological assessment is recommended*".

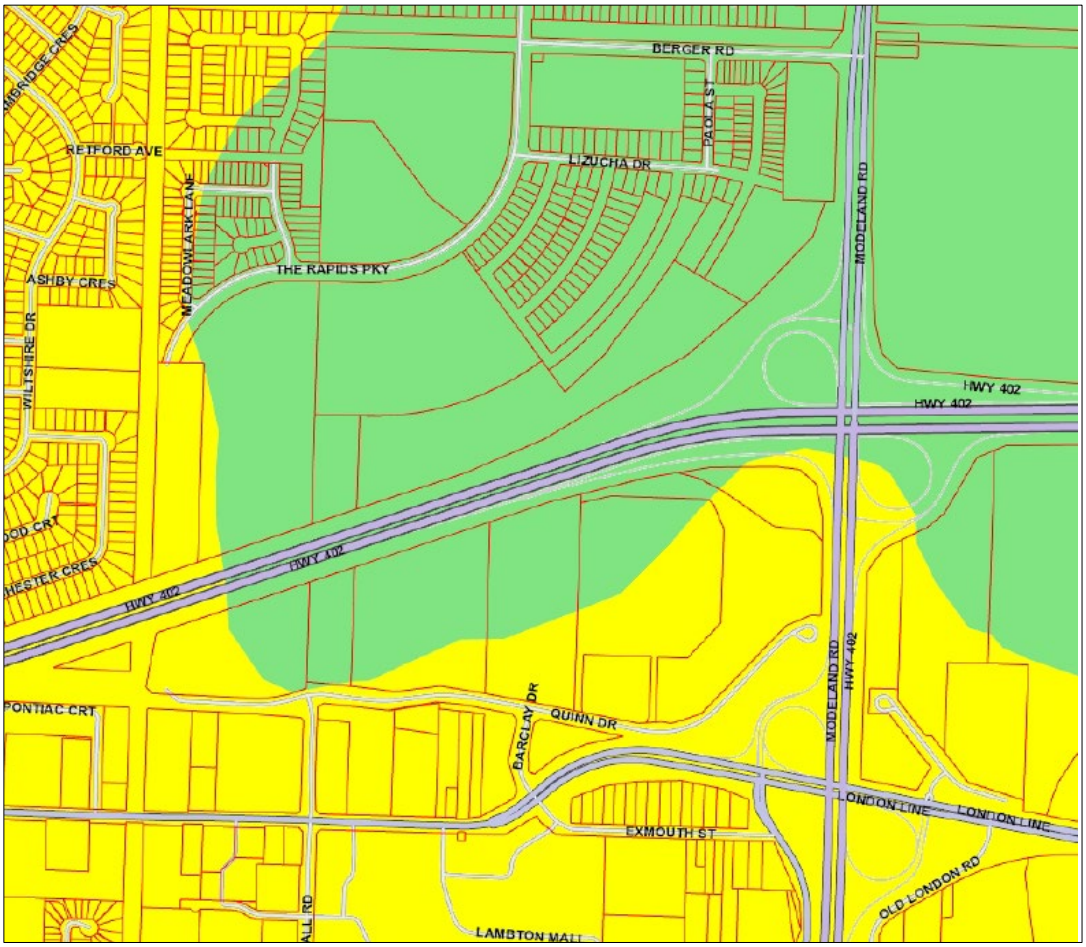
4.4.4 Source Water Protection

For the purposes of Source Water Protection, Sarnia is located within the Thames-Sydenham Source Protection Region which includes watersheds managed by the Lower Thames Valley Conservation Authority, St. Clair Region Conservation Authority and the Upper Thames River Conservation Authority. The study area for this EA is in the St. Clair Region Conservation Authority (SCRCA) jurisdiction.

The serviced urban area of Sarnia is served by the Lambton Area Water Supply System (LAWSS) which draws water from the St. Clair River, near the community of Point Edward.[12] As part of the 2018 infrastructure EA Screening Report, vulnerable areas located in and near Sarnia were mapped as shown on Exhibit 4.2 – Significant Groundwater Recharge Areas (Figure 2.6 from the B.M. Ross 2019 infrastructure EA Final Screening Report).

Exhibit 4.2 shows that most of the road / trail extension corridor that is the subject of this current Class EA is located within the limits of Significant Groundwater Recharge Area (SGRA) "Vulnerability 2 shown in green and 6 shown in yellow, as is the planned subdivision expansion.

Exhibit 4.2 – Significant Groundwater Recharge Areas



[12] Thames-Sydenham and Region Source Protection Committee, 2015

A SGRA is an area within which it is desirable to regulate or monitor drinking water threats that may affect the recharge of an aquifer. Consultation with SCRCA Source Protection staff will occur once a preferred alternative road / trail extension is selected in order to ensure that potential impacts to these sensitive areas and associated mitigation recommendations are given consideration. These recommendations are included as commitments in Section 8.4 of this report. Also, from liaison with the Source Protection Coordinator at the Thames-Sydenham and Region Drinking Water Source Protection Region, it is noted that significant threats to drinking water do not exist in areas designated as SGRAs. Only moderate and low threats to drinking water may exist.

Below are Threat Types as listed in the Thames-Sydenham & Region Source Protection Plan that may apply to this project. Significant threats to drinking water do not exist in areas designated as SGRAs. Only moderate and low threats to drinking water may exist, including:

Associated Threats:

- Application, handling and storage of road salt
- Storage of snow
- Spills prevention, spills contingency and emergency response plans

These threats occurs within all Sarnia road right-of-way corridors and do not apply solely to the subject road / trail extension. The City of Sarnia already maintains best practices and follows legislation in place to ensure that these items do not become a risk to drinking water sources.

Intake Protection Zone 1 (IPZ-1 and -2) and Wellhead Protection Areas (WHPA – A, B, and C), with higher vulnerability scores (8 or higher) are the most vulnerable protection zones, but do not involve the planned road / trail extension corridor in Sarnia.

4.4.5 Geotechnical Conditions – Contamination Overview

In 2018 EXP Services Inc. (EXP) was retained by the City of Sarnia to conduct a geotechnical investigation for the proposed sanitary forcemain and watermain installation along the Howard Watson Nature Trail from Highway 402 to just south of Willa Court. This study area did not extend north of the Highway because The Rapids Parkway extension as planned does not follow the abandoned CPR rail corridor straight north of Highway 402, but diverts easterly to connect with the existing Parkway road alignment. Geotechnical findings south of the highway will be relevant to the design of The Rapids Parkway extension.

According to the EXP report, the investigation "*did not test for contaminants that may be considered hazardous. This testing and a potential hazard study can be carried out prior to detailed design if so requested."* For example, in most residential/commercial areas undergoing reconstruction as in Sarnia, buried oil tanks are common, but not detectable using conventional geotechnical procedures.

The EXP investigation confirmed that no methane was detected in any of the boreholes.

5 Alternative Design Concepts for Preferred Solution (Class EA Phase 3)

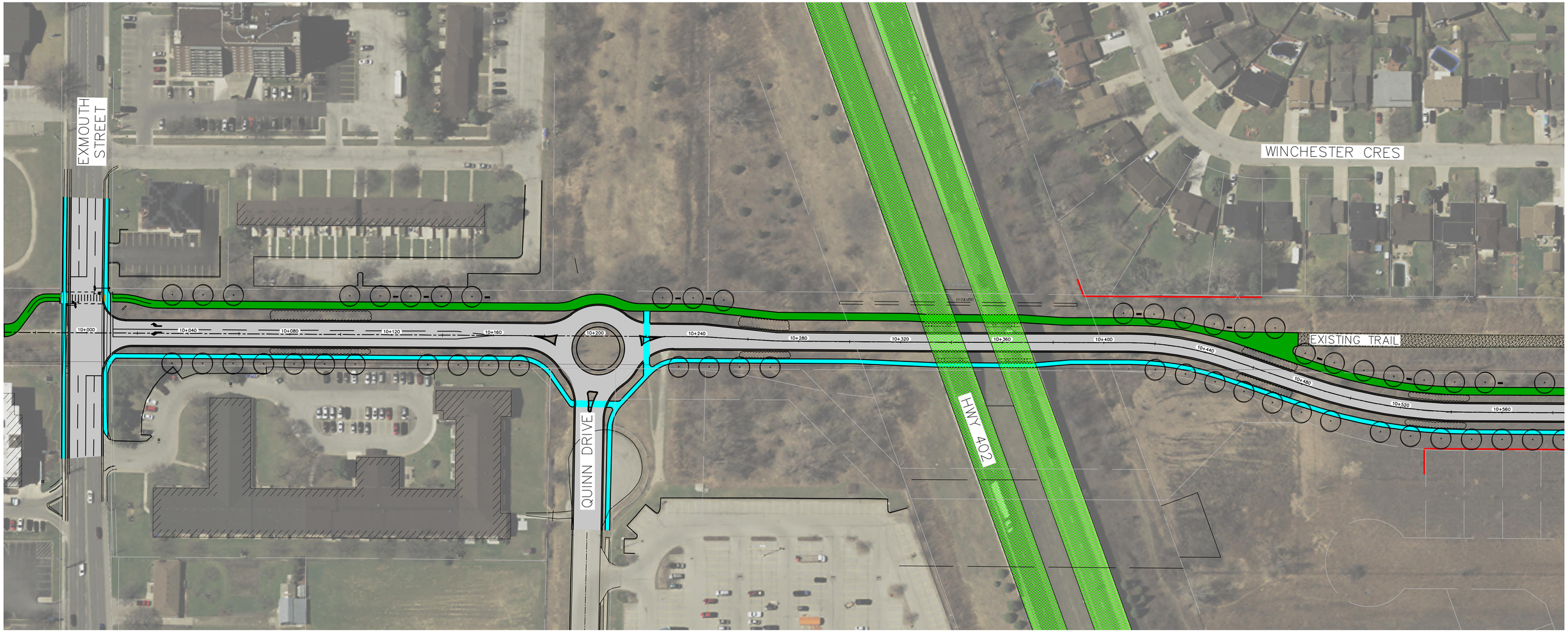
Possible design concepts that may be used to implement the preferred Rapids Parkway / Trail Extension alignment are identified and evaluated in Phase 3 of the EA process. The following conceptual design alternatives have been evaluated in terms of potential impacts.

5.1 Design Alternative #1 – Road/Trail Alignment North/South of Highway 402

Phase 3 of the Class EA process requires that alternative design concepts be identified and evaluated to address the established Problem / Opportunity (Phase 1) and Preferred Solution (Phase 2). In the case of the planned Rapids Parkway Extension, the road and associated trail alignments are dictated by four associated alignment factors that restrict consideration of any alternative alignments north and south of the Highway 402 crossing:

- The approved Secondary Plan (see Exhibit 1.1) from the Sarnia Official Plan (see Exhibit 1.3) established the functional alignment of the Parkway / Trail Extension.
- This alignment was subsequently confirmed by the City's 2014 Transportation Master Plan;
- Existing residential development has been built along a northern portion of this alignment;
- Subdivision plans have been developed for the remaining lands abutting the planned alignment; and
- Alignment of the planned infrastructure crossing under Highway 402 (see previous Exhibit 3.1) is also based on the established road and trail alignment, except for the section immediately under the highway as described next.

Based on these conditions, the proposed alignment of The Rapids Parkway road and trail extension north and south of Highway 402 is shown on Exhibits 5.1A and 5.1B.



LEGEND:

ROADWAY

MULTI-USE PATH

CURB & GUTTER

SIDEWALK

EX RIGHT OF WAY / PROPERTY LINE

EX HYDRO LINE / POLE

PROPOSED NOISE MITIGATION FEATURE

POTENTIAL LANDSCAPING/ TREE

SHRUBS/PERENNIALS/GRASSES

BENCH

CONSULTANT OR DIVISION

IBI GROUP
203 – 350 Oxford Street West
London ON N6H 1T3 Canada
tel 519 472 7328 fax 519 472 9354
ibigroup.com

SARNIA ONTARIO·CANADA

SCALE
HORZ – 1 : 500
5,0 0 10m
VERT – 1 : 50
0,5 0 1m

TITLE
THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

PROPOSED ALIGNMENT

PROJECT No. 120368

SHEET No. EXHIBIT 5.1A

PLAN FILE No.

J:\120368-RapidsParkway\EA\5.0 Drawings\Civil\layouts\Rapids Parkway_PP.dwg

LEGEND:

ROADWAY		CURB & GUTTER		EX RIGHT OF WAY / PROPERTY LINE	
MULTI-USE PATH		SIDEWALK		EX HYDRO LINE / POLE	
POTENTIAL LANDSCAPING/ TREE		SHRUBS/PERENNIALS/GRASSES		PROPOSED NOISE MITIGATION FEATURE	
BENCH					

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SARNIA ONTARIO•CANADA

SCALE
HORZ – 1 : 500
5.0 0 10m
VERT – 1 : 50
0.5 0 1m

TITLE
THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

PROPOSED ALIGNMENT

PROJECT No. 120368

SHEET No. EXHIBIT 5.1B

PLAN FILE No.

5.2 Design Alternative #2 – Corridor Alignment Under Highway 402

Initially a cross section alternative was submitted to the Ministry of Transportation (MTO) showing some fill beyond the roadway under Highway 402. This cross section essentially elevated the sidewalk and multi-use pathway with fill above the existing piers and a retaining wall between the pathways and the roadway. Following the receipt of MTO's comments (see Section 6.1.2), IBI revised the cross section to address their concerns.

Based on the MTO's comments, Exhibit 5.2 shows the revised cross-section.

