TOWN OF INNISFIL

REPORT NUMBER: FINAL

PRELIMINARY DESIGN REPORT

25TH SIDE ROAD FROM INNISFIL BEACH ROAD TO BIG BAY POINT ROAD/13TH LINE

September 21, 2022

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Town of Innisfil

FINAL REPORT

PROJECT NO.: 211-01252-00
CLIENT REF: RFP P-20-24
DATE: SEPTEMBER 21, 2022

WSP CANADA INC.
100 COMMERCE VALLEY DRIVE WEST
THORNHILL, ON L3T 0A1

WSP.COM

September 21, 2022

Attention: Bobbi-Jo Duncan, Capital Project Manager

Subject: Preliminary Design Report (Final) for 25th Side Road Reconstruction and Active Transportation from Innisfil Beach Road to Big Bay Point / 13th Line

WSP is pleased to submit this final Preliminary Design Report for the reconstruction and active transportation improvements on 6.9 kilometres of 25th Side Road from Innisfil Beach Road to Big Bay Point Road/13th Line. The design aligns with the Town's vision to implement roadway improvements to accommodate growth while prioritizing active transportation, safety and environmentally sustainable design along the length of the project to support community and environmental health and wellness.

Key deliverables include topographic survey and base plan, Subsurface Utility Engineering (SUE) drawings to Quality Level B, geotechnical investigation and pavement design report, arborist report and tree preservation plans, stormwater management report, preliminary design drawings, roadway safety review, phasing plan, preliminary cost estimate, consultation materials, and preliminary design report.

Design comments received from the Town of Innisfil as part of draft submissions are included in a comment sheet with designer responses, in Appendix L.

Appendices included are as follows:

A. Preliminary Design Drawings – Plan and Typical Sections
B. Subsurface Utility Engineering Drawings and Circulation Summary
C. Geotechnical Investigation and Pavement Design Report
D. Arborist Report and Tree Preservation Plans
E. Stormwater Management Report
F. Alternatives Evaluation Matrix
G. Roundabout Alternatives and Analysis
H. Engagement Report
I. Roadway Design Criteria
J. Plan Based Roadway Safety Review
K. Cost Estimate and Phasing Plan
L. Comment Tracking Sheet with Designer Responses

Yours sincerely,

Shawn Smith

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Ontario Co-Lead, Active Transportation and Complete Streets Centre of Excellence
Transportation Planning and Science
WSP Canada Inc.

Encl.

cc. Carolina Cautillo

REVISION HISTORY

FIRST ISSUE

May 19, 2022	**Draft**			
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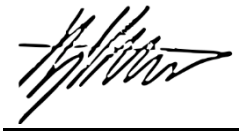

Sept 21, 2022

Kyle Dow
Transportation Planner

Date

APPROVED[1] BY

Sept 21, 2022

Shawn Smith, P.Eng., M.Eng., PMP
Senior Project Manager

Date

[1] Approval of this document is an administrative function indicating readiness for release and does not impart legal liability on to the Approver for any technical content contained herein. Technical accuracy and fit-for-purpose of this content is obtained through the review process. The Approver shall ensure the applicable review process has occurred prior to signing the document.

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1 BACKGROUND INFORMATION

1.1 PURPOSE

The Town of Innisfil has retained WSP to complete a preliminary design, phasing plan and cost estimate for improvements to 6.9 kilometers of 25th Side Road from Big Bay Point Road/13th Line to Innisfil Beach Road. The corridor is identified as a "key community link", and the Town envisions an "active transportation first" approach to its design, providing an improved active transportation experience along this key community link. The Town further desires to explore and incorporate traffic calming initiatives and Low Impact Development (LID) features into the design. By focusing the road improvement design on these elements, the Town hopes to achieve a vision that supports both community and environmental health and wellness. The Town's project goals are identified in **Figure 1**.

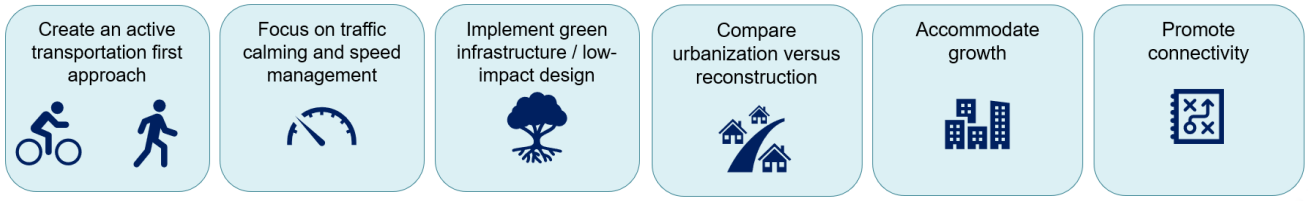


Figure 1: Project Goals

1.2 RELEVANT PLANNING AND ENGINEERING DOCUMENTS REVIEWED

The following documents were reviewed as part of a background review to inform the proposed design.

- **2016 Active Innisfil Trails Master Plan:** Proposes a multi-use trail along 25th Side Road through the full project area, to be constructed between 2022 and 2031 at an estimated cost of $1.925M. The 25th Side Road project reviewed this recommendation and identified alternative options for accommodating an active transportation route, keeping in mind the vision for the corridor.

- **2018 Transportation Master Plan:** Identifies 25th Side Road as major collector, with the southern 5.5 km budgeted for urbanization in the short term, and the northern 1.5 km budgeted for reconstruction in the short term. Appendix B of the TMP (Detailed Active Transportation Improvement Locations) did not propose a multi-use trail along 25th Side Road but included 800m of sharrows from Pinegrove Avenue to Lockhart Road. The TMP also noted future intersection improvements at 25th Side Road at 9th Line, Lockhart Road and Big Bay Point Road/13th Line. The intersection improvements have been incorporated into the preliminary road design and considered when formulating the phasing plan.

- **2018 Official Plan:** Identifies several different land use contexts along the corridor, including built-up low density residential, key natural heritage features, and the future Sandy Cove Acres downtown commercial area. Schedule C identifies 25th Side Road as a Major Collector (min 26 m right-of-way), as shown in **Figure 2**. The project team has proposed a 23 m right-of-way for the areas considered future downtown context, and maintaining the existing right-of-way (approx. 20m) for low density residential and green and rural contexts.

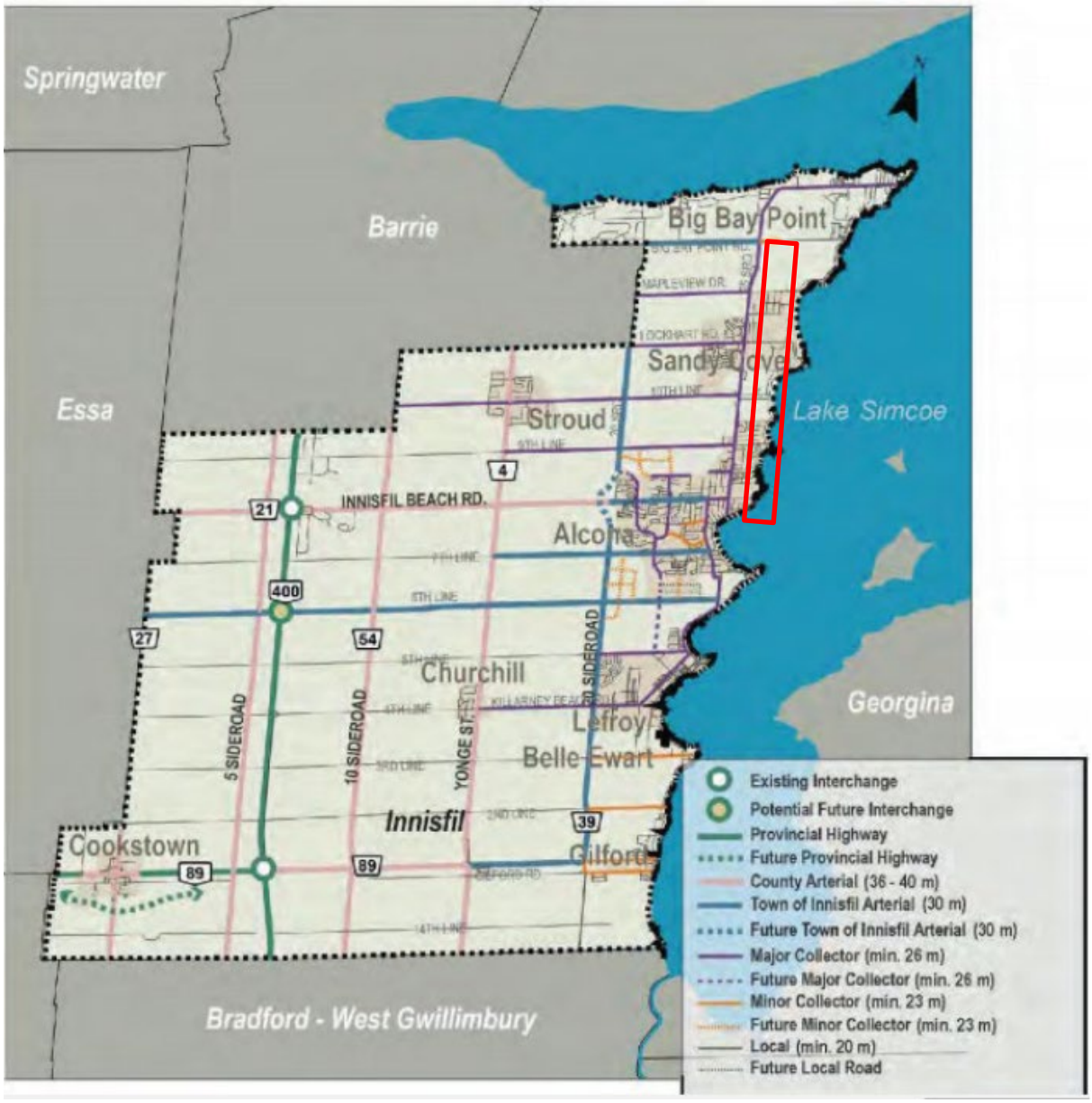


Figure 2: Road network from the Innisfil Official Plan Schedule C: Transportation Network – Roads (2018). Project limits are identified with the red box.

- **2018 Complete Streets Policy:** Identifies different street typologies and recommendations for improving comfort and safety for all road users. Figure 3, Figure 4 and Figure 5 show examples of different road typologies relevant to 25th Side Road from the Town of Innisfil Complete Street Guidelines, Appendix D of the TMP. The project team identified alternative options for accommodating an active transportation route, keeping in mind the vision for the corridor.

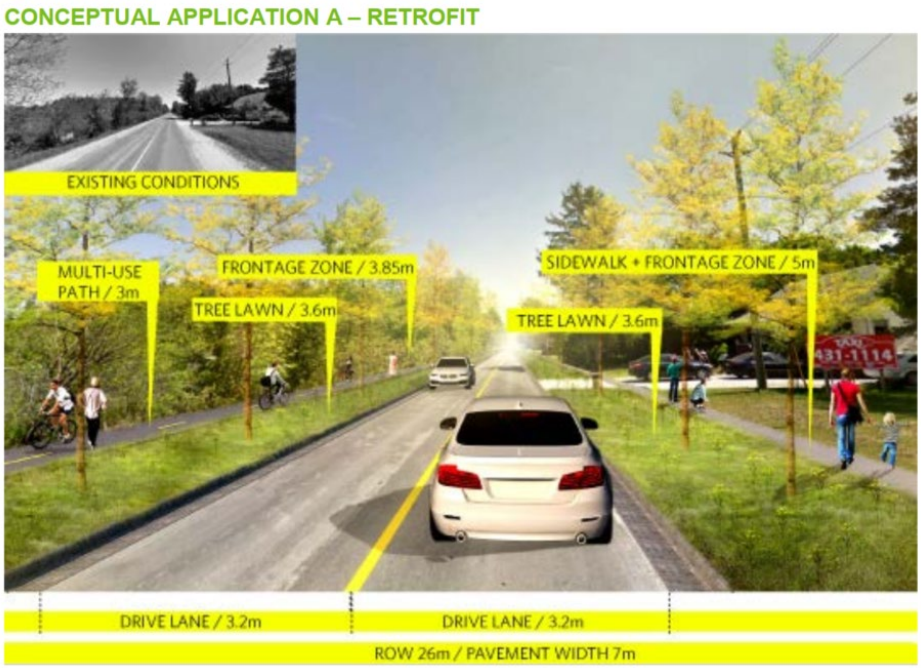


Figure 3: Urban Thoroughfare Context, Complete Streets Guidelines

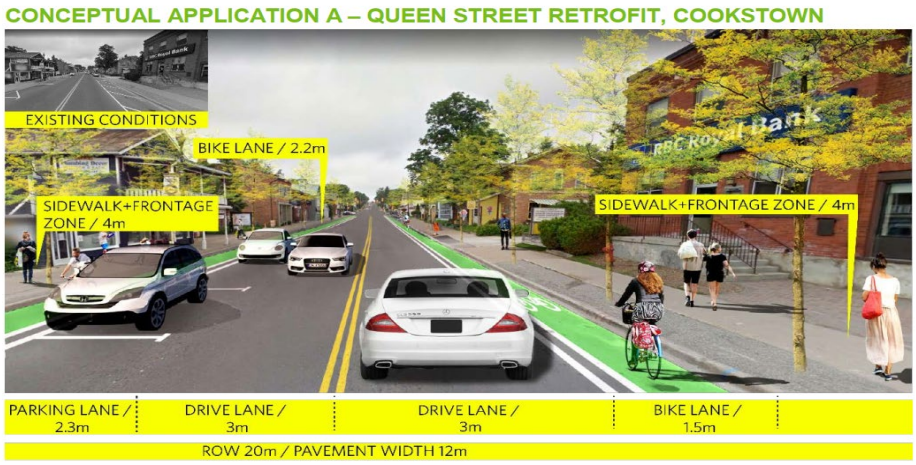


Figure 4: Downtown Commercial

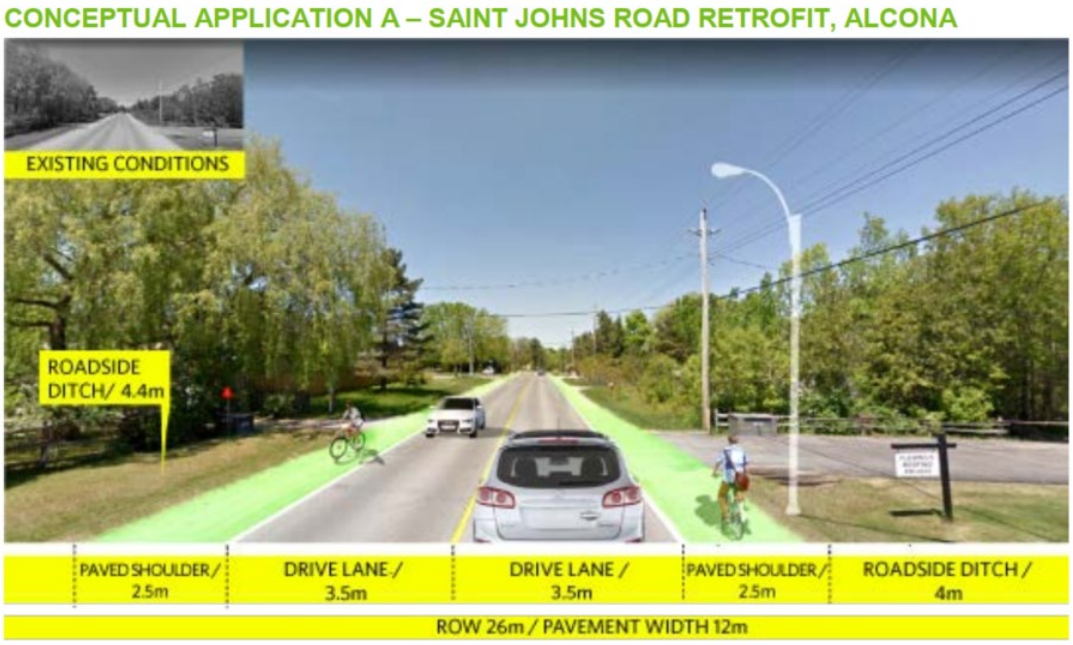


Figure 5: Neighbourhood Collector – Rural Cross Section

- **2018 Servicing Master Plan:** Identifies two projects along the corridor to upgrade underground infrastructure before 2031: a watermain upgrade from Innisfil Beach Park to 9th Line, and a sanitary sewer upgrade from Lockhart Road to Pinegrove Avenue. These have been considered in the phasing plan for 25th Side Road.

- **Innisfil Beach Park Master Plan:** Innisfil Beach Park is a large, irregularly shaped lot of approximately 85 acres, and is known municipally as 2155 25th Side Road. The Park is zoned Open Space, which provides for outdoor recreation, public uses, and passive recreation opportunities. The Innisfil Beach Park Master Plan (IBPMP) has been prepared to set a bold, long-term vision for the revitalization of Innisfil's largest urban Park. The Plan envisions a year-round community asset that could put Innisfil on the map as a completely unique tourism destination for Lake Simcoe. The Plan proposes significant long-term strategic investments which will result in new gathering and social spaces, cultural programming opportunities, and enhanced natural resources. 25th Side Road is a key link to connect people to the park and offers an opportunity to complete a pathway loop of the park for active recreation.

  The project team has proposed a two-way cycling facility plus sidewalk on the east side of 25th Side Road where it fronts the park, which could form part of a park loop and would connect to the existing multi-use path on the north side of Innisfil Beach Road to the east.

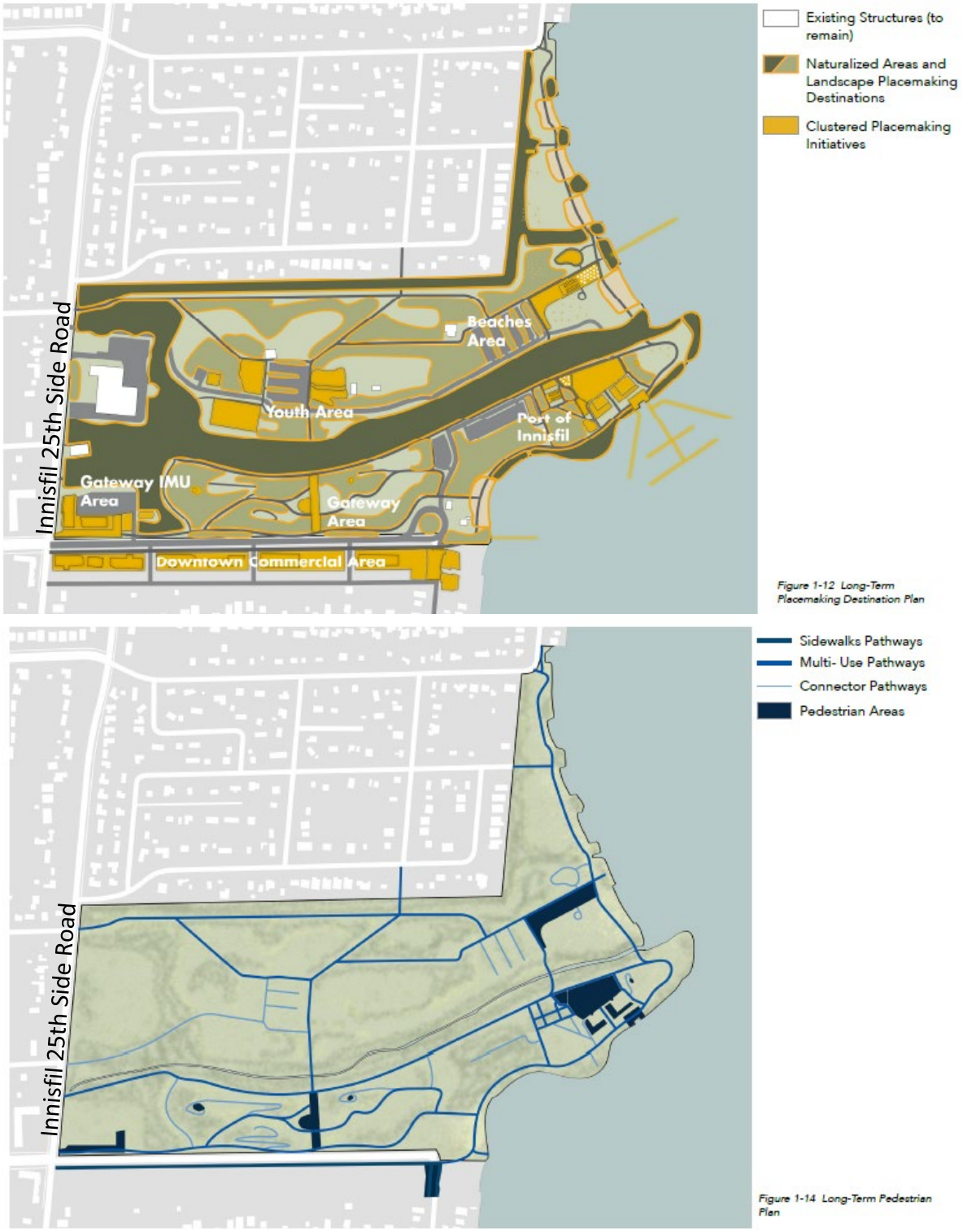


Figure 6: Long-term placemaking destinations and pedestrian plans proposed for Innisfil Beach Park

- **Town Engineering Design Standards and Specifications Manual (May 2021):** The Town's standards were reviewed in development of design criteria for 25th Side Road. A context-sensitive approach was taken that aligns with the Town's Complete Streets Policy and vision as an active transportation-first corridor. Refer to the design criteria in Appendix I.

