



NS&TRAIL Feasibility Master Plan

Prepared for the City of Niagara Falls
by IBI Group
February 2023

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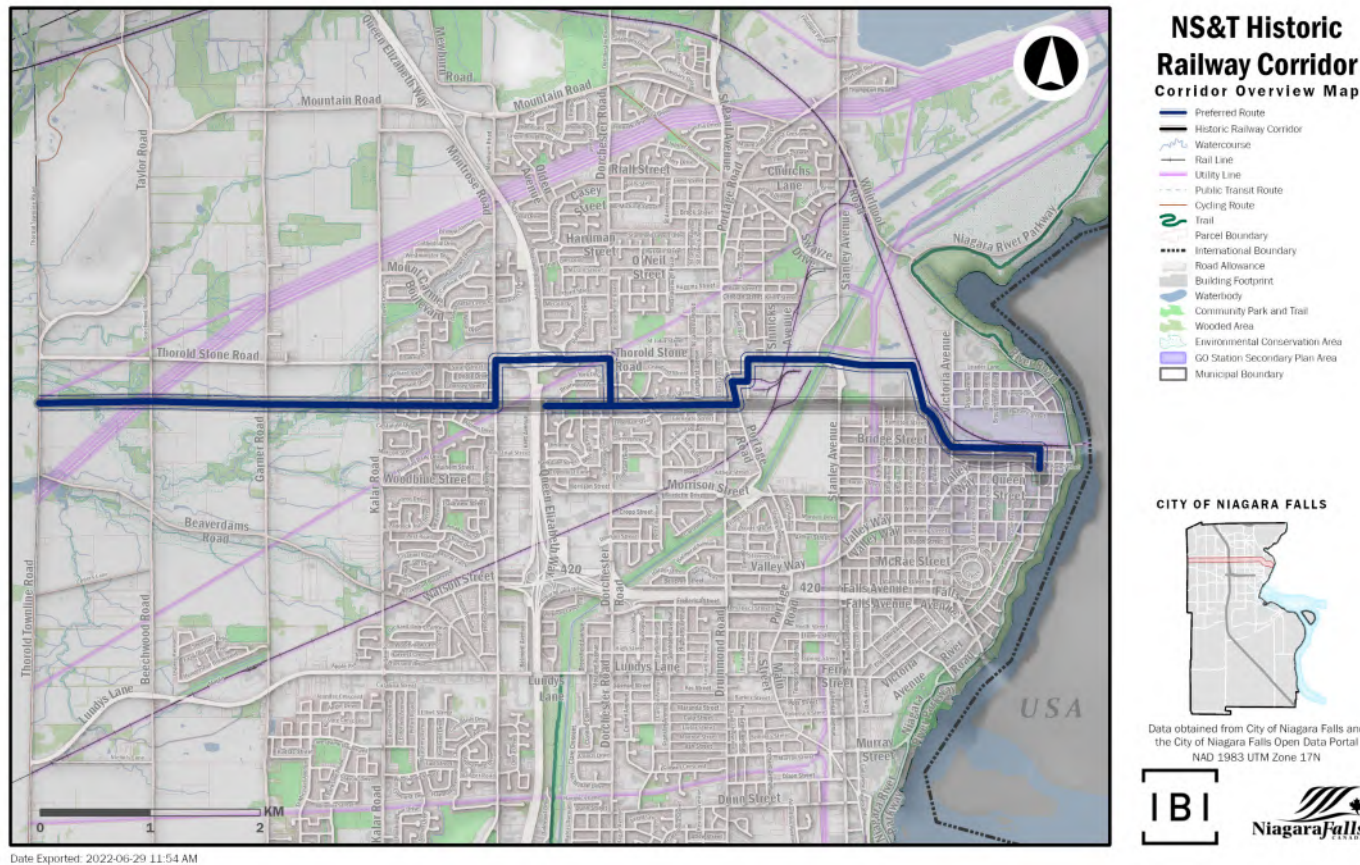
1 EXECUTIVE SUMMARY

The purpose of this feasibility master plan is to develop a strategy for a continuous multi-use recreational facility which will repurpose and occupy a portion of the decommissioned Niagara, St. Catharines & Toronto (NS&T) Rail Corridor. The study provides a high-level planning framework for redevelopment and construction of this corridor. The study also examines potential integration with surrounding community to establish a city-wide recreational trail. The recommended route for the trail has been developed in consultation with the general public as well as a number of key stakeholder groups.

Over the course of the study, a preferred route was identified based on an iterative process consisting of site inventory and analysis, public and stakeholder consultation, research, and general feasibility assessment.

The overarching intent is to utilize as much of the existing historic rail corridor alignment as possible for the recommended route, however, routing changes deviations have been identified for challenging site conditions and spatial constraints, which limit where site conditions present a major challenge to trail implementation along the rail corridor. The recommended route was also informed by applicable studies and policy to maximize integration potential and share resources where possible within the community.

The primary facility type for the trail will be an off-road multi-use path, however the configuration and design are intended to be responsive to context, maintenance requirements, accessibility needs, and environmental constraints. There will also be separated, dedicated and/or shared cycling facilities along urban roads, where necessary.



The recommended trail route has been divided into four contiguous phases largely based on context and feasibility. Phases 1 and 2 are further subdivided and prioritized based on timing of other capital improvement projects, safety, feasibility and project costs.

In addition to defining the route, this planning study identifies branding and wayfinding opportunities to help create a cohesive trail identity, and opportunities for amenities to be considered along the length of the route. These elements will help to define the NS&T Trail, provide access to users of all abilities, and make it an iconic destination.

Once complete, the NS&T Trail will be a continuous and connected recreational route that will connect the City's downtown core to its rural community and provide opportunities for future Regional connections. The facility will connect neighbourhoods on a City-wide scale, support alternative modes of transportation, and provide a unique recreational experience which highlights the rail corridor's important history within the City of Niagara Falls.



INTRODUCTION





2 INTRODUCTION

2.1 Overview of the Master Plan

The purpose of this project is to develop a Feasibility Master Plan for a future City-wide trail that will link downtown Niagara Falls with nearby communities, connect parks and open spaces, and enhance recreation, tourism and active transportation opportunities across the City. The Feasibility Master Plan provides design and planning guidance for the phased implementation of the trail.

With guidance from public and stakeholder inputs, the proposed plan for the Niagara, St. Catharines and Toronto Rail Trail (NS&T) will provide an all ages and abilities connection across the City. The plan considers user comfort and safety, minimizing impacts on existing infrastructure, enhancing connectivity, and paying homage to the historic NS&T Railway.

2.2 Vision

The NS&T Trail will become an iconic active transportation & recreational facility that takes advantage of a historic City-wide railway corridor to enhance City-wide connectivity, multi-modal mobility, and recreation. The trail will include a mixture of facility types and provide safe and enjoyable recreational experiences for people of all ages and abilities.



The NS&T Trail pays homage to the history of the rail corridor. The multi-use links downtown Niagara Falls with nearby communities, connect parks and open spaces, and enhance recreation, tourism and active transportation opportunities across the City.

Image 1 - Aerial photo of QEW highway

2.3 Project Objectives

The following five objectives were identified at the outset of the study:



To maximize the potential for the idle NS&T rail corridor by developing an accessible multi-use trail that connects people to where they work, live and play.



To identify a trail alignment and route that improves neighbourhood connectivity, establishing a continuous network of public recreation and active transportation options and encourages health-supportive choices for local trips.



To solicit public and stakeholder feedback to ensure community buy-in and impart local influence on the trail.



To develop a branding strategy that embraces the history of the rail industry and its contributions to the development of the City, adding placemaking value and an enhanced sense of local pride.



To develop a feasible phasing and implementation plan that prioritizes trail implementation and identifies “quick win” opportunities.

Image 2 - Aerial photo of the Gale Centre





CONTEXT

THE HISTORY OF THE CORRIDOR



¹“Niagara, St. Catharines & Toronto Railway” by Canadian National Railways is licensed under Public Domain

²“The Niagara, St. Catharines & Toronto Electric Railway car crossing Twelve Mile Creek in St. Catharines, behind McKinnon Industries” is licensed under Public Domain

3 CONTEXT

3.1 A Local and Regional Connector: Historical Context

The NS&T started as an “interurban” electric line, which refers to streetcar-like ‘light’ electric rail cars running primarily within (but also to-and-from) neighbouring cities and towns. Prior to electrification, the railway had its beginnings in the 1870s with horse-drawn streetcars.

Changing ownership throughout the nineteenth and twentieth century, the main lines of the NS&T provided service to St. Catharines, Niagara Falls, Niagara-on-the-Lake, Port Dalhousie, Thorold, Welland and Port Colborne and were pieced together from several smaller lines. These included the St. Catharines Street Railway, the Victoria Lawn Line and the St. Catharines & Niagara Central Railway. The patchwork of rail lines was incorporated as the NS&T services in 1899.

At its peak, the NS&T comprised roughly 120 kilometers of track and numerous yards, carrying passengers, mail, express baggage and freight. The railway’s popularity rose during World War II when bus service was reduced to ration fuel, however by the 1950’s, improved roadways and a new reliance on the automobile had critically reduced demand for the rail service. The railway slowly began to wind down and lines were gradually replaced with buses. In 1960, the NS&T fully merged into the Canadian National Railway CN.

Many of the remnant lines and their vestiges remain visible throughout the City and provide the unique opportunity for a new and modern transportation network³.

³ (Niagara St Catharines and Toronto Railway. (n.d.). Canada-Rail. <https://www.canada-rail.com/ontario/railways/NSCT.html>

3.2 Policy Context

3.2.1 Planning and Policy Influences

There are a number of policy documents and projects which will impact the project and which the master plan must have regard for, including but not limited to:

1. Niagara Region Complete Streets Design Manual

An initiative addressing the design/re-design of all Regional Roads prioritizing active transportation as an essential component. There may be opportunities to partner with the Region where sections of the trail pass along Regional road corridors.

2. Thorold Stone Road (TSR) Extension Environmental Assessment and Roundabout

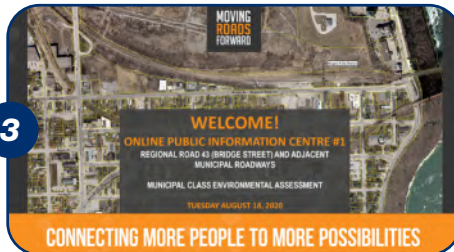
The TSR extension will provide a key connection to the Queen Elizabeth Way (QEW), enhanced linkage to the City of Niagara Falls' downtown area and Niagara River Parkway. There is an opportunity to take advantage of planned improvements for potential alternative trail routes.

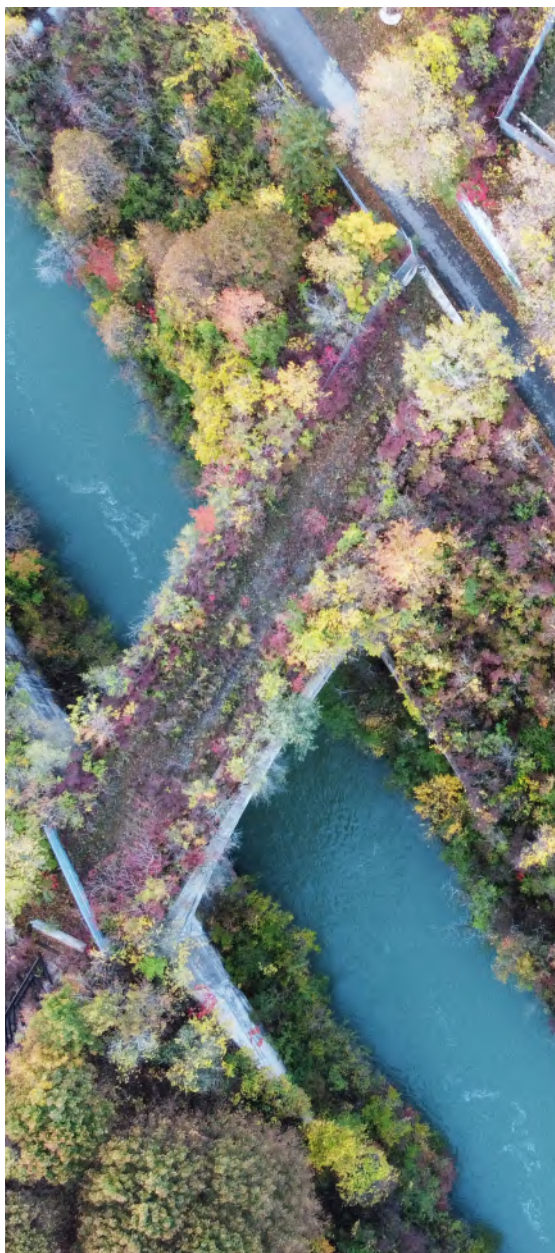
3. Bridge Street Environmental Assessment (EA)

The Bridge Street EA considers intersection enhancements and the inclusion of active transportation infrastructure, as well as streetscape and urban design improvements within the Regional GO Station Secondary plan area and the City's downtown. There is potential to coordinate design concepts with the Rail Trail Master Plan.

4. Niagara Falls GO Station Secondary Plan, Niagara Region

This Secondary Plan provides a vision and planning framework to advise transit-supportive development around the future GO station, located on Bridge Street at the existing VIA Rail station. The planning framework will be a key influence on the trail at the east terminus in the downtown area.





3.3 Spatial Context

THE PHYSICAL AND GEOGRAPHICAL CONTEXT OF THE FORMER NS&T RAILWAY CORRIDOR

The project area comprises a 9.3km section of the historic NS&T Railway corridor footprint which extends east-to-west across the City of Niagara Falls, from Thorold Townline Road to Downtown Niagara Falls..