Advantages

The revised cross-section shows the proposed sidewalk and multi-use pathway on either side of the existing piers, roughly at the same elevation of the roadway. A retaining wall with a pedestrian railing is then located beyond this. This cross section addresses MTO concerns with the structural crossing under Highway 402, planning and design issues, geotechnical requirements and general concerns about drainage and possible impacts on existing piers and footings associated with a possible bridge replacement in the future.

The alignment under the highway minimizes the conflict between high-speed vehicular traffic and trail users. It also eliminates the need for traffic control that would be required to mitigate that conflict.

The existing trail currently connects under Highway 402, therefore users are accustomed to the concept of using an underpass.

While there are constraints to the width of the underpass, the corridor allows a full 3.0m multiuse path width on the west and a 1.5m sidewalk on the east.

Separation between vehicular traffic and multi-use path and sidewalk users will be maintained at the underpass.

As a result, this option is **recommended** and is shown in Exhibit 5.2.

Exhibit 5.2 – The Rapids Parkway Extension Corridor Alignment Under Highway 402

Disadvantages

There are concerns for public safety especially where the supports for the highway causes some reduced visibility of the flow of trail users.

The multiuse path and sidewalk are flanked by the built infrastructure (highway supports and concrete retaining walls) directly beneath which breaks up the aesthetic of the trail.

Consideration must be made for erosion onto the trail surface, particularly during the winter months where ice and snow from the embankment may interfere with usability, even with regular maintenance. Care must be taken in the design of grading and drainage facilities to support maximised use of the multiuse trail during all seasons of the year.

Regular surveillance and adequate lighting will be required to support the safety of users and to monitor any unwanted activity in the vicinity, particularly between dusk and dawn.

If the retaining wall is built just outside of the roadway prior to the sidewalk/multi-use pathway, this may create concerns about possible impacts to the existing piers and footings. As a result, this type of design modification is **not recommended**.

5.3 Design Alternative #3 – Extension to Quinn Drive vs. Exmouth Street

In The Rapids Parkway Extension Traffic Study Update, **Appendix 1,** a sensitivity analysis conducted by WSP in May 2019, extending the Parkway only to Quinn Drive was investigated. This alternative originally stemmed from input from some adjacent property owners during the 2017 infrastructure EA. The Rapid Parkway / Exmouth Street intersection would not exist and The Rapids Parkway / Quinn Drive intersection would be an elbow curve instead of an intersection, with the option of a two-leg modern roundabout at this location (see Section 6.4).

Advantages

Terminating The Rapids Parkway Extension at Quinn Drive could remove the need to clear existing vegetation between that location and Exmouth Road, although this removal may still be required for stormwater management and drainage improvements. (see Section 7.6). It would also remove the extension from proximity to the 20 townhouse units on Pontiac Court, although the rear of these units is separated from the extension right-of-way by approximately 25 metres of rear yard and parking space.

Disadvantages

If an intersection of The Rapids Parkway and Quinn Drive were configured as a two-leg roundabout it would be functionally identical to an elbow curve. The elimination of The Rapids Parkway & Exmouth Street intersection would result in the trips being redistributed to the two intersections to the east, at Lambton Mall Road and at Barclay Drive. The operation of these intersections, plus the intersections of Barclay Drive and Quinn Drive, and Barclay Drive and Exmouth Street/London Line were analyzed.

As part of the analysis of the reduced extension scenario, the phasing splits were optimized for all signalized intersections studied to adjust for the relative changes in intersection movement volumes caused by the traffic redirection. Additionally, the cycle

length of the intersection of Lambton Mall Road & Exmouth Street was increased from 110 to 120 seconds during the Saturday peak hour, as without this increase there were capacity constraints.

From this analysis, it was found that the intersection of Exmouth Street & Lambton Mall Road would be operating above capacity during the Saturday peak hour. Under forecasted conditions, the reduced extension to Quinn Drive could be viable with no intersections operating over-capacity, however the high volume/capacity ratios suggest that there may be problems for motorists seeking to access the existing and future retail establishments in the area along Quinn Drive.

As a result, this alternative to terminate the extension at Quinn Drive is **not recommended.**

5.4 Design Alternative #4 – The Rapid Parkway / Quinn Drive Modern Roundabout

With the recommended extension of The Parkway to Exmouth Street, the opportunity still exists to construct The Parkway / Quinn Drive intersection as a one-lane, three leg modern roundabout. As an alternative, the WSP Traffic Study concluded that although traffic signal warrants are not met at all of the assessed intersections, they are recommended for intersections of Quinn Drive and Rapids Parkway Extension, Exmouth Street and Rapids Parkway Extension and Quinn Drive and Lambton Mall Road.

Significant long delays for left-turn vehicles forecast at Quinn Drive and The Rapids Parkway Extension and Quinn Drive and Lambton Mall Road greater than two minutes can result in aggressive driving by drivers seeking to complete left-turns, thereby increasing risk of collisions. Dedicated left-turn lanes are recommended for new southbound and westbound left turns at the intersection of Quinn Drive and Rapids Parkway.

Advantages

An alternative to this signalized intersection configuration is a one-lane, three leg modern roundabout. Roundabouts are engineered to offer several potential advantages over signalized and stop controlled intersections, including improved safety performance (reduced collision severity), less delay, shorter queues (particularly during lower volume periods), reduced speeds and improved aesthetics for community enhancement.

Roundabouts also act as effective traffic calming measures. In some applications, roundabouts can avoid or prolong the need for expensive widening of an intersection approach that would otherwise be necessary under traffic signal control.

Roundabouts also operate best at locations where intersecting traffic flows are relatively balanced so that each travel direction through the roundabout has equal or similar movement opportunities without undue delays to the any road. This is the case at the Parkway / Quinn intersection where traffic forecasts from the WSP 2017 Traffic Study show no major differences in expected flows shown in Exhibit 5.3.

Exhibit 5.3 – 2027 Rapids Parkway / Quinn Drive Intersection Volume Forecasts

Period	The Rapids Parkway southbound	The Rapids Parkway northbound	Quinn Drive East / West
Weekday: AM Peak Hour	569	263	555
Weekday: PM Peak Hour	432	509	623
Saturday: Peak Hour	617	512	839

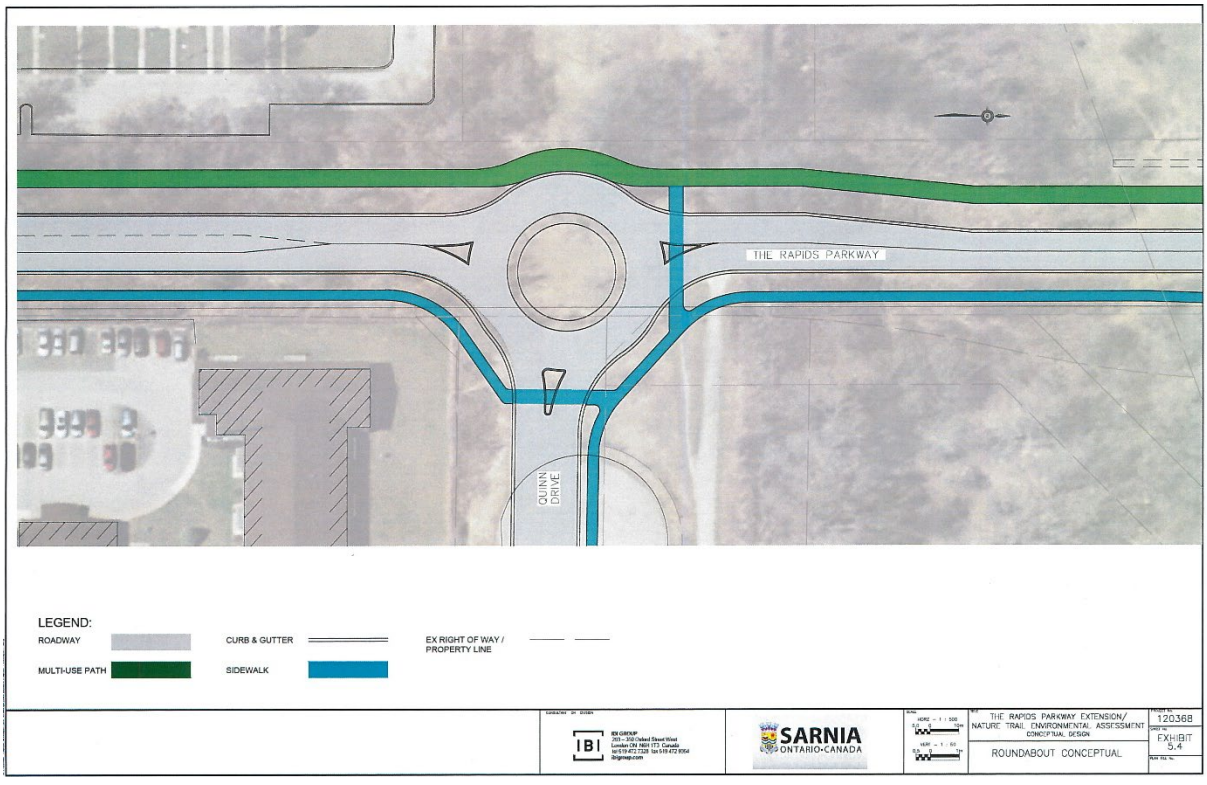
As shown on Exhibit 5.4, there is sufficient space at The Rapids Parkway / Quinn Drive intersection to construct a one-lane / direction roundabout with a truck apron to accommodate truck movement in this commercial area.

Disadvantages

If this is the first roundabout location in Sarnia, there will be an education and learning period for drivers, but this is common in any new application. Actual construction costs can be similar at $0.25 M for a new signalized intersection compared $0.30 M for a one - lane, three leg roundabout. However, the 20 year lifecycle costs of these facilities can be similar at about $0.30 M.

Owing to the operational, traffic calming and comparative life cycle costs of these two alternatives, a single lane / direction (2 travel lanes), three leg roundabout at a new Rapids Parkway / Quinn intersection is **recommended**. Note that pedestrian crossings of the north and east legs of the roundabout are recommended to incorporate pedestrian crossovers to facilitate access. It is anticipated these crossovers will take the form of a Class B, C or D pedestrian crossover (PXO), with specific warrants from OTM Book 15 to be reviewed during project implementation and design.

Exhibit 5.4 – The Rapids Parkway / Quinn Roundabout Concept



5.5 Design Alternative #5 - Exmouth Street Crossing

Rather than pedestrians and cyclists on the Howard Watson Nature Trail crossing Exmouth Street mid-block against traffic without right of way, there are two basic alternatives to improve the ease of the mid-block crossing: 1) a marked and signed pedestrian crossover (PXO); or 2) a midblock pedestrian signal.

In July, 2017, Sarnia City Council directed staff to explore the financial implications of installing a midblock PXO on Exmouth Street at the Nature Trail crossing in advance of full signalization of this intersection and integrating its function into the existing coordinated traffic network along Exmouth Street.

A PXO is a distinct combination of pavement markings and signs that provides pedestrians and cyclists with a protected crossing opportunity. Under the Highway Traffic Act, the driver of a motor vehicle approaching the PXO crosswalk must stop before entering the crosswalk if a pedestrian and/or cyclist is present within the crosswalk, or if a pedestrian and/or cyclist is signaling to enter the crosswalk. Pedestrians and cyclists are required to ensure all motor vehicles are stopped prior to entering the crosswalk.

A 2016 traffic survey by the City determined that approximately 10,300 motor vehicles crossed the Howard Watson Nature Trail at Exmouth Street during the highest 8hrs of pedestrian use. Guidelines in the Ontario Traffic Manual (OTM) Book 15 recommend against the installation of any type or level of PXO across a four lane roadway like Exmouth Street when vehicle traffic is greater than 7500.

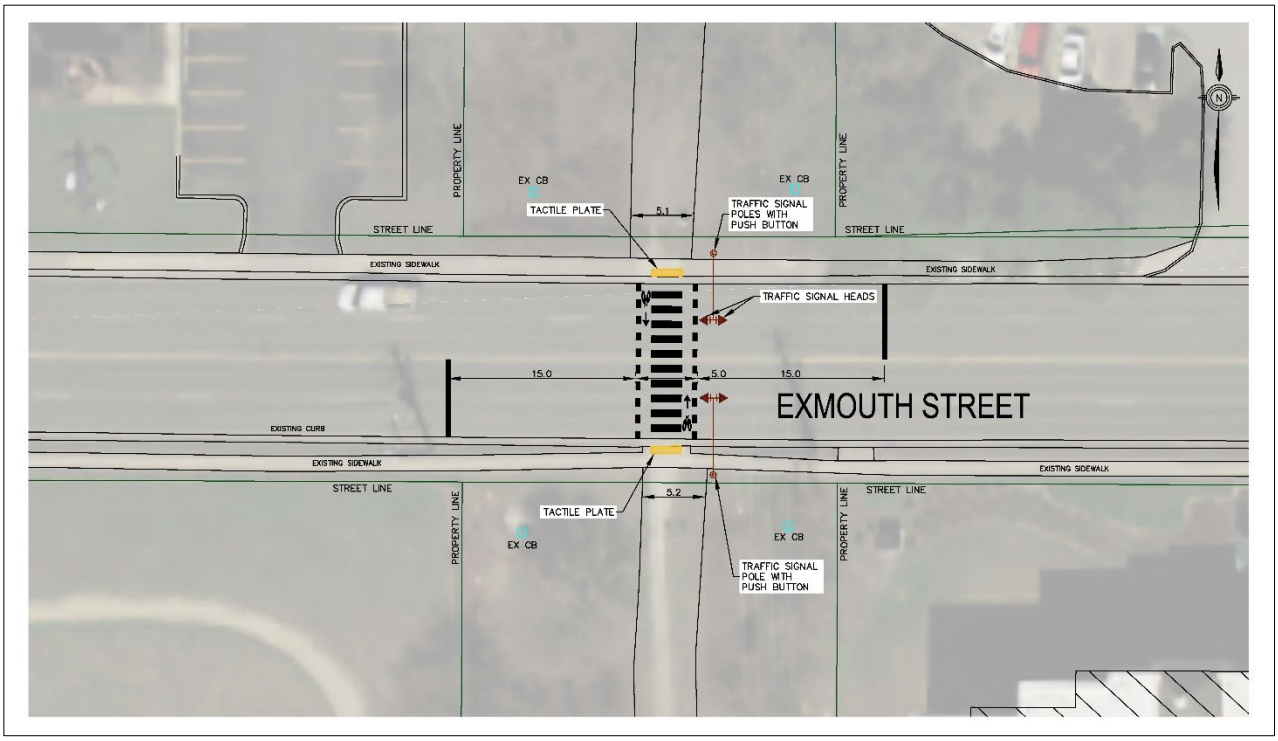
As a result, City staff recommended that to provide pedestrians and cyclists with an improved crossing facility on Exmouth Street at the Trail, then a midblock pedestrian signal is appropriate (per OTM Book 15) and **is recommended**. Phased conceptual designs of this new Exmouth Street crossing before and after The Rapids Parkway Extension is shown on Exhibit 5.5.