1.3 COORDINATION WITH DEVELOPMENT AND PLANNED ROAD WORK

1.3.1 INNIS VILLAGE

Innis Village is envisioned as a vibrant mixed-use development designed to include a range of housing, commercial and institutional uses appropriate to the local context that will support not only retirement and aging-in-place initiatives but will cater to families across the entire age spectrum. Urban design measures such as landscaped boulevards, tree lined streets, sidewalk linkages to surrounding areas and buildings that appropriately address the street will be employed throughout the development in a coordinated manner to create a safe, walkable and sustainable neighbourhood that appropriately fits its context within the Town of Innisfil and adjacent to the established Sandy Cove Acres adult lifestyle community.

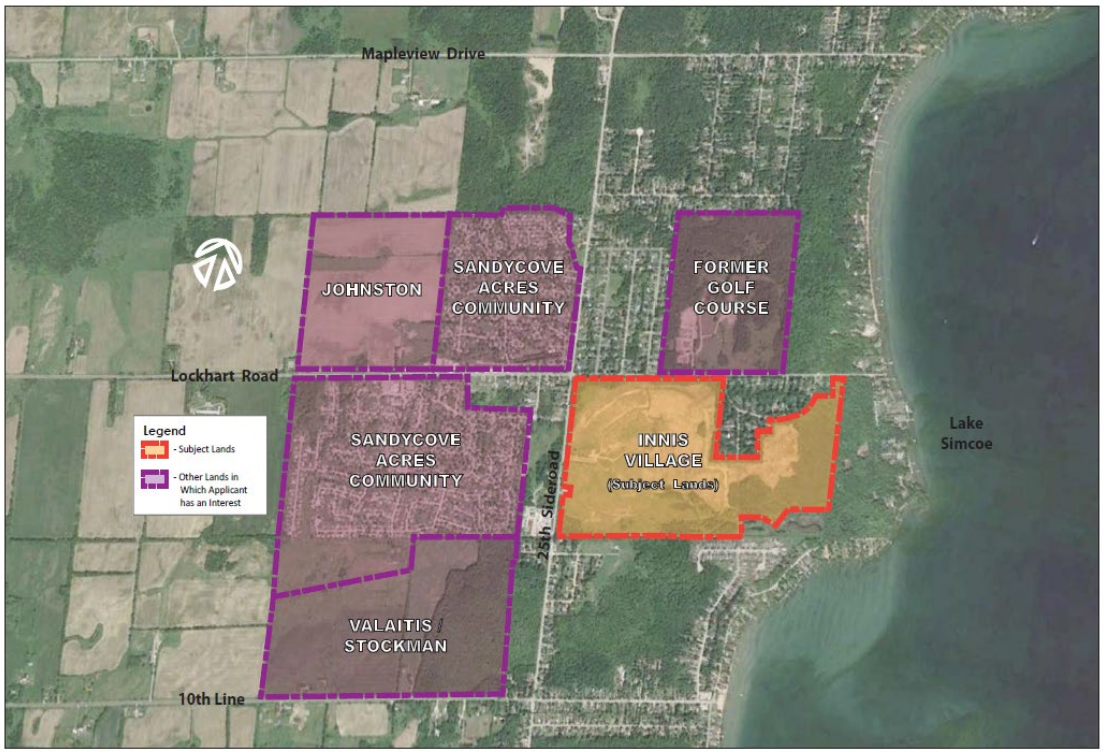


Figure 7: Development context of Sandy Cove Acres, showing the scale of the Innis Village development

The Innis Village Urban Design Guidelines have been developed to assist in the design of a high-quality public realm. The public realm is a vital component of Innis Village that will work together with the proposed built forms to assist in the efficient functioning of the neighbourhood and defining its character.

The Innis Village development fronts approximately 650 metres of the east side of the 25th Side Road corridor, from just north of Cook Street to Lockhart Road. According to the Phasing Plan from March 2019, the ultimate site build out will include:

- One new access road (Ireton Street) fronting 25th Side Road along with a northbound right turn taper on 25th Side Road, located 350 metres south of Lockhart Road (these works are complete as of the writing of this report)
- An active transportation connection from the internal road, Lamb Street, meeting 25th Side Road 115 metres south of Lockhart Road
- Commercial land use along 25th Side Road between Ireton Street and Lockhart Road
- Institutional land use along 25th Side Road south of Ireton Street
- Widening 25th Side Road to add a two-way left turn lane from Ireton Street to Lockhart Road
- Local intersection improvements at Lockhart Road

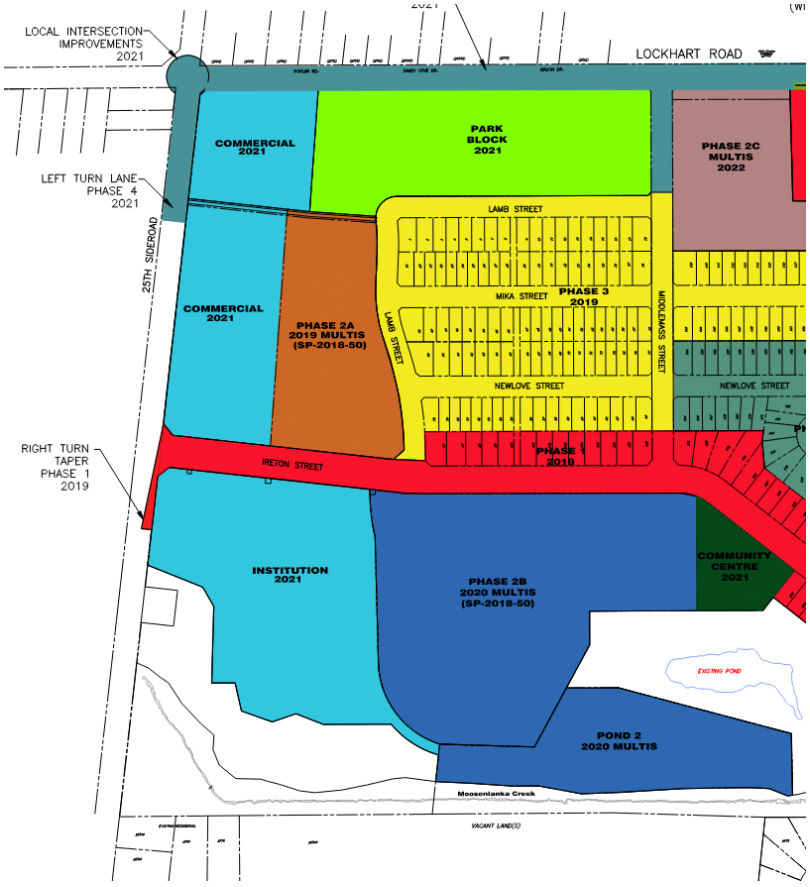


Figure 8: Excerpt from Phasing Plan for Innis Village development (March 2019)

Figure 9: Conceptual layout for commercial block from Ireton Street to Lockhart Road (Innis Village Urban Design Guidelines, 2018)

1.3.2 LOCKHART ROAD AND 25TH SIDE ROAD INTERSECTION IMPROVEMENTS

This intersection expansion and signalization is required to be done by the Innis Village developer as part of their development approvals, and designed by Tatham Engineering. The scope of work includes:

- Urbanization of 25th Side Road from 70 metres south of Ireton Street to 150 metres north of Lockhart Road
- Widening of 25th Side Road to add a northbound right turn lane at Ireton Street, a shared left turn lane from Ireton Street to Lockhart Road, and a southbound left turn lane at Lockhart Road
- Addition of a traffic signal at 25th Side Road and Lockhart Road along with pedestrian ramps and signals

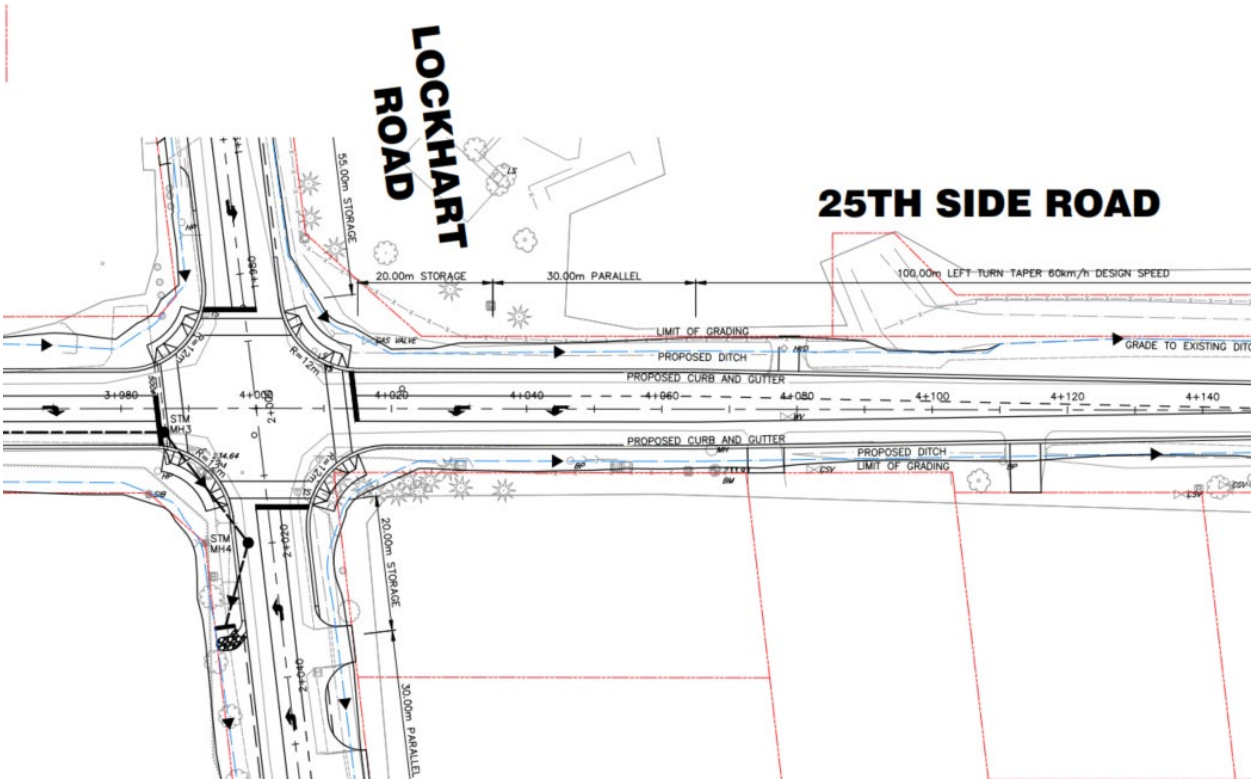


Figure 10: Extract from Lockhart Road and 25th Side Road Intersection Improvements project, April 2021

These proposed works are planned for implementation in 2023 and as such, the preliminary design for this assignment assumes tying into the modifications designed by Tatham Engineering. Discrepancies arose in the use of a higher design speed (60 km/h) for the segment by Tatham Engineering, which was adjusted to 50 km/h to align with the goals for the corridor, as well as the addition of midblock turn lanes and reduced turning radii where it can be accommodated, and bicycle crossrides.

1.3.3 TEROMI INC. LANDS AT MAPLEVIEW DRIVE / 25TH SIDE ROAD

A large parcel of privately owned developable land exists at the south-east corner of 25th Side Road and Mapleview Drive. The land is designated "Future Urban" in the Town's Official Plan and could include a mix of commercial and residential land uses. WSP's preliminary design considers the anticipated future development context of the site. Timing for the development is currently unknown, and an interim rural condition with paved shoulders should be considered until the development proceeds.

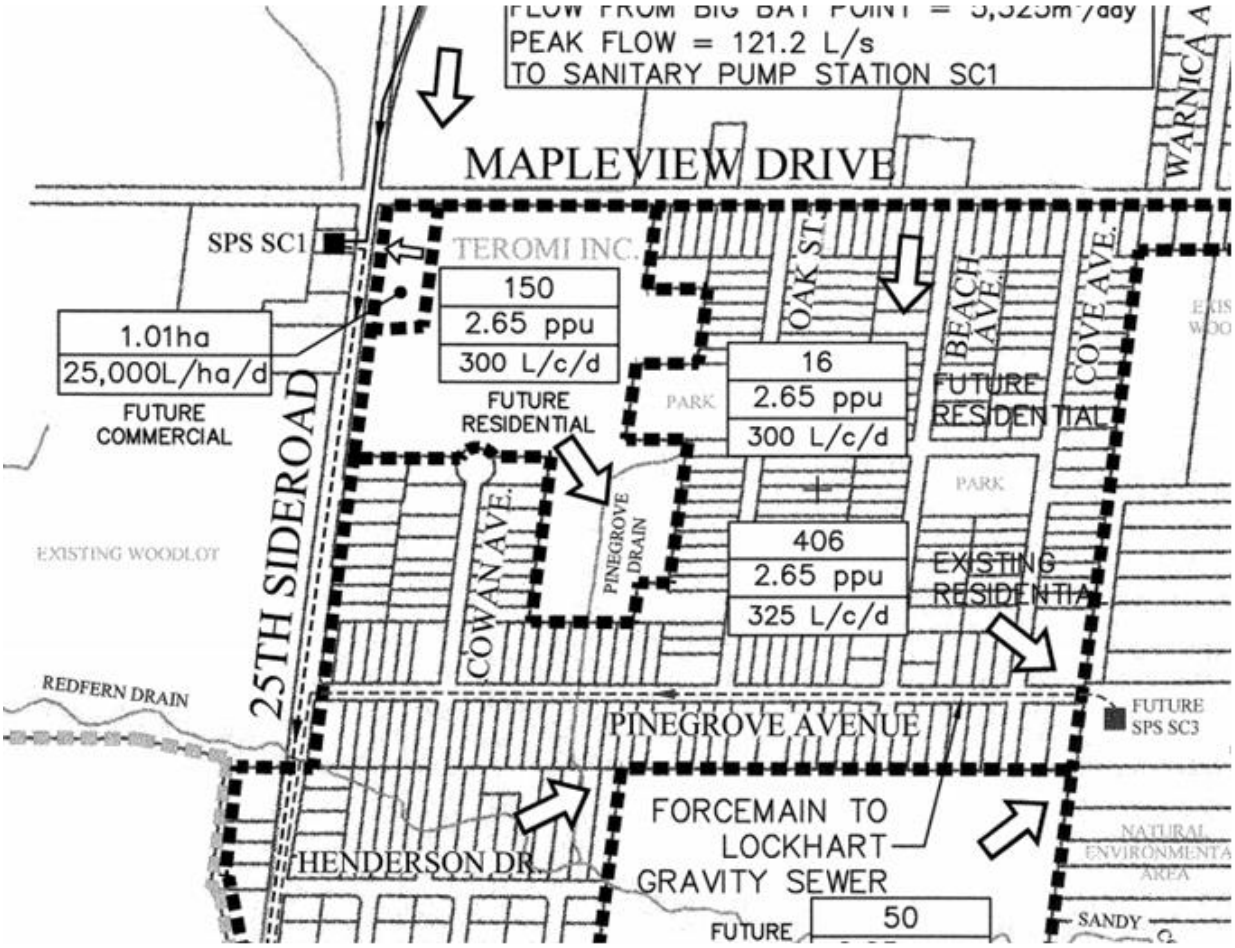


Figure 11: Preliminary sanitary estimates for the Teromi Inc. lands, provided by the Town of Innisfil, showing potential future commercial and residential uses

1.3.4 FRIDAY HARBOUR DEVELOPMENT

Located in Big Bay Point on the northeast side of Innisfil, Friday Harbour is a four-season 600-acre resort featuring natural landscapes alongside urban attractions. With a variety of amenities, Friday Harbour promotes economic growth while preserving ecosystems and natural habitats.

At the northeast corner of 25th Side Road and Big Bay Point Road, a fire hall is built and operational. There is a possibility that the remainder of the Fire Hall property will be used for another civic use, i.e. community centre or library. The plans have not yet been advanced. While the Friday Harbour development is beyond the project area, it is expected that the project will influence travel in the study area and generate more travel along 25th Side Road. The development will create a natural anchor destination at the north end of the study area, supporting more active transportation use along the 25th Side Road corridor.

1.3.5 ROUNDABOUT AT 25TH SIDE ROAD AND BIG BAY POINT ROAD / 13TH LINE

In support of the Friday Harbour development as well as the surrounding community, the existing stop-controlled intersection of 25th Side Road & Big Bay Point Road / 13th Line is being upgraded to a single-lane roundabout, designed by BA Group. WSP's preliminary design will tie into the roundabout. Implementation is anticipated in 2023.

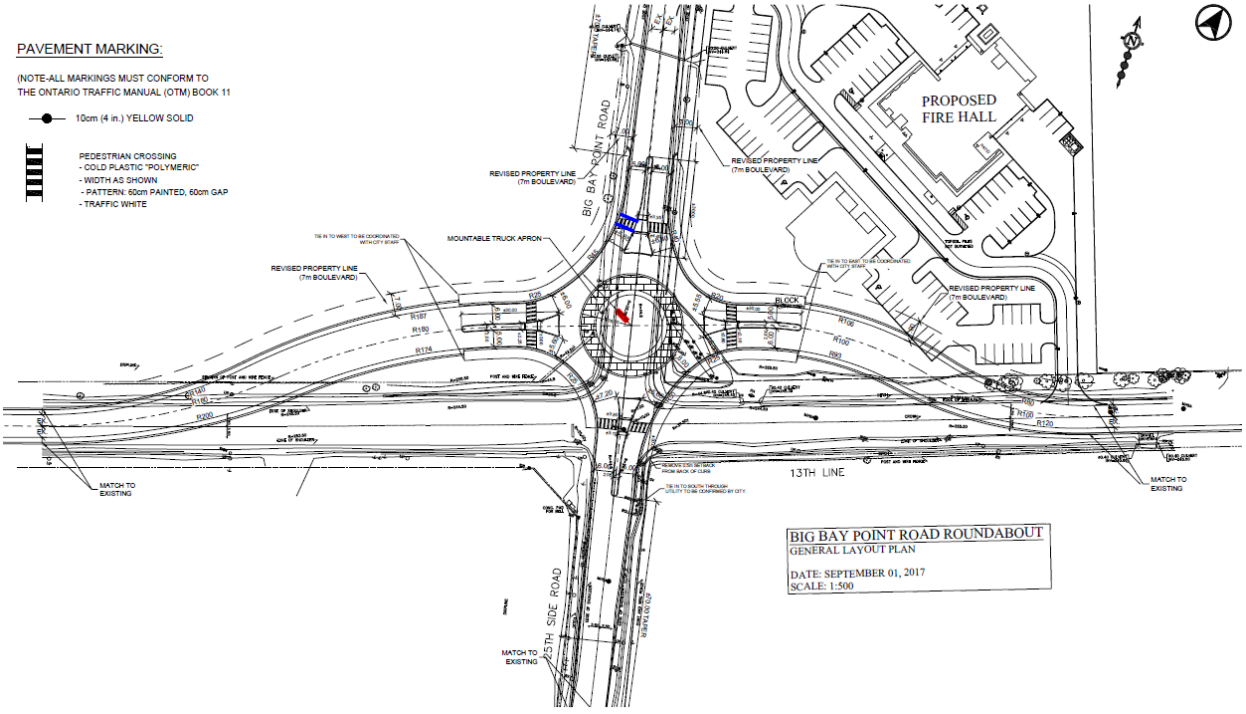


Figure 12: Functional roundabout design (preferred north option) from 2017

1.3.6 PEDESTRIAN CROSSING AT LEBANON DRIVE

To support access to Innisfil Beach Park, the Town is planning to construct a signalized intersection pedestrian signal (IPS) at the intersection of 25th Side Road and Lebanon Drive. WSP's design provisions for this new future crossing.

Figure 13: Location for proposed intersection pedestrian signal at Lebanon Drive

1.3.7 ORBIT GO STATION DEVELOPMENT

The Town of Innisfil is growing quickly. Within a few years, the Town will have a new GO station on the rail line between Barrie and Toronto. The Orbit: Innisfil is a vision for a community that will help the Town grow while preserving its agricultural lands and natural landscapes. The Orbit will encourage high-density living instead of suburban sprawl, mixing small town with urban living.

This development is located 3.5 kilometres southwest of the southern extent of the 25th Side Road project area and will likely have minimal influence on 25th Side Road. Regardless, the development represents a significant shift within Innisfil towards walkable, transit-oriented development. In future, residents of Alcona will be within a 5 km (15-20 minute) bike ride of the GO station.

Figure 14: Rendering of Orbit development, from Town of Innisfil website

1.3.8 PLANNED TOWN CAPITAL WORKS

The following projects in or near the study area have been identified to be coordinated with the plans for 25th Side Road.