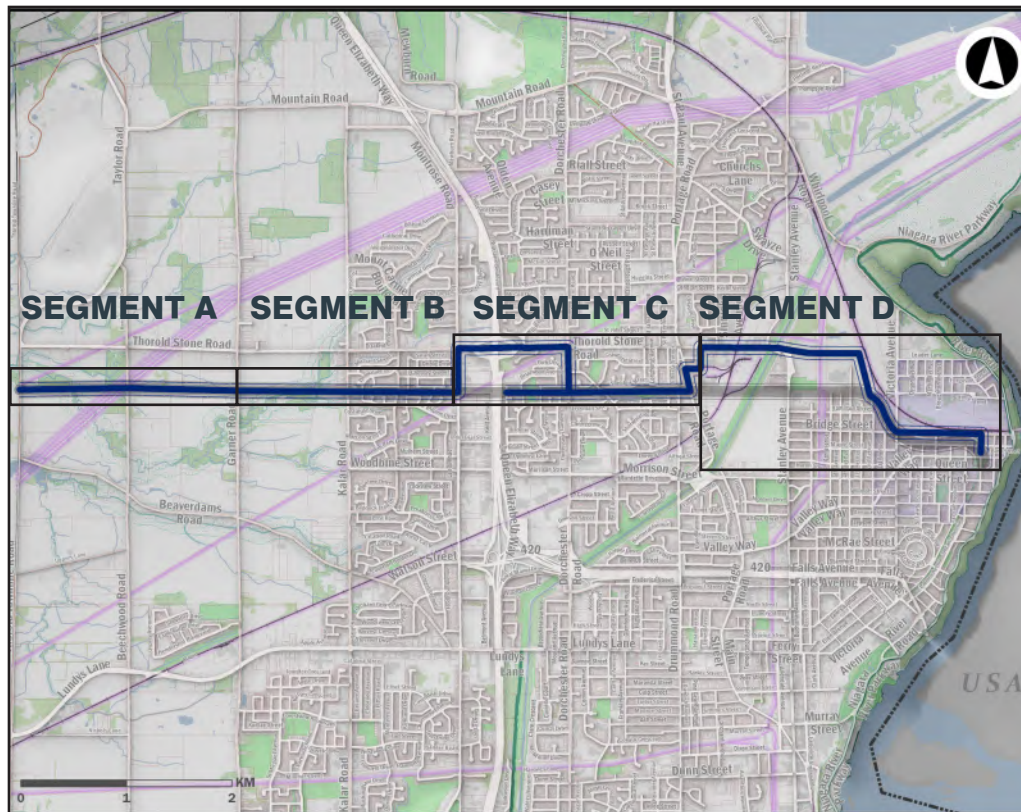
The railway corridor is ideal for a City-wide trail as it intersects with a variety of neighbourhood communities, existing park and trail networks, and key transportation routes. Throughout this project, the existing rail corridor will be prioritized, with the original footprint of the railway being an ideal alignment. Due to constraints listed herein, deviations from the existing route are required. This in turn increases the trail network's variety of scenery, context, composition and conditions.

Immersed within the City's urban fabric, the corridor's existing connections support what will be a quality, regional commuter trail. In many locations, the presence of natural vegetation within and along the corridor provides a natural buffer to adjacent residential developments and main through-ways.

Overall, the corridor is well-situated for the creation of a high-profile, cross-City trail that will have widespread benefits for the extended community.

CONNECTIVITY TO THE NIAGARA CIRCLE ROUTE AND GREAT LAKES WATERFRONT TRAIL SYSTEM – NIAGARA PARKS COMMISSION

The historic NS&T rail line extended throughout the Niagara Region and well beyond the limits of the City. Holding the same potential, the rail trail has the opportunity to facilitate a wider contextual network. In particular, there is opportunity at the west terminus which could see connections to Thorold, Pelham, St. Catharines, Welland and beyond. Given the success of attracting cycling tourism to Niagara Region through major trail investment (i.e. Greate Niagara Circle Route), it is important that this trail is developed with a regional outlook.



3.3.1 A closer look

To examine the existing corridor in greater detail, four separate 'segments' have been defined based on existing municipal features. Each segment features unique characteristics and as such should be reviewed on a segment-by-segment basis.

PRIORITY SEGMENTS

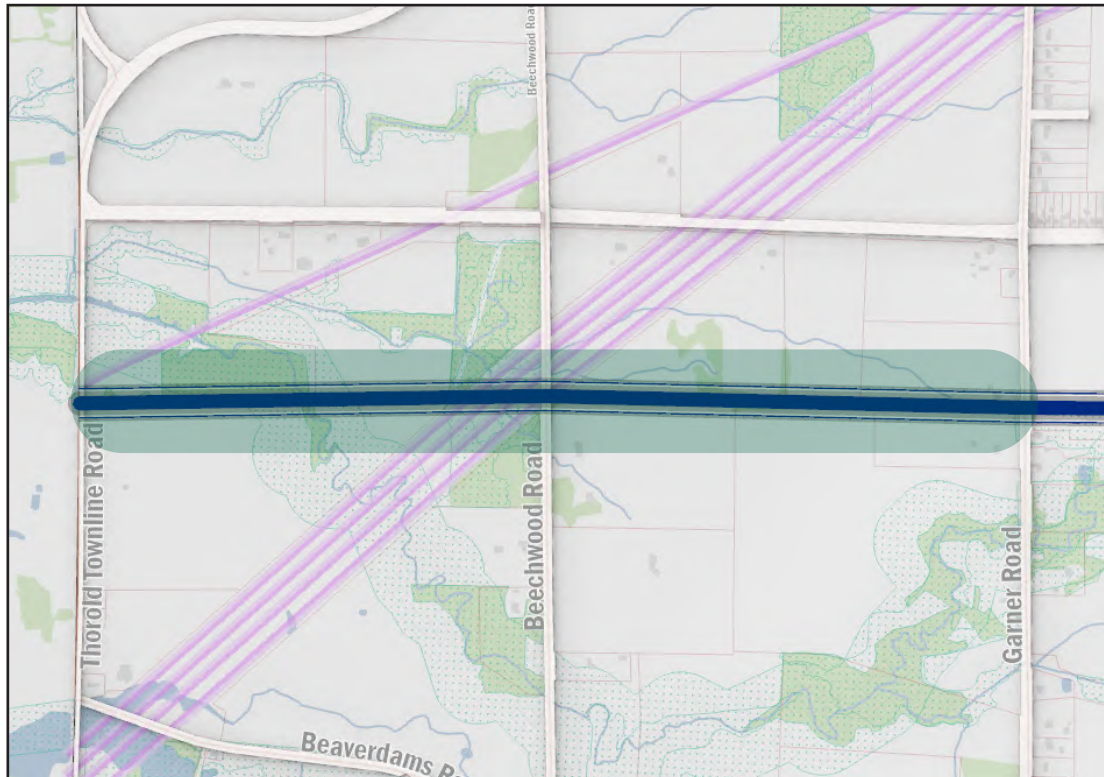
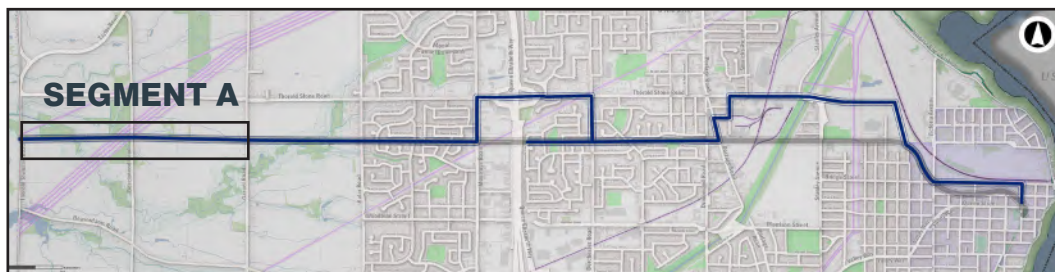


Exhibit 1 - Priority Segment A

- Recommended Route
- Historic NS&T Railway Corridor



SEGMENT A: THOROLD TOWNLINE ROAD TO GARNER ROAD

The western limit of the proposed Rail Trail starts and finishes at Thorold Townline Road, which is also the City limit. Segment A extends eastward from this point roughly 2 kilometers to Garner Road, traversing agricultural lands. The naturalized state appears to have left the rail bed in questionable condition. Instances of creek crossings and low-lying areas may have compromised the railbed itself and are factors to consider when reinstating the trail.

Segment A would be considered a low-priority section given its current potential and lack of existing connections. This however could change as the potential for future Regional trail connections exists and holds great potential for linking into Thorold and other communities nearby. The development of this section is dependent on future connections to Thorold and the greater region.

PRIORITY SEGMENTS

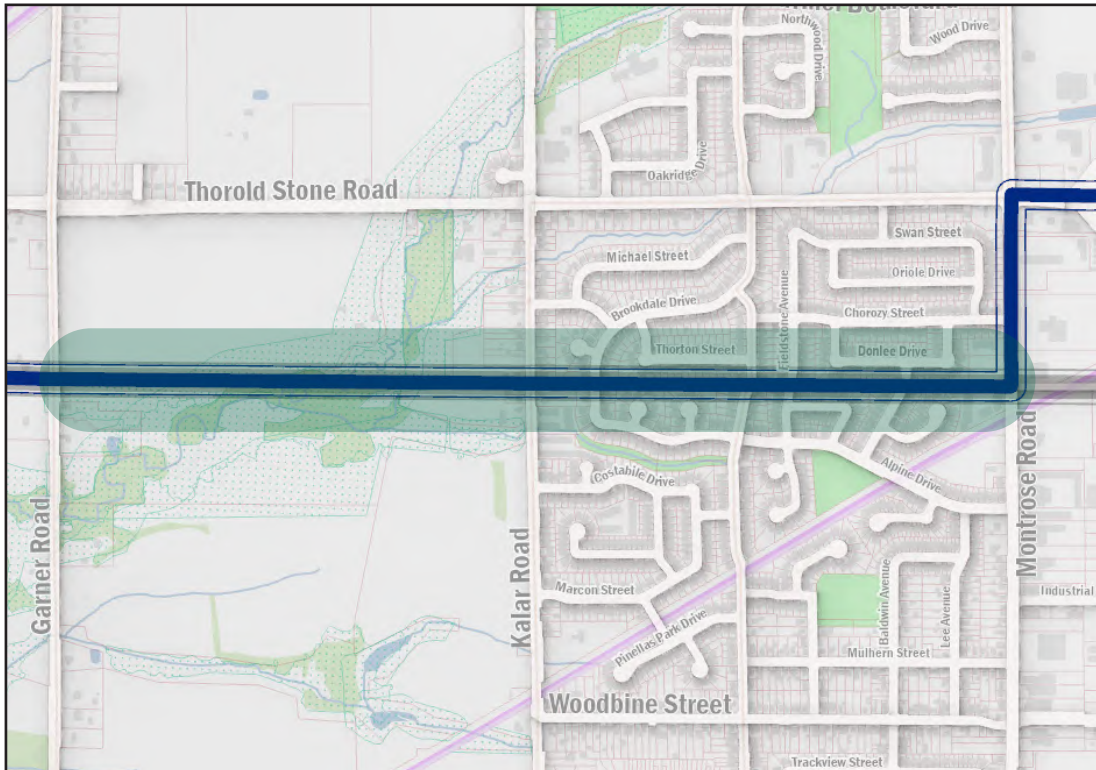
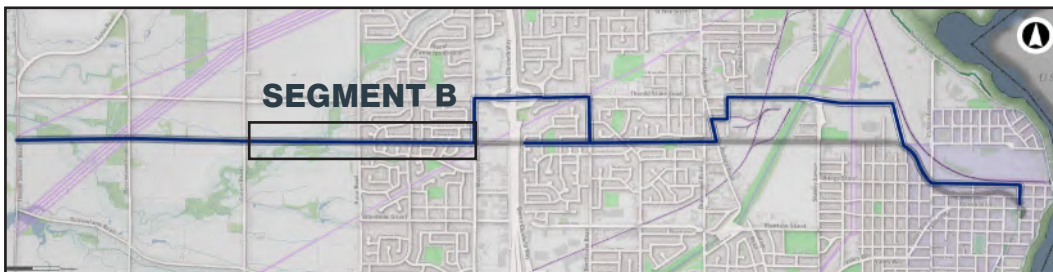


Exhibit 2 - Priority Segment B

- Recommended Route
- Historic NS&T Railway Corridor



SEGMENT B: GARNER ROAD TO MONTROSE ROAD

Segment B begins at Garner Road and extends east towards Montrose Road. While the first half of this segment features much the same natural and agricultural land typology from Segment A, including environmentally sensitive and NPCA-regulated lands, it quickly enters a suburban landscape at Kalar Road, which becomes more of the typical condition moving east.

Special considerations for the historic corridor alignment within this segment include:

- ⚙️ Trail integration at the existing Regional Pump station at Kalar Road. This station driveway occupies lands within the rail corridor.
- ⚙️ The most significant and obvious barrier for the trail within the existing railway corridor is the QEW Highway. Existing land uses and spatial limitations, complexity, and cost, are critical reasons why this crossing may preclude a trail crossing at this location – or at least within the short term.
- ⚙️ A more feasible and likely alternative route is to travel north along Montrose Road, use the existing Thorold Stone Road overpass and return southward towards the trail via Dorchester Road. This would require significant coordination with multiple stakeholders.