In the ultimate configuration, the design will evolve to a full traffic signal, as recommended through the The Rapids Parkway Extension Traffic Study Update. In the future scenario, it is important to consider potential strategies to mitigate the impact of the new conflicting vehicles from Rapids Parkway. Depending on the volume of potential southbound right-turning vehicles, strategies to be considered include:

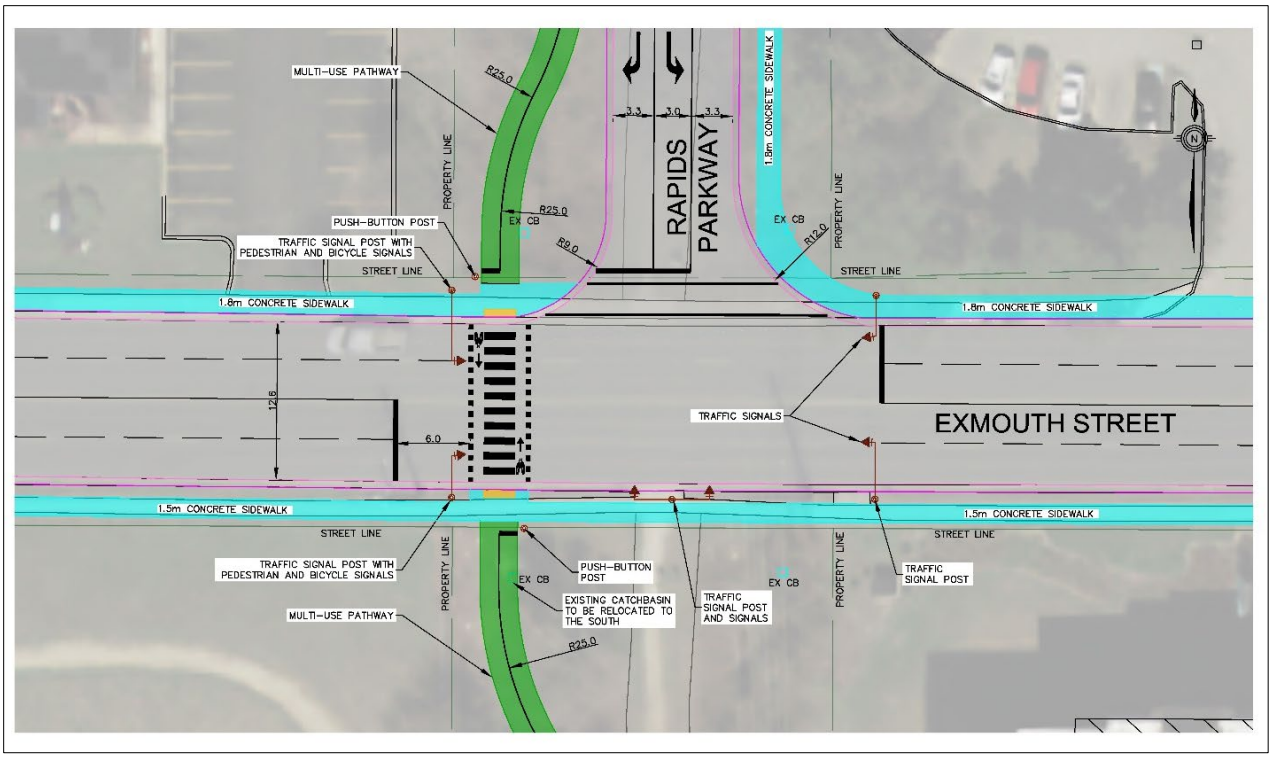
- Bending out the multi-use path 4-6m to provide space for right turning vehicles to yield without risk of rear-ending (element of a protected intersections), as shown in Exhibit 5.5.
- Leading cyclist and pedestrian phase
- Fully protected cyclist and pedestrian phase

Exhibit 5.5 – Recommended Mid-Block Pedestrian Signal

INTERIM TREATMENT CONCEPT



ULTIMATE TREATMENT CONCEPT



6 Public and Agency Consultation

6.1 Study Contacts

For this EA, IBI Group used the previous Highway 402 Corridor Screening Report as the foundation for the contact list. This included surrounding municipalities, governing ministries, adjacent school boards, stakeholders, utility companies and First Nations connected by the St. Clair River, Lake Huron and the Thames River.

The City of Sarnia undertook communications with internal City departments, properties adjacent to the study area and the Sarnia Transit Co.

The following summarizes the comments received, throughout the consultation process, with additional information contained in the attached Appendix 2.

6.1.1 Utility Companies

Bluewater Power – "*We have poles in the area that may be impacted by The Rapids Parkway Extension. I would think that we would need to be consulted as part of the design process of this project and not the environmental assessment process."* 2019-04-08

Cogeco – *"We have no concerns with this project and do not wish to be consulted."* 2019-04-08;

Union Gas – "*We currently have no pipe in the location identified."* 2019-04-08;

Bell – *Notification of Commencement sent via email and read*-2019-04-08.

6.1.2 Agency and Stakeholder Contacts

County of Lambton:

- Emergency Medical Services
- Public Works Department
- Planning and Development
- Administration Department

Ministry of Transportation
Ministry of Environment, Conservation and Parks Southwest Region
Ministry of Natural Resources and Forestry
Ministry of Tourism, Culture and Sport
Lambton Kent District School Board
St. Clair Catholic School Board
Providence Catholic School Board
Bluewater Trails Committee
Sarnia Transit
CLASS Shared School Services
St. Clair Region Conservation Authority
Upper Thames River Conservation Authority (Source Water Protection)

Comments, requirements and concerns received from the associated **Ministry Offices** have been recorded and responded to individually. Appendix 2 provides a copy of comments received.

Bluewater Trails Committee, on May 8, 2019 the Bluewater Trails Committee, the Study Team and the City of Sarnia met to discuss the study background, trail design and Exmouth crossing options. A copy of the minutes are provided in Appendix 2.

Chatham Kent Lambton Administrative School Services (CLASS) identified 50 school buses transporting students to schools located on The Rapids Parkway. There are two French language schools within the subdivision creating traffic congestion at the intersection of Berger Road and The Rapids Parkway for passenger vehicles and school buses as they enter and exit the school sites. This organization stated they are in favour of the extension connecting to Exmouth Street to provide alternative exit.

Ministry of Transportation (MTO) had been consulted with in 2018 and 2019 regarding the City's Infrastructure Extension project under Highway 402. This consultation continued with The Rapids Parkway road / trail extension EA. In an e-mail from MTO dated August 29, 2019 (see Appendix 2), the Ministry noted their concerns with the structural crossing under Highway 402, planning and design issues, geotechnical requirements and general concerns about drainage and possible impacts on existing piers and footings associated with a possible bridge replacement in the future. These concerns were subsequently addressed in the functional design of the crossing, which was thoroughly reviewed by MTO.

The City responded to these concerns in their e-mail to MTO dated October 10, 2019 by confirming how each would be addressed by the EA and subsequent detailed design of the crossing. The proposed crossing cross-section was submitted to MTO for comment. In their response dated January 17, 2020, they concluded that a review of the proposed underpass had been conducted and MTO has no concerns with the City moving forward with this design in completing the EA process. A number of associated MTO comments have been included in the Commitments section of this ESR (Section 8.1). All of this correspondence is included in Appendix 2 of this ESR.

Ministry of Tourism, Culture and Sport asked in a letter to the City of Sarnia dated May 16, 2019 (see Appendix 2) if technical cultural heritage studies had been conducted to identify cultural heritage resources, archaeological resources and built heritage and cultural heritage landscapes. The City responded to MTCS in a letter dated May 24, 2019 (see Appendix 2) that:

"the study area for this current roadway/trail extension EA is within the same study area for the Infrastructure Crossing of Provincial Highway 402 Corridor EA (MTCS file: 0008803) prepared in 2018. The Archaeological Assessment screening for that project resulted in preparation of Stage 1 and 2 Archaeological Assessments conducted by Timmins Martelle Heritage Consultants Inc. and submitted to MTCS. The Cultural Heritage Value screening for that project concluded there are no features of value in the study area and this will be reported in the new roadway/trail extension EA.

As a result of these recent and directly related investigations, the current roadway/trail extension EA does not include any further cultural heritage investigations."

Ministry of the Environment, Conservation and Parks in a letter to the City dated May 30, 2019 (see Appendix 2) provided their requirements and suggestions for aboriginal consultation, source water protection, climate change and the process for making any Part II Order request.

6.1.3 Comments Received from Residents:

- Resident of 687 Winchester Crescent – questions received regarding various aspects to the design requirements under the Screen Report completed in February 2019. These comments were reviewed and responded to by our Project Manager. 2019-04-12;
- Resident of 230 Meadowlark Lane – requested to be included in the study mailing list, with preference using email-2019-04-10;
- David C – raised concerns regarding high speeds near school districts and The Rapids Parkway existing onto Exmouth already has high volumes of traffic. Email 2019-04-15.
- Daniel O – gave formal objection of The Rapids Parkway Extension – email 2019-06-20
- Other emails were received from residents to remain on the contact list as the study progresses.
- General comments received from the Comments Sheets provided have been summarized in Section 6.3.1.

6.1.4 First Nations

The following lists the First Nations that received study and Public Information Centre notices as included in Appendix 2. IBI Group received one response from the COTTFN as stated below. No other First Nations input or comments was provided:

- Chippewas on the Thames First Nation (COTTFN) – July 10, 2019, indicating minimal concern with the project unless there are substantive changes and requested to remain informed. This is the same response received February 2019 Screening Report.
- Aamjiwnaag First Nation
- Kettle & Stony Point First Nation
- Onedia Nation of the Thames
- Morvian of the Thames First Nation
- Munsee-Delaware Nation
- Walpole Island First Nation
- Historic Saugeen Metis
- Metis Nation of Ontario

6.2 Notice of Study Commencement

IBI Group with the City of Sarnia completed a Notice of Commencement mail-out on April 4, 2019 to review agencies, utilities, stakeholders, First Nations and adjoining property owners.

As part of the public awareness program, the Notice of Commencement was advertised in the Sarnia Observer on April 6, 2019 and April 13, 2019. Notice of Commencement materials are in Appendix 2

6.3 Public Information Centres (PIC)

6.3.1 Public Information Centre #1

A Public Information Centre (PIC) Notice was published in The Sarnia Observer on June 7, 2019. A direct mailout of the PIC Notice was sent to all residents within the study area; residents who contacted the study team and requested to be put on the mailing list; agencies, First Nations and other interested agencies and stakeholders who had indicated they wished to be kept informed.

The Public Information Centre No. 1 was a drop-in format held Tuesday, June 18, 2019 from 5:00 p.m. to 7:00 p.m. at the St. Patrick's Catholic High School, located at 1001 The Rapids Parkway. Project boards were on display for attendees to review and ask the project team members or City of Sarnia representatives any questions or concerns.

As part of the public consultation, IBI Group supplied comment sheets for feedback. Completed sheets are included in Appendix 2 and attendees could also provide feedback by accessing an online feedback form located at: https://engineering.smartsarnia.com/public-information/

Forty-six (46) attendees signed in and ten (10) comment sheets were completed and handed back to our Study Team that evening. Other comments sheets were received via email or through the online feedback form. Refer to Appendix 2 for all the responses received from the Public Information Centre No. 1, as summarized below.

Exhibit 6.1 – Summary of PIC#1 Comments Received

The Rapids Parkway Extension	
Pros	**Cons**
• Traffic congestion, a nightmare; • Additional traffic access in and out of The Rapids Parkway area; • It might alleviate traffic from Murphy Road; • School buses access to schools.	• Traffic will increase as people will use this as a shorter route or to bypass Modeland to travel north; • Increased traffic will cause access difficulties at nearby apartments at Exmouth; • Increase in driving speeds.

Exhibit 6.1 Continued…

Howard Watson Trail	
Pros	**Cons**
• Keep the trail access through the City; • Important, valued asset; • Replace and plant trees and shrubs; • Preserve a separate trail; • Option for outside the columns, multi-use path needs separation.	• Loss of natural environment; • Walking/biking safety concerns, lighting; • Noise and pollution;

6.4 Public Information Centre # 2

6.4.1 Process

This meeting was held as part of the requirements of a Schedule 'C' project as outlined in the Municipal Engineers Association's *Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011 and 2015).*

Public Information Centre (PIC) No. 2 was held online due to the COVID-19 pandemic. Discussions were held with the City of Sarnia Engineering Division regarding format, platform and length of time to display the presentation.