Table 1: Planned Town Capital Works in or near the Study Area

Project	Timing (anticipated)
RDS287 – 25th Side Road & Big Bay Point/13th Line Roundabout	2023 Construction
RDS349 - Pinegrove Ave from 25th Side Road to Cove Ave (resurfacing)	2023 Construction
Sanitary sewer upgrade from Lockhart Road to Pinegrove Avenue	2024/25 Construction
RDS258 - Improvements to Lockhart Road and 25th Side Road intersection and Lockhart Road east to the Lake	2023 Construction
RDS309 - 10th Line - Sandy Cove west settlement boundary to Purvis St - Urbanization/Active Transportation	Timing appears to be around 2024 for design. Construction unknown, driven by development
RDS349 - Capital Engineering - Rose Lane from 25th Side Road to Leonard Street and Leonard Street from Rose Lane to Burton Dr	2022 Construction
RDS349 - Capital Engineering - William St 50m east of Sandy Trail to 25th Side Road	2022 Construction
Watermain upgrade on 25th Side Road from Innisfil Beach Park to 9th Line	Construction before 2031 (per 2018 Servicing Master Plan)
RDS349 - 25th Side Road south from Innisfil Beach Road to Lakelands	2022/23 Construction
Rehabilitation of 20th Side Road from Big Bay Point Rd to Innisfil Beach Road	2023 Construction

1.4 CONTEXT

The roadway context varies significantly along its length. The project team determined three separate contexts for consideration throughout the design process, characterized as follows:

- **Context 1: Low Density Residential**
  - Includes community of Alcona from 80 m north of Innisfil Beach Road to 70 m north of Cook St (3.1 km) and through Sandy Cove Acres from Lockhart Road to 300 m south of Mapleview Drive (0.8 km)
  - Characterized by frequent driveways and older, low-density, primarily residential development; land use is expected to remain stable
  - Urban and rural cross sections to be considered

Figure 15: Existing conditions along an identified low-density residential portion of the 25th Side Road.

- **Context 2: Green and Rural**
  - Includes the segment north of Mapleview Drive (1.4 km) which is adjacent to rural and key natural heritage feature areas.
  - Limited driveways/development existing and planned
  - Rural cross section desired

Figure 16: Existing conditions along a Green and Rural portion of the 25th Side Road.

- **Context 3: Downtown Commercial**
  - Includes the first 80 m north of Innisfil Beach Road, the Innis Village development in Sandy Cove Acres (0.9 km) and the future urban area south of Mapleview Drive inclusive of the intersection approaches (0.4 km)
  - Undergoing active development; desired as an "urban village" in the Official Plan
  - Desire for streetscaping, placemaking, walkable development, and lower vehicle travel speeds, and on-street parking
  - Urbanized cross section desired

Figure 17: Existing Conditions of a soon-to-be Downtown and Commercial area of the 25th Side Road.

The Town's right-of-way is consistently 20 m wide through the project corridor, though the portion adjacent to the Innis Village development is proposed to be widened to 23 m. The existing paved width is fairly consistent along the corridor: approximately 7.0 m with 2.0 m gravel shoulders.

The limits of each context are as follows and identified on **Figure 18**:

- **Context 1: Low Density Residential:** Includes the community of Alcona from 80 m north of Innisfil Beach Road to Rose Lane (3.4 km) and through Sandy Cove Acres from Lockhart Road to 300 m south of Mapleview Drive (1.0 km)
- **Context 2: Green and Rural:** Includes the segment north of Mapleview Drive to Big Bay Point Road (1.4 km)
- **Context 3: Downtown Commercial:** Includes the first 80 m north of Innisfil Beach Road, the Innis Village development in Sandy Cove Acres (0.9 km) and the future urban area south of Mapleview Drive inclusive of the intersection approaches (0.4 km)

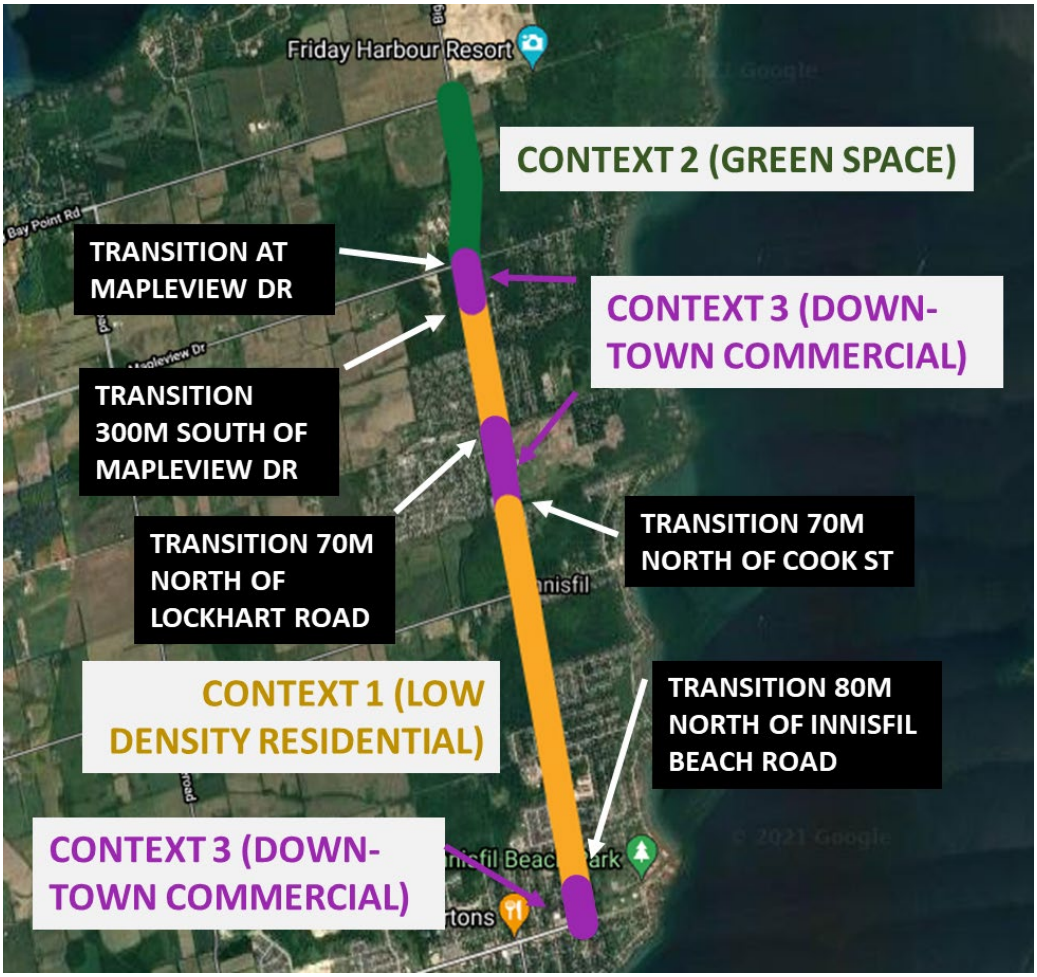


Figure 18: Map of the study area including the three corridor contexts

2 INVESTIGATIONS COMPLETED

2.1 SITE OBSERVATIONS AND EXISTING CONDITIONS

2.1.1 SITE VISIT

A site visit was conducted of the study area on July 17, 2021 to collect photos, identify constraints, and understand active uses along the corridor. Observations included:

- The basketball court within the park on the east side of 25th Side Road north of Innisfil Beach Road is a popular destination and likely a generator of active transportation trips
- Traffic appeared to generally be travelling at faster than the 50 km/h speed limit
- Several pedestrians were observed on the sidewalk at the south end of the study area
- Multiple cyclists were observed riding on the street at the edge of the vehicle lanes. Most appeared to be cycling recreationally.

Figure 19: Photos captured from the site visit showing (from left to right), the basketball court, two people walking, and two people cycling

2.1.2 ACTIVE TRANSPORTATION

At present, sidewalks are provided along the east side of the corridor through Alcona between Innisfil Beach Road and Rose Lane. Shoulders are not paved, and cyclists are observed to generally operate in mixed traffic and ride at the edge of vehicle lanes.

The Trails Master Plan calls for a multi-use pathway along the corridor, while the scope of this project includes a review of other options as well. This project identifies options and a preferred approach for providing continuous cycling and walking facilities along the corridor. Cycling facilities may transition to different types between contexts (such as from paved shoulders to cycle tracks), and the desire is to make transitions smooth and as uninterrupted as possible (ex. minimizing transitions between one-way and two-way facilities.

2.1.3 TRAFFIC

The posted speed of the roadway is 50 km/h south of Mapleview Drive and 60 km/h north of Mapleview Drive. In June 2021, Ontario Traffic Inc. was retained by the Town to collect speed and volume data along the corridor. The key findings at the observation site on 25th Side Road south of 9th Line were:

- Average travel speed was 46 km/h
- 41.5% of vehicles exceeded 50 km/h
- The 85th percentile speed was 57 km/h

The Town has noted resident concerns of speeding along the corridor and a desire to implement traffic calming measures. This suggests that speeding is common in the study area, and it may be desirable to incorporate traffic calming measures into the design to reduce operating speeds closer to the posted speed limit.

Daily traffic volumes along the corridor vary significantly, generally becoming lower towards the north end:

- Innisfil Beach Road to 9th Line: ~7,000 ADT
- 9th Line to Cook Avenue: ~4,000 ADT
- Cook Avenue to Big Bay Point Road: ~2,000 ADT

As part of the major Innis Village development and other planned developments in Sandy Cove Acres, it can be expected that traffic volumes will increase in future years.

In line with the desire for traffic calming, the project team has proposed a lowered posted speed limit for Context 1 (Low Density Residential) and 3 (Downtown Commercial) to 40 km/h. A separate memo requesting an exemption for 25th Side Road from the Speed Limit Policy was prepared for consideration by the Town. The project's design criteria proposes a design speed of 50 km/h to enable sharper tapers and other traffic calming elements to be integrated into the design. The intent is a safer and people-oriented corridor design.

2.1.4 HEAVY VEHICLE TRAFFIC

The Road Needs Study indicates that trucks account for 4% of vehicle traffic along the corridor. Given the primarily residential use along the corridor, absence of major commercial uses, and designation of the corridor as a major collector, it is assumed that any truck traffic on the corridor will be local-only, infrequent, and likely limited to smaller trucks as opposed to tractor trailers.

The Town has also approved 25th Side Road as a haul route from 10th Line to Mapleview Drive for the Innis Village development, meaning that larger vehicles such as dump trucks will occasionally travel this portion of 25th Side Road during the construction of the subdivision.

Two elementary schools are located in close proximity to the corridor: Holy Cross Catholic School and Goodfellow Public School. Overall, multiple school bus routes service 10 different schools along the study area of 25th Side Road. The majority of buses are regular 72-passenger vehicles, while others include wheelchair vehicles and vans. The Simcoe County Student Transportation Consortium (SCSTC) has confirmed that existing bus routes include turns at most of the side street intersections along the corridor.

2.1.5 UTILITIES

Hydro poles are continuously present in the corridor, but frequently alternate between sides.

- West side between Big Bay Point Road and Maple View Drive (1.4 km)
- East side between Maple View Drive and Lockhart Road (1.4 km)
- West side between Lockhart Road and 10th Line (1.4 km)
- East side between 10th Line and Innisfil Beach Road (2.8 km)

The location of these poles has been considered in the identification and evaluation of cross sections.

Within the Preliminary Design Phase, the Town confirmed a preference to relocate hydro poles as required and maintain the active transportation facility alignment where the facility could not bend around without meeting the design criteria minimum widths for cycle track, sidewalk and clearances from poles. For preliminary design purposes, the Town noted a cost of $15,000 for each HP relocation. North of Lockhart Road to Big Bay Point Road, poles have recently been relocated. As such, the intent is to avoid further relocations in this area as much as possible.

2.2 SUBSURFACE UTILITY ENGINEERING

As part of the 25th Side Road Preliminary Design project, SUE Quality Level D and SUE Quality Level B was completed by PlanView Utilities Services to capture utilities within the project limits. A Subsurface Utility Engineering (SUE) Quality Level D investigation was carried out for the entire study area, and field work for Quality Level B was carried out for 3,000 m of the 6,930 m study area, divided into 230m segments at each of the 13 intersections. A circulation to utility firms in Fall 2021 is summarized in **Table 2** and has been incorporated into the preliminary design. Any adjustments, relocations, or removals to utilities are identified on the roll plans and quantified in the construction cost estimate. As part of detailed design, utility relocation will require coordination with utility firms.

Table 2: Summary of Utility Responses

Utility Owner	Response
Bell Canada - Planning	Mark-ups provided
InnPower	Mark-ups provided
Rogers	Mark-ups provided
Beanfield Technologies	Beanfield Technologies has no infrastructure in the study area
Enbridge Gas	Mark-ups provided
Group Telecon	Group Telecon has no infrastructure within 2m of work area
Hydro One Telecom	Hydro One Telecom does not have infrastructure (existing or planned) in the project area
Telus	Telus has no underground infrastructure in the project area
Simcoe County	No infrastructure

The design intent is to avoid infrequent major utility impacts (Bell Manholes, Enbridge Power Stations, Ditch Inlet Catch Basins) which are more easily accommodated by bending the facility and maintaining lateral clearance. Composite utility drawings and summary of responses from the utility circulation is found in **Appendix B**.

2.3 SURVEY

A survey was completed for the entire study area. AutoCAD information was georeferenced with coordinate system NAD83 (CSRS) UTM Zone 17N. The survey includes:

- Existing benchmarks and property bars found
- Property lines
- Road centreline
- Edge of pavement
- Street line grades recorded at centreline at 20-30m intervals.
- Individual trees and shrubs including approximate diameter within the ROW
- Ditch bottoms and slopes
- Catchbasins and Ditch inlets
- Centreline and driveway culverts including type, invert and diameter
- Driveway limits and surface materials
- Existing storm and sanitary manholes
- Bell manholes, hydro and gas boxes, maintenance holes, poles, handwells, hydrants, valves, headwalls, posts, and other utilities

2.4 GEOTECHNICAL INVESTIGATION AND PAVEMENT DESIGN REPORT

The Innisfil 25th Side Road Geotechnical Investigation and Pavement Design Report provides the results and recommendations of a geotechnical investigation along the 6.9 km corridor between Innisfil Beach Road and Big Bay Point Road/13th Line. The purpose of the investigation was to determine the strength and composition of the existing pavement structure and subsoil types, as well as local groundwater conditions, and to collect samples for laboratory testing for the rehabilitation work for the 25th Side Road. The results of the study ensured that the geological profile along the corridor can support the rehabilitation/resurfacing of the road and intersections in addition to adding a new roundabout and active transportation facilities.

The asphalt and soil assessment resulted in the optimal recommendations for rehabilitating the 6.9 km roadway being proposed as partial depth reconstruction:

- Removing the existing pavement structure to a depth of 270 mm;
- Place 150 mm new Granular 'A' (OPSS 1010);
- Pave 70 mm SP 19.0 for Base Asphalt; and
- Pave 50 mm SP 12.5 for Surface Course

Additionally, the assessment resulted in the following proposed sidewalk composition:

- Excavating to a depth of 300 mm
- Placing 150 mm of new 19mm Granular 'A' Crushed Run Limestone; and
- Placing 150 mm of new Portland Cement Concrete.

And finally, it established the following pavement structure for multi-use paths and cycle tracks:

- Excavate to a depth of 300 mm
- 200 mm layer of Granular 'A' or 19 mm crusher run limestone.
- 60 mm layer of Asphalt base course;
- 40 mm layer of Asphalt surface course

The final report provides additional recommendations including recycling and re-using materials such as reclaimed asphalt pavement, and granular materials removed from the roadway during the rehabilitation process. Finally, the report provides recommendations for enhancing the solubility and drainage along the corridor. The full Geotechnical Investigation and Pavement Design Report can be found in **Appendix C**.

2.5 ARBORIST REPORT

A vegetation inventory within the right-of-way and along adjacent private properties was completed for the 6.9 km 25th Side Road corridor. The purpose of the study was to assess vegetation health, location, and the potential impacts and mitigation efforts required because of the 25th Side Road rehabilitation.

The study details the results of the tree inventory; provides an overview of the relevant policy and legislation in relation to the proposed works; and makes recommendations for tree protection, tree injury, mitigative measures and removals based on the proposed design.

The inventory developed from the corridor was compared to the proposed site plan of the rehabilitation works to determine what trees were required to be removed, preserved, or retained along the corridor. The Landscape Architecture Team provided clear directions for determining tree impacts and provided recommendations for ensuring that identified trees were preserved or retained in an appropriated manner. Finally, the Arborist report provides a series of mitigation tactics and individual tree preservation plans that are recommended to be followed during future phases of the 25th Side Road rehabilitation. Mitigation tactics include detailed recommendations on the following list of subjects:

- General Mitigation Measures;
- Air-Spade / Hydro-Vacuum Excavation;
- Root Pruning Practices;
- Branch Pruning Practices;
- Migratory Bird Protection; and
- Construction Implementation .

A total of 599 trees were assessed for this report:

- 371 individual trees:
    - Tree numbers from A1 to A324
    - Tree numbers from 501 to 539
    - Tree numbers from 201 to 208
- 228 trees in 21 tree groupings:
    - TG-1 to TG-21

Impacts to trees in proximity to the proposed works will be quite high and will require the removal of three hundred and forty-nine (349) trees. Thirteen (13) of these trees are already in poor condition. In addition to tree removals, one-hundred and twenty (120) trees will require root pruning and air-spade / hydro-vacuum excavation. Recommendations derived from the Arborist Report prioritize the retention or preservation of vegetation beyond the construction limits. The comprehensive list of proposed mitigation measures will help minimize the detrimental effects from construction activities and will help to ensure that good tree health will continue along 25th Side Road.

The Town of Innisfil's Engineering Design Standards Manual details the recommended tree species to be planted within the boulevard of 25th Side Road (Refer to Table 3).

Table 3: Recommended Boulevard Trees

Botanical Name	Common Name
Acer x freemanii cvs.	Freeman Maple
Acer rubrum	Red Maple
Acer saccharum	Sugar Maple
*Amelanchier spp.**	Serviceberry
Celtis occidentalis	Nothern Hackberry
Gleditsia triacanthos var. inermis	Honeylocust
Gymnocladus dioicus	Kentucky Coffeetree (male cultivar)
*Malus cvs.**	Flowering Crabapple (non-fruiting, disease resistant)
*Prunus virginiana 'Schubert'**	Schubert ChokeCherry
Pyrus calleryana	Ornamental Pear (not Bradford cultivar)
Quercus alba	White Oak
Quercus bicolor	Swamp White Oak
Quercus macrocarpa	Bur Oak
Quercus palustris	Pin Oak
Quercus rubra	Northern Red Oak
Tilia cordata	Littleleaf Linden
Ulmus carpinifolia	Homestead Elm
Zelkova serrata	Japanese Zelkova

* Small trees are to be used only in situations where space is constrained.

The full Arborist Report can be found in **Appendix D.**

2.6 STORMWATER MANAGEMENT REPORT

A Stormwater Management Plan was completed for the proposed reconstruction of the 25th Side Road. The study area is within the Innisfil Creeks sub-watershed under the jurisdiction of the Lake Simcoe Region Conservation Authority (LSRCA).

The objective of this report was to provide a preliminary direction for stormwater management along the corridor, design a range of Low Impact Development (LID) systems appropriate for the subject site and analyze the capacity of the 25th Side Road existing crossing culverts.

2.6.1 CULVERT CAPACITY ANALYSIS AND CONDITION ASSESSMENT

The existing culvert capacities were evaluated using CulvertMaster. The physical measured properties of the culverts, including diameter, length, and slope, were applied to a CulvertMaster model from the existing survey plan. Based on the CulvertMaster modeling results, the capacities of the existing culverts are significantly lower than the 25- and 100-year storm events. CulvertMaster was used to estimate the minimum required size of the culverts to pass the 25-year design storms.

2.6.2 LOW IMPACT DEVELOPMENT OPPORTUNITIES

Typically, LID features are designed to implement the functions of natural drainage systems by attenuating, filtering and infiltrating stormwater runoff as close as possible to where it is generated. With this approach, stormwater runoff can be reduced substantially with the right environmental conditions. The LID systems can be installed in areas where runoff is controlled or uncontrolled to provide additional stormwater quantity and quality control as well as promote infiltration and groundwater recharge. The applicable LID systems within the study area are:

1. Bioswales
2. Infiltration Chambers

Bioswales

Bioswale units are soil filter systems that temporarily store and filter stormwater runoff. These units rely on the engineered soil media placed below the channel invert to provide stormwater runoff reductions and improve water quality. The proposed bioswale within the subject site contains:

1. Filter Media Layer
2. Mulch Layer
3. Storage layer
4. Pea gravel layer
5. Underdrain to remove excess water
6. Overflow pipe

The depths of the bioswale facilities within the subject site were estimated based on the required storage volumes for stormwater management control, infiltration rate of the native soil, porosity (void space ratio) of the gravel storage layer media and the targeted time period to achieve complete drainage between storm events. Bioswales should be separated from the seasonally high water table by a minimum of one (1) metre to ensure groundwater does not intersect the filter bed. Based on the geotechnical report provided by WSP Canada Inc dated April 2022, groundwater was not encountered during the investigation, and all of the boreholes remained open and dry upon completion. Bioswale units are proposed within Contexts 1 and 2.