PRIORITY SEGMENTS

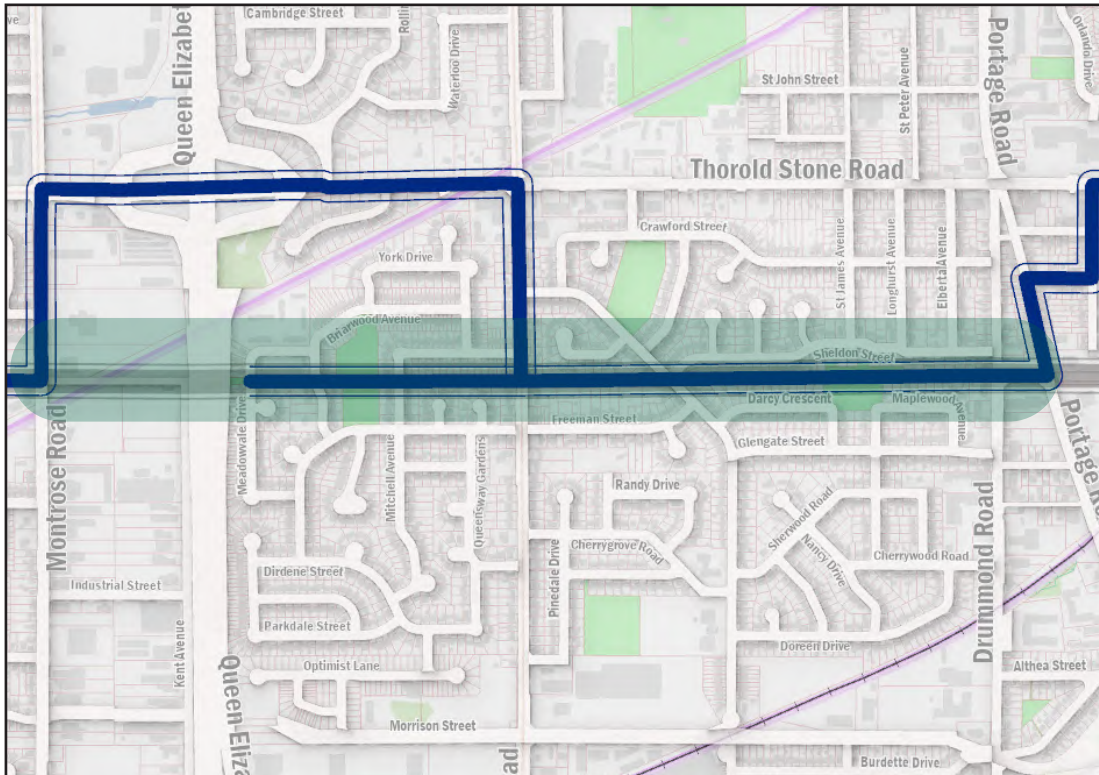
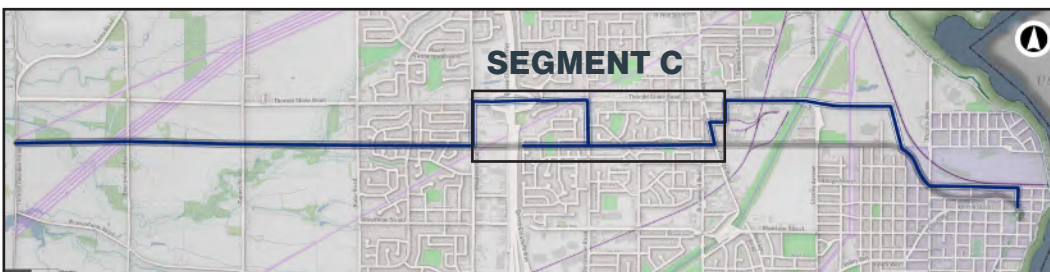


Exhibit 3 - Priority Segment C

- Recommended Route
- Historic NS&T Railway Corridor



SEGMENT C: MONTROSE ROAD TO DRUMMOND ROAD

Segment C is a central portion of the trail bounded by major infrastructure hurdles on either side: the QEW Highway and the Hydro Canal (and adjacent rail yard). Traversing residential neighbourhoods within the historic railway corridor for the majority of the segment, the rail trail can easily be envisioned connecting parks and streets within the manicured properties and lawn-covered railbed. The relative simplicity of this 'backyard' condition changes, however, once the corridor intersects with Drummond Road, and even more so further east at the rail lines adjacent the Oleo Energies lands.

Mindful at all times of pedestrian safety, avoiding interaction with active rail lines should be prioritized. As a result, traveling north along Portage Road to Thorold Stone Road should be considered as likely and a logical alternative option for crossing over to the lands east of the Hydro Canal.

PRIORITY SEGMENTS

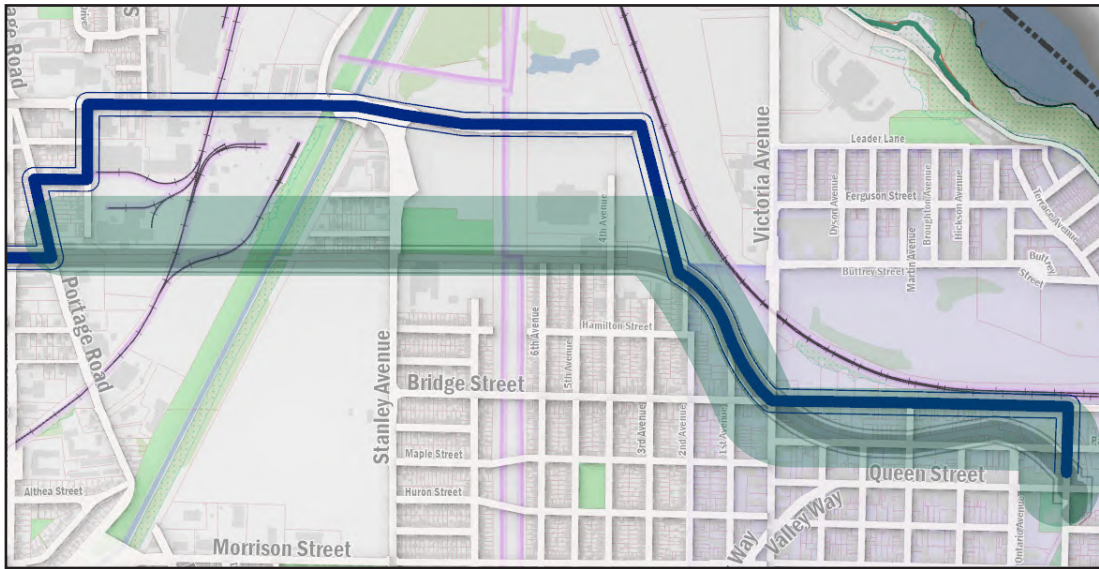
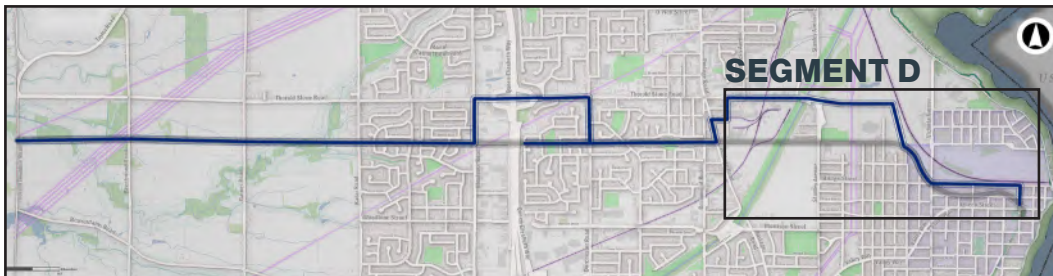


Exhibit 4 - Priority Segment D

- Recommended Route
- Historic NS&T Railway Corridor



SEGMENT D: PORTAGE ROAD TO QUEEN STREET @ ERIE AVE (ROSBERG PARK)

Segment D is the most unique of the four, primarily because it is the only segment where the historic NS&T rail alignment does not follow a linear trajectory. East of the Hydro Canal, the trail corridor continues for nearly 1 kilometer before veering south towards the intersection of Victoria Ave and Bridge Street. It then follows a serpentine form to Erie Ave and Queen Street.

Segment D is also the most urban of the four trail segments as it enters the downtown area of Niagara Falls and crosses into office/commercial lands. Integration with the Region's GO Station secondary plan is critical for this trail section.

Continuing along Thorold Stone Road from the Hydro Canal bypass in Segment C, the trail would continue west around the Gale Center Arena via the existing multi-use path which was installed as part of the Region's Phase 1 Thorold Stone Road Extension project, and south via the future planned Regional Road connection (Phase 2 Thorold Stone Extension) to the intersection of Victoria Ave and Bridge Street, where a future roundabout planned.

While not a physical barrier, coordination with the GO Station Secondary Plan area plans might prove to be a valuable connection point and opportunity for the trail to integrate within existing planning initiatives. If this were the case, from the future roundabout at Victoria Ave and Bridge Street, the trail could utilize an on-street option along Bridge Street towards the trail terminus at Erie Ave and Queen street, rather than following the serpentine corridor of the historic line.





COMMUNITY AND STAKEHOLDER ENGAGEMENT



4.2 What We Heard



A total of **1400 people** visited the online engagement site in various respects:

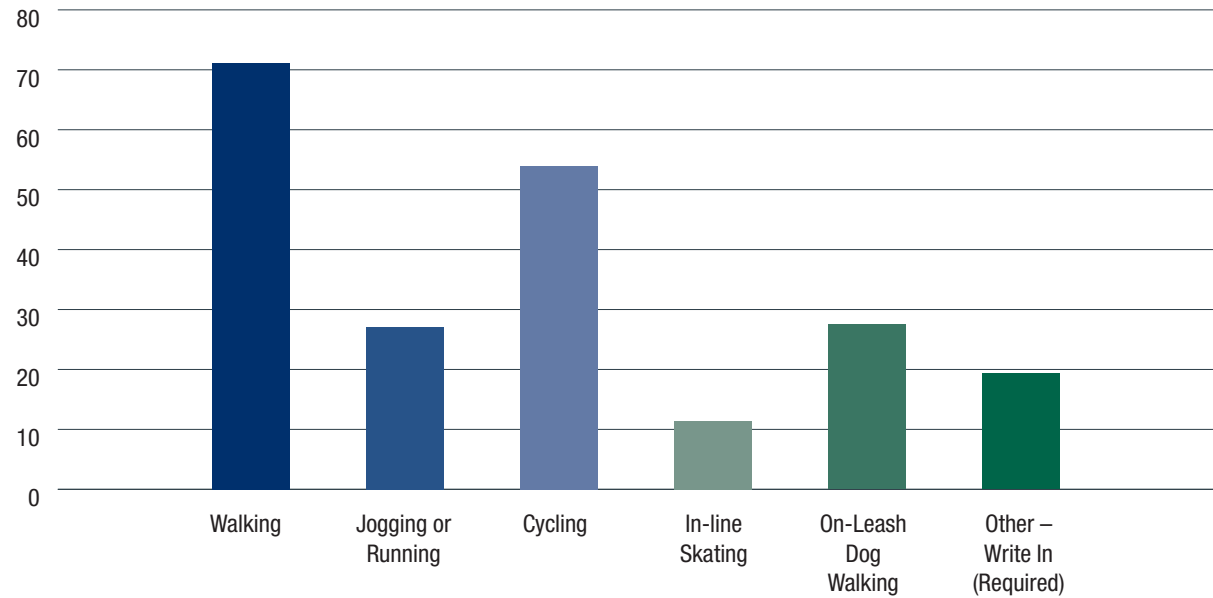
- » **Engaged:** Participants that contributed to the map, dropping a pin, providing a comment, etc.
- » **Informed:** Participants that took the time to view more information on the page, including viewing a photo, downloading supporting documents, clicked on additional links, etc.
- » **Aware:** Participants that visited the page without interacting without the material but gained awareness of the project.



Overall, comments were predominantly positive with the majority of citizens supportive and excited for the trail to be developed. The following are conclusions gathered from the results of the survey:

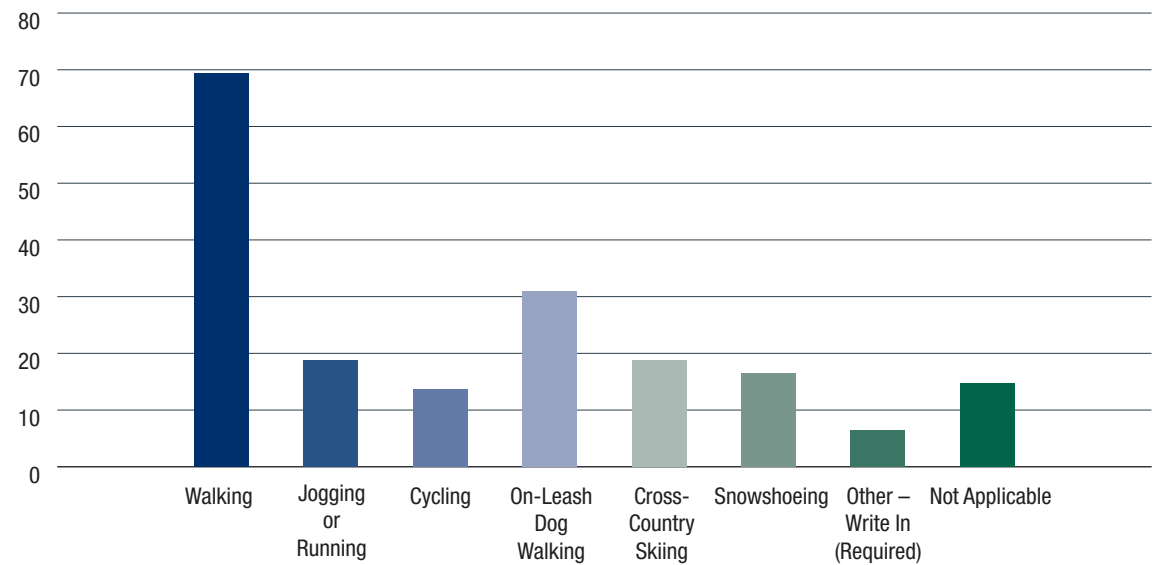
- » The community indicated that they would mostly use the trail for walking, cycling and jogging
- » In both rural and urban areas of the trail, people would prefer asphalt surfaces
- » Residents would like to see a variety of amenities along the trail, including site furnishings such as seating, lighting and wayfinding signage as well as natural features such as trees and vegetated areas.
- » Most participants would like to see the historical narrative reflected along the trail by means of historical markers of significant locations, interpretive graphic display boards and historical plaques.