Speak-Up Sarnia, (www.speakupsarnia.ca) was the platform used for the public to view the presentation, ask questions and complete a project survey.

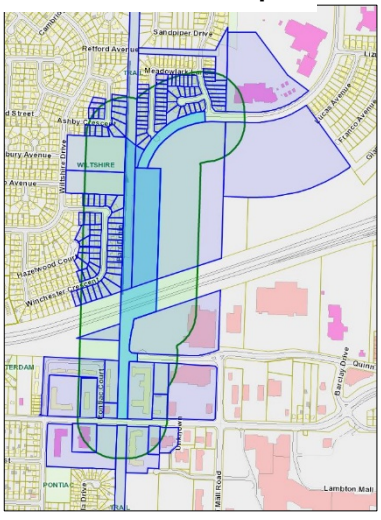
IBI Group narrated the slide presentation, featuring: background information, comments received from PIC#1, four alternative design concepts illustrating options, advantages and disadvantages and recommendations, preliminary preferred design depicting drainage, noise barriers, and landscaping using native species; and next steps. The design slides were also available to view individually.

The Public Information Centre Notice was advertised three times in the Sarnia Observer Civic Corner, on May 15, 22 and 29, 2020 and the presentation was available for view on the Speak-Up Sarnia website from May 15, 2020 to June 5, 2020.

The City of Sarnia completed a mail-out notifying residents and property owner of the Public Information Centre No. 2. The Communications Map indicates the surrounding area of property owners. In accordance with the *Freedom and Protection of Privacy Act*, these addresses will not be provided in this report.

Notices were sent via email to stakeholder groups, First Nations and residents who requested to be placed on the project's mailing list and those who commented at the Public Information Centre #1. Ministry agencies who had a direct interest in the project were also notified.

Communications Map



6.4.2 Speak-Up Sarnia Presentation Engagement

The Speak-Up Sarnia site records online traffic such as how many people visited the site, viewed the presentation video, left comments, and completed the online survey.

The following chart indicates the number of visitors and how many completed surveys were received.

For PIC2, 437 completed surveys and 5 distinct emails were received from the general public and stakeholders as compared to PIC1 where 21 comments were received by email or comment sheets.

Visitors					
1012					
Contributors			Responses		
429			437		
70	359	0	71	366	0
Registered	Unverified	Anonymous	Registered	Unverified	Anonymous

6.4.3 Comments Received/Survey Results

In the online PIC2, there were two methods to submit comments. The first method was through email. The Speak-Up Sarnia site included contact information for Alister Brown, Manager, Transportation Division for the City of Sarnia; and Sandra Hayman, Project Manager for IBI Group. A few emails were received giving opinions of the project; concerns regarding backyard flooding; inquiries with respect to the proposed width of the new trail; and another intersection on Exmouth Street and traffic impact. These questions were quickly responded to and can be found in Appendix 2 – Public Consultation.

The second choice of communication was through the online survey. The following questions were asked:

- Do you support The Rapids Parkway Extension design?
- Does The Rapids Parkway Extension and the Nature Trail Improvements provide safe and attractive cycling and pedestrian facilities?
- Does the road design provide appropriate traffic speeds for safety?
- Do you see benefits of the proposed road extension?

The following summarizes comments received for each question, based on 437 responses received. Numbers vary since some questions were not answered by everyone. The survey results document is contained in Appendix 2 – Public Consultation.

Do you support The Rapids Parkway Extension design?

Based on 435 respondents, 37.9% of respondents indicated they are in support of The Rapids Parkway Extension and 62.1% indicated they did not support the extension.

The following summarizes the concerns submitted by 103 respondents. These concerns represent concerns that were cited repeatedly throughout the survey and listed as to the importance of each concern:

- Do not destroy this attractive natural trail/area; destruction of nature and wildlife, harmful and unnecessary.
- A natural trail/area for physical fitness, i.e. walking, cycling and running. It promotes active transportation for health, mental and physical well-being;
- The Howard Watson Trail is a great area for children, away from traffic and surrounded by nature;
- Do not pave as this is better for joints when running and it will take away the attractiveness.
- Exmouth already a traffic nightmare, fix existing roads.

Does The Rapids Parkway Extension and the Nature Trail Improvements provide safe and attractive cycling and pedestrian facilities?

Based on 434 respondents 43.3% of respondents agreed the design would provide safe and attractive cycling and pedestrian facilities; and 56.7% indicated they would not feel safe. The following summarizes the concerns received:

- Higher risk of pedestrian / vehicle collision; Added risk to active individuals;
- Need a roundabout at Exmouth;
- Air/exhaust fumes and noise pollution; not attractive;
- Want to run in nature, not with traffic;
- No longer a nature trail, it will be a sidewalk and access for cars;
- Cars so close to trail makes it unsafe, especially for young children;
- High traffic volumes and increased speeds.

Does the road design provide appropriate traffic speeds for safety?

Of the 424 responds received for this question 53.1% agreed the road design provided appropriate traffic speeds for safety; and 46.9% indicated the design did not represent traffic safety. The following lists summary points of concerns:

- The roadway will turn into a race track;
- Need additional calming measures;
- No additional intersection at Exmouth Street, already a traffic nightmare, will lead to further traffic congestion on Exmouth Street; Stop at Quinn;
- Paving will allow for dirt bikes, mopeds, and electric bikes;
- Too secluded to patrol.

Do you see benefits of the proposed road extension?

This question is similar to the first question and resulted similar responses. Of the 434 responses received 38.0% indicated they see benefit in the proposed road extension; and 62.0% indicated they see no benefit.

Of the 213 respondents the following are the benefits listed.

- Benefits for school buses to St. Patrick's and St. Anne's schools;
- Emergency services access;
- Benefit for those only living in the subdivision;
- Benefit only for the big box stores.

The following answers outline the concerns. These were consistently repeated and are similar to the responses from the first question:

- Loss of green spaces; nature; not environmentally friendly; destruction of nature and wildlife;
- Green space has a positive physiological effect on people;
- Nature trail for people, not cars;
- Need to keep the Lambton County trails, it is what we are known for;
- Sarnia should not participate in urban sprawl;
- Effect the value of the homes along the trail;
- Natural beauty, fresh air and calming.

6.4.4 Frequently Asked Questions/Response

Partway through the online PIC2 it was noted that there was significant engagement from the public. As there were a number of common questions within the responses received, a Frequently Asked Questions (FAQ) page was added to the online presentation. Following are the frequently asked questions and the response from the study team:

Q: Why is this access being provided to residents of Development Area 1?

A: *Ongoing growth in Development Area 1 has advanced to the point where it is now time for the City of Sarnia to follow through with their original commitment to the developers and residents of that area. The access is being provided because it is planned, funded and merited through continued growth and development. The Rapids Parkway was planned and exists as the only collector road in the subdivision. By definition, a collector road connects local roads to arterial roads. The completed traffic study has further supported the original plan noting that there will be benefits to the overall traffic congestion related to the major commercial area.*

Q (Common Concern): I am concerned about safety on the trail and its proximity to the proposed road.

A: *As with any engineering design, safety is held paramount in the decisions that form the final result. This preliminary concept of our preferred design alternative is no exception. We have proposed to keep the portion of the trail that is adjacent to the roadway to the absolute minimum required for passage under Highway 402. The*

existing trail will remain in the same location, unscathed immediately to the North and South of the underpass, respectively. While the proposed design will modify the trail as it exists today, the disturbance will be kept to an absolute minimum. Where modification is required, the concept provides 2.9m (9.5') of separation between the closest edge of the trail to the back edge of the curb. To further facilitate this from a community safety standpoint, the planned road width has been reduced from the original plan, which benefits pedestrian and cyclists through increased separation and reduced driving speeds on the single lane roadway. The trail is also proposed as being 3.0m wide through this section, an increase from the approximate 2.5m surface width in the existing state to reduce the risk of incidental contact between users through this zone.

Q: Why not spend money on repaving other roads in need before building this one?

***A:** The cost of the road is almost fully funded by Development Charges and direct contributions from the residential properties that have been constructed in Development Area 1. Under the provincial legislation, these funds are subject to certain rules and have to be used for a development growth related project. In short, the money being used for this project cannot be used towards improving existing roads or infrastructure.*

Q: Why is an Environmental Assessment being completed if the road extension has already been confirmed?

***A:** The option of providing a road beneath Highway 402 has already been confirmed through the planning process for Development Area 1, through the Official Plan and through the Transportation Master Plan. With a thorough understanding of what the Howard Watson Nature Trail means to our community, staff have elected the Class EA process to properly identify and address all environmental and social impacts. The purpose of this EA is provide the most favorable solution possible for the road extension and its interaction with the existing nature trail.*

Q: What environmental considerations are being provided?

***A:** We are fully committed to identifying and understanding our environmental impact. We have engaged the Upper Thames River Conservation Authority (UTRCA) as the local Source Water Protection Agency to identify any and all considerations required in the region for protecting source water.*

Further, an environmental screening report and a species at risk study have been undertaken. These comprehensive studies identify sensitive trees, wildlife and vegetation in the project area and outlines the required accommodations to protect them, which includes, but is not limited to; providing alternative habitat, relocation or replanting, avoiding construction windows for habitat sensitivity or disruption of vegetation. A detailed landscaping plan will be completed as part of the final design for this project. The City's Environmental Advisory and the Bluewater Trails Committees would be integral as part of that process to ensure the unique characteristics of the Howard Watson Natural Trail are maintained to the best of efforts.

Q: How will additional noise be addressed for adjacent residents?

***A:** A noise study was completed as part of the Class EA process. The recommendations of the study towards protecting existing residential areas from increased noise will be incorporated into the final detailed engineering design.*

Q: Why does this project propose to pave this section of the Howard Watson Nature Trail?

A: *As the trail is adjacent to a road for this section, it will be treated and maintained as a city facility with the multi-use trail being used for more commuter related active transportation. As such, it will be plowed during the winter months.*

A full copy of the PIC2 presentation, comments and report is located in Appendix 2 – Public Consultation.

6.5 Notice of Study Completion

Upon completion of the study, an Environmental Study Report (ESR) was compiled that documents the work undertaken through Phases 1 to 4 of the Municipal Class EA process. A Notice of Study Completion was then issued, which documents the recommendations of the study and the provision for a 30-day public review and comment on the ESR. The Notice was advertised in *The Sarnia Observer Civic Corner* and posted on the City of Sarnia website. The Notice was also sent out electronically and via regular mail to stakeholders and technical agencies.

7 Project Description

Having described the design alternatives and rationale for the evaluation of alternatives for each major element of the design in Section 5, this section of the Environmental Study Report (ESR) summarizes the preferred design and includes recommendations where appropriate regarding its implementation.

7.1 Design Criteria

The recommended extension of The Rapids Parkway Roadway and nature trail are based on the basic design criteria presented below.

7.1.1 The Rapids Parkway Extension

Exhibit 7.1 – Vehicular Design Criteria

Feature	Reference Standards (Sources)	Proposed Project Standards	
		Min.	Max.
Posted Speed	N/A	50 km/h	
Design Speed	"Use design criteria that are at or below the target speed of a given street. The use of higher speeds should be reserved for limited access freeways and highways and is inappropriate on urban streets, including urban arterials." (a)	50 km/h	
Vehicular Lane *Exclusive of gutter width*	3.0m – 3.7m (b)	3.0m	3.3m
Curb Lane[13] *Exclusive of gutter width*	See above	3.0m	3.3m
Horizontal Curves *Minimum Radius for 50km/hr with reverse crown (+0.02 m/m)*	115 with e_{max} +0.04 (c) 135 with e_{max} +0.06 (c)	Depending on pavement elevation, typically 115m-135m	
Vertical Curves *Equivalent Minimum 'K' for 50km/hr, assuming illumination provided*	5-6 Sag (d) 7 Crest (e)	5-6 Sag 7 Crest	

Vehicle Design Criteria Sources:

a) NACTO Urban Street Design Guide. Design Controls – Design Speed. Available online: https://nacto.org/publication/urban-street-design-guide/design-controls/design-speed/

[13] Excludes possible pavement widening through horizontal curves

b) TAC Geometric Design Guide for Canadian Roads – Chapter 4 – Cross Section Elements (2017); Table 4.2.3: Through Lane Widths – Urban Roadways
c) TAC Geometric Design Guide for Canadian Roads – Chapter 3 – Alignment and Lane Configuration (2017); Table 3.2.4: Minimum Radii for Urban Designs
d) TAC Geometric Design Guide for Canadian Roads – Chapter 3 – Alignment and Lane Configuration (2017); Table 3.3.5: K Factors to Provide Minimum Stopping Sight Distance on Sag Vertical Curves Based on Comfort Control
e) TAC Geometric Design Guide for Canadian Roads – Chapter 3 – Alignment and Lane Configuration (2017); Table 3.3.2: K Factors to Provide Stopping Sight Distance on Crest Vertical Curves

7.1.2 Howard Watson Nature Trail Extension

Exhibit 7.2 – Pedestrian and Cycling Facility Design Criteria

Feature	Reference Standards (Sources)	Proposed Project Standards
Cycling Design Speed	20 -30km/hr (a) 20 -30km/hr (d) 30km/hr; Coasting speed of 40 km/hr for grade of 6%; Coasting speed of 60 km/hr for over 8% (e)	30 km/hr, with consideration for higher design speeds depending on the downgrade of the cycling facility
Shared Multi-Use Path Width[14]	3.0m-6.0m; Absolute lower limit 2.4m; Practical lower limit 2.7m (a) 3.0m-4.0m; Constrained minimum = 2.4m (b)	Minimum = 3.0m Preferred = 4.0m Constrained Minimum[15] = 2.4m-2.7m
Pedestrian Clearway Width	1.8-2.0m; Practical lower limit = 1.5m for peak pedestrian flow rate < 400 ped / 15min (a) Minimum 1.5m (e)	Minimum = 1.5m
Street Buffer[16] **Between Cycling Facility & Adjacent Travel Lanes**	0.3m -1.0m (a) 1.0m typical (b)	Minimum = 0.5m Preferred = 1.0m Constrained Minimum[15]=0.3m
Continuous Lateral Clearance	0.5 min.-1.0m rec. (b) 0.6 min.-1.0m rec. (d)	Minimum = 0.5m Preferred = 1.0m

[14] TAC suggests that separate bicycle and pedestrian facilities should be provided where there are greater than 20% pedestrian users and total volumes are greater than 33 persons per hour per metre of path width; or where there are less than 20% pedestrian users and total volumes are greater than 50 persons per hour per metre of path width.
[15] These minimums are suitable only for short sections which are highly constrained; for example, underneath the existing 402 bridge.
[16] Defined as the buffer strip between the face of curb of the closest adjacent vehicular lane and the edge of the pedestrian and/or cycling facility; these references are for the street buffer adjacent a cycle track / protected bike lane.