Context 1 (Low-Density Residential)

The proposed 25th Side Road will be graded at the detailed design stage to have a slope from the center of the road towards the curbs and from the sidewalks towards the bioswales on both sides of the road. Curb cuts are proposed to direct roadway runoff from the center of the road to the proposed bioswales on both sides of the road. Sheet flows from sidewalks and cycle tracks on both sides of the road will be directed to the proposed bioswales as well. In addition, sheet flows from the adjacent neighbouring areas west side of the road will be discharged into the proposed bioswale.

To provide pre-treatment at the location of curb-cuts between the edge of the pavement and the bioswales facilities, small trenches filled with pea gravel are proposed. The runoff will then be infiltrated into the underlying native soil of the bioswales. As the upstream bioswale planter fills up with runoff, it overflows out and enter to the next downstream planter. Check dams will be placed within the bioswale alignments to help slow the water. The check dams will be designed to provide maximum 0.2 m allowable ponding depths within the proposed bioswales.

Overflow pipes are proposed within the bioswales to direct the excess runoff to the existing 25th Side Road crossing culverts should the runoff from a storm exceed the capacity of the bioswales. The inlet of the proposed overflow pipes should be placed above the allowable bioswale ponding depths (i.e., 0.2 m). The proposed bioswales were sized to provide water balance, quality control and runoff reduction for the roadway drainage areas. To meet quality control targets, bioswales were sized to provide 80% total suspended solids (TSS) removal for the roadway runoff prior to being discharged into existing 25th Side Road crossing culverts.

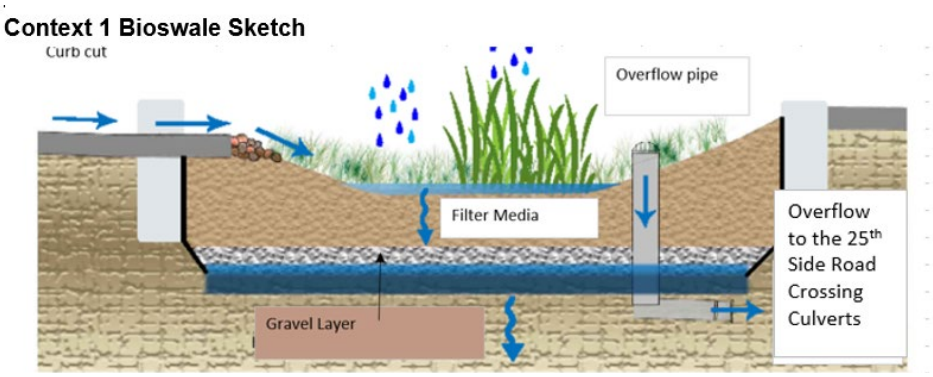


Figure 20: Illustration of bioswale proposed for Context 1

Context 2 (Green and Rural)

The proposed 25th Side Road will be graded at the detailed design stage to have a slope from the center of the road towards the proposed bioswale on both sides of the road. In addition, sheet flows from the 3 m multi-use pathway on the east side of the roadway and the adjacent neighboring drainage areas on the west side of roadway will be directed into the proposed bioswales. Small trenches filled with pea gravel are proposed between the edge of the pavement and the bioswale facilities to provide pre-treatment. The runoff will then be infiltrated into the underlying native soil of the bioswales. Since the infiltration rate of the native soil is lower than 15 mm/hr, the proposed bioswale within Context 2 will have 200 mm diameter perforated pipes. As the upstream bioswale planter fills up with runoff, it overflows out and enter to the next downstream planter. Check dams are proposed within Context 2 bioswales alignments as well. Check dams will provide maximum 0.2 m ponding depths within the Context 2 bioswales.

Overflow pipes are proposed within the bioswales to direct the excess runoff towards the existing 25th Side Road crossing culverts in the event that the runoff from a storm exceeds the capacity of the bioswales. The inlet of the proposed overflow pipes should be placed above the allowable bioswales ponding depth of 0.2m. Bioswales within Context 2 were sized to provide 80% TSS removal for the roadway runoff prior to being discharged into existing 25th Side Road crossing culverts.

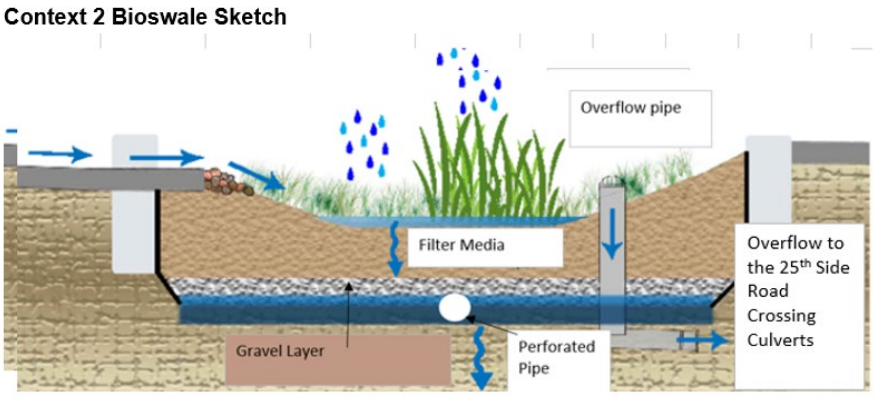


Figure 21: Illustration of bioswale proposed for Context 2

Infiltration Chambers

Underground infiltration chambers are constructed below grade and therefore take up little or no space at the surface. They include a range of proprietary manufactured modular structures installed underground, that create large void spaces for the temporary storage of stormwater runoff and allow it to infiltrate into the underlying native soil. Stone reservoirs of the infiltration chamber systems should be filled with uniformly-graded, washed stone that provides 30 to 40% void space. Granular material should be 50 mm clear stone.

The proposed underground chamber systems within the subject site will have open bottoms, perforated side walls, and underlying granular stone reservoirs. Capped vertical standpipes consisting of anchored 150-millimeter diameter perforated pipes with lockable caps will be installed at the bottom of the facilities to provide a means of inspecting and flushing the facilities out as part of routine maintenance. Underground infiltration chambers are proposed within Context 3.

Context 3 (Downtown Commercial)

The proposed 25th Side Road will be graded at the detailed design stage to have a slope from the center of the road towards the proposed catchbasins and from sidewalks towards the proposed catchbasins on both sides of the road. In addition, sheet flows from the adjacent neighboring areas on the west side of roadway will be directed into the proposed catchbasins on the west side of the road. The proposed catchbsins will have outlets towards proposed storm pipes and underground chamber systems. The proposed catchbasin outlets will be placed at different elevations. The first bottom outlet will convey runoff towards the underground chamber systems while the second outlet will convey runoff towards proposed underground storm pipes. The underground chamber systems flow will then be infiltrated into the underlying native soil at the bottom of the systems.

The proposed underground chamber systems within the subject site were sized to provide water balance, quality control and runoff reduction for the roadway runoff, and 80% TSS removal for quality control requirements. The underground chamber systems will have perforated pipes and underdrain pipes. As such, in the event that runoff exceeds the capacity of the systems, perforated pipes and underdrain pipes will convey the excess runoff towards proposed storm pipes.

The full Stormwater Management Report can be found in **Appendix E.**

3 ALTERNATIVES

3.1 CYCLING FACILITY SELECTION

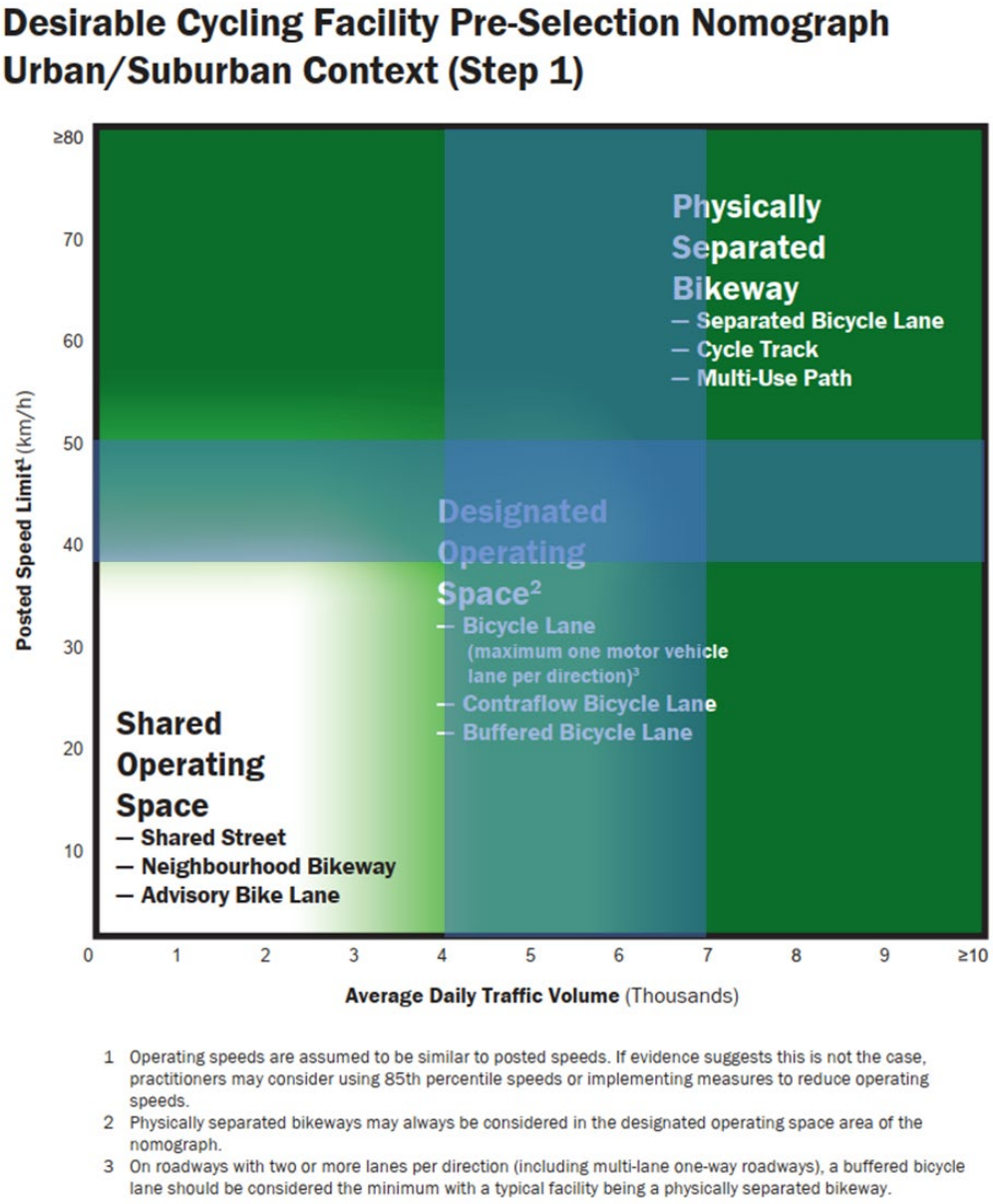
WSP considered the following relevant contextual information for the corridor and followed the Ontario Traffic Manual (OTM) Book 18 (2021 edition) cycling facility selection process:

Table 4: 25th Side Road Roadway Characteristics

Motor Vehicle Speed	50 km/h (posted)* *With potential for 40 km/h posted speed in urban areas pending bylaw amendment
Motor Vehicle Volumes (Average Annual Daily Traffic - AADT)	4,000 – 7,000 for Context 1 and 3 2,000 for Context 2
Function of Street	Mobility and access (e.g. collector)
Vehicle Mix	Low portion of heavy vehicles, no transit service along route, some school bus routes
Pedestrian Activity	Moderate in Contexts 1 and 3; Low in Context 2
On-street Parking	A consideration for Context 3 and near Innisfil Beach Park in Context 1
Frequency of Intersections and Crossings	Contexts 1 and 3: Low-volume driveways and unsignalized intersections Context 2: Limited intersections and driveway crossings
Roadway context	Context 1 (Low Density Residential): Rural/ Urban Context 2 (Green and Rural): Rural Context 3 (Downtown Commercial): Future Urban

The facility selection process from OTM Book 18 was used to identify facility types for consideration for each context.

For Contexts 1 and 3, using the urban/suburban pre-selection nomograph (**Figure 22**), the operating conditions fall between Designated Operating Space (ex. buffered bicycle lanes) and Physically Separated Bikeway (ex. multi-use pathway or cycle tracks).



1 Operating speeds are assumed to be similar to posted speeds. If evidence suggests this is not the case, practitioners may consider using 85th percentile speeds or implementing measures to reduce operating speeds.
2 Physically separated bikeways may always be considered in the designated operating space area of the nomograph.
3 On roadways with two or more lanes per direction (including multi-lane one-way roadways), a buffered bicycle lane should be considered the minimum with a typical facility being a physically separated bikeway.

Figure 22: Urban/suburban facility pre-selection nomograph from OTM Book 18 used for Contexts 1 and 3

Given the expected increase in traffic volumes along the corridor with the planned developments, the preference is given to the higher end of the Average Daily Traffic Volume range.

For Context 2, the Rural Context nomograph was used. Based on the operating conditions highlighted in Figure 23, the desirable facility is a Paved Shoulder or separate Multi-Use Pathway.

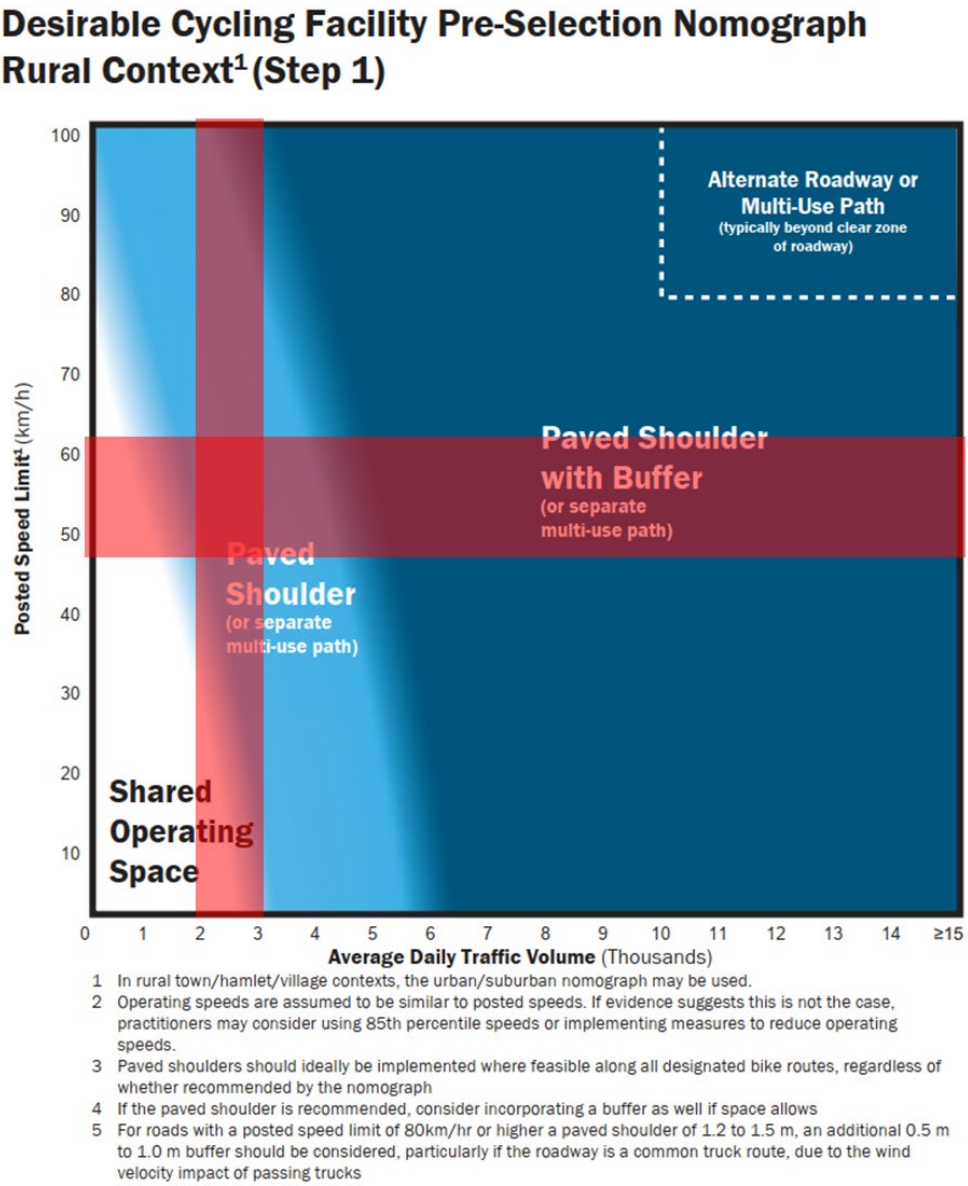


Figure 23: OTM Book 18 nomograph for rural roadways, with the operating speed and AADT for Context 2 highlighted

Based on the Book 18 facility selection methodology, and with application of professional judgement based on the context the relevant facility types to be considered for this context are:

- Multi-use pathway
- Buffered paved shoulders
- Cycle tracks (urbanized sections only)

Combining the relevant facility types with the unique characteristics of each context results in up to three alternatives considered for each context, summarized in **Table 4.**

Table 5: Summary of alternatives for each context

Context 1 (Low Density Residential)	**Alternative 1**: Multi-use pathway behind ditch (rural cross section) **Alternative 2**: Buffered paved shoulders (rural cross section) & sidewalk east side **Alternative 3**: Multi-use pathway behind east ditch, sidewalk behind west ditch (semi-urban cross section) **Alternative 4**: Sidewalks and unidirectional cycle tracks both sides (urban cross section)
Context 2 (Green and Rural)	**Alternative 1**: Multi-use pathway behind ditch (rural, shift crown) **Alternative 2**: Buffered paved shoulders (rural cross section) **Alternative 3**: Multi-use pathway behind ditch (rural, maintain existing crown)
Context 3 (Downtown Commercial)	**Alternative 1**: Raised, bi-directional cycle track (urban cross section) & sidewalks on both sides **Alternative 2**: Unidirectional cycle tracks (urban cross section) & sidewalks on both sides Note: both options for Context 3 have 2m sidewalk on both sides

The three general facility types considered are discussed in the following sections. Each alternative described above is discussed in detail in the Alternatives Evaluation Matrix in **Appendix F**.

3.1.1 MULTI-USE PATHWAYS

A multi-use pathway (MUP) provides a space separate from traffic where active modes share the travel area. In all instances where an MUP is considered within this evaluation, the MUP is located behind the ditch and against the property line.

While MUPs provide a comfortable space for slower modes, they may lead to more conflicts between cyclists and pedestrians, especially among faster cyclists. They also lead to greater conflicts on streets with a high frequency of driveway turns, where turning motorists do not anticipate two-way bicycle traffic.

Given the regional significance of this cycling route, faster cyclists may need to be guided to (or may choose to) operate in mixed traffic instead.

Figure 24: An example of a multi-use pathway in a rural context in Ottawa, ON

Figure 25: Example of a multi-use pathway in a rural context in Aurora, ON

3.1.2 BUFFERED PAVED SHOULDERS

This option adds paved shoulders on both sides of the road with painted buffers and a preference for physical separation treatments within the buffers such as pinned curbs or bollards.

Paved shoulders are more comfortable for faster, experienced cyclists compared to the broader range of ages and abilities. Paved shoulders may also help reduce conflicts with pedestrians, as pedestrians are always facing oncoming cyclists. Still, paved shoulders provide less comfort for those of a broader range of ages and abilities due to typically less separation from traffic compared to MUPs. In areas with higher curbside parking demand, they may also be inadvertently used by stopped or parked vehicles, creating hazardous situations where cyclists and pedestrians need to detour onto the road. Both of the above issues can be partially mitigated by placing physical separation measures in the paved shoulders, such as the example from Gatineau, QC in **Figure 26.**

Figure 26: Example of rural paved shoulders separated from vehicle lanes by pinned curbs and bollards in Gatineau, QC

3.1.3 CYCLE TRACKS

Cycle tracks provide a dedicated space on urbanized streets for cycling that is set back from the roadway and in the boulevard, behind a barrier curb or mountable curb. They provide a high level of comfort and separation from traffic and can be integrated with streetscaping in areas of higher priority for urban design.

Especially in areas of higher pedestrian activity, cycle tracks provide a distinct area for cyclists to travel separate from people walking. Cycle tracks can be designed to carry one-way or two-way traffic as shown in **Figure 27** (one-way) and **Figure 28** (two-way).