“
How would you use the
NS&T Rail Trail?
”



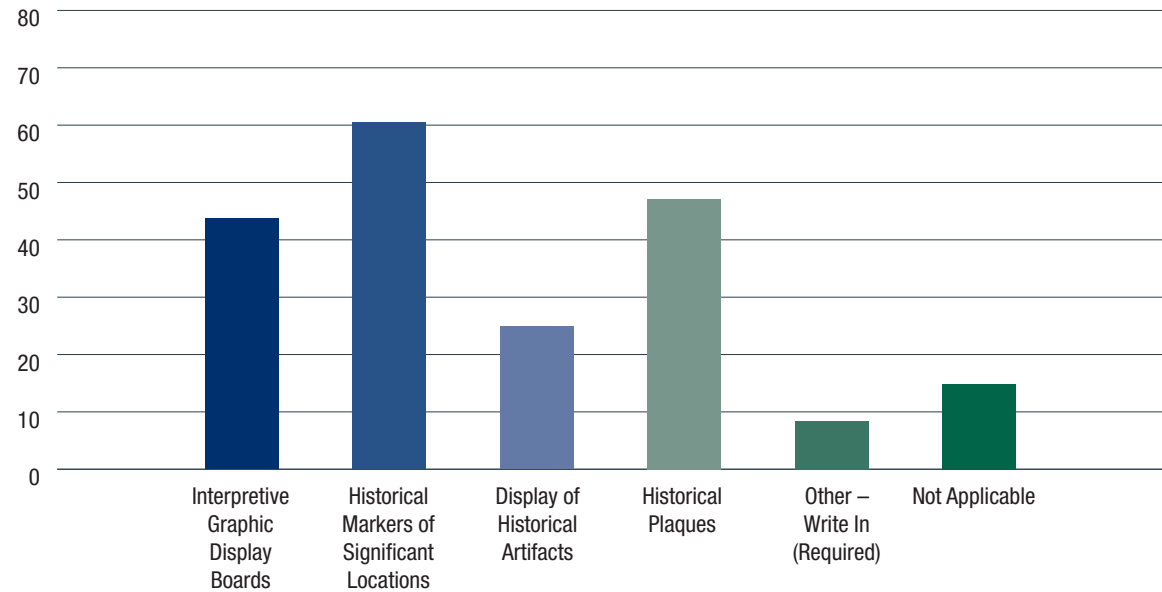
| Value | | Percent | Responses |
|-----------------------------|------------------------|---------|-----------|
| Walking | <div><div></div></div> | 71.1% | 199 |
| Jogging or Running | <div><div></div></div> | 27.1% | 76 |
| Cycling | <div><div></div></div> | 53.9% | 151 |
| In-Line Skating | <div><div></div></div> | 11.4% | 32 |
| On-Leash Dog Walking | <div><div></div></div> | 27.5% | 77 |
| Other - Write in (Required) | <div><div></div></div> | 19.3% | 54 |

“
What winter activities
would you be
interested in?
”



| Value | | Percent | Responses |
|-----------------------------|------------------------|---------|-----------|
| Walking | <div><div></div></div> | 69.4% | 193 |
| Jogging or Running | <div><div></div></div> | 18.7% | 52 |
| Cycling | <div><div></div></div> | 13.7% | 38 |
| On-Leash Dog Walking | <div><div></div></div> | 30.9% | 86 |
| Cross-Country Skiing | <div><div></div></div> | 18.7% | 52 |
| Snowshoeing | <div><div></div></div> | 16.5% | 46 |
| Other - Write in (Required) | <div><div></div></div> | 6.5% | 18 |
| Not Applicable | <div><div></div></div> | 14.7% | 41 |

“
If the NS&T rail corridor history is part of the trail project, how do you think it should be told? Identify the options that you feel are important.
”



| Value | | Percent | Responses |
|---|------------------------|---------|-----------|
| Interpretive Graphic Display Boards | <div><div></div></div> | 43.7% | 114 |
| Historical Markers of Significant Locations | <div><div></div></div> | 60.5% | 158 |
| Display of Historical Artifacts | <div><div></div></div> | 24.9% | 65 |
| Historical Plaques | <div><div></div></div> | 47.1% | 123 |
| Other - Write in (Required) | <div><div></div></div> | 8.4% | 22 |
| Not Applicable | <div><div></div></div> | 14.9% | 39 |





DESIGN PRINCIPLES AND GUIDELINES

5 DESIGN PRINCIPLES AND GUIDELINES

5.1 Influences Shaping the Trail

OPPORTUNITIES



Enhanced Mobility

The proposed trail alignment will enhance mobility options for residents through the City of Niagara Falls, providing opportunities for walking, cycling, jogging and other forms of active transportation.



A Destination

The historic significance and geographical convenience of this section of the existing NS&T rail line presents the opportunity for the trail to become an iconic facility and a destination feature for the City of Niagara Falls.



Regional Connections

The historic NS&T rail line extended throughout the Niagara region and well beyond the limits of the City. In a similar fashion, the rail trail has potential to create a Regional trail connection. In particular, there is future opportunity at the west terminus which could see connections to Thorold, Pelham, St. Catharines, Welland and beyond.



Natural & Environmental Benefits

The proposed project presents the opportunity for added benefit beyond the function of the trail facility, such as opportunities for expanded environmental monitoring within the region, and the creation and support of wildlife habitat.



CONSTRAINTS

1

Major Physical Barriers

Major physical barriers are those that pose a significant obstacle to utilizing the historic railway alignment and require identifying interim solutions. Such major physical barriers include the QEW Highway and Hydro Canal crossings.

2

Minor Physical Barriers

Minor physical barriers may be less obvious, and require less drastic adaptation measures, yet still pose obstacles to the trail development. Examples include the conflict with the existing pump station at Kalar Road and the complex intersection of Drummond Road, Gallinger Street, and Portage Road.

3

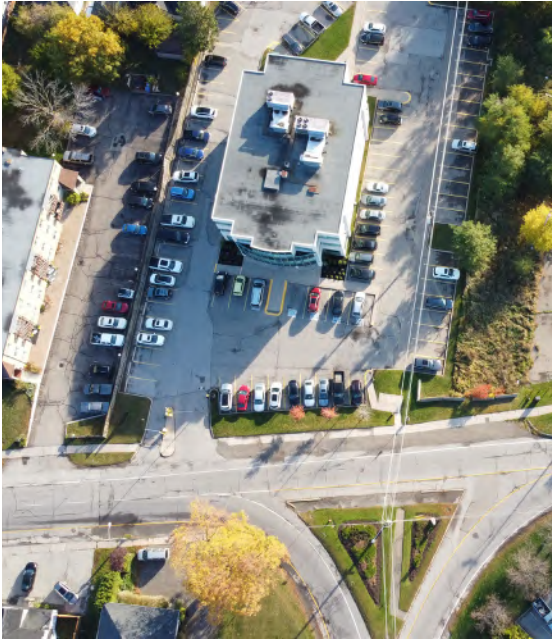
Land Ownership

Land ownership will provide challenges on a site-by-site basis. While the majority of the land within the corridor is municipally owned, it is not exclusively, and therefore there will be instances throughout which will require coordination with Regional, Private, and general public stakeholders.

4

Other

Potential overarching constraints posed to the ultimate trail route include such things as current or planned development applications (e.g. the GO Station Secondary Plan area, etc.), environmentally sensitive areas, and challenging physical geography, particularly in the lands west of Garner Road.



5.2 Design Principles

In line with the vision for the proposed NS&T Rail Trail as described in section 1.2, it is important the trail is planned, designed and delivered to reflect the following design principles:

- ⚙ **Accessibility:** Through specific design elements and materials, the trail is designed to be accessible for residents of all ages and abilities, including meeting, and where possible, exceeding the AODA requirements for recreational trails.
- ⚙ **History:** Through thoughtful references and design considerations, the trail emphasizes the unique history of the corridor and local heritage.
- ⚙ **Compatibility:** Through context sensitivity in design practices, the trail reflects and enhances the neighbourhoods, open spaces and corridors it passes through.
- ⚙ **Placemaking:** Utilize strategic design to provide the trail with its unique identity and make it a destination within the City.
- ⚙ **Environment:** Encourage design that supports a sustainable urban environment using design that contributes to such things as canopy cover and stormwater management.
- ⚙ **Safety & Comfort:** Coordinate design elements to provide visual interest, support Crime Prevention Through Environmental Design (CPTED) principles, and pedestrian amenity. Improve the desirability of walking and cycling.
- ⚙ **Connectivity:** Introduce new and enhance existing connections throughout the corridor, including major surrounding corridors, nodes and neighbourhoods.
- ⚙ **Good Neighbour:** Listen and incorporate feedback from trail neighbours to provide respectful and sensitive design solutions.