Feature	Reference Standards (Sources)	Proposed Project Standards
Horizontal Clearance To Hazards	Minimum = 0.25m for features between 100mm & 750mm high; Minimum = 0.5m for features > 750mm (a) Minimum 0.25m (b)	Minimum = 0.25m for features between 100mm & 750mm high Minimum = 0.5m for features > 750mm **Clearance to utility poles to be confirmed with local utility providers*
Vertical Clearance	2.7m - 3.6m (a) 2.5min. – 3.0m rec. (c) (d)	Minimum = 2.5m Preferred = 3.0m
Railing Between Pedestrian / Cycling Facility & Slope / Drop-Off	Where clearance to the slope is < 2.0m, a guard is recommended where: • Slope is 6:1 (16.7%) or steeper and • Height difference is greater than 0.6m Where clearance to slope is 2.0m or greater, guard is recommended where: • Slope is steeper than 2:1 (50%) and • Height difference is greater than 0.6m (d)	Where clearance is < 2.0m from the slope / drop-off, guard is recommended where: • Slope is 6:1 (16.7%) or steeper and • Height difference is greater than 0.6m Where clearance to slope is 2.0m or greater, guard is recommended where: • Slope is 2:1 (50%) or steeper and • Height difference is greater than 0.6m
Cyclist-Friendly Railing Height	1.37m (a) 1.37m (b)	1.37m
Accessible Pedestrian Handrail Height	.865-.965m (e)	.865-.965m
Running Slope Of Facility	<4% pref. (a) 5% recommended; up to 1:12 (8.3%) can be accommodate if landings are provided at intervals of no more than 9.0m (d) No steeper than 1:20 (5%) (e)	Preferred = 1:25 (4%) Maximum = 1:20 (5%); unless slope of roadway is greater Constrained Maximum = 1:12 (8.3%) with level landings spaced at ⩽9.0m
Cross Slope Of Facility	Concrete – 1.5% - 2.0%; Asphalt – 2% - 4% (a) 1:20 (5%) max. 1:50 (2%) pref.(e)	Preferred = 2.0 -4.0% Maximum = 5%

Sources:

a) TAC Geometric Design Guide for Canadian Roads; Chapter 5 – Bicycle Integrated Design (2017)
b) OTM Book 18 (2013)
c) VeloQuebec's Planning & Design for Pedestrians and Cyclist (2010)
d) City of Toronto Multi-Use Trail Design Guidelines (2014)
e) GAATES Illustrated Technical Guide to the Accessibility Standard for the Design of Public Spaces (2014)

7.2 Typical Cross-Sections

Typical cross-sections of The Rapids Parkway extension are provided in Exhibit 7-5. Sidewalk locations and boulevard grading details are to be finalized during detailed design. Some shifts in pathway locations may be required in order to accommodate stormwater management features such as swales and landscaped features accommodating storm runoff.

The cross-section generally includes:

- Two-lane roadway with 3.3m travel lanes, with 3.0m left turn lane approaching Exmouth Street
- Wide boulevards (generally >3.0m)
- 3.0m multi-use path (west/north side) and 1.5m sidewalk (east/south side) – refer to Section 7.3
- Wide bio-swales / ditches

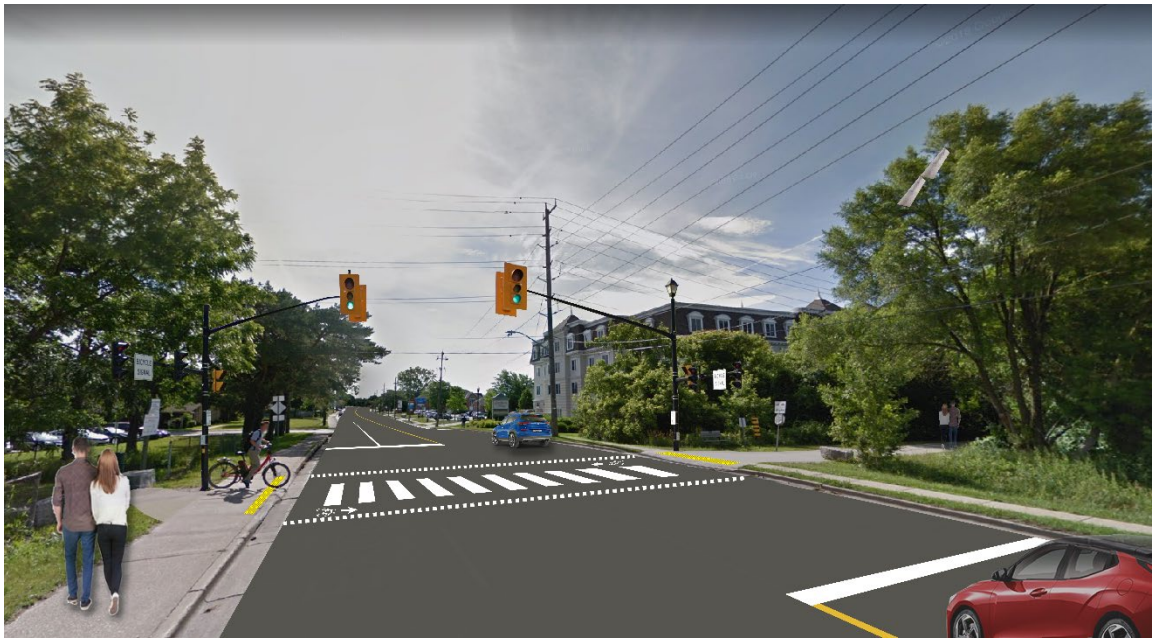
7.3 Active Transportation Facilities

One of the key goals of this project is to maintain and enhance the Howard Watson Nature Trail through the study area. A variety of elements will be incorporated to achieve this:

- Upgrading the surface of the trail to improve accessibility – an asphalt surface is proposed for the multi-use path where the roadway runs adjacent to the trail (Exmouth Street to north of Highway 402) which will provide a smoother and more easily maintained surface for safe, year-round access.
- Introducing a variety of trail amenities such as benches, trees and wayfinding signage – refer to Section 8.22;
- Shifting the road alignment away from the trail north of Highway 402 to maintain the trail in a naturalized state – refer to Section 5.1; and
- Buffering the trail with separation, vegetation and landscaping where the roadway runs adjacent to the trail – refer to Section 8.22.

In addition to the improvements along the trail, as noted in Section 5.5, the trail crossing at Exmouth Street will also be improved with a signalized crossing and crossride (refer to conceptual rendering shown in Exhibit 7.3). This will be implemented as an interim improvement prior to the road construction and reinstated as a fully signalized intersection when the road is built.

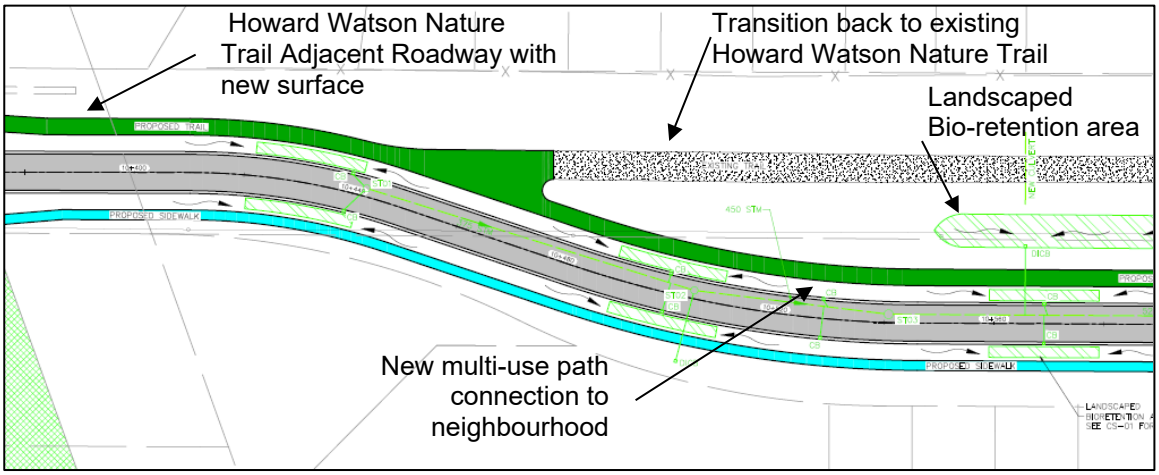
Exhibit 7.3 - Conceptual Rendering of Interim Midblock Pedestrian Signal at Exmouth Street

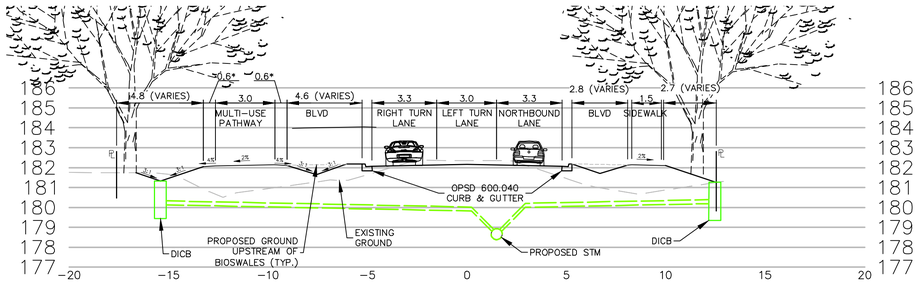


7.3.1 Nature Trail Connectivity

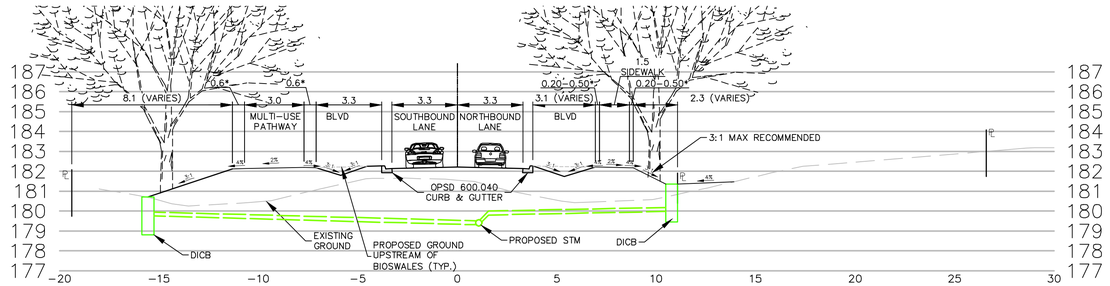
From a network perspective, the proposed roadway will shift away from the Howard Watson Nature Trail alignment directly north of the Highway 402 underpass and a landscaped bioretention swale will be introduced to further preserve the existing trail experience. This minimizes the impact on the section of the Howard Watson Nature Trail north of Highway 402 (See Exhibit 7.4). To improve connectivity into the Rapids Parkway neighbourhood, an asphalt multi-use path will continue along the full roadway extension, terminating at Sandpiper Drive. Refer to Exhibits 7.6, 7.7 and 7.8.