Figure 27: One-way cycle tracks on Main Street in Ottawa, ON

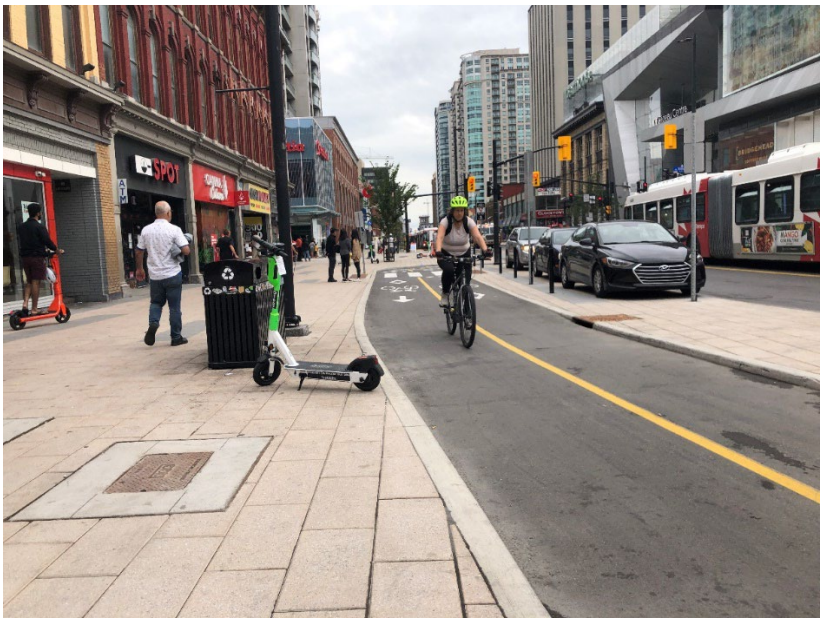


Figure 28: example of a two-way cycle track on a downtown street

3.2 EVALUATION OF ALTERNATIVES

Each option was evaluated against a series of criteria and scored to determine the most suitable facility type for each context. Criteria and their weighting are based on the values of the Town expressed in the RFP document and are as follows:

- Active Transportation User Experience (weighted 40/100)
- Traffic Safety (weighted 10/100)
- Environmental Benefit (weighted 10/100)
- Constructability and Cost (weighted 40/100)

The scoring of each alternative against these criteria can be found in the Alternatives Evaluation Matrix in **Appendix F**.

3.2.1 DISCUSSION OF COSTS

At a high level, the key variables that will influence the ultimate cost of the design include:

- **The level of urbanization:** The Transportation Master Plan Update indicated that urbanization is significantly more costly than reconstruction for existing roadways. Urbanization of an arterial was estimated to cost $3.2M per kilometre, compared to reconstruction at a cost of $1.2M per kilometre. Alternative #3 presents a partial urbanization option, which is estimated to cost an additional $150,000 per kilometre above the costs for reconstruction per side of the roadway, but less than full urbanization.
- **Extent of hydro pole relocations:** There are many utility poles in conflict with the proposed alignments for several options. The estimated cost of each pole relocation is $15,000-20,000. With extensive relocations, this could increase the cost by $250,000 to $500,000 per kilometre. In some cases, it may be possible to avoid utilities, though this would require the use of constrained facility widths.
- **Extent of LID features:** These require more roadway materials to construct and carry higher ongoing maintenance costs. The preliminary assessment estimates that the addition of bioswales on both sides of the road will cost $660,000 per kilometre to construct.

3.2.2 CONCLUSIONS AND DISCUSSION

The total scores for each alternative are shown in Table 5.

Table 6: Summary of scores for each alternative considered

Context 1 (Low Density Residential)	**Alternative 1**: Multi-use pathway behind ditch (rural cross section)	260
	Alternative 2: Buffered paved shoulders (rural cross section) & sidewalk east side	200
	Alternative 3: Multi-use pathway behind ditch (semi-urban cross section)	230
	Alternative 4: Sidewalk and unidirectional cycle track both sides (urban cross section)	**270**
Context 2 (Green and Rural)	**Alternative 1**: Multi-use pathway behind ditch (rural, shift crown)	310
	Alternative 2: Buffered paved shoulders (rural cross section)	330
	Alternative 3: Multi-use pathway behind ditch (rural, maintain existing crown)	**350**
Context 3 (Downtown Commercial)	**Alternative 1**: Raised, bi-directional cycle track (urban cross section) & sidewalks on both sides	290
	Alternative 2: Unidirectional cycle tracks (urban cross section) & sidewalks on both sides	**300**
	Note: both options for Context 3 have 2m sidewalk on both sides	
	Note: Selection of Context 3 should largely be driven by the decision of Context 1 and continuity of unidirectional or bidirectional cycling facilities	

While each alternative has its own merits, the evaluation finds **sidewalk and unidirectional cycle track both sides (urban cross section)** performed best in Context 1, **multi-use pathway behind ditch (rural, maintain existing crown)** in Context 2, and **unidirectional cycle tracks (urban cross section) & sidewalks on both sides** in Context 3.

For Context 1, Alternative 4 performs best from a user and safety perspective because facilities are provided on both sides of the road, as well as the opportunity for street trees. Urbanization of the roadway has been budgeted for in the Town's capital plan. Alternative 1 represents a lower-cost alternative.

From a corridor-level, minimizing transitions between one-way and two-way facility types is preferred. The preferred options provide continuous unidirectional facilities from Innisfil Beach Road to Mapleview Drive, then a transition to a bidirectional pathway on the east side from Mapleview Drive to Big Bay Point Road where there is less vehicular traffic and fewer active transportation users.

3.2.3 ROUNDABOUT AT 9TH LINE

The Town requested additional scope to complete the preliminary roundabout design at 9th Line and 25th Side Road. The Town's 2018 Transportation Master Plan (TMP) was intended to cover the initial stages of an EA, however the Town has indicated that property take may be required as part of the preliminary roundabout design. Additional impacts to property could trigger additional considerations for an EA.

Supplementary survey and geotechnical works were completed as part of the preliminary roundabout design. A design criteria was developed based on TAC Canadian Roundabout Design Guide (2017) with two Alternatives:

1. 20 m inscribed circle DIA (mid-size mini roundabout design)
2. 28 m inscribed circle DIA (smallest size of collector/collector roundabout)

AutoTurn analysis with heavy single-unit truck (HSU) control vehicles per the roadway design criteria were developed and summitted to the Town, along with initial designs noting property and utility impacts, and the geometric design of the roundabout alternatives.

As an iteration to the preliminary roundabout design, an offset design was developed to avoid major Enbridge impacts in the southeast quadrant; however, property trade-offs became too significant on the west side of 25th Side Road and the offset design was removed from evaluation.

After review and discussion with the Town, option 1 (mini-roundabout) was selected, as it best achieves the objectives of accommodating the required vehicles, reducing impacts on property and utilities, and improving safety and comfort for all users. The design is illustrated in **Figure 29**.

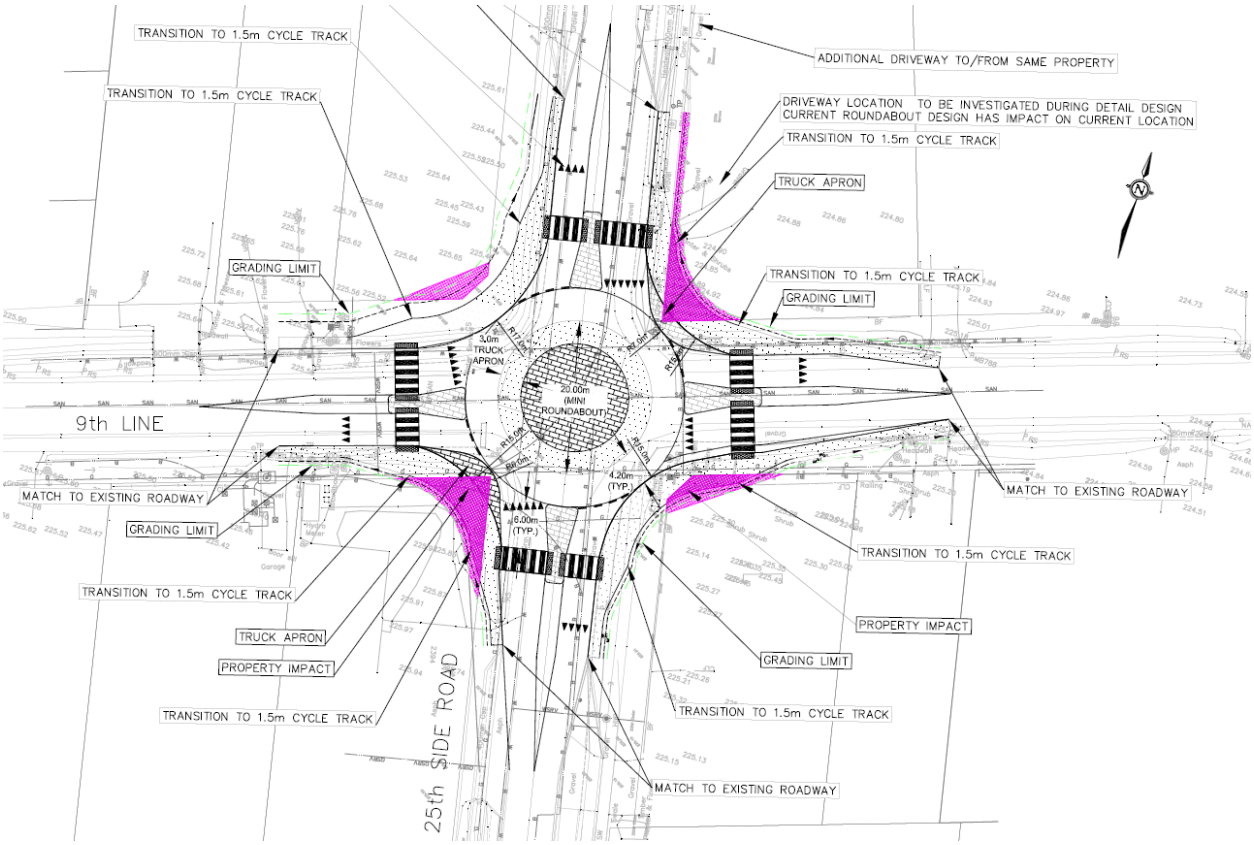


Figure 29: Mini roundabout design at 25th Side Road and 9th Line, with property impacts shown in purple

The mini roundabout design considers the following:

- **Impacts to vicinity driveways**: The driveway located on north leg is impacted by the roundabout as the outbound turning left movement is constrained. This driveway either requires shifting slightly to the north or be closed, as the property owner has another access to the north from the u-shaped driveway. Driveways in the vicinity of the proposed roundabout on south, west and east legs will not have any impact on inbound and outbound movements with the respective leg's splitter islands. The only change at these driveways will be due to minor changes in grade as the existing culverts might require removal, relocation and realignment as per detail grading design.
- **Grading and Property Impact**: The roundabout grading limits based on the existing survey elevation and impact to the property in each four quadrants are identified.
- **Active Transpiration Facilities at Roundabout**: Pedestrian Crossovers (PXOs) and tactile walking surface indicators based on Figure 6.81, OTM Book 18 have been included.
- **Potential Utility Impact**: The removals and relocation as well as potential utility conflicts are labeled on the drawing.

4 CONSULTATION SUMMARY

4.1 BACKGROUND

The Project Team received questions, comments, and concerns and responded to each of them to build positive rapport with the community surrounding the project. Engaging and collaborating with the existing community in Innisfil was an integral step for the corridor redesign to succeed. Engagement activities and outcomes are highlighted in this section. The full report engagement report can be found in **Appendix G**.

4.2 ENGAGEMENT OBJECTIVES

The Project Team approached the study by using the International Association of Public Participation (IAP2) process and practices.

The IAP2 approach emphasizes the importance of a consultation plan which is tailored to the understanding, commitment, and contribution of each of the unique groups. By identifying the stakeholders early in the study process the project team will be able to anticipate, identify, plan for and communicate the expectations based on the intended audience.

For the Town of Innisfil 25th Side Road reconstruction and active transportation project, the Project Team identified key audiences that were required to be consulted throughout the Project. The identified audiences include:

- Town of Innisfil Project Manager
- Town of Innisfil Staff
- Council Members
- Surrounding Utility Agencies
- Lake Simcoe Regional Conservation Authority
- Area Landowners
- Adjacent Property and Business Owners
- Neighbourhood Residents
- Local Accessibility, Cycling and Sustainability Committees

4.3 ENGAGEMENT APPROACH AND RESULTS

Throughout Fall 2021, several engagement activities were held with relevant stakeholders to gain input on existing conditions and to identify strengths, gaps, and concerns along the corridor to gain support for implementing specialized active transportation facilities in Innisfil. The following activities informed the development of the Preliminary Design for the 25th Side Road:

- An Internal Staff workshop
- Get Involved Innisfil Platform Q&A Section
- Get Involved Innisfil Platform Mapping Exercise
- School Zone - Traffic and Safety Advisory Committee Presentation
- Town of Innisfil Communication
- A Virtual Public Information Session

The Innisfil 25th Side Road Engagement Report contains descriptions for each of the activities including tools used and participation levels for each event. Furthermore, the Engagement Report contains direct summaries of the feedback received from each of these activities. For more information on the methods for the consultation process refer to the Engagement Report located in **Appendix G**.

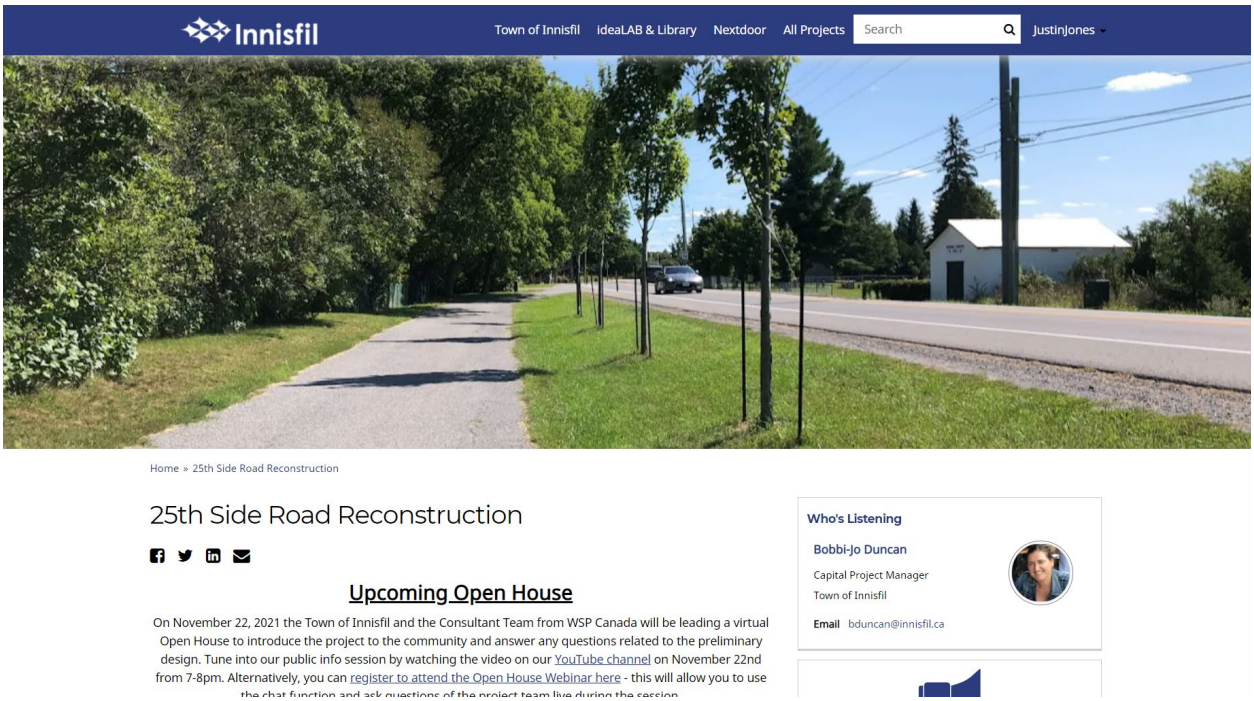


Figure 30: A screenshot of the homepage for Get Involved Innisfil

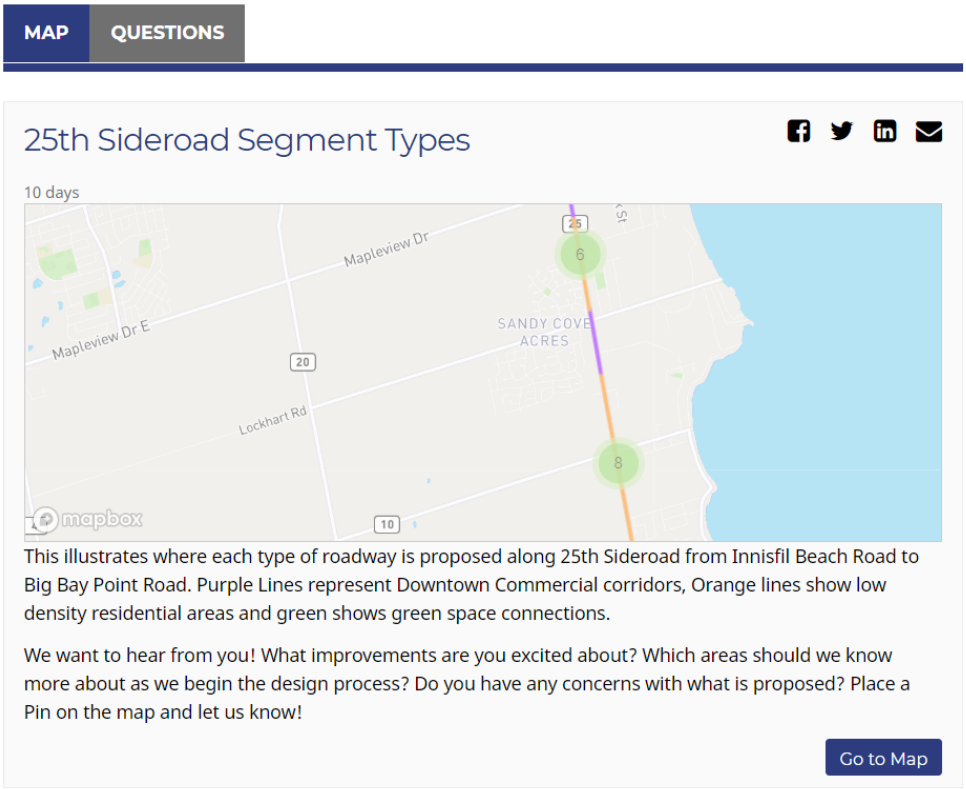


Figure 31: The mapping exercise provided on Get Involved Innisfil

4.4 WHAT WAS HEARD

The engagement activities conducted throughout the project provided valuable insight into existing conditions and key insights in redesigning a key mobility corridor to be more accommodating for active transportation modes. The engagement captured priorities from both members of the public and key stakeholders including staff at the Town of Innisfil and the School Zone - Traffic Safety Advisory Committee. Ultimately, the engagement conducted allowed the Project Team to tailor corridor redesign directly to the needs and desires of those than live, work and visit Innisfil.

Overall, several key themes emerged from these activities and were used to guide the development of the preliminary redesign of the corridor and will continue to shape its development as it progresses to the detailed design phase. Some of the key themes that emerged are summarized below.

- Overall, there was broad support for implementing active transportation and green infrastructure features along the 25th Side Road. Most people expressed excitement over the idea of having separated facilities for different modes of transportation. The preliminary designs in the downtown, rural, and low-density contexts were welcomed by key stakeholders including residents and Town staff.

- The preliminary design approach largely reflected what the community was hoping for and matches how the Town of Innisfil is seeing growth occurring in the future. However, many residents wished for additional traffic calming features to be added along the corridor, especially in school zones.
- The majority of questions asked throughout all activities of the engagement process were technical in nature and were subsequently answered either by the Consultant Project Team or Town Staff. Many comments will be applicable for future phases of the project including the detailed design phase and construction phase.
- Many residents expressed a desire of having the active transportation facilities extend all the way to the end of Big Bay Point Road. Residents noted that the route is very busy in the spring and summer and is used by both residents and visitors of all ages and abilities.

4.5 WHAT WE DID

The feedback received during Phase 1 of the project was incorporated in several ways. Most notably, the project team expanded the number of areas where the "Downtown Commercial" typology was being proposed to align with current and future land-use trends in those areas. The overall objectives for the corridor were refined and confirmed during the early stage of the project, providing the project team with the confidence to proceed with the design of an Active Transportation priority design for the corridor.

Much of the feedback received during this phase relates to specific technical challenges – drainage, trees, maintenance standards – that will be addressed during detailed design of the corridor.

5 PREFERRED DESIGN OPTION

5.1 DESIGN INTENT

The preferred design adds all-ages-and-abilities supportive cycling and walking infrastructure along the entirety of the project area, while integrating traffic calming elements into the design to reduce the potential for speeding and improve safety.

In **Context 1 (Low Density Residential)**, the design includes 1.5m sidewalks and 1.5m unidirectional cycle tracks on each side of the road. Sidewalks are offset 0.3m from the property line. Both contexts include a 3.2m drive lane in each direction (excluding gutters).

In addition to the above, Context 1 includes bioswales on each side of the roadway designed to filter and store stormwater runoff. Between the drive lanes and bioswale, a mountable curb with narrow gutter is proposed, plus a 0.5m maintenance strip to accommodate snow storage and allow overhanging of snowplow blades.