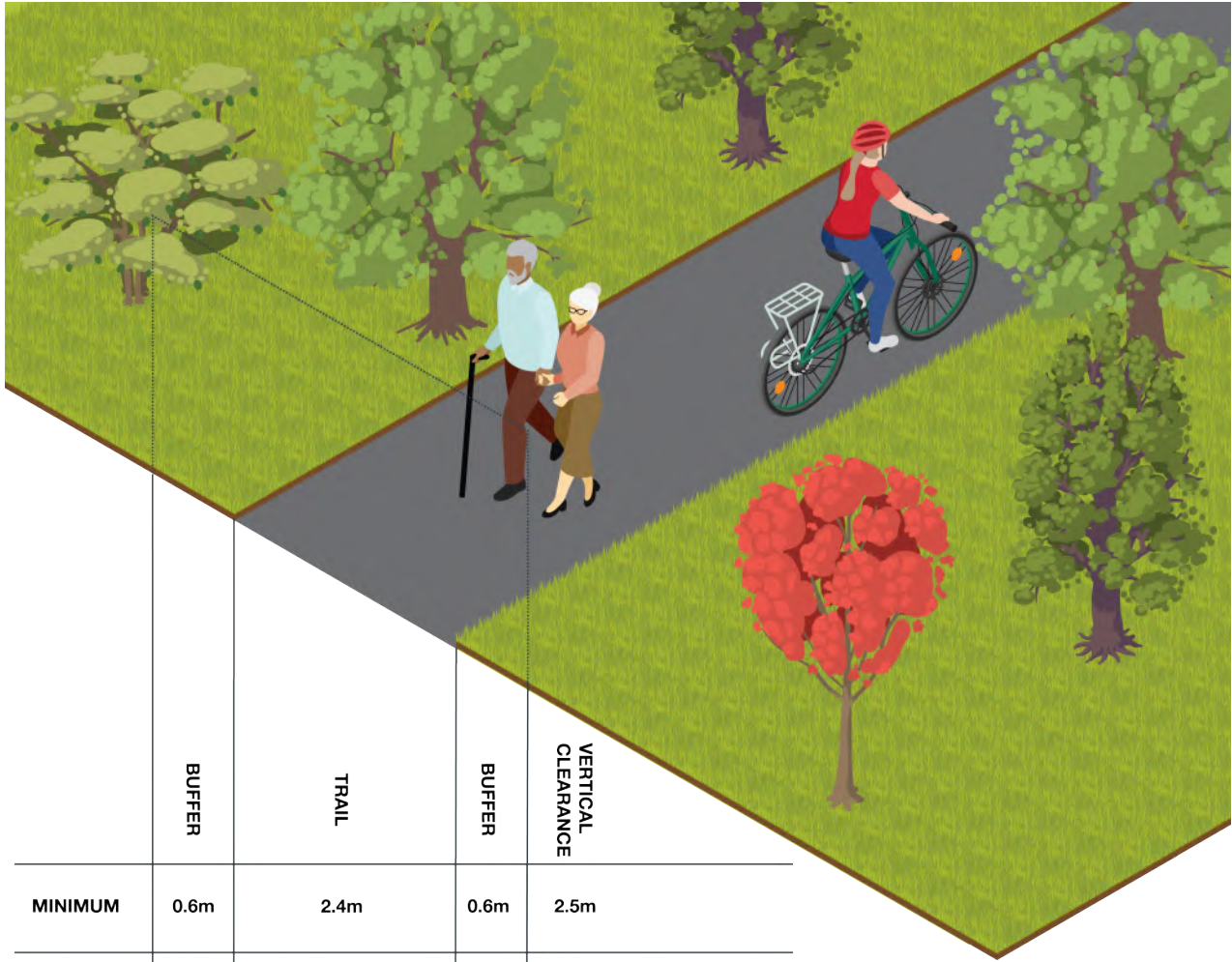


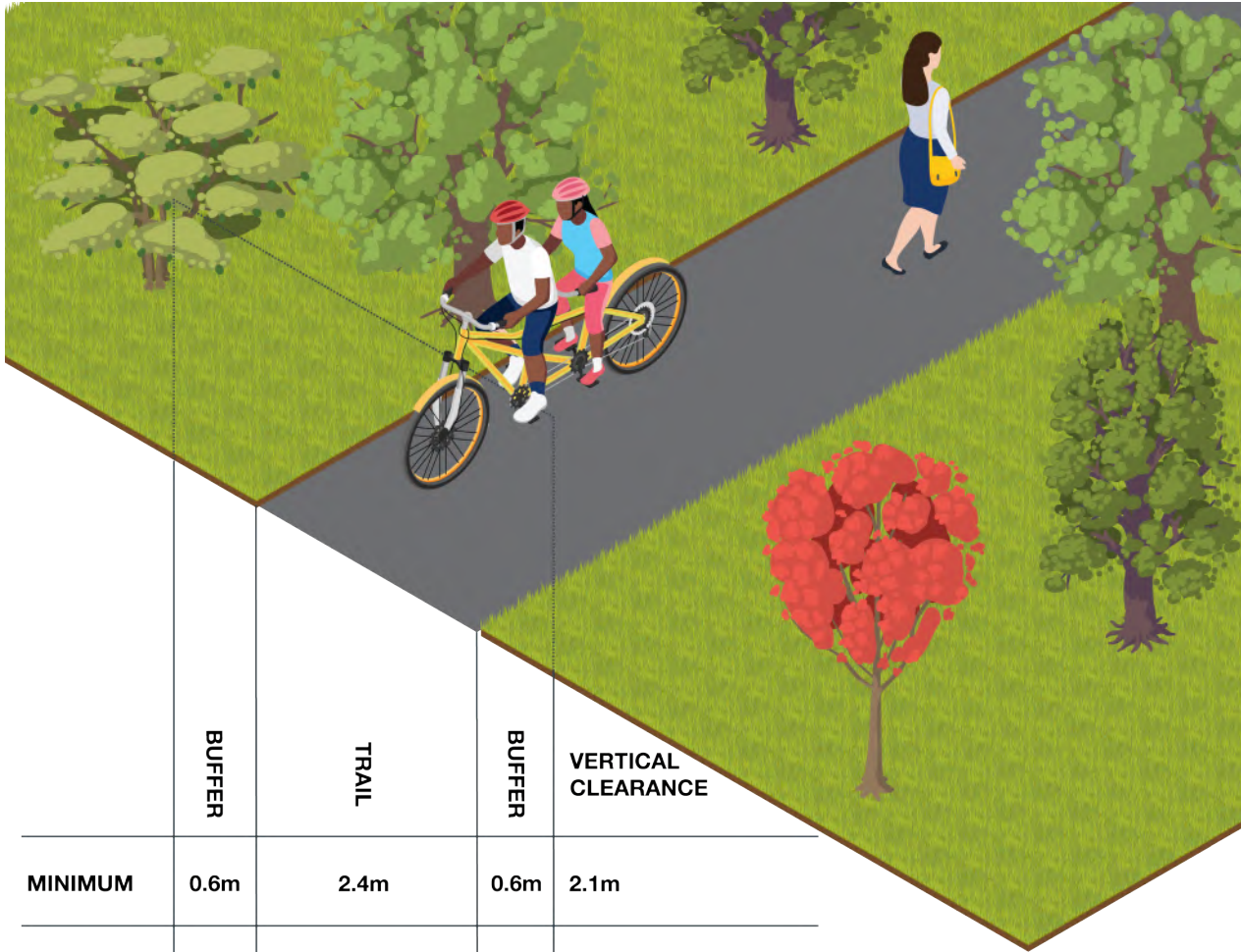
Exhibit 6 - Typical Midblock

5.3 Design Guidelines

5.3.1 Typical Midblock Cross-sections

1. Typical Midblock

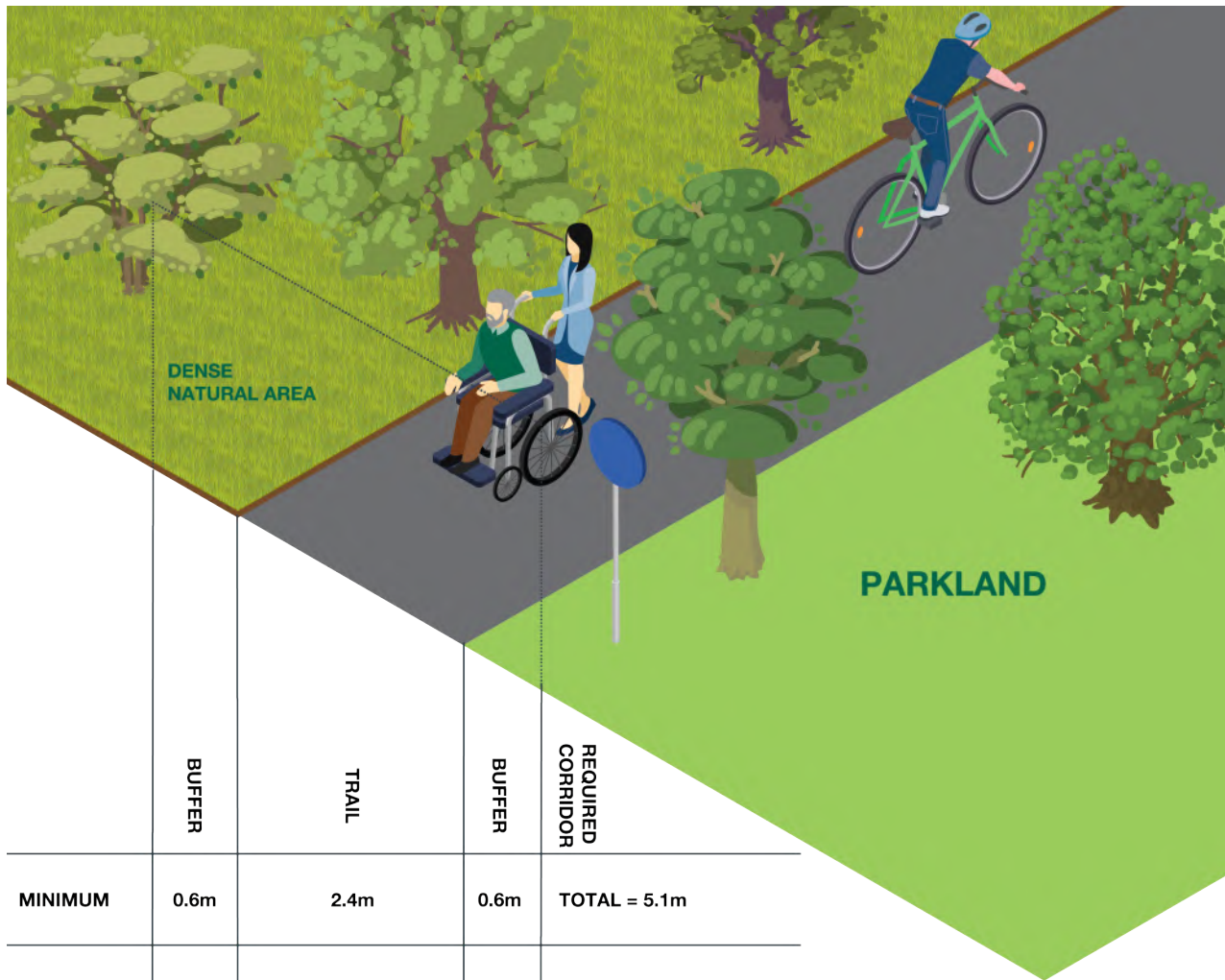
The default proposed operating condition for the NS&T Trail is illustrated in Exhibit 6. This configuration includes a shared multi-use path.



2. Alternate Midblock - Constrained

In environmentally sensitive areas, or areas requiring additional screening of adjacent land uses, an alternate cross-section may be considered which incorporates a narrower trail footprint with less overall impact, as illustrated in Exhibit 7a.

Exhibit 7a - Alternate Midblock Constrained

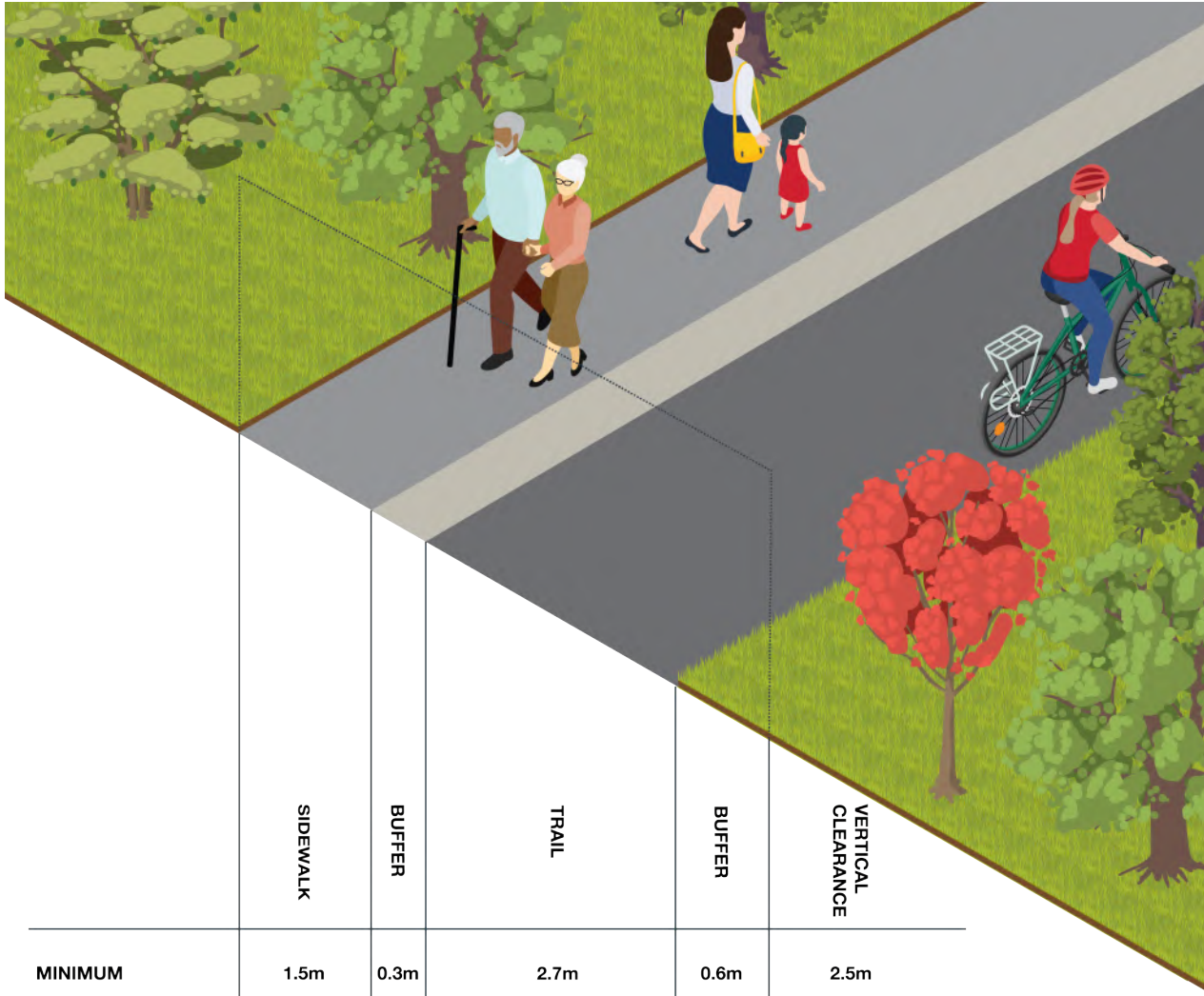


| | BUFFER | TRAIL | BUFFER | REQUIRED CORRIDOR |
|-----------|--------|-------|--------|-------------------|
| MINIMUM | 0.6m | 2.4m | 0.6m | TOTAL = 5.1m |
| TYPICAL | 1.0m | 2.7m | 1.0m | TOTAL = 7.0m |
| PREFERRED | n/a | ≥3.0m | n/a | n/a |

Exhibit 7b - Alternate Midblock Constrained

3. Alternate Midblock - Constrained (Cont.)

Additionally, granular paving materials such as limestone screening, or similar, may be beneficial to minimize construction disturbance and increase storm water infiltration.

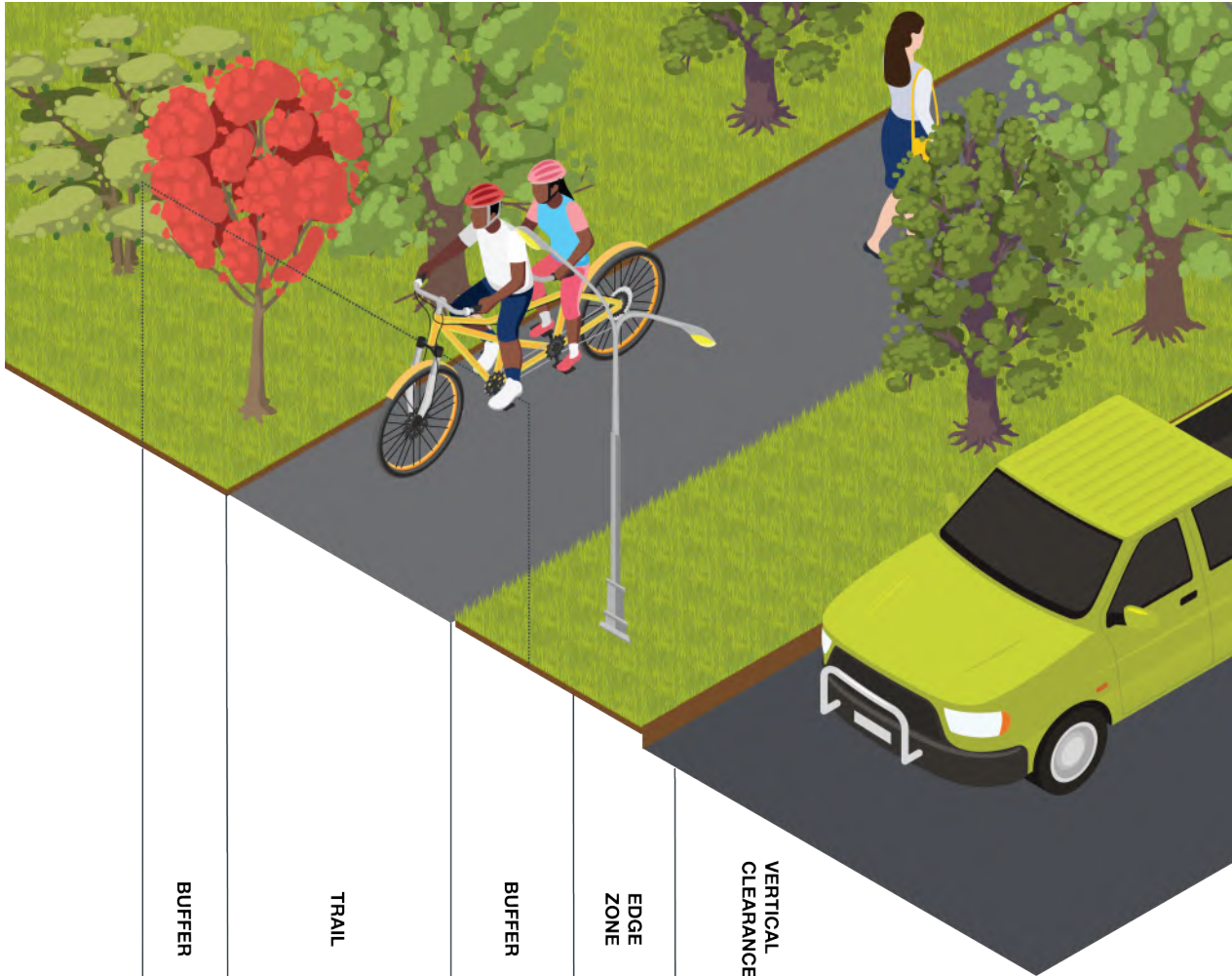


| | SIDEWALK | BUFFER | TRAIL | BUFFER | VERTICAL CLEARANCE |
|-----------|----------|--------|-------|--------|--------------------|
| MINIMUM | 1.5m | 0.3m | 2.7m | 0.6m | 2.5m |
| TYPICAL | 1.8m | 0.6m | 3.0m | 1.0m | 3.0m |
| PREFERRED | 2.1m | 0.6m | ≥4.0m | 1.5m | 3.0m |

4. Alternate Midblock – High Demand

In some cases, particularly as the trail approaches downtown Niagara Falls, there may be opportunities to develop separate paths for pedestrians and other faster trail users such as cyclists, rollerbladers and/or scooters. Where feasible, a high-capacity trail configuration such as the one shown in Exhibit 8 may be considered. This configuration provides separate pedestrian and cycling spaces.