Exhibit 7.4 - Trail Connectivity

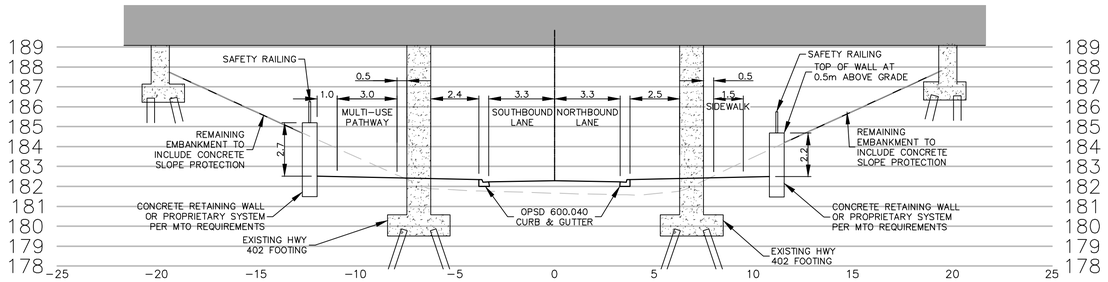




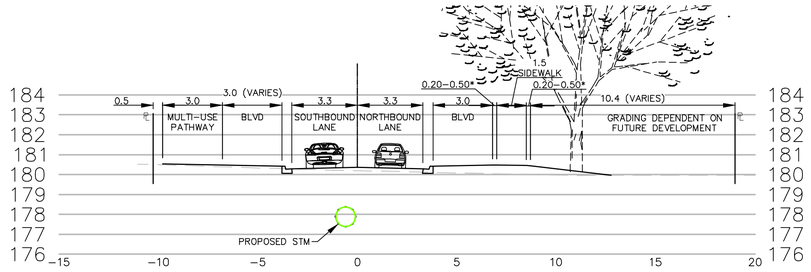
EXMOUTH STREET TO QUINN DRIVE



QUINN DRIVE TO 402 UNDERPASS

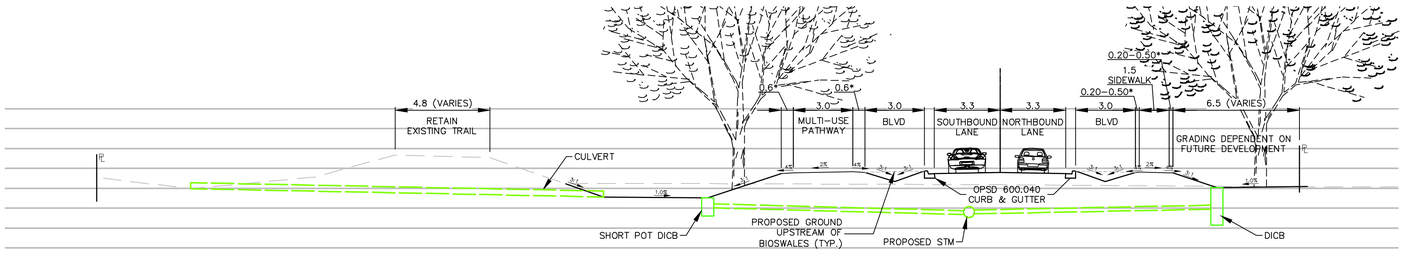


402 UNDERPASS



MEADOWLARK LANE TO SANDPIPER DRIVE

NOTE: * TO DENOTE DIMENSIONS TO BE ACCOMMODATED WHERE POSSIBLE



402 UNDERPASS TO MEADOWLARK LANE

CONSULTANT OR DIVISION

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London ON N6H 1T3 Canada
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SARNIA ONTARIO•CANADA

SCALE
HORZ – 1 : 150
1.5 0 3m
VERT – 1 : 30
0.3 0 0.6m

TITLE
THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

TYPICAL CROSS SECTIONS
THE RAPIDS PARKWAY

PROJECT No. 120368
SHEET No. EXHIBIT 7.5
PLAN FILE No.

J:\120368-RapidsParkway\EA\5.9 Drawings\Civil\current\120368_Sections.dwg

7.4 Structural Impact Review

The Terms of Reference for The Rapids Parkway / Trail Extension EA requires that the EA team work collaboratively with the Ministry of Transportation (MTO) on how to extend the road and trail under Highway 402. In their January 24, 2019 response to the City regarding the related infrastructure crossing EA, the Ministry confirmed that placing the trail between the bridge abutment and pier was an alternative to consider structurally. In this case, the stability of the abutment slopes would have to be ensured, including investigation of any new or unbalanced loading exerted onto the piers, pile caps or piles. MTO approval will be required for the proposed design under Highway 402.

In response, a structural memo by IBI Group reported that in recognition of MTO comments and suggestions regarding the crossing, a final trail/roadway crossing under Highway 402 is proposed. The originally designed structure spanned two rail tracks. This new approach places the trail between the piers and abutments and as such adds no additional loading to the existing piers.

It is noted that the original crossing spanned a provision for twin track rail operations and would be designed for any rail loading influence on the foundation. As such the removal of the tracks and replacement with a roadway cross section on the former rail alignment will not add any additional operational loads on the piers. Traffic protection for the piers can be added if required by the Ministry.

The placement and grading of the trail behind the piers as previously shown in Exhibit 5.2 removes the need for any additional fill influencing the pier foundations (deep piled foundations). Furthermore, the addition of a low modular block retaining wall will not add additional load to the foundations and can be easily removed for structure replacement. A safety railing can also be added along the top of the wall. The retaining wall can be constructed without impact on the existing bridge structure while maintaining lateral support to the existing piles of the abutment foundations.

7.5 Utilities

There are no known utility conflicts within the corridor. During detailed design, utilities are to be circulated to determine any requirements.

7.6 Stormwater and Drainage

Currently, stormwater runoff from the existing Bluewater Trail corridor is collected by ditches on both the east and west sides of the trail. The majority of the corridor between the Highway 402 overpass and Exmouth St. drains south to a pair of existing ditch inlet catchbasins (DICB's) which are connected to the Exmouth St. storm sewer. The ditches within the old rail corridor north of the overpass are very flat but have an overall slope to the north.

The proposed Rapids Parkway profile will be designed to maintain the north-south drainage break at approximately the location of the overpass. This will avoid the need to construct sewers beneath the overpass.

With a full road extension to Exmouth Street a new storm sewer system will be installed south of the bridge to collect the runoff from The Rapids Parkway corridor and outlet to the existing Exmouth Street trunk storm sewer.

The Rapids Parkway corridor north of the bridge will be serviced by a new storm sewer system which will drain north to Sandpiper Drive and connect to an existing trunk storm sewer.

Catchbasins are proposed within the roadway to pick up road drainage as well as any overflow from boulevard areas/landscaped areas. Stormwater quality and quantity control for the area north of Highway 402 is already provided for within an existing downstream stormwater management facility. Stormwater quality control for the right-of-way drainage area south of Highway 402 will include the installation of an oil/grit separator. Shallow roadside swales are designed throughout the project length where feasible. These swales will allow for the filtration of sediment in stormwater runoff prior to entering the storm sewer system. In addition, directing stormwater to suitably landscaped bioretention areas at the low points in the profile, where feasible, will allow for some infiltration and the settlement of sediment prior to entering the storm sewer.

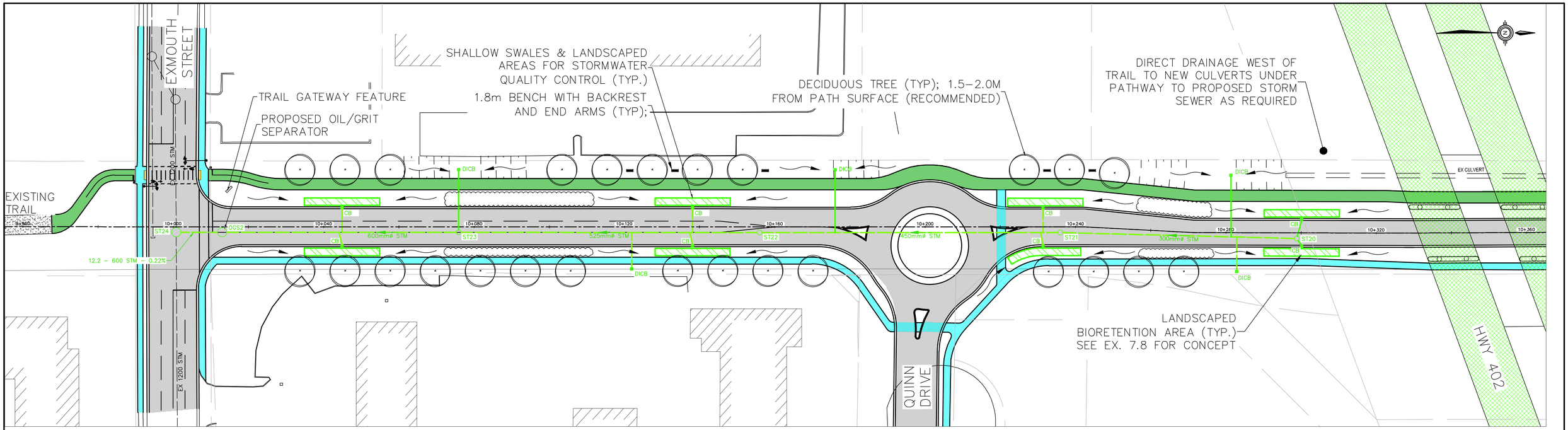
Comments received from the public noted that there are some drainage issues between the existing pathway and the rear of the lots along the west side. These drainage issues can be accommodated with some minor grading along here to direct the storm flows through culverts under this pathway and into the proposed storm sewer.

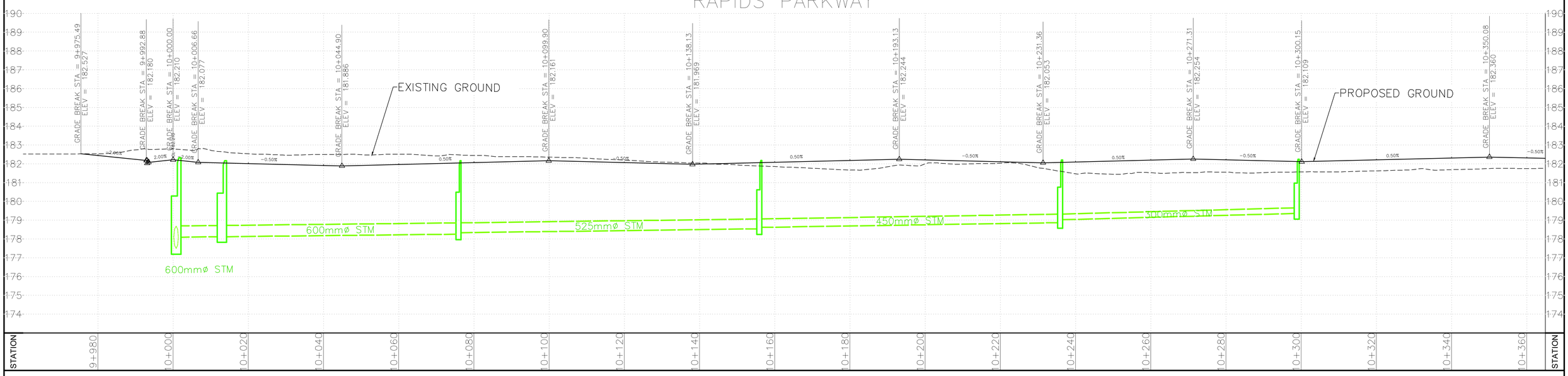
The following exhibits show a conceptual design of the drainage and stormwater features of the proposed The Rapids Parkway Extension.

Exhibit 7.6 – Exmouth to Highway 402

Exhibit 7.7 – Highway 402 to Nicolina Way (Future ROW)

Exhibit 7.8 - Meadowlark Lane to Sandpiper Drive





LEGEND:

ROADWAY | CURB & GUTTER | EX RIGHT OF WAY / PROPERTY LINE | PROPOSED NOISE MITIGATION FEATURE | FLOW DIRECTION | BIORENTION AREA SEE EXHIBIT 7.8 FOR CONCEPT | POTENTIAL LANDSCAPING/ TREE | BENCH

MULTI-USE PATH | SIDEWALK | EX HYDRO LINE / POLE | DICB/CATCHBASIN & LEAD | PROPOSED STORM SEWER (CONCEPTUAL) | SHRUBS/PERENNIALS/GRASSES

CONSULTANT OR DIVISION

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SCALE
HORZ – 1 : 500
5.0 0 10m
VERT – 1 : 50
0.5 0 1m

TITLE
THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

PLAN & PROFILE
EXMOUTH TO HIGHWAY 402

PROJECT No. 120368
SHEET No. EXHIBIT 7.6
PLAN FILE No.

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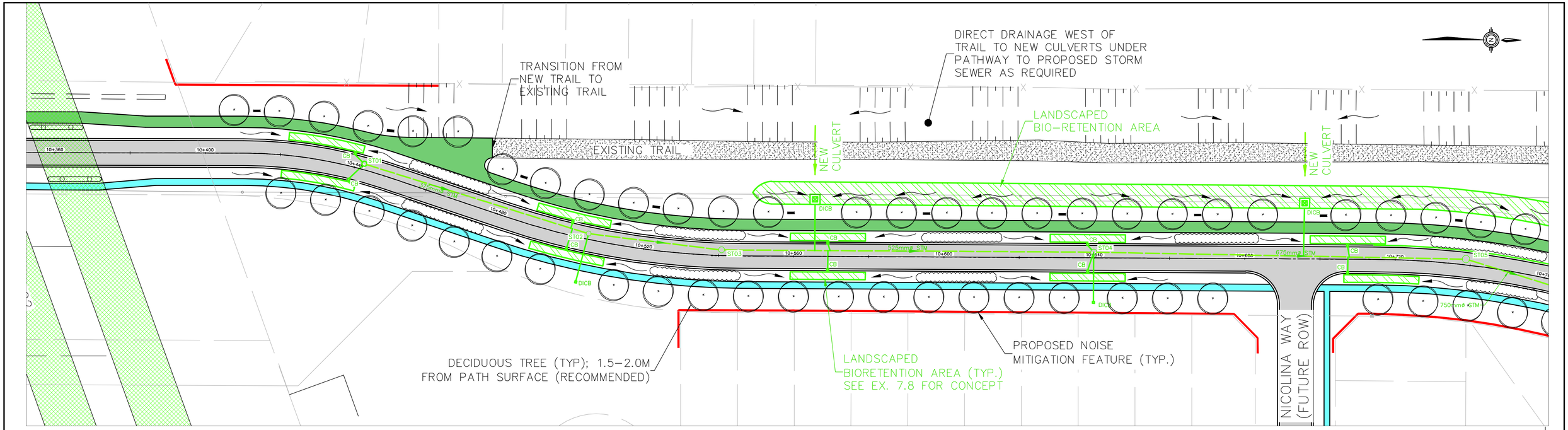