Figure 32: Illustration of a typical cross section for Context 1

In **Context 2 (Green and Rural)**, priority is given to maintaining the rural character of the roadway. A 3.0m multi-use path behind the ditch on the east side of the roadway, adjacent to the property line, is accommodated while maintaining the existing road alignment. Between the two Martin Crescent intersections (15+820 to 16+220), the path narrows to between 2.4 to 3.0m to avoid a centreline shift. The generally low pedestrian volumes expected, and relative absence of driveways makes a multi-use path a suitable option to accommodate all ages and abilities. Low-impact drainage infrastructure is integrated into the ditches on either side of the roadway.

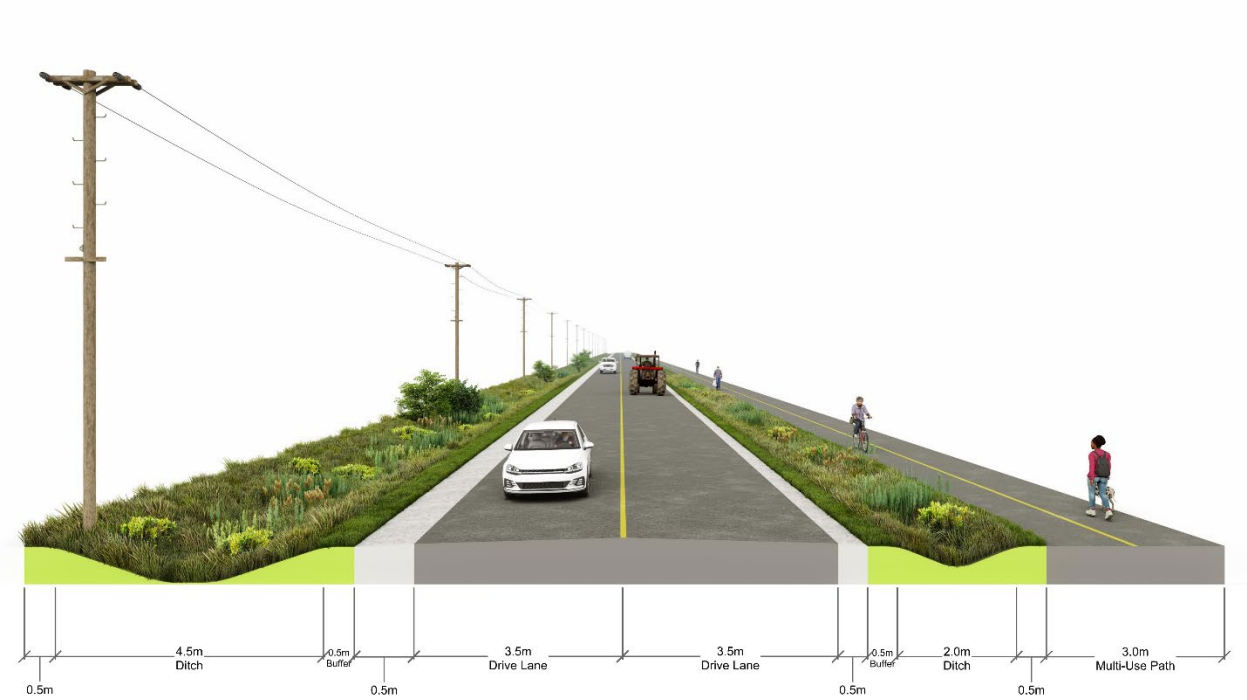


Figure 33: Illustration of a typical cross section for Context 2

In **Context 3 (Downtown Commercial)**, for the area north of Innisfil Beach Road, around Mapleview, and Innis Village, more attention is provided to urban design, pedestrian space, and vehicle loading and access. The cross section is anticipated to support street-oriented retail uses including patios. Wide, 2.0m sidewalks are provided on both sides with 0.3m buffers to the property line. On the east side, on-street parking is proposed, which includes occasional landscaped curb extensions to support traffic calming. On the west side, a 3.4m treed buffer zone is included to provide shade and improve the pedestrian realm. Finally, 1.5m one-way cycle tracks are provided on each side of the road.

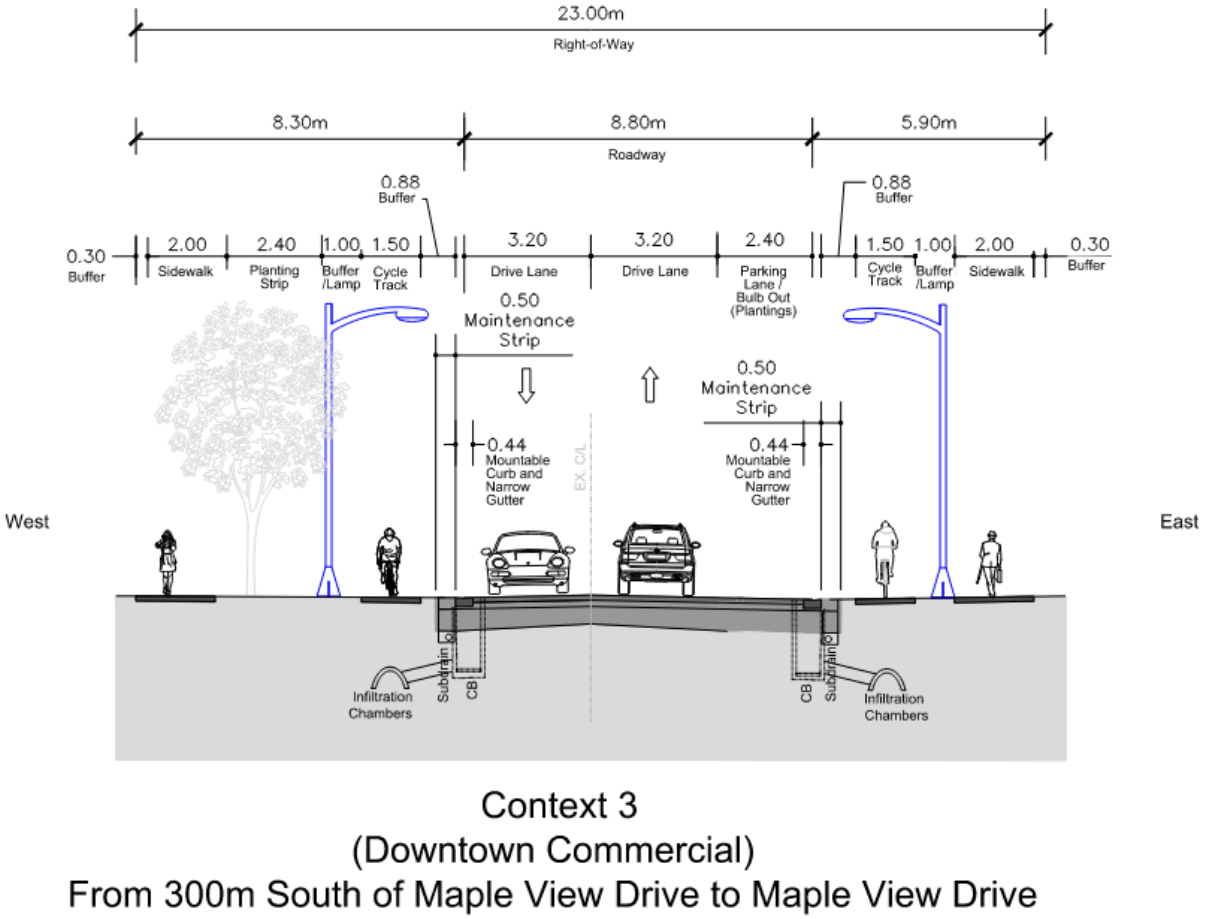
Figure 34: Illustration of a typical cross section for Context 3

The following design approach was determined based on discussions with Town staff:

- Current ROW of approximately 20m for Context 1 and 2, and assuming no property acquisition
- Future ROW of 23m for Context 3
- Cross-sections were developed for each context based on Town standards, Ontario Traffic Manual, and TAC Geometric Design Guide for Canadian Roads (2017)
- Matching/tie-in to planned works at Lockhart and Big Bay Point (currently being designed by others)
- Please refer to **Appendix H** for the Roadway Design Criteria (DC)

Integration with Innis Village Development Road Works

Between just south of Ireton Street and north of Lockhart Road, the 25th Side Road design coordinates with a separate design project underway as part of active developments in the area, adding left turn lanes at the Lockhart Road intersection and a 3.5m continuous centre left-turn lane within the limits. The addition of the turn lane limits the amount of boulevard space compared to the other contexts. Barrier curbs separate travel lanes from the boulevard, which includes 0.6m buffers, 1.5m unidirectional cycle tracks, 0.3m detectable buffer strips, and 2.0m sidewalks offset 0.3m from the property line. In the portion south of Lockhart Road, additional right-of-way is expected to be acquired through development, allowing space for wider buffers between the cycle tracks and the sidewalks, and planting strips.



Context 3
(Downtown Commercial)
From 300m South of Maple View Drive to Maple View Drive

Figure 35: Typical cross section for Context 3 where coordination is provided with other planned road works

5.1.1 DELINEATION BETWEEN CYCLE TRACKS AND SIDEWALKS

Where cycle tracks are adjacent to sidewalks, a 0.3m buffer is included to delineate the two facilities, discourage people from walking in the cycle tracks, and allow people with reduced vision to detect the edge of the sidewalk. The colour of the buffer should contrast with the adjacent cycle track and sidewalk to provide visual delineation. It should also have a textured surface to improve detectability for people navigating using a cane. Red-coloured concrete with a stamped brick pattern would meet these objectives; another example from the City of Ottawa can be seen in **Figure 36**.

Figure 36: Example use of a strip to delineate a cycle track and sidewalk in Ottawa

5.1.2 TRAFFIC CALMING ELEMENTS

A key design objective is to address speeding concerns along the corridor. To achieve this, traffic calming measures have been integrated into the design, including:

- The use of a design speed equal to 50 km/h south of Mapleview. According to TAC GDG 2.3.6.3, “choosing too high of a design speed for an urban collector street can induce drivers to travel beyond the speed that is consistent with their surroundings and poses significant risks to vulnerable road users (e.g., pedestrians, cyclists)”
- The addition of landscaping and trees in proximity to the roadway and raised centre medians at T-intersections to create “side friction” which is proven to reduce drivers’ travel speeds (TAC GDG 2.3.4.2)
- The use of narrow vehicle travel lanes of 3.2m which are consistent with the Innisfil Complete Streets Guidelines. According to TAC GDG 4.2.2.1, “wider lane widths may induce higher operating speeds, which in urban areas can be linked to reduced pedestrian and bicycle safety performance”

- The recommendation to consider a lower posted speed limit of 40 km/h for Contexts 1 and 3, and 50 km/h for Context 2, to encourage lower operating speeds. One study from 2015 estimated that reducing the speed limit on urban major collector roadways from 50 km/h to 40 km/h resulted in a 26% reduction in crashes[2]

5.1.3 CONTINUOUS SIDEWALKS AND CYCLE TRACKS

Continuous sidewalks are an emerging treatment type that prioritizes the safety of pedestrians and cyclists at side-street intersections, typically between collector and local roadways. Whereas the traditional approach ramps down cyclists and pedestrians to the road level at these crossings, continuous sidewalks and cycle tracks maintain the elevation of pedestrian and cycling facilities, adding ramps on both sides for drivers. While the ramps on each side serve to slow turning drivers, these features also psychologically communicate to drivers that they are crossing pedestrian/cycling space, encouraging improved yielding behaviour.

This treatment type was recently implemented in a comparable context on Metral Drive in Nanaimo, BC as part of a Complete Streets project (see **Figure 37**). The project was one of the first test cases of Nanaimo's Complete Streets Guidelines, which received the ITE Complete Streets Transportation Achievement Award in 2021.

Continuous sidewalks and cycle tracks are proposed throughout the project at all locations in Contexts 1 and 3 where 25th Side Road intersects a driveway or local street where only the side street is stop controlled. The only exception is at Ireton Street, which is being constructed as a conventional crossing as part of the Innis Village development.

Figure 37: Example of a continuous sidewalk and cycle track implemented on Metral Drive in Nanaimo, BC (Source: Roy Symons on Flickr)

[2] https://www.cmfclearinghouse.org/study_detail.cfm?stid=448

5.1.4 T-INTERSECTION DESIGNS

The study area includes a significant number of three-way intersections where 25th Side Road intersects a local street. At some of these intersections, a unique design has been developed to provide improved pedestrian crossing opportunities, traffic calming, and improved safety for pedestrians and cyclists crossing the local road.

The key elements of this design approach include:

- A short, dedicated left turn lane to accommodate the turn from 25th Side Road to the side street
- A raised concrete median opposite the left turn lane with a flared roadway, which interrupts the straight path of travel for motorists and encourages slower travel speeds
- A pedestrian crossover (PXO) across 25th Side Road opposite the left turn lane, extending from sidewalk to sidewalk
- A continuous sidewalk and cycle track treatment across the side street crossing

Intersections have been selected for this treatment on the basis of providing a pedestrian crossing opportunity approximately every 200 metres through Alcona and Sandy Cove Acres. The Ontario Multi-Modal Level of Service Guide provides a pedestrian level of service score of "A" for street segments where the maximum distance between crossings is 200 metres. Local considerations for the design of these pedestrian crossings should be considered at the next stage of design. An example illustration of this design treatment is shown in **Figure 38**.

Figure 38: Example rendering of the proposed T-Intersection design, from the Hamilton Complete Streets Design Manual (2022)

5.1.5 MAJOR INTERSECTIONS

25th Side Road intersects seven major collector roads in the study area:

- Innisfil Beach Road (signalized)
- Leslie Drive / Roberts Road (signalized)
- 9th Line (side street stop controlled)
- 10th Line (side street stop controlled)
- Lockhart Road (all-way stop controlled)
- Mapleview Drive (all-way stop controlled)
- 13th Line / Big Bay Point Road (all-way stop controlled)

To compliment the addition of cycle tracks along 25th Side Road, each of the intersections have been redesigned to provide improved cycling and pedestrian crossing opportunities, traffic calming, and enhanced safety measures to reduce pedestrian-vehicle conflicts along the corridor.

General elements of the major intersection designs include:

- Adding tactile walking surface indicators (TWSIs) to the base of each sidewalk ramp to improve legibility of intersections for visually impaired users
- Adding crossrides through intersections to increase conspicuity of cyclists at conflict points
- Reducing turning radii to slow turning vehicles and improve safety, while still accommodating larger vehicles
- Setback crossings to enhance visibility of pedestrian and cyclists at crossings

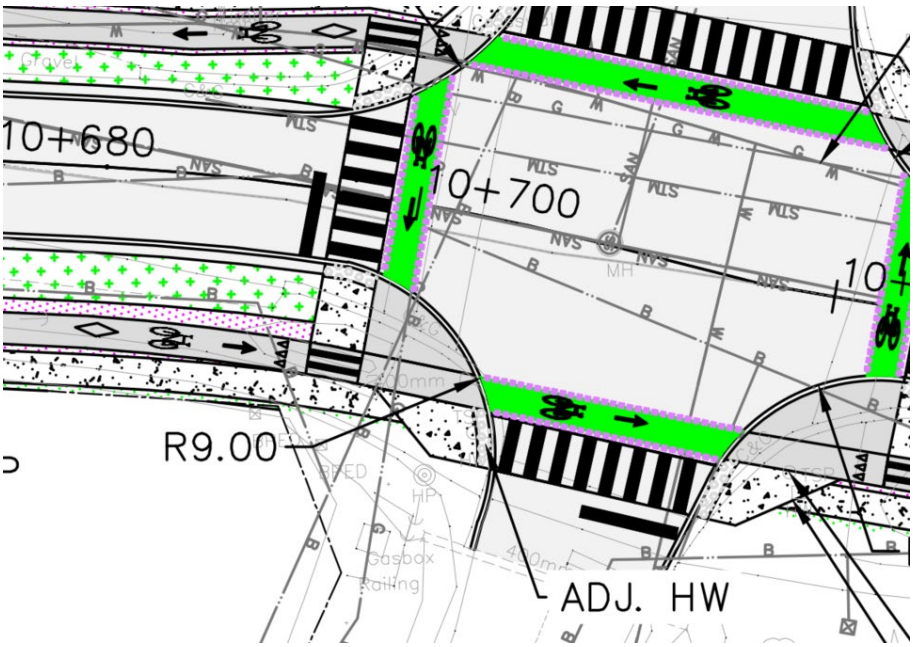


Figure 39: The south-west corner of the Leslie Drive intersection, showing some of the intersection design features

Key design improvements for the 25th Side Road's major intersections are described in the following section.

INNISFIL BEACH ROAD

The Innisfil Beach Road intersection is an existing signalized intersection at the southern project terminus. WSP's design focus for this intersection is transitioning the new 25th Side Road facilities while minimizing changes to the existing intersection. Innisfil Beach Road also contains on-street bike lanes on the east and west legs of the intersection, and a multi-use pathway on the east leg that terminates at the north-east corner.

Proposed intersection modifications include:

- Addition of southbound cycle track on the west side and bidirectional cycle track on the east side, with sidewalks adjusted accordingly. Cycle tracks end just before the existing intersection corners, where cyclists can transition to connecting facilities while yielding to pedestrians
- A direct connection in the north-east corner between the new two-way cycle track and the existing multi-use pathway
- Adjustments to the southbound right turn lane to match the proposed design criteria
- New hardscaped boulevard on both sides on the north leg of the intersection to accommodate urban design elements such as benches or street trees, consistent with the Downtown Commercial context
- Given the addition of many new cycling movements at the intersection, detailed design should consider signalization measures to improve safety, such as leading pedestrian intervals and/or fully-protected turn phases. More guidance can be found in OTM Book 18, Section 6.5 Bicycle Traffic Signals

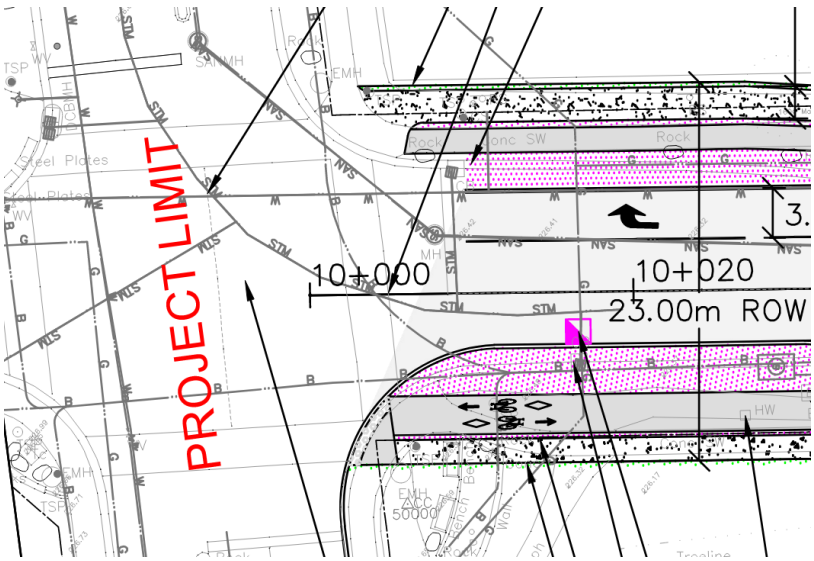


Figure 40: The north side of the 25th Side Road and Innisfil Beach Road intersection

LESLIE DRIVE / ROBERTS ROAD

The intersection at Leslie Drive / Roberts Road and the 25th Side Road is an existing signalized intersection. Leslie Drive is a major collector roadway, while Roberts Road is a local street. Holy Cross Catholic School is located 400 m west of the intersection, emphasizing the need to prioritize safety for students walking and cycling through the intersection.