Exhibit 8 - Alternate Midblock, High Demand

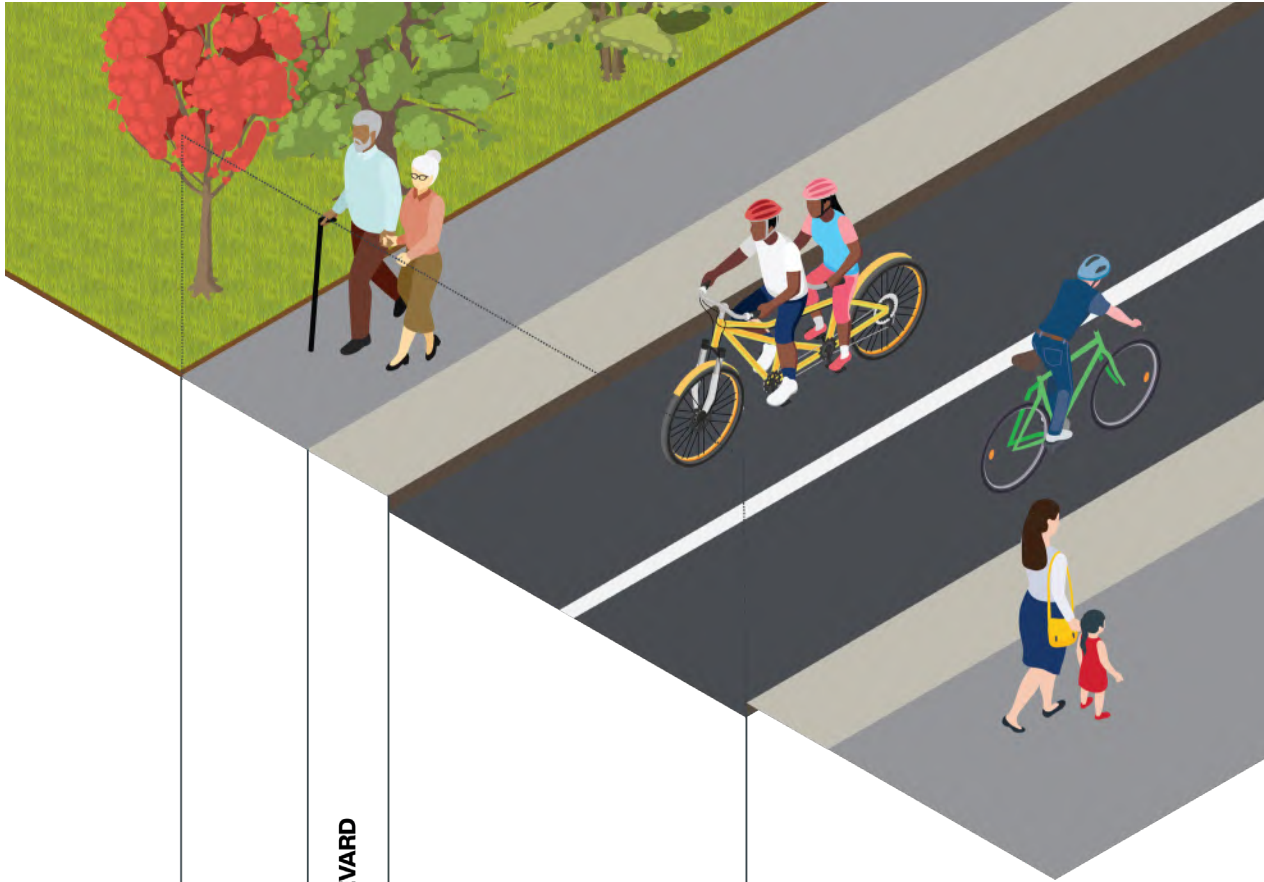


| | BUFFER | TRAIL | BUFFER | EDGE ZONE | VERTICAL CLEARANCE |
|-----------|--------|-------|--------|-----------|--------------------|
| MINIMUM | 0.6m | 2.4m | 0.5m | 0.5m | 2.5m |
| TYPICAL | 1.0m | 3.0m | 1.5m | 1.0m | 3.0m |
| PREFERRED | 1.5m | ≥4.0m | 1.5m | 1.0m | 3.0m |

5. Mid Block – Along Roadway

In some instances, the trail will need to travel along a road corridor. Therefore the trail will continue along roadways with appropriate edge zones and buffer areas.

Exhibit 9 - Mid Block along Roadway



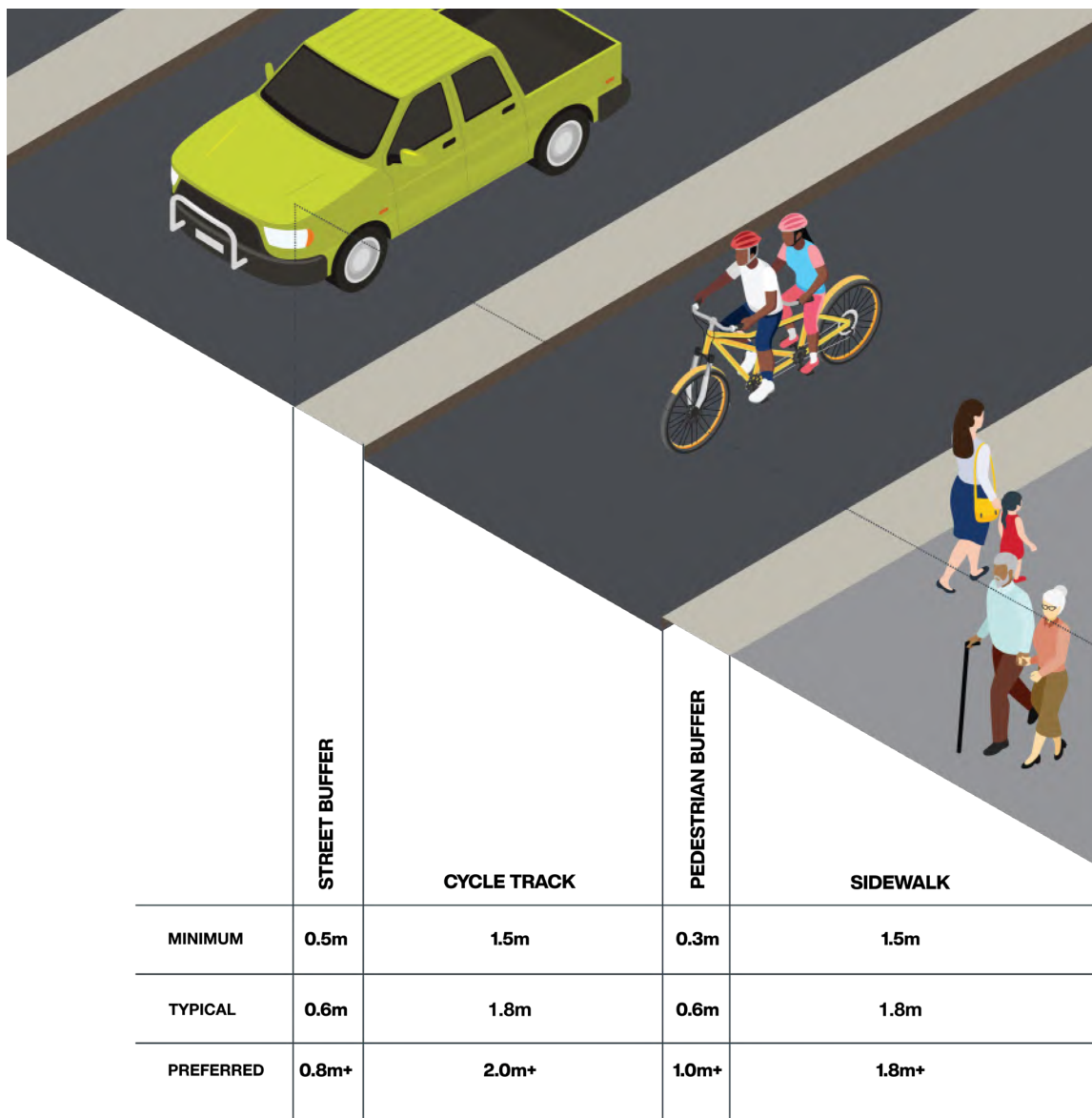
SIDEWALK
BOULEVARD
SHARED ROAD

| | SIDEWALK | BOULEVARD | SHARED ROAD | |
|-----------|----------|-----------|-------------|--|
| MINIMUM | 1.5m | 0.5m | 6.0m | |
| TYPICAL | 1.8m | 1.0m | 7.0m | |
| PREFERRED | 1.8m+ | 1.0m+ | 6.0m - 7.0m | |

6. Mid Block – Along Roadway (Cont.)

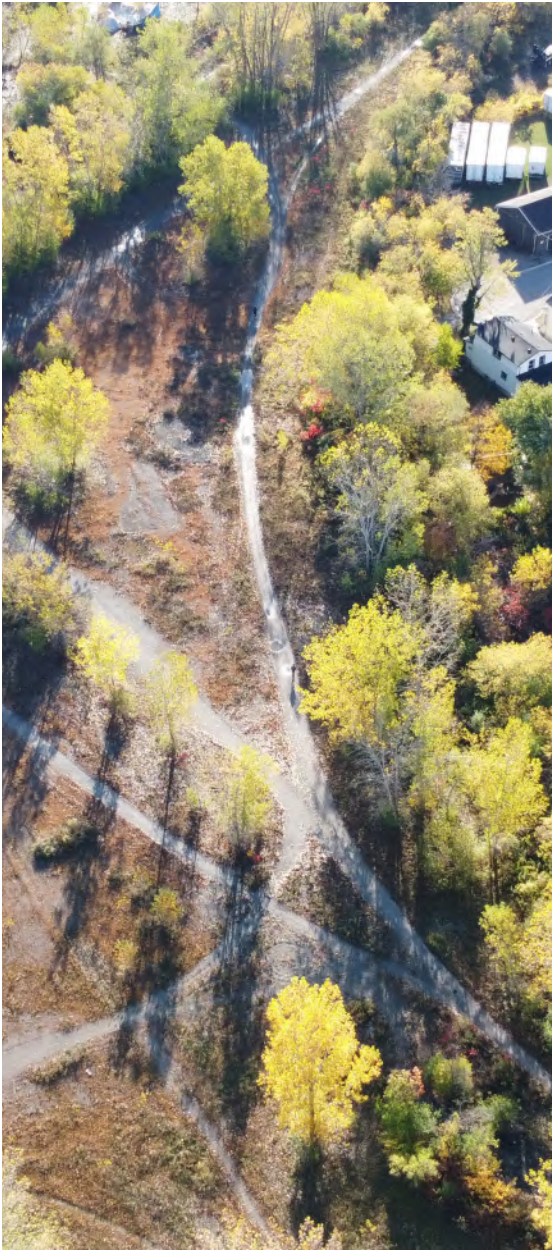
In some instances, alternate routes are required. Therefore the trail will continue along roadways where appropriate edge zones and buffer areas are necessary.

Exhibit 10a - Shared Roadway and Sidewalk



7. Mid Block – Along Roadway (Cont.)

Exhibit 10b - Cycle Track and Sidewalk



5.3.2 Trail Crossings

Wherever trails cross roads, there are several principles of good intersection design that apply:

- ⚙ **Ensuring Visibility:** The most critical element of promoting safe crossings is ensuring that trail users and crossing drivers or other road users can detect and perceive each other, with ample opportunity to avoid conflict. Depending on whether the trail crossing is a controlled or uncontrolled crossing will dictate the corresponding sight distance/sight triangle requirements.
- ⚙ **Communicating Priority:** It must be clear to both trail users and conflicting traffic who has the right of way. This can be established through a combination of traffic control devices (such as stop, yield, and traffic signals) as well as through subtler physical changes in the operating environment such as textured pavements, and/or raised crossings and crosswalks.
- ⚙ **Minimizing Barriers:** When asking trail users to negotiate crossings, it is important that they are focused on the task of negotiating the crossing, without introducing additional physical challenges for users. For this reason, the introduction of gates or bollards at trail crossing should generally be avoided, unless there is a noted concern with encroachment from motorized vehicles on the trail.

Each trail crossing at a roadway requires a detailed review and evaluation with respect to traffic control warrants, proximity to current crossings and design prior to implementation. However, it is anticipated that most road crossings along the NS&T Trail will generally fall into one of two categories. In all cases, the first preference for a trail crossing is providing a formal traffic control device that assigns priority to the trail user. Where that is not feasible, uncontrolled crossings may be considered where they incorporate mitigating safety devices such as refuge islands or raised crossings.



Minor Street Crossing

Minor streets crossings cross local or minor collector roadways with lower volumes and speeds. For trail crossings of two-lane roadways with low vehicular volumes and speeds, either a Type C or D pedestrian crossover (as prescribed by the Ontario Traffic Manual, OTM), or a raised trail crossing may be considered (assuming appropriate sightlines are available on the approach to the trail crossing). A site-specific warrant review should be completed for each site in keeping with OTM Book 15.

Major Street Crossing

A major roadway is one where vehicular movement is the primary function at speeds typically up to 60km/h. Accordingly, special facilities are desired for cyclists and trail users.

Signalized, at-grade crossings should be considered with combined crossrides as the default approach at a mid-block crossing. For crossings with higher volumes of trail users and/or at locations with higher speeds and volumes of vehicular traffic, separates crossrides may be considered.

A site-specific warrant review should be completed for each site in keeping with OTM Book 12 & 15. It is important the anticipated trail usage be factored into the warrant evaluation by considering usage patterns along similar trails in Niagara Falls.

5.3.3 Trail Signage

REGULATORY AND WARNING SIGNS

Regulatory signs should conform the standard layout and dimensions of the OTM requirements. Additional signage should maintain conformity in terms of scale appropriate to trail users.