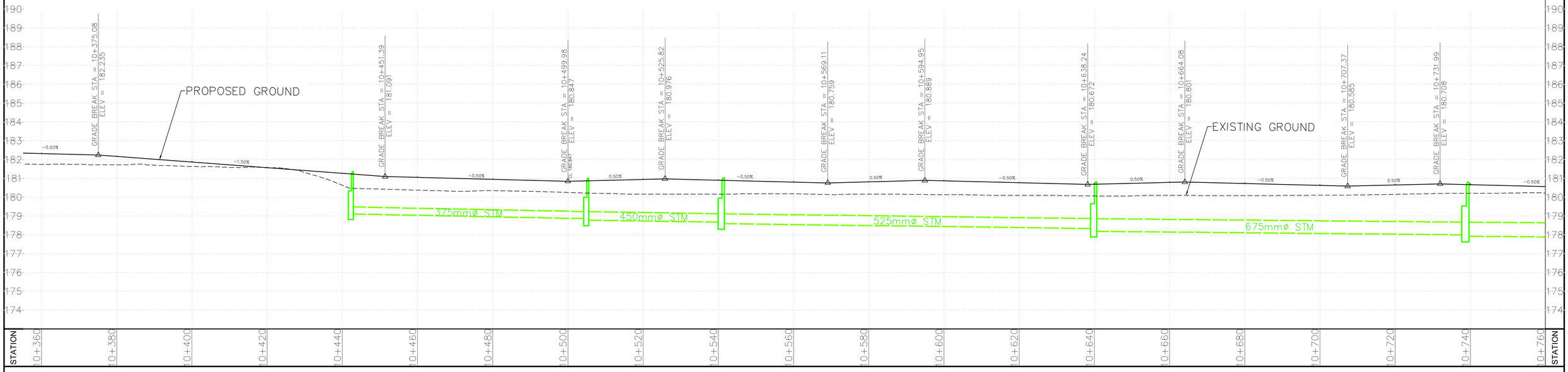

LEGEND:

ROADWAY | CURB & GUTTER | EX RIGHT OF WAY / PROPERTY LINE | PROPOSED NOISE MITIGATION FEATURE | FLOW DIRECTION | BIORENTION AREA SEE EXHIBIT 7.8 FOR CONCEPT | POTENTIAL LANDSCAPING/ TREE | BENCH

MULTI-USE PATH | SIDEWALK | EX HYDRO LINE / POLE | DICB/CATCHBASIN & LEAD | PROPOSED STORM SEWER (CONCEPTUAL) | SHRUBS/PERENNIALS/GRASSES

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HORZ – 1 : 500
5,0 0 10m
VERT – 1 : 50
0,5 0 1m

THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

PLAN & PROFILE
HIGHWAY 402 TO NICOLINA WAY (FUTURE R.O.W.)

120368

EXHIBIT 7.7

DIRECT DRAINAGE WEST OF TRAIL TO NEW CULVERTS UNDER PATHWAY TO PROPOSED STORM SEWER AS REQUIRED

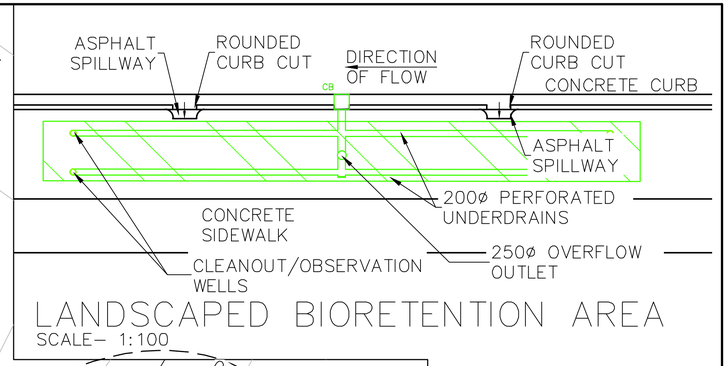
MEADOWLARK LANE

BLUEBIRD COURT

LANDSCAPED BIORETENTION AREA (TYP.)
SEE EX. 7.8 FOR CONCEPT

DECIDUOUS TREE (TYP); 1.5–2.0M FROM PATH SURFACE (RECOMMENDED)

PROPOSED NOISE MITIGATION FEATURE (TYP.)

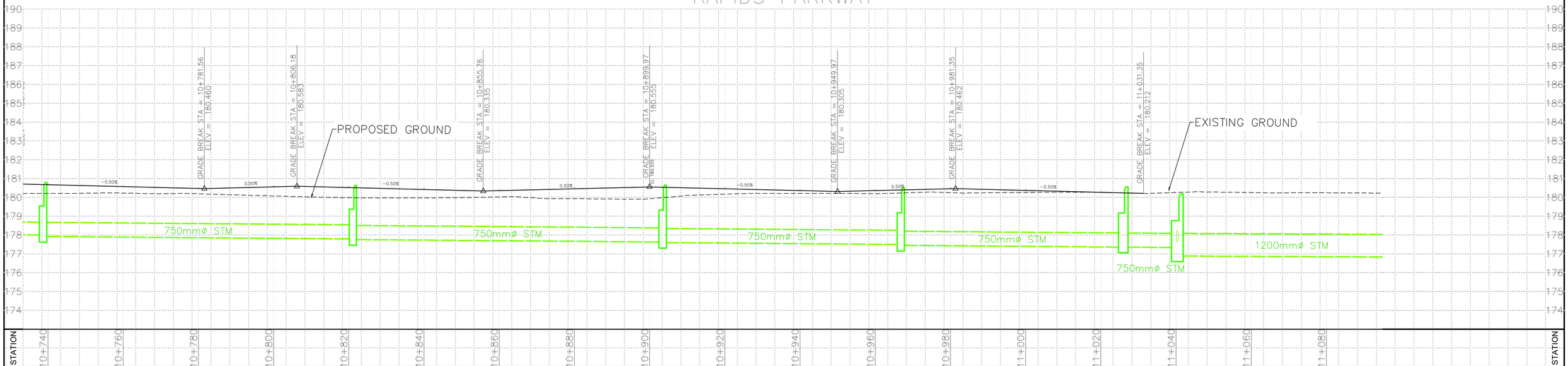


LANDSCAPED BIORETENTION AREA
SCALE– 1:100

SANDPIPER DRIVE

TRAIL CONNECTION TO NEIGHBOURHOOD TO BE FURTHER DEFINED IN FUTURE BY CITY OF SARNIA

RAPIDS PARKWAY



LEGEND:

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MULTI-USE PATH | SIDEWALK | EX HYDRO LINE / POLE | DICB/CATCHBASIN & LEAD | PROPOSED STORM SEWER (CONCEPTUAL) | SHRUBS/PERENNIALS/GRASSES

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5.0 0 10m
VERT – 1 : 50
0.5 0 1m

TITLE
THE RAPIDS PARKWAY EXTENSION/ NATURE TRAIL ENVIRONMENTAL ASSESSMENT
CONCEPTUAL DESIGN

PLAN & PROFILE
MEADOWLARK LANE TO SANDPIPER DRIVE

PROJECT No. 120368
SHEET No. EXHIBIT 7.8
PLAN FILE No.

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7.7 Right-of-Way and Property Requirements

The only requirement for property on this project is the need for additional land at the daylight corners for the northeast and southeast quadrants of the Quinn Drive / The Rapids Parkway roundabout. This is shown on Exhibit 7.6.

7.8 Capital Cost Estimate

The total capital cost estimate to construct the planned The Rapids Parkway / Howard Watson Trail Extension is $6.52 Million in 2020 dollars as summarized below and detailed in Appendix 3.

Exhibit 7.9 - The Rapids Parkway Extension Capital Cost Estimate Summary (2020)

Feature	Cost2	Notes
Civil Engineering	$2.80 M	Cut/fill, stormwater management, surface works
Street Lighting	$0.11 M	
Signalization (Exmouth)	$0.25 M	
Roundabout	$0.30 M	
Noise Mitigation	$0.43 M	
Landscaping	$0.43 M	
Misc.	$0.22 M	
Sub-Total	*$4.54 M*	
Contingency (25%)	$1.13 M	
Total Cost	**$5.67 M**	Property acquisition not included
Engineering (15%)	$0.85 M	
Estimated Total Capital Cost	**$6.52 M**	2020 $

7.9 Construction Staging

The City of Sarnia plans to construct The Rapids Parkway / Howard Watson Trail extension in two (2) phases summarized below:

Exhibit 7.10 – The Rapids Parkway Extension Construction Staging

Phase	Works	Schedule *
1	Exmouth Street interim crossing improvement (see Section 5.5 and Exhibit 5.5). Detailed design of road and trail extension.	2020
2	Grading, stormwater management, noise attenuation, landscaping, The Rapids Parkway extension and Howard Watson Trail extension construction from Sandpiper Drive to Exmouth Street.	2021

* Tentative based on City Council funding approval and MTO design approval under Highway 402

During the course of this construction, a pedestrian / bicycle way will be maintained at all times. The pedestrian way is to be fully accessible under Ontario Accessibility requirements. As such, it will be necessary to construct the trail from just north of the Highway 402 crossing to Exmouth Street initially, prior to road construction. Construction staging will need to have regard for the City's planned installation of associated infrastructure services including the sanitary sewer, storm sewer and watermain. Details of construction staging are to be developed at the detailed design stage.

7.9.1 Pre-Planting of New Vegetation

The City's July 2016 Official Plan policies for the Public Realm (Policy 5.2.2.1) require that new development and redevelopment "shall" enhance the appearance and function of adjacent streets and open spaces by providing plantings. Section 5.2.2.2 also encourages the planting of street trees in boulevards. Both of these policies are incorporated into the planned streetscape design for The Rapids Parkway and nature trail extension planned in this report.

Further, Section 8.1.3.4 of the Official Plan requires that the design and development of the pedestrian trail extension south of Wiltshire Park "shall" proceed "well in advance" of the design and development of the proposed future Rapids Parkway arterial road. According to the Official Plan, this policy was intended to provide sufficient time for the maturing of supplementary plantings in the trail extension area. Policy 8.1.3.9 further requires that this be undertaken "as soon as practical" in advance of residential development near the trail.

Based on the more detailed route planning and design conducted as part of this new Environmental Assessment, "pre-planting" of new vegetation along the road and trail extension should not be included as envisioned in the Official Plan. This study has concluded that such staging would not be "practical" since doing so would involve constructing road extension features such as drainage features, curbs, vegetation placement and other street and trail extension, except the street pavement. Construction of the final street extension pavement could then impact any pre-planted features. This would require new mitigation of vegetation impacts, or worse the replanting and cost of replanting new street and trail vegetation features.

8 Environmental Impacts and Mitigation Commitments

8.1 Noise Impact and Mitigation

An Environmental Noise Study prepared in late 2019 for this EA forecasts future noise levels with the planned extension of Rapids Parkway in order to identify if noise mitigation measures are required, and if so, to recommend these measures. Environmental noise assessments for road improvement projects typically consider noise levels at Outdoor Living Areas (OLAs) since noise mitigation at existing buildings is not typically practical given the building exists and its receiver locations are typically elevated.

Based on provincial guidelines and practices, noise mitigation features such as walls and/or landscaped berms will be considered for OLAs of existing residential properties under the following conditions:

- Where no road is present, as in the case of this EA, the 'existing' or ambient noise level is set at 55 dBA;
- If the outdoor living area (OLA) for each residential lot has side-yard and rear-yard exposure to The Rapids Parkway;
- Where the projected noise levels are predicted to exceed 65 dBA (0700 to 2300 16-hour LEQ) or where the projected noise levels are predicted to be above 60 dBA (0700 to 2300 16-hour LEQ) and the difference between the existing and projected noise levels is 5 dBA or more; and
- The proposed mitigation measures must provide a minimum reduction of 5 dB of mitigated to as close to ambient as technically feasible over the 0700 to 2300 time period to warrant construction.

The noise forecasting technically described in attached Appendix 4 demonstrated that noise mitigation is warranted. North of Highway 402 where space is limited by planned residential development along the east / south side of The Rapids Parkway extension, installation by the developer of a noise wall along the road right-of-way is recommended at the time of development. It is recommended that the developer prepare a noise study as part of the development approval process to confirm noise levels at that time and confirm the type of noise attenuation measure. These noise barriers are proposed for residential properties with rear- or side-yards facing The Rapids Parkway. No existing or planned residential properties front The Rapids Parkway where the building would act as a noise barrier.

On the west / north side of the road extension north of Highway 402, an existing solid wooden privacy fence with brick columns exists for abutting Bluebird Court lots. A chain link fence is in place for abutting Winchester Crescent lots. Suitable noise mitigation measures will be included in the detailed design of the road extension. Along the Winchester Crescent lots, space is available for the City to include a landscaped noise berm as part of the extension construction. This could use a combination of a maximum of 2.4 m (8 feet) fence height on a 0.6 m (2 foot) height earthen berm. This will be confirmed in the detailed design of the extension.

The abutting Wiltshire Park requires no noise mitigation from the road extension. South of Highway 402, no mitigation is required for the Pineview Apartments along Pontiac Court owing to their distance from the new road and for the non-residential land uses in this area.

In summary, the road extension detailed design should confirm a similar fencing style as already in place along the existing residential sections of The Rapids Parkway north of Highway 402.

Noise can also be mitigated through the use of air conditioning and sealed windows for homes backing onto the road extension.

The locations for the proposed noise mitigation features are shown on Figure N1 to N3 in attached Appendix 4.

The construction of the road / trail extension will also cause construction noise. This noise is temporary in nature and typically difficult to control. Accordingly, the Ministry of Environment, Conservation and Parks (MECP) does not require mitigation of construction and instead imposes noise emission standards on the construction equipment. The MECP NPC-115 guidelines provide noise emission standards for construction.