Proposed intersection modifications include:

- Curb radii reduction to 12 m on the northwest and southwest corners, and 9 m on the northeast and southeast corners to reduce turning vehicle speeds and improve visibility of pedestrians/cyclists crossing
- New setback bicycle and pedestrian crossings on all corners of the intersection, with space in the boulevard for people cycling to turn left in two stages
- Expanded waiting areas for pedestrians with tactile walking surface indicators on all corners
- Yield lines on cycle tracks approaching the intersection to emphasize the need to yield to pedestrians
- As part of the detailed design stage, it is recommended that truck aprons be considered. Truck aprons further help reduce turning vehicle speeds by providing a tighter turning path for passenger vehicles while accommodating less frequent larger trucks. More information can be found in OTM Book 18, page 157

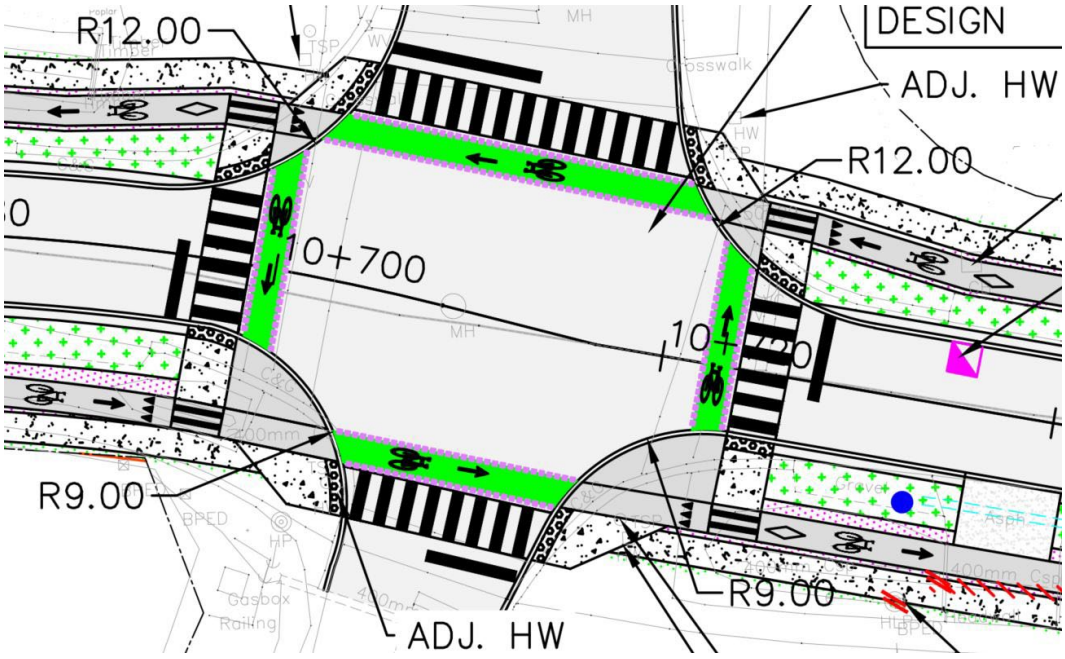


Figure 41: The 25th Side Road and Leslie Drive / Roberts Road intersection

9TH LINE

The 9th Line intersection is set to receive a complete transformation through its conversion from all-way stop control to a single-lane roundabout. The proposed radial roundabout design will improve the vehicle throughput of the intersection while carefully managing vehicle speeds at the entry and departure points. This intersection is also close to an elementary school. Prior to entering on each leg, the cycle tracks and sidewalks are merged into multi-use pathways that wrap around all corners of the roundabout. Pedestrian crossovers (PXOs) are proposed set back from the roundabout on all legs. While this treatment requires motorists to yield to pedestrians, cyclists are not legally permitted to ride through PXOs in Ontario and must dismount to cross.

To accommodate very infrequent large vehicles, the centre of the roundabout is proposed to be fully traversable by tractor trailers. Given the infrequent nature of these vehicles, it is expected that a large truck will "take over" the roundabout to complete a turn and regular traffic will temporarily hold.

Property acquisition is required on all four quadrants of the intersection to accommodate the proposed design. There is also a major ditch in the SW corner.

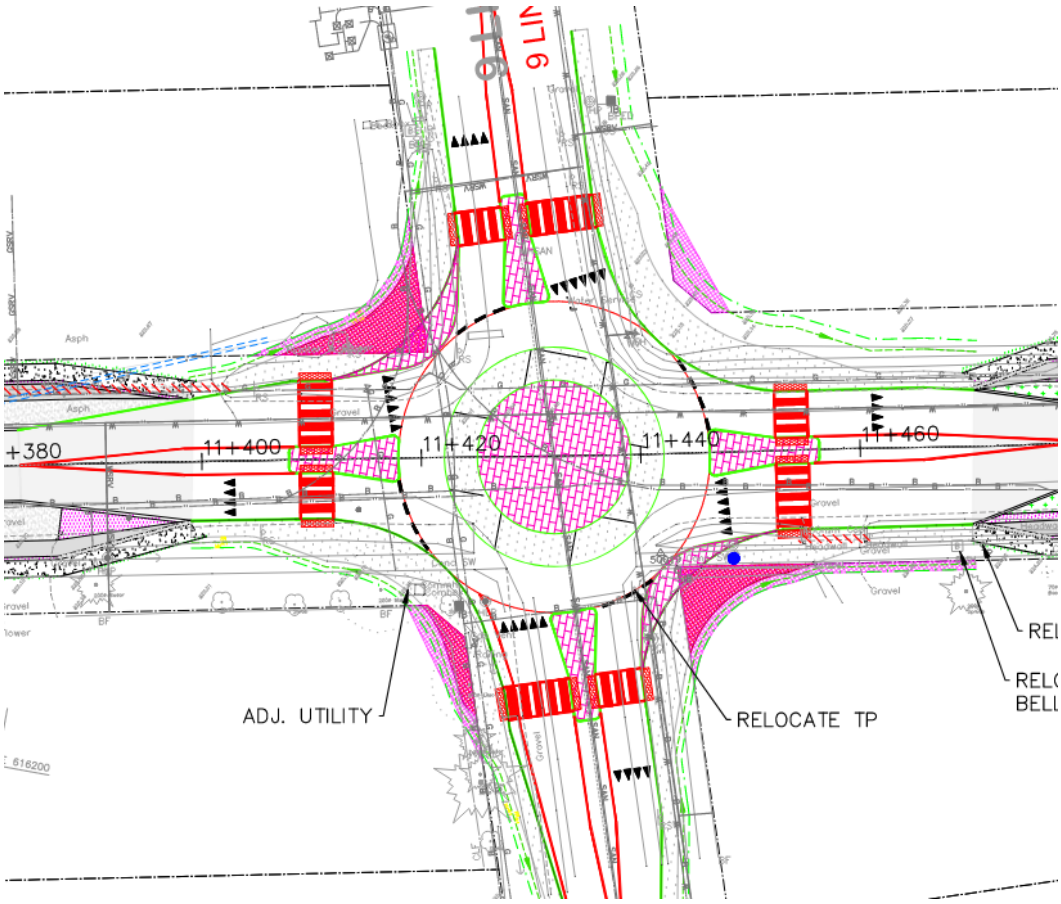


Figure 42: Preliminary drawing of the proposed 9th Line roundabout

10TH LINE

The 10th Line intersection is currently stop-controlled on the 10th Line approaches, with 25th Side Road uncontrolled. 10th Line is a major collector roadway west of the intersection and a local street east of the intersection. Leonard's Beach, a major destination for active travel, is 800 m east of the intersection on 10th Line. Proposed modifications to the intersection include:

- Conversion to all-way stop control to better prioritize pedestrian and bicycle crossing opportunities and provide new east-west controlled pedestrian and bicycle crossings. This should be further reviewed at the detailed design stage
- Extending the curb to provide 12 m corner radii on the west side and 9m corner radii on the east side of the intersection to help calm vehicle turning speeds
- New setback bicycle and pedestrian crossings on all corners of the intersection, with space in the boulevard for people cycling to turn left in two stages
- Expanded waiting areas for pedestrians with tactile walking surface indicators on all corners
- Yield lines on cycle tracks approaching the intersection to emphasize the need to yield to pedestrians
- Conflict zone markings added to each cross ride to draw additional attention to cycling crossings

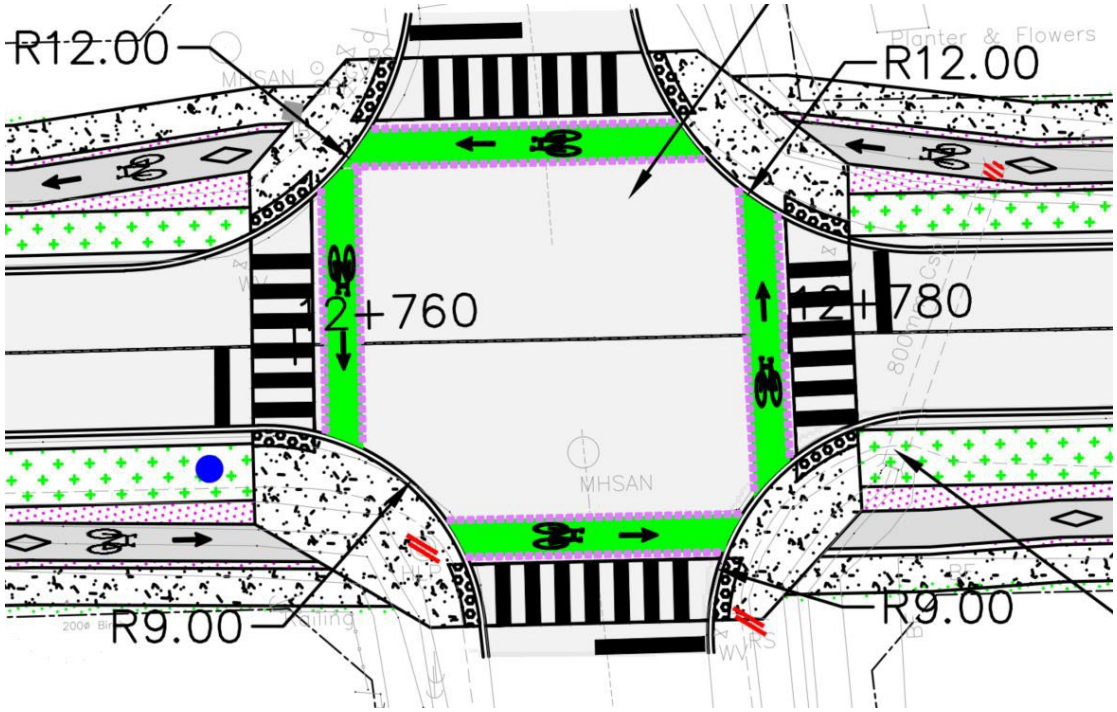


Figure 43: The proposed design for the 10th Line and 25th Side Road intersection

LOCKHART ROAD

Lockhart Road is an existing all-way stop-controlled intersection in the centre of Sandy Cove Acres, within the project's Downtown Commercial context. As discussed in Section 1.3.2, the developer has contracted Tatham Engineering to conduct detailed design of this intersection including the addition of a traffic signal and left turn lanes. The design recommendations as part of the 25th Side Road study include incorporating the planned cycle tracks into the intersection design, with setback crossings for pedestrians and cyclists.

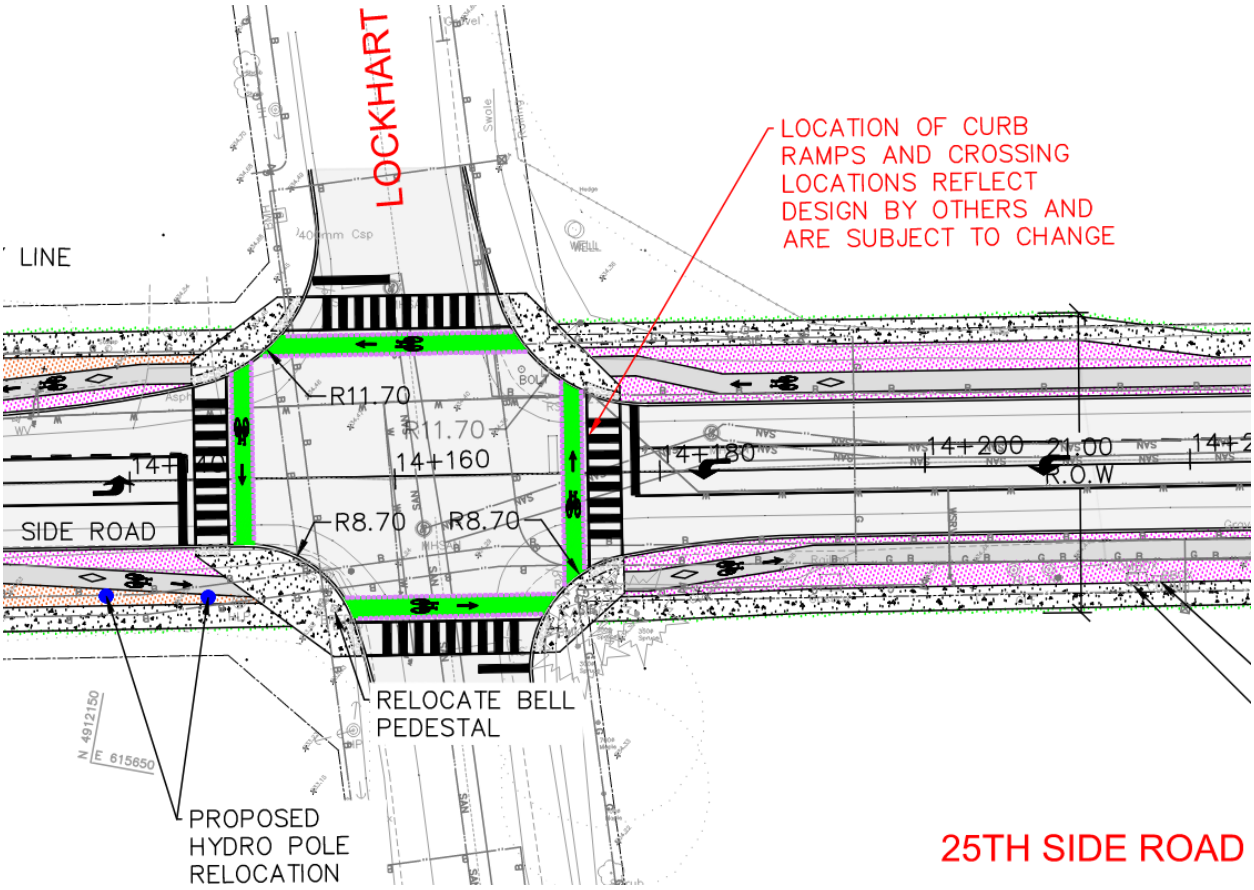


Figure 44: The Lockhart Road and 25th Side Road intersection

MAPLEVIEW DRIVE

Mapleview Drive is an existing all-way stop-controlled intersection at the boundary of the Downtown Commercial and Green and Rural contexts towards the north end of the study area. Mapleview Drive is a major collector road west of the intersection and a local street east of the intersection. Through the intersection, the sidewalks and cycle tracks transition to an east-side multi-use pathway. Proposed intersection modifications include:

- A two-way separated crossride with conflict zone markings on the east side of the intersection to provide a seamless connection for cyclists moving to the multi-use path and a westbound crossride across the south leg to reach the southbound cycle track
- Crosswalks and pedestrian queuing areas on each corner of the intersection
- Tactile walking surface indicators at the base of each crosswalk

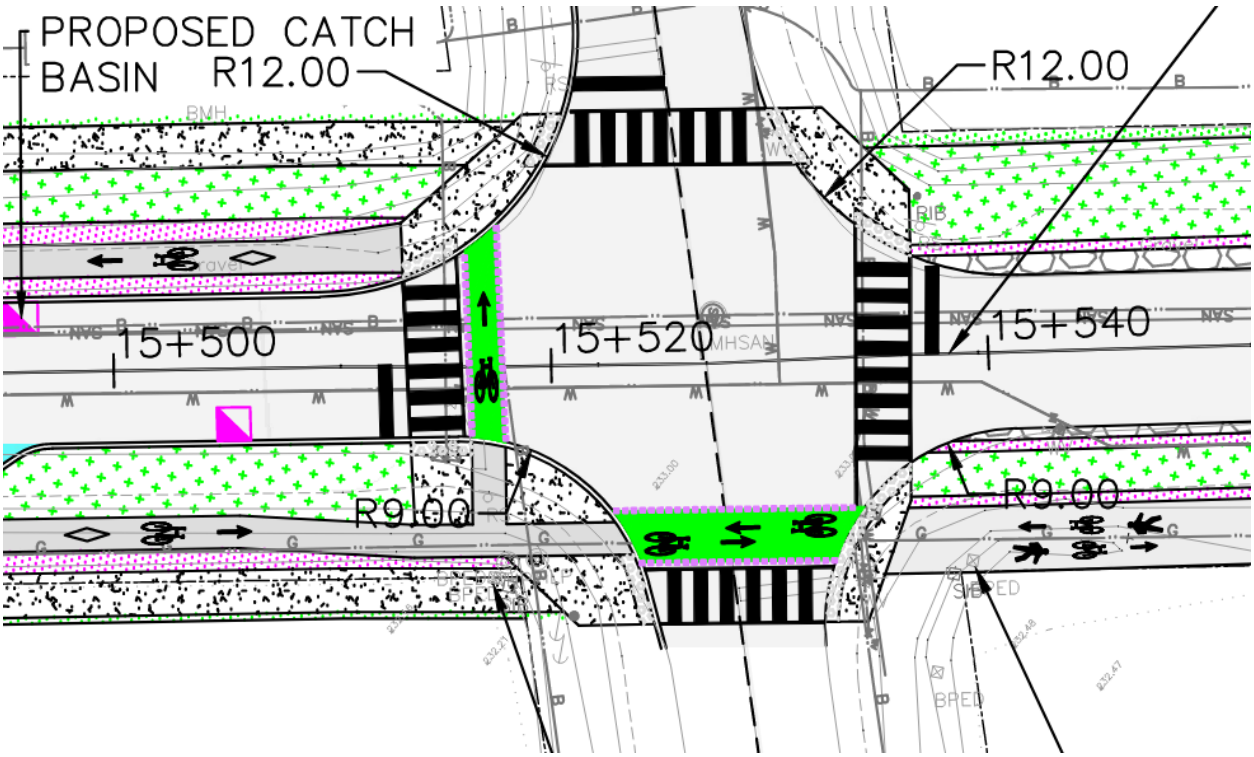


Figure 45: The proposed intersection drawings for Mapleview Drive and 25th Side Road.

13TH LINE / BIG BAY POINT ROAD

Big Bay Point Road is an arterial road west of the intersection and major collector north of the intersection, while 13th Line is a minor collector east of the intersection. As discussed in Section 1.3.5, this intersection is undergoing conversion to a single-lane roundabout as part of a separate project. The proposed design includes continuing an east side MUP and tying in to the roundabout, designed by others and still in preliminary design.

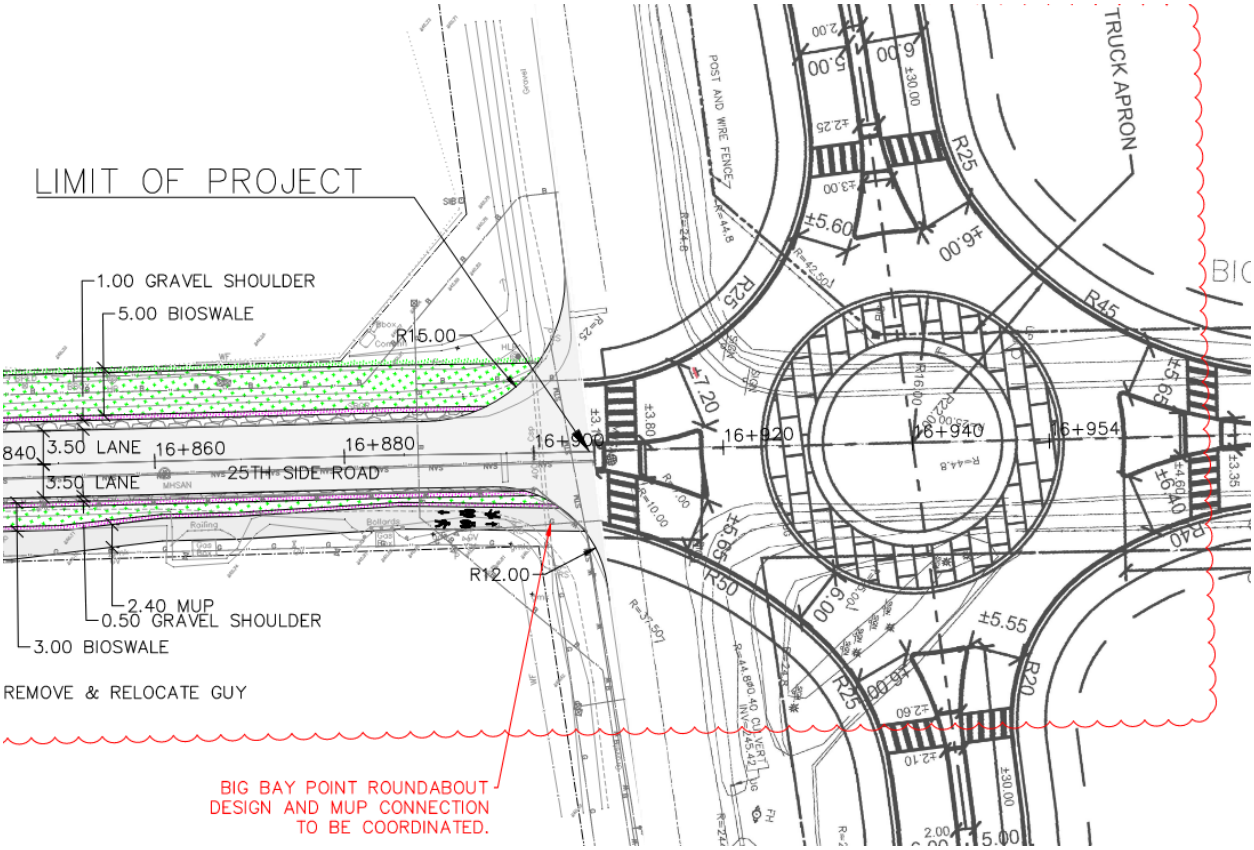


Figure 46: The proposed conceptual design for the roundabout at 25th Side Road and Big Bay Point / 13th Line

5.2 STRUCTURES

There is one bridge within the study limits, located 70m south of Pinegrove Ave. The design proposes to use the existing bridge by converting the sidewalk and cycle tracks to shared pathways at the bridge crossing, as shown in **Figure 47**. This is advantageous from a cost perspective. Town staff have said the bridge was recently rehabilitated. However, pedestrians and cyclists would need to share a constrained space of about 2m on each side of the bridge, directly adjacent to the motor vehicle lanes, behind a full height curb.