INFORMATION AND WAYFINDING SIGNS

Interpretive signs, directional signs, distance markers, trailheads and other miscellaneous signs should be made clear and legible to be read at higher speeds, as necessary.

5.3.4 Accessibility

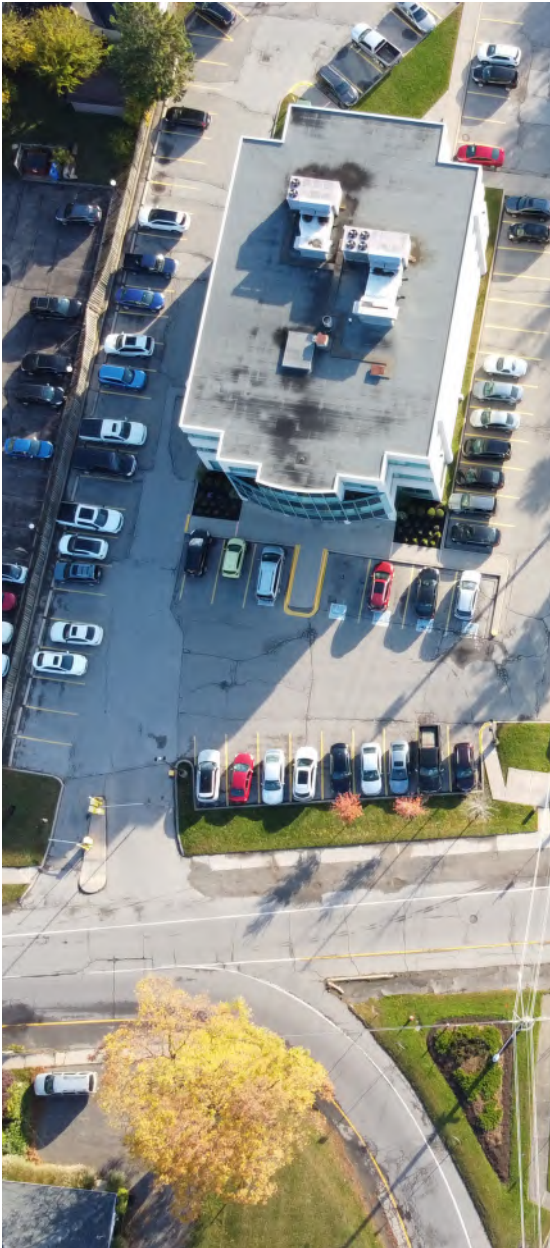
Providing a high level of accessibility will be critical to achieve the goals of the trail. Best practices should be applied, and accessibility considerations should be held in equal priority as other design considerations. Such accessible design measures include limiting cross-slopes to 2% maximum and running-slopes to 5% maximum. From an accessibility perspective, the preferred surface for the trail is asphalt.

Having accessible signage for trail users is also important. The minimum requirements for the trail should be defined by provincial standards and guidelines that represent best practices for safety and trail experience. It supports a safe and welcoming environment for those with sight loss and enhances the overall user experience for the trail.

Accessibility should not be limited to the trail facility itself, but to the complete facility, which includes site amenities and signage.

5.3.5 Safety

Having mindful consideration for trail user safety, including having regard for tenets of **Crime Prevention Through Environmental Design (CPTED)**: natural surveillance, access control, territorial reinforcement and space management will be important to implement during future design development of the trail.



5.3.6 Parking

As a destination trail, it can be expected that some users will arrive via personal vehicle. Therefore, provisions for parking must be considered, especially at key trail head locations.

Potential Parking Strategies:

1. **Public parks/Current Existing Trail Accesses**, eg. Millennium Trail Parking Lots
2. **Municipal/Regional Parking Lots and Facilities**, eg. Gale Centre Parking Lot, Future Go Station Parking Lots
3. **On-Street Parking**, eg. Parallel Parking Spots
4. **Potential Proposed Parking**, eg. In-Corridor parking west Side of Dorchester Road, In-Corridor Parking West Side of Kalar Road



5.4 Trail Amenities

SIGNAGE

Effective signage along the NS&T Trail will be important for welcoming trail users, communicating priorities, identifying Points of Interest (POI's), controlling traffic, and aiding wayfinding and branding.

The details of signage should be determined during future design phases, however there is a clear opportunity and public interest in developing clear and recognizable signage that incorporates the NS&T's history.

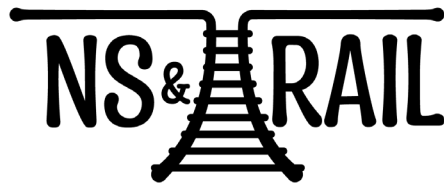
BRANDING

Interpretive signs, directional signs, distance markers, trail heads and other wayfinding signs should be made clear and legible to be read at higher speeds, as necessary.

Wayfinding can extend beyond signage and take the form of iconography, where branding can be incorporated into such things as site amenities and paving.

As noted in section 3.0, public engagement highlighted the importance of incorporating the historic significance of the trail into the branding. In particular, strategic and informative markers, plaques, and interpretive graphic display boards should be explored as part of the trail branding.

As part of the trail master planning, preliminary iconography has been developed. Two complementary logos were generated to provide a readily identifiable brand for the NS&T Trail with a subtle nod to the history of the rail line. The colours and form were selected to be highly visible and adaptive - able to be applied to a variety of signage and/or branding applications, including but not limited to: orientation and trailhead signage; trail identification and directional signage; interpretive and historic signage; and, general trail branding.





Regardless of the intended application, any proposed use of either icon should be developed in accordance with relevant regulatory/policy guides to ensure compatibility with standard formats, accessibility, and colour themes.

REST AREAS & SITE FURNISHINGS

As part of the complete trail facility, site amenities and furnishings should be included to support multi-activities, rest and accessibility. These should include such things as accessible benches and other forms of seating, spaced conveniently throughout (roughly 1 bench for ever 200m of trail), as well as waste and recycling receptacles. Consideration for dog walkers should also be considered by providing for dedicated dog was receptacles.

BARRIERS AND FENCING

Barriers and fencing are typically used along trails for safety, privacy, and access control. The exact location of which should be determined during the detailed design of the trail, and while these trail features are primarily functional, they provide an opportunity to be key features of design for the trail. Where possible, the trail should look to utilize more natural options such as planted buffers, however it will be up to the trail designers to provide the best possible option. For the NS&T, three types of barriers could be considered:

1. **Motor-Vehicle protection and Access Control** - While vehicular access to the corridor will generally be restricted, there may be instances where access is required for maintenance, servicing, or emergency vehicles, and so controlled access will be important. Where appropriate, controlled access should be facilitated using physical barriers such as bollards or swing gates ('P' Gates).





2. **Property delineation** – Physical barriers should be provided where appropriate to delineate physical boundaries between the trail and adjacent properties. While not all will require fencing, alternative markers could include unique planting or physical objects to denote transitions.
3. **Privacy** - Privacy in many parts of the suburban segments of the trail may require partitions for private homeowners, for example. Such considerations should be coordinated on a site-by-site basis.

TRAIL CONSTRUCTION

There are several factors that should influence the choice of materiality for the trail surface, including but not limited to context, accessibility, environmental impact, and cost and maintenance requirements. Material application for the trail is intended to balance accessibility, maintenance, and environmental sensitivity. The selection of paving material should be explored during detailed design phases, and might include:

- ⚙ **Asphalt** – Commonly used for multi-use trails for its balance of cost and accessibility. Asphalt paving provides a quality, economical option which is easy to maintain. Drawbacks include a relatively short life-span, impermeability and environmental impact.
- ⚙ **Granular** – A surface material which is highly economical and more environmentally friendly, granular surfacing such as limestone screenings can provide an effective surface for a variety of trail applications. This material does however pose several key limitations when compared to asphalt paving, including functionality (some activities, eg. rollerblading are hindered), maintenance requirements, susceptibility to weather, and accessibility. Where granular surfacing is an ideal choice for a multi-use path or trail is within areas requiring a more environmentally sensitive approach.



- ⚙️ **Concrete** – Concrete paving is the most durable paving material and is often selected for its longevity, ease of maintenance and quality of surface, however it is far and away the costliest option.
 - » The preferred multi-use trail or cyclist-only surfaces is asphalt. Other hard, durable surfaces that conforms to accessibility standards may be considered.
 - » For pedestrian-only surfaces along a right of way, such as a sidewalk, concrete is the preferred surface. Granular surface material may be considered in specific situations, as long as accessibility standards can be maintained.
 - » **Trail Width:** The optimal width of the multi-use trail will be 3.0m, with no maximum, to allow for pedestrian and non-motorized vehicular circulation in both directions, and users of all abilities. Where necessary, due to site constraints, pedestrian-only trail widths will be a minimum of 2.1m. Separate routes are advised for other modes of transport. Warning signage must be placed to indicate changes in width or usage.

⚙️ **Clearances**

» **Lateral Clearances**

Lateral clearance is preferred at 1.5m from the edge of the trail. Low vegetation (under 1.0m) may be allowed within the clearance but must otherwise remain unobstructed. The minimum clearance should be 0.6m, where site constraints require it. Warning signage or mitigations measures should be provided. Signage should be placed outside the preferred (or minimum) lateral clearance zone.



Clearances may widen at the approach to rest stops to allow for leg room and movement within the rest stop areas without encroaching on the trail.

Lateral clearances over 1.5m are not recommended, except for establishing sight lines at sharp turns.

» **Vertical Clearances**

VEGETATION

Vegetation within the lateral clearance should not exceed 1.0m in height. Where the lateral clearance has been reduced due to existing plant material, trees will be pruned up to 3.0m from the finished grade to maintain visibility. Shrubs and perennials of heights greater than 1.0m will need to be removed and replaced with appropriate plant material, less than 1.0m in height.

SIGNAGE

The bottom edge of the sign panel should be no lower than 1.8m from the finished grade



PLANTING ALONG THE TRAIL

The NS&T rail corridor displays a diverse variety of vegetation conditions. Within the more urban areas and particularly the residential neighbourhoods, the corridor features sod with large specimen trees on either side. In more naturalized locations, the corridor typically includes the gravel railbed with unmaintained grass cover, and larger shrubs and trees growing in on either side. However, there are exceptions to this where the corridor expands to larger open spaces or recedes within denser vegetation.

Given the nature of the corridor, it can be expected that construction of the trail will require minimal intrusion into the planted buffers on either side. Existing landscape that does not need to be removed for construction should be evaluated on a property-by-property basis to determine potential impact and implications. As part of design development, it may be prudent to consult a certified arborist for formal vegetation assessments and to help inform the design phases.

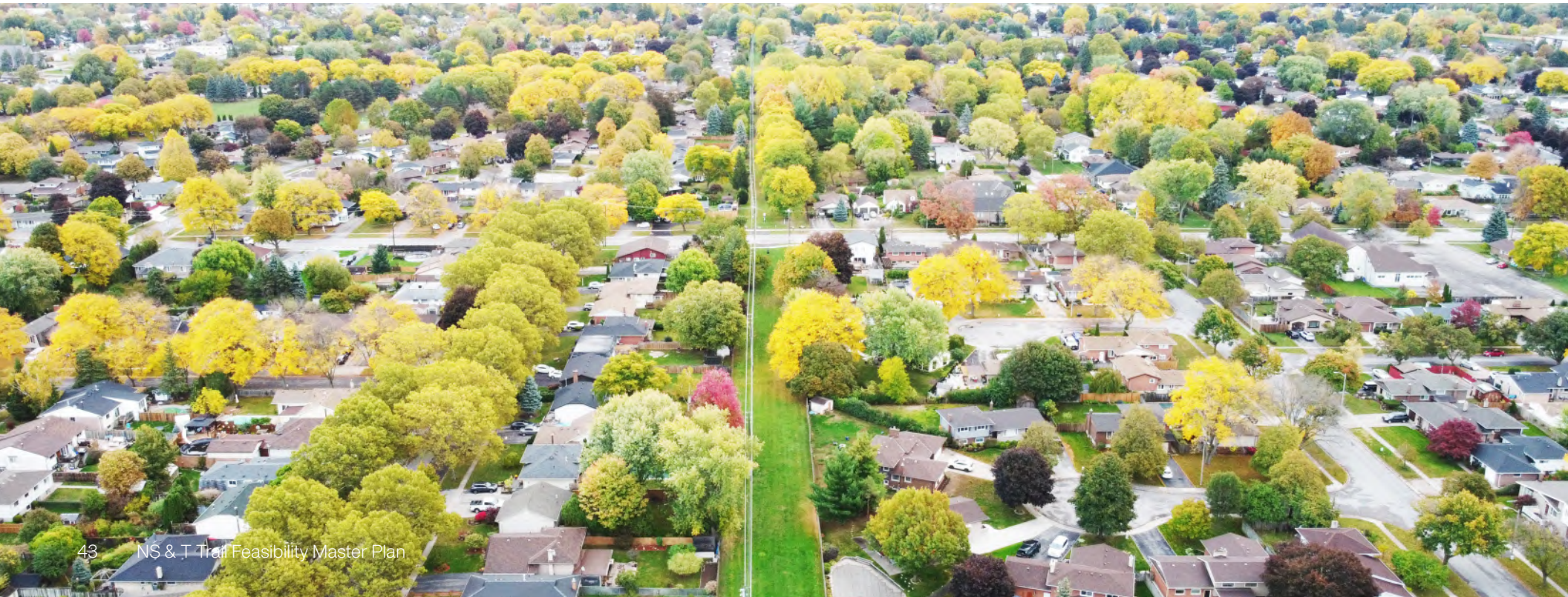
Where tree removals and clearing are required, the trail buffers should be replanted in a strategic manner to respond to local and regional conditions – considering such things as wildlife habitat, species assemblages (and saturation), and microclimate. Planting along the trail will should be kept simple and with emphasis on low maintenance and native selections.




Trail planting strategies should be mindful of safety and accessibility of trail users and should have regard for Crime Prevention Through Environmental Design (CPTED) principles. For example, providing large shrubs and tall grasses as visual screens and environmental buffers between the trail and abutting residences should be used sparingly. The trail shall be opened to improve public visibility and provide added comfort. Accordingly, shrubs should typically be planted 1.5-2m or more from the trail edge, and trees 4.5-5m or more from the trail, where possible and depending on species.