8.2 Landscaping

The use of vegetation and street trees will serve several purposes along the Rapids Parkway extension:

- Providing a visual naturalized buffer between the roadway and reinstated Howard Watson Nature Trail
- Where no noise walls are recommended, providing a buffer between residential properties and the trail and roadway

As this is a naturalized area, consideration for existing vegetation should be included in the design and construction phase. Recommendations for vegetation removal/replacement and streetscaping are described in the following sections.

8.2.1 Vegetation Removal / Replacement

All woody vegetation with a diameter at breast height (dbh) of 15cm or more, within 6 m of the impacted area, or whose canopy and/or rootzone is within the area of development, should be inventoried and tagged. The inventory will include the identification of individual species, dbh, crown size, overall tree health. Tree health is recommended to be analyzed in terms of:

a) GOOD - dead branches less than 10%; signs of good compartmentalization on any wounds, no structural defects.

b) FAIR - 10-30% dead branches, size or occurrence of wounds present some concerns, minor structural defects.

c) POOR - more than 30% dead branches, weak compartmentalization, early leaf drop, presence of insects or disease, major structural defects.

d) DEAD - tree shows no signs of life

Tree inventory information should be included in a chart on the Tree Management Plan and will also be shown a map at an appropriate scale to identify the trees that will be preserved, transplanted or removed, including the rationale for removal.

Tree protection should be bound, at minimum, by Tree By-Law 34 (1992) and the following arboricultural practices:

a. All existing trees to remain on site, or on adjacent properties as indicated above, should be tagged and fully protected with fencing beyond their dripline to the satisfaction of the city. Tree protection zones may be expanded as required based on the species of the tree. These barriers are created to protect the roots, trunks and branches during development, as well as the understorey and groundcovers. Small lot by lot tree protection requires snow fencing with metal post enclosures. Long term development construction requires special page wire fencing or plywood to a minimum height of 1.2m.

b. Fences are recommended to be located at a minimum of 0.5 times the crown radius of the tree from the dripline, 360 degrees around the perimeter of individual or clustered trees.

c. Areas within the tree protection zone should not be used for the storage of building materials, structures or equipment. This tree protection zone shall be completed prior to the commencement of site clearance, demolition, or any type of construction.

d. Surplus soil, equipment, vehicles, tools, debris or materials should not be placed over the root systems of the trees within the tree protection zone. No contaminants shall be dumped or flushed where feeder roots of trees exist.

e. Tree root zones typically spread well beyond the dripline of trees, up to 3.5 times the dripline radius, and are located predominantly in the top 30cm of soil. As this area is not protected, activity should be kept to a minimum to prevent root damage and soil compaction. Where root systems of trees are exposed or damaged by construction work, the city must be advised first before the roots are trimmed neatly and the area back-filled with topsoil.

f. Equipment should not compact soil over the root zone of existing trees. To avoid damage to trees that area to be protected, access routes must be established away from protected areas. All access routes regardless of how temporary, must be identified and approved by the city.

g. Where vehicular traffic or construction activities cannot be kept outside of the root zone for the entire duration of construction, one of the following actions is recommended to be taken, as approved by the city:

    i. Applying 15-30cm of wood chip mulch to the area.

    ii. Laying 2cm thickness plywood, beams, commercial logging or road mats over 10+cm thick layer of wood chip mulch.

    iii. Applying 10-15cm of gravel over a taut, staked geotextile fabric

    Stone, geotextile and mulch exceeding 10cm thick must be removed from the TPZ once the threat of soil or root damage is passed.

h. Work within the tree protection zone and/or within the dripline of trees to be preserved will be undertaken in the presence of a certified tree professional.

Suitable measures such as hand excavation, pneumatic excavation, hydrovac soil excavation, tunneling and root pruning should be undertaken under the guidance of the certified professional.

i. Written permission must be obtained from the city prior to commencing work such as tunneling, torpedoing, digging or trenching within the dripline of any tree to minimize root injury and avoid soil compaction.

j. Wherever possible avoid cutting surface roots. During excavation, if root cuts are necessary, it should be done quickly, making flush cuts while supervised by an inspecting city forestry representative. The roots should be backfilled and watered before they have a chance to dry out. Where roots require removal, there may be a subsequent decline within the tree canopy. Branches should only be removed if dieback occurs.

k. Where limbs or portions of trees are damaged or must be to accommodate construction work, they should be removed in accordance with accepted arboriculture practices, upon written approval from the city. Measures should be taken to prevent any further damage.

l. Unless authorized, all individuals should avoid disturbing original grades around trees in areas of the tree protection zone. In addition, road grades should match topography at the curb lines to maximize tree retention in boulevard and front yards. If grades around protected trees are likely to change, the developer and their agents should be required to take such precautions as dry welling, retaining walls and root feeding to the satisfaction of the city.

m. No cables, braces or ropes should be wrapped around or installed in or on any tree that is to remain after construction. Nor should it have signs or fences nailed to it, or survey markings or paint applied to it.

n. All vegetation within the tree protection zone, including trees, shrubs, grasses are to be watered, and maintained to an acceptable level as required. 5-10cm of wood chips should be maintained to conserve soil moisture, moderate soil temperatures, eliminate turf competition, promote soil organisms and protect the soil from compaction.

o. The city is to be notified to inspect all tree protection zones. These measures are to remain in effect until the completion of the work, at which time authorization from the city must be obtained before removal.

p. The city must be notified immediately when any municipally owned tree is injured or destroyed during construction or development.

q. In accordance with the Migratory Birds Convention Act, 1994, tree removal shall not take place from March 31st to August 31st.

Trees identified as one listed in the Species at Risk in Ontario List (*Ontario Regulation 230/08*) shall be verified by a professional forester or certified arborist. The tree shall be protected as required by the Species at Risk Act (SARA).

The replacement for a tree that is proposed to be removed, or is damaged or the environment has been altered as to cause eventual tree mortality during the course of construction should be based on the following equation:

$$\frac{\text{DBH of the Pre-existing Tree}}{\text{DBH of the Replacement tree}} = \text{the total number of replacement trees required}$$

(Note: DBH is measured in millimeters)

Species selected for replacement are recommended to be deciduous woody trees that are hardy in the Sarnia area, with consideration given to soil conditions, salt tolerance, climatic factors and resistance to insects and disease. Coniferous trees are not recommended to be used within the right of way. Tree locations shall conform to the Streetscape Design Treatment parameters. Tree species are to be approved by the city and identified in a Landscape or Streetscape Plan.

8.2.2 Streetscape Design

8.2.2.1 Plant Material

Planting strips along the curb should not be designed less than 3.0m wide to facilitate nutrient cycling, root collar and trunk flare development and to mitigate the effects of road salt by maximizing infiltration and percolation through the soil profile. Where a 3.0m wide boulevard cannot be achieved, the use of soil cells, permeable pavement, pavement bridges system or other low impact development (LID) practices may be incorporated or combined to compensate for the loss of soft surface area and should maintain a minimum cut-out area of $1.5m^2$. Regardless of surface treatment, individually planted trees should have a minimum soil volume of $30m^3$ of planting soil, and groups of 2 or more trees should have a minimum soil volume of 20 m^3 per tree. Open planters are preferred.

Trees should achieve the following minimum setbacks

- 1.0m from the curb face
- 1.0m from any adjacent sidewalk.
- 2.0m from driveways, alleyways and entrances to maintain visibility and public safety
- 10.0m from a stop sign or traffic signal
- 6.0m from any other intersection
- 2.0m from light standard, fire hydrant, utility pedestal, transformer or water valve

Trees should be spaced 12.0m apart for large trees (mature canopy greater than 10.0 diameter) and 6.0m apart for smaller trees (mature canopies between 5.0m and 10.0m) Trees should not be planted within any swales or ditches, but should remain a minimum of 1.0m from the top of slope.

Deciduous trees should conform to the latest Canadian Nursery Stock Standard, be of standard quality, true to name and type, and be free from defect. Plants should have normal, well-developed branches and vigorous root systems. They should be healthy,

vigorous plants free from defects, decay, sunscald injuries, bark abrasions, insect pests and all forms of infestation or objectionable disfigurements. Trees with minimum caliper of 50mm will be accepted. Trees that do not conform may be rejected.

Tree installation are to conform to current arboricultural practices regarding placement, pruning, season of planting, transportation and handling, backfilling, irrigation and staking, or as directed by the city. Post-installation care and monitoring are to be as directed by the city.

Tree species should be suitable for the site conditions at the time of planting and must accommodate the mature size of the tree. While native trees are preferred, in order to encourage diversity, non-invasive introduced species and cultivars will also be considered. No species should make up 20% or more of the proposed species and under no circumstances should invasive plant material, or plant material with invasive tendencies be allowed in the right of way.

The following tree types are not permitted:

- Trees with large or messy fruit;
- Trees with large thorns;
- Species such as poplar and willow are not allowed for street tree planting.
- Coniferous needle-bearing trees or other species will not be planted on the right-of-way where they will cause sight line obstructions but may be considered if the location supports placement of this type of tree.

Woody shrubs and perennials may be used as an aesthetic element and as screening between private property and the public right of way. Plant selection and placement must consider Crime Prevention Through Environmental Design (CPTED) principles and the anticipated maintenance protocol.

Maintenance and monitoring of installed plant material will be executed for the duration of the warranty period (2 years). A maintenance schedule may be requested for post-construction maintenance once the warranty period is complete.

8.2.2.2 Site Furniture

Benches are envisioned to be placed along the trail at recommended intervals of 35-40m on center to provide adequate rest stops for all abilities of trail users and at trail gateways. The benches are recommended to be 1.8m in length with a seat height between 405mm and 460mm, be made of a metal and/or composite material, and have a backrest and end arms to allow for easy transfers. Benches are recommended to be mounted on concrete pads. Concrete pads should include an additional clearance on one side of the bench of 1015mm by 1220m to accommodate one person using a wheelchair, scooter or stroller. Additional clearance is also recommended to be included to accommodate waste receptacles, minimum 800 mm beyond the other side of the bench. A connection from the proposed trail to the concrete should be of minimum width of 1.5m.

Waste receptacles are recommended to be placed adjacent to benches on the concrete pad. Waste receptacles should be standard City receptacles.

8.2.2.3 Signage

Wayfinding signage is recommended to be placed at 25m intervals. Signage should include the name of the trail, trail regulations and nearby amenities consistent with signage along the existing Howard Watson Nature Trail. A gateway feature is to be established at the Exmouth Drive location.

8.3 Source Water Protection

As previously reported in Section 4.4.4 of this report, consultation with St. Clair Region Conservation Authority (SCRCA) Source Protection staff will occur prior to detailed design of the road / trail extension in order to ensure that potential impacts to these sensitive areas, and associated mitigation recommendations are given consideration.

It is also recognized that the extension project is within the Thames-Sydenham & Region Source Protection Region and falls under the Thames-Sydenham & Region Source Protection Plan. The desired result of the plan's objectives is to protect sources of municipal drinking water against existing and potential threats.

A number of vulnerable areas are delineated under the Clean Water Act for municipal drinking water systems. As also previously reported in Section 4.4.4 of this report, the planned road / trail extension project involves a Significant Groundwater Recharge Area (SGRA) Vulnerability – 6. It is noted that significant threats to drinking water do not exist in areas designated as SGRAs. Only moderate and low threats to drinking water may exist.

There are only 3 policies in the Thames-Sydenham and Region Source Protection Plan (SPP) that apply to moderate and low drinking water threats. Of these, only one applies to the road / trail extension project, which essentially notes that new terms and conditions in existing and proposed legislation/regulations are to be considered and used to manage activities such that they reduce and/or do not become a Significant Drinking Water Threat.

8.4 Climate Change

The Ministry of Environment, Conservation and Parks has encouraged the City of Sarnia to include climate change in this EA. It should be considered in the context of mitigation and adaptation. Regarding mitigation, the Municipal Class EA (Appendix 2) includes mitigation measures such as managing increased surface water runoff by directing it to grassed swales as planned for The Rapids Parkway extension.

Climate adaptation is addressed in the Sarnia Official Plan (Section 6.1.1) with policies that favour environmental designs that are resilient to stresses of climate change. In the case of The Rapids Parkway extension, this involves stormwater management, improving tree cover and ecological restoration.

Furthermore, the City is currently preparing a Climate Change Adaptation Plan for its water resource, infrastructure and transportation systems to:

- efficiently allocate financial resources, ensure public health and safety, mitigate property damage, and reduce or eliminate reliance on costly preventative works;
- assess the risks to human systems as well as natural systems;

- assess adaptation options and their costs and benefits in reducing unacceptable risks;
- identify the most effective adaptation option(s);
- develop polices and action plans to reduce risks to acceptable levels; and
- identify the most effective approaches and mechanisms, and incorporate them into development planning and decision-making.

When completed in 2021, this Plan can be referenced in developing the detailed design for the road / trail extension.

8.5 Permits and Agreements

Applications for permits and agreements will be required during the detailed design stage as follows:

- Ministry of the Environment, Conservation and Parks (MECP): an Environmental Compliance Approval (ECA) will be required for the construction of the storm sewer.
- St. Clair Region Conservation Authority (SCRCA): The southern portion of The Rapids Parkway extension, between Highway 402 and Exmouth Street is within a Regulated Area. A permit will be required from the SCRCA under the Conservation Authorities Act - Ontario Regulation 171/06 as amended (Application for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses).
- Ministry of Transportation (MTO): Approvals will be required from the MTO for construction of the roadway and pathway under the Highway 402 overpass.

Appendix 1

Traffic Study, 2019

Appendix 2

Consultation Material

Appendix 3

Capital Cost Estimate

Appendix 4

Environmental Noise Study