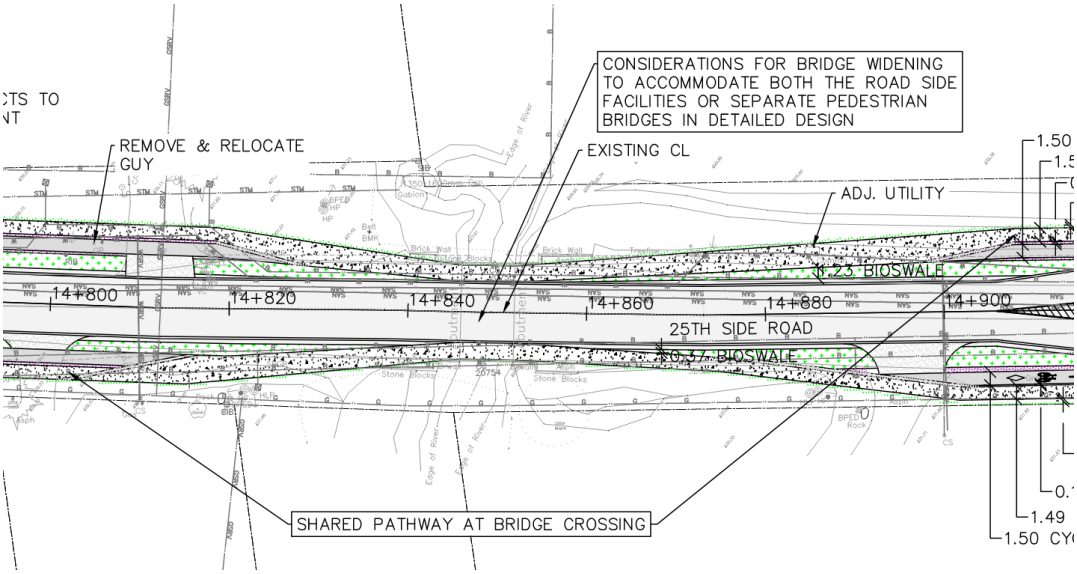
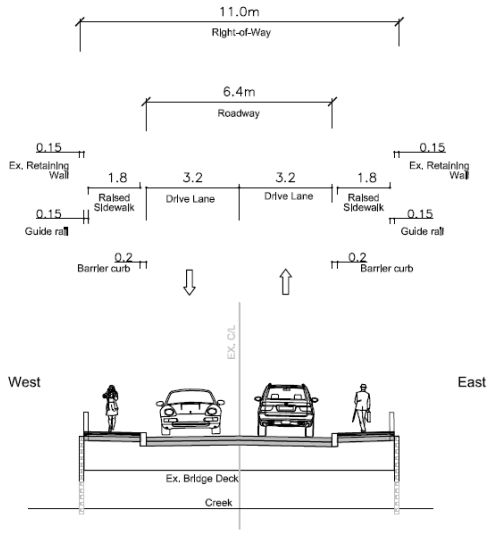
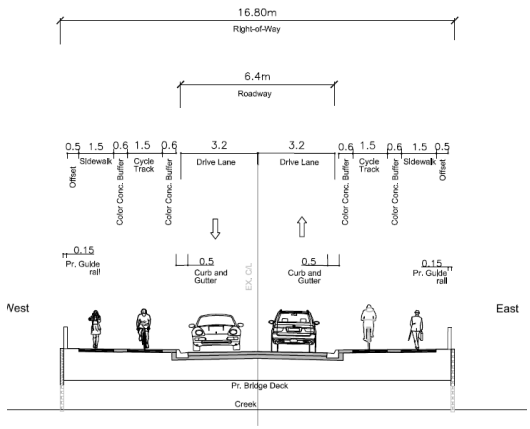
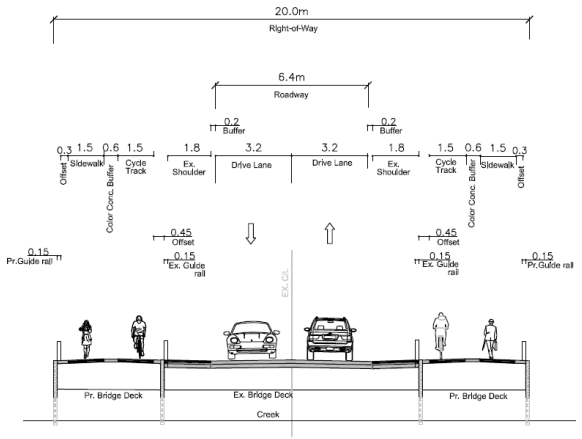


Figure 47: Bridge crossing on 25th Side Road south of Pinegrove Ave

Other options to accommodate both the roadway and active transportation facilities include bridge widening or adding a separate active transportation bridge on either side of the existing bridge, to be considered in the detailed design phase. Figure 48 provides an example from Florida, USA of a separate pedestrian bridge instead of widening. **Table 6** provides a summary of the pros and cons of each option.

Figure 48: Separate pedestrian bridge on County Hwy 30A, Santa Rosa Beach, Florida (Source: Google Maps)

Table 7: Bridge options

Option	Pros	Cons
1. Use existing bridge 	- Least costly	- Pedestrians and cyclists share constrained space
2. Bridge widening 	- Provides space to separate active transportation users and provide more separation from traffic - Easier traffic staging for future bridge repairs	- Most expensive
3. Separate active transportation bridges 	- More cost effective than widening - Pedestrians and cyclists are separated from traffic	- Salting in winter on separate pedestrian bridges will cause corrosion to the bridges and pollution to the creek - Less flexibility for staging future bridge repairs

5.3 PLAN-BASED ROADWAY SAFETY REVIEW

A plan-based road safety review was completed of the proposed preliminary design for the 25th Side Road corridor between Innisfil Beach Road and Big Bay Point Road. The project team conducted a review of historical collision data between 2017 and 2021, and a qualitative risk assessment of the design. Various issues were examined upon which mitigative recommendations were provided that prioritized road safety, human factors, and operations. The final recommendations were based on the following categories:

- **Intersections:**
  - 74% of collisions report along the corridor occurred at intersections
  - 44% of the intersection collisions occurred at 9th Line and Innisfil Beach Road. The future roundabout at 9th Line should significantly improve safety and operations at this intersection. Options to improve road safety at Innisfil Beach signalized intersection may include the provision of fully protected left-turn signal phasing.
- **Accommodating Active Transportation Modes:**
  - The biggest conflict along the corridor for the proposed active transportation facilities was the abundance of commercial and residential driveways. Adequate signage and lighting is recommended for mitigating these challenges. Continuous raised crossings, as proposed, are a recommended countermeasure.
- **Mid-Block Crossings:**
  - The report suggests adding 10 mid-block uncontrolled pedestrian crossings along the corridor to act as a pedestrian collision countermeasure. It also recommends adding high-visibility crosswalk markings, adequate nighttime lighting levels, and crosswalk warning signs.
- **Access Management:**
  - A two-way left-turn lane proposed between Cook Street and Lockhart Road should be examined to limit the number of driveways through effective access management, potentially replacing the TWLTL with more localized exclusive turning lanes.
- **Roadside Design**
  - The historical collision data revealed that 12% of collisions reported involved a roadside design element. The plan-based review also identified several hazards in the clear zone that included trees, utility poles, and exposed driveway culvert ends.
  - Recommendations include constraining vehicle speeds in urban environments through geometric design that encourages safer travel speeds.

The final report contains in-depth tables of specific recommendations where road safety improvements can be made. Refer to **Appendix J** for the final report.

5.4 CONSTRAINTS

A consistent approach was developed by the design team to mitigate impacts and address recurring design trade-offs along the corridor. The intent of this approach was also to balance low- to high- impact constraints with the objective of implementing all ages and abilities active transportation infrastructure.

Table 8: Constraint Impact Categorization

Category	Description/Approach	Constraints
High Impact	Highly challenging (i.e., with regards to stakeholders, process, or technical complexity) and costly to relocate or mitigate. Precedence given to low- to moderate- impact options. Reduction of facilities to minimums for limited segments to avoid high-impact constraints is acceptable.	• Property acquisition • Main line hydro poles • Mature trees
Moderate Impact	Moderate challenge (i.e., with regards to stakeholders, process, or technical complexity) and cost to relocate or mitigate. Precedence given to low-impact options. Reduction of some design elements to minimums may be considered for limited segments, however, impacts considered acceptable for longer segments.	• Streetlight poles • Traffic signal poles • Guy poles and guy wires • Young trees • Retaining walls • Fire Hydrants
Low Impact	Low challenge (i.e., with regards to stakeholders, process, or technical complexity) and cost to relocate or mitigate. Precedence generally given to maintaining design elements at targets.	• Street furniture • Manholes • Signs • Landscaped areas • Utility pedestals • Fences

Impacts are summarized as follows:

- **Property requirements**
  - Within roundabout works (20m diameter roundabout)
  - Within Context 3 (Downtown Commercial), tied to new development (23m ROW)

- **Tree impacts**
  - Per the Arborist report, approximately 175 tree removals will be required per the Preliminary Design. This quantity will be refined once grading limits are established in detailed design, and compensation measures to increase the overall tree canopy along the corridor will be identified.

- **Utility impacts** (refer to the cost estimate in Appendix B for more details)
  - Bell Manhole Adjustments
  - 46 Bell Pedestal Relocations
  - 1 Hydro Box Relocation
  - 1 Communication Box Relocation
  - 51 Hydrant Relocations - this quantity will be refined once grading limits are established in detailed design
  - 130 Hydro Pole Relocations

- **Driveway impacts**
  - Each residential driveway is narrowed at the throat to align with the width at property line, where feasible. Existing driveway flares are eliminated, which is aligned with the traffic calming measures to slow vehicles as they turn within the corridor
  - Driveway modifications and consideration for parking reconfiguration beyond the right-of-way will be confirmed as part of detailed design in consultation with property owners. These include:
    - #2371 25th Side Road – Petro Canada
    - #2379 25th Side Road – Fork and Plate Restaurant
    - #2394 25th Side Road – Main Street Hair Salon
    - #2858 25th Side Road – Sandy Cove Marine

- **Parking impacts**
  - Parking is removed throughout all of Context 2 and Context 3 limits
  - Context 3 cross-sections include flexible space that has potential for parking bays or landscaping/furnishing zone. The preferred parking bay locations, if any, should be carried through into detailed design, or otherwise converted to additional furnishing and/or landscaping zone

6 PRELIMINARY COST ESTIMATE

Below is the Preliminary Design Construction Cost Estimate for the full corridor. Note that the costs include 30% Contingency, 5% for Engineering, and 10% for Construction Administration and Inspection.

Table 9: Preliminary Cost Estimate for Entire Corridor

Context	Distance (km)	Construction Cost Estimate
Context 1 – Low Density Residential	4.2	$24.4 M
Context 2 – Green and Rural	1.4	$3.8 M
Context 3 – Downtown Commercial	1.3	$8.8 M
	6.9	**$37.0 M**

Detailed cost estimates broken down by context, including general, roadway and boulevard, utilities, LID and electrical items, can be found in **Appendix K**. Notes are included for preliminary assumptions and considerations for detailed design.

7 PHASING PLAN

The corridor was split into nine segments based on changes in context, block-by-block uses, and limits of other capital works as described in this report and shown in **Table 9**. More details can be found in **Appendix K**.

Table 10: 25th Side Road Segments within Study Limits

No	Segment	North STA Limit	South STA Limit	Distance (m)	Context	Coordination with Other Works	Phase	Construction Year
1	Big Bay Point Road / 13th Line to Mapleview Dr	16+954	15+535	1419	Green and Rural	Big Bay Point Roundabout (2023)	1	2024
2	Mapleview Dr to 300m south of Mapleview Dr	15+535	15+225	310	Downtown Commercial	Planned mixed-use development (timing unknown)	2 (interim paved shoulders)	2025
3	300m south of Mapleview Dr to north of Lockhart Rd	15+225	14+410	815	Low Density Residential	Sanitary sewer upgrade from Lockhart to Pinegrove 2024-25	2	2025
4	North of Lockhart Rd to 70m north of Cook St	14+410	13+470	940	Downtown Commercial	Lockhart Intersection works Fall 2023 to Spring 2024, Innis Village Servicing	2	2025
5	70m north of Cook St to 10th Line	13+470	12+780	690	Low Density Residential		2	2025
6	10th Line to south of James Street	12+780	11+480	1300	Low Density Residential	Urbanization / AT of 10th Line, construction timing unknown	3	2027
7	9th Line Roundabout from James Street to north of William Street	11+480	11+380	100	Low Density Residential	Watermain upgrade from Innisfil Beach Road to 9th Line before 2031	3	2027
8	North of William Street to Park Road	11+380	10+370	1010	Low Density Residential	Watermain upgrade from Innisfil Beach Road to 9th Line before 2031	4	2029
9	Park Road to Innisfil Beach Road	10+370	10+000	370	Low Density Residential / Downtown Commercial	Watermain upgrade from Innisfil Beach Road to 9th Line before 2031	4	2029

A phasing plan has been proposed that considers the following:

- Bundling opportunities with planned adjacent and parallel capital works to achieve cost efficiencies and minimize construction impacts on residents and travellers
- Timing of developments
- Active transportation connectivity and benefit to residents, particularly in the interim condition
- Lead time required for detailed design, moving of utilities, property acquisition, permits
- Capital budget
- Construction duration
- Minimizing construction impacts to the public

Based on the above considerations, the following phasing plan is recommended:

Table 11: Recommended Phasing Plan

Phase	Year	Limits	Distance (m)	Estimated Cost[3]
1	2024	Big Bay Point to Mapleview Dr	1419	$3.8M ($2.6 – $4.9M)
2a	2025	Mapleview Dr to North of Lockhart[1]	1125	$6.8M ($4.8 - $8.8M)
2b	2025	North of Lockhart to 10th Line including 10th Line roundabout	1630	$10.2M ($7.2 - $13.3M)
3	2027	10th Line to south of James St	1400	$8.1M ($5.7 to 10.6M)
4	2029[2]	South of James St to Innisfil Beach Road	1380	$8.1M ($5.6 to $10.4M)
		Total:	**6954**	**$37.0M ($25.9 to $48.1)**

Notes:
1. The future downtown commercial segment from Mapleview Dr to 300m south is recommended as an interim rural condition with paved shoulders until development on the east side proceeds.
2. Timing of watermain upgrade to be confirmed
3. A range of +/- 30% is shown to account for unknowns and assumptions at this preliminary design stage, which will be confirmed in detailed design

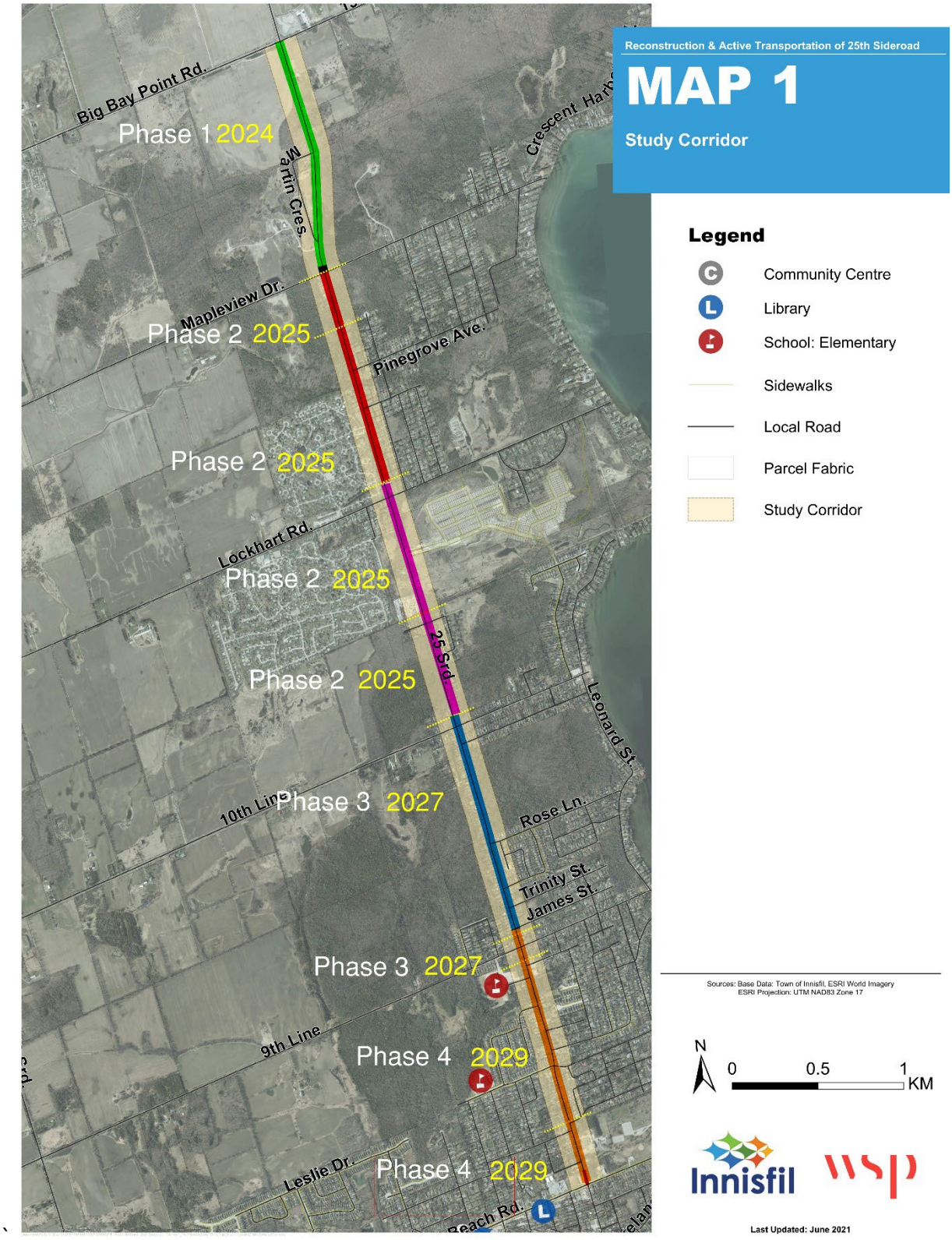


Figure 49: Phasing Plan

8 NEXT STEPS

8.1 MUNICIPAL CLASS EA REQUIREMENTS

Property acquisition is required in the three downtown commercial context areas to achieve a 23m ROW, and at the 9th Line roundabout. The Municipal Class EA (MCEA) could be Schedule B or A+. We have considered the advice from the MCEA Companion Guide in the following sections:

- **CGN - A1-15:** No EA process is required for property purchase. If the proponent acquires property to widen a road allowance through another process (negotiation with owner or planning policies for minimum width of road allowances), then the project within the altered road allowance is A+ provided there is no increase to continuous lanes of travel for traffic. If there is dispute about the property acquisition, then a Schedule B process should be followed to support the acquisition (expropriation). But, if the property can be acquired without dispute, then Schedule A+.
- **CGN - A1-18:** "Same location" means there is not a substantial change in location. A substantial change could be considered a change of more than approximately 10%. For example, a road allowance 20m wide and 1 km long has an area of 20,000m^2 and a change less than 2,000m^2 would be <10%.

With these comments about property acquisition and same location, we are of the opinion that the widened ROW falls within the definition of 'existing' and the project would be designated as Schedule A+.

8.2 ACTIONS FOR DETAILED DESIGN PHASE

The following tasks will need to be undertaken in the next phase of design:

- **Agency Permits:** Erosion and Sediment control mitigation measures around all creek crossings. Permits required in works surrounding conservation authority jurisdictions.
- **Tree Relocation, Preservation and Removals Plan, Landscaping Plan**: Confirm tree impacts based on grading, detailed design and opportunities for tree plantings.
- **Grading Design**: Confirm impacts to adjacent properties and Permission to Enter (PTE) requirements. Modelling 20m intervals and at key locations to verify crossfalls and tie-in locations.
- **Roundabout Design and Property Acquisition:** 9th Line roundabout design and associated property acquisition
- **Utility Relocations:** Coordination with utility companies to relocate or adjust utilities for hydro poles and light standards, Bell pedestals and other utilities in conflict with the preferred design alignment
- **Traffic Engineering:** Review and confirm proposed changes to traffic control including new PXOs and all-way stop-controlled intersections, and potential changes to signal phasing
- **Electrical Design:** Photometric analysis and illumination design to meet the Town's lighting standards for both road and active transportation facilities, as well as traffic signal design for signalized intersections and signalized crossings
- **Construction Staging / Traffic Management Plan:** This should be developed in coordination with adjacent capital works

A PRELIMINARY DESIGN DRAWINGS

B UTILITIES

C GEOTECHNICAL INVESTIGATION AND PAVEMENT DESIGN REPORT

D ARBORIST REPORT AND TREE PRESERVATION PLANS

E STORMWATER MANAGEMENT REPORT

F ALTERNATIVES EVALUATION MATRIX

G ROUNDABOUT ALTERNATIVES AND ANALYSIS

H ENGAGEMENT REPORT

I DESIGN CRITERIA

J ROADWAY SAFETY REVIEW REPORT

K COST ESTIMATE AND PROJECT PHASING

L COMMENT TRACKING SHEET AND DESIGNER RESPONSES