VEGETATIVE BUFFERS

A planting design strategy should be developed during design development. Preference should be given to native trees that are suitable to the site conditions. Consideration should also be given to the contextual appropriateness and sensitivity of use with regards to natural buffer planting as visual and acoustic screening. Plantings of varying heights that provide seasonal colour and interest and are regionally appropriate are desirable and are provided in page 44.

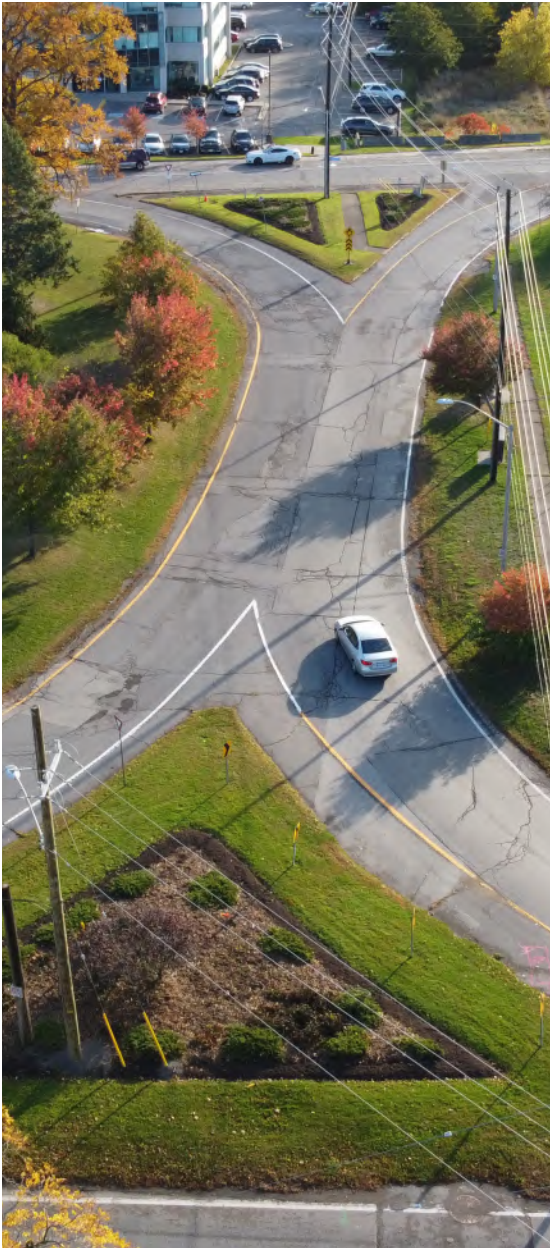
It would be advisable to consult with local forestry and regional conservation authorities in developing ideal planting strategies along the corridor.



| URBAN | RURAL |
|---|--|
|  <p>TREES</p> <ul style="list-style-type: none"> ⚙ Street Trees, Specimen Trees, Salt and Pollution Tolerant <ul style="list-style-type: none"> » <i>Tilia americana</i>, Basswood » <i>Acer rubrum</i>, Red Maple » <i>Quercus macrocarpa</i>, Burr Oak » <i>Syringa reticulata</i> ‘Ivory Silk’, Ivory Silk Lilac » <i>Amelanchier canadensis</i>, Serviceberry » <i>Gymnocladus dioicus</i>, Kentucky Coffeetree | <ul style="list-style-type: none"> ⚙ Native Naturalized Species, Habitat Producing <ul style="list-style-type: none"> » <i>Prunus pensylvanica</i>, Pin Cherry » <i>Populus tremuloides</i>, Trembling Aspen » <i>Picea glauca</i>, White Spruce » <i>Cercis Canadensis</i>, Eastern Redbud |
|  <p>SHRUBS</p> <ul style="list-style-type: none"> ⚙ Screening/Shielding, Low-Maintenance and Drought-Tolerant. <ul style="list-style-type: none"> » <i>Cornus alternifolia</i>, Pagoda Dogwood » <i>Thuja occidentalis</i>, White Cedar » <i>Taxus canadensis</i>, Canadian Yew | <ul style="list-style-type: none"> ⚙ Native Naturalized Species, Habitat Producing <ul style="list-style-type: none"> » <i>Cornus alternifolia</i>, Pagoda Dogwood » <i>Cornus sericea</i>, Red-Twig Dogwood » <i>Rhus Typhina</i>, Staghorn Sumac » <i>Sambucus Canadensis</i>, Common Elderberry » <i>Hamamelis virginiana</i>, Witch - Hazel |
|  <p>GRASS</p> <ul style="list-style-type: none"> ⚙ Urban Fauna, Pollinator Species <ul style="list-style-type: none"> » <i>Rudbeckia hirta</i>, Black-Eyed Susan » <i>Andropogon gerardii</i>, Big Bluestem » <i>Symphyotrichum ericoides</i>, White Heath Aster » <i>Panicum virgatum</i>, Switchgrass | <ul style="list-style-type: none"> ⚙ Seedmixes <ul style="list-style-type: none"> » Rural Ontario Roadside Seedmix » Native Prairie Seedmix » Pollinator Meadow Seedmix |



IMPLEMENTATION



6 IMPLEMENTATION

6.1 Recommended Route

While the historic NS&T railway corridor alignment is the preferred and ultimate condition for the trail, in some locations the routing may need to deviate from this base alignment to avoid major conflicts, be more readily implementable, and/or reduce costs. Given these considerations, the recommended route deviates from the ultimate condition in the following sections:

- ⚙ Montrose Road > Thorold Stone Road > Dorchester Road > Meadowvale Drive.
- ⚙ Drummond Road > Thorold Stone Road > Thorold Stone Road Extension (Future, Planned)
- ⚙ Victoria Ave @ Bridge Street > Bridge Street. (**Note:** Park Street should be considered as a further alternative if Bridge Street is determined as not favourable).

While the full implementation of the length of the trail is preferred, the identified phasing strategy has regard for:

- ⚙ Realistic expectations for the feasibility of some of the major physical constraints;
- ⚙ The potential time required to acquire the appropriate capital funding;
- ⚙ The amount of coordination on projects and policy items that overlap and/or are adjacent; and,
- ⚙ The prioritization of the various portions of the recommended trail route according to the existing conditions and required input.



After the Master Plan is adopted and enters the implementation phases, the City of Niagara Falls should likely begin further environmental review and closer construction assessments in accordance with the identified phases and trail segments.

6.2 Implementation Phasing

This master plan provides for a phased approach to the implementation of the NS&T Trail, which has been developed having consideration for context, coordination, resources, and capital investment; availability and source of funding will ultimately influence the establishment of implementation priorities

While the majority of the trail will require full construction, small portions are either partially complete (such as the existing multi-use pathway on the south side of Thorold Stone Road between Stanley Ave and the Gale Centre) or are planned within other active studies (such as the Regional Thorold Stone Road extension to Bridge Street, or the Regional GO station Secondary Plan), and require only coordination and continuity considerations such as wayfinding, branding, and site amenity consistency.

Determination of the requirement for individual Environmental Assessments should be sought at the implementation stages of each section.

With this in mind, this document section provides a breakdown of the recommended trail in terms of the existing infrastructure, and levels of effort, resources and high-level costs required to establish each indicated portion of the trail as a part of the extended Trail System.

As noted in Chapter 2.3, project segments have been grouped into three phases for implementation:

1. **Short Term:** 1 – 3 years
2. **Medium Term:** 4 – 7 years
3. **Long Term:** 8+ years

Of course, while the projected implementation phases occur over the next eight to ten years, opportunities to accelerate implementation and provide a fully connected trail prior to these dates should be explored as opportunities arise.

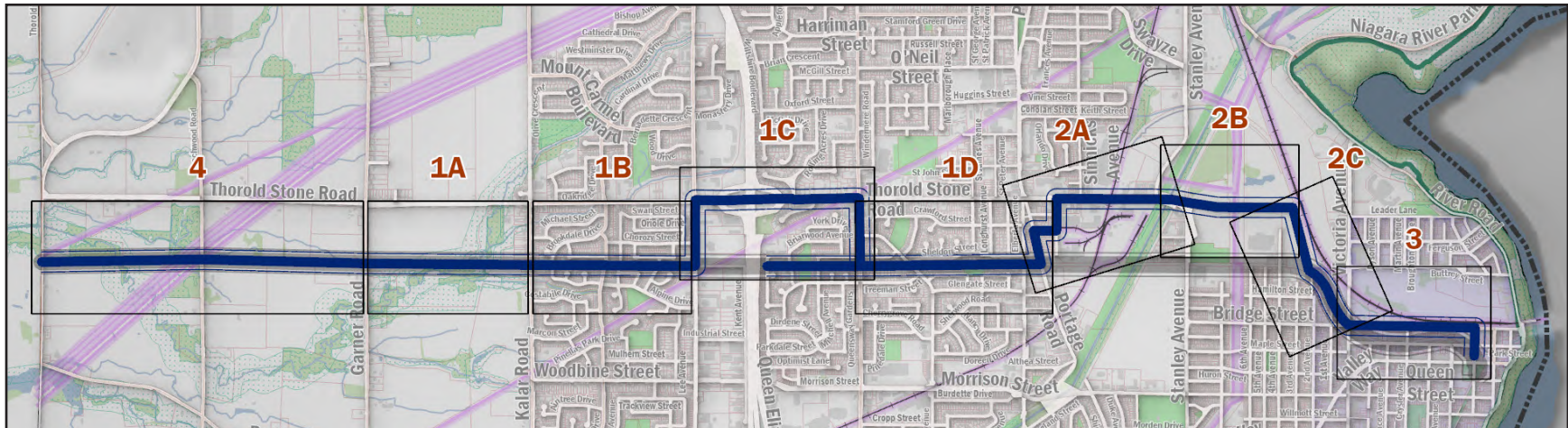


Exhibit 11 - Overview Trail Segmented Map

6.3 Project Sheets



SEGMENT 1A: GARNER ROAD TO KALAR ROAD

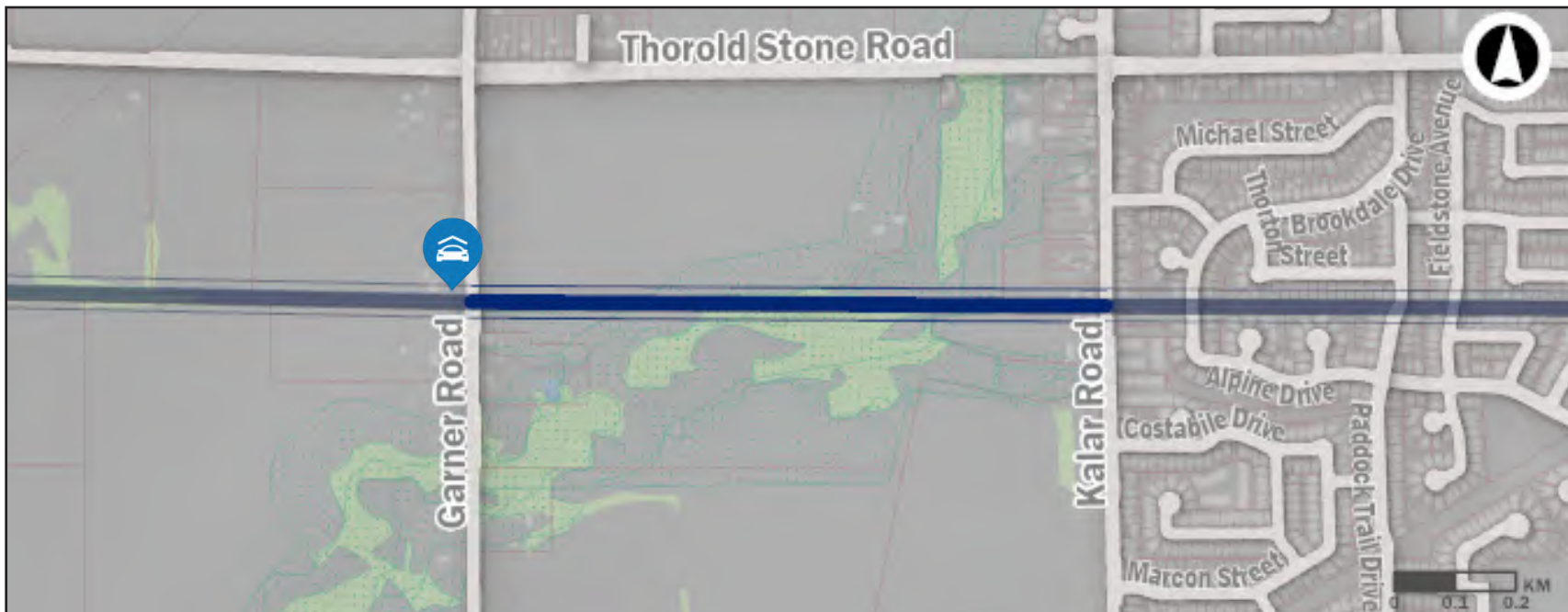
Overview

Corridor Limits: Garner Road to Kalar Road

Length: 1.05 KM

Segment Description: Perhaps the most naturalized segment of the entire corridor, this segment is entirely within rural agricultural lands, which happen to feature a significant wooded area which encompasses the corridor. While the historic railbed remains identifiable, much of this segment of corridor is overgrown with naturalized vegetation.

-  Potential Parking Location
-  Trailheads



A minor watercourse (Shiner's Creek) bisects the trail and holds ecologic interest for the local conservation authority (NPCA), and should be considered in the potential development of the trail. Nearing the eastern limit of this segment at Kalar Road, the beginnings of suburban development begin to appear.

Points of Interest: Shriner's Creek

Design Considerations

Trail Classification: Standard Mid-block

Trail Surface Type: Limestone Screening (Granular)

Topography: Generally flat

Trail Design Notes:

This will be the western terminus of Phase 1 trail works, meaning the trail will begin/end at Garner Road. Trailhead markers and vehicular barriers should be implemented at this location. Given the rural and natural context for this trail segment, it may be appropriate to provide a more sensitive trail surface, such as limestone or other granular screening. At minimum, consultation with the NPCA should be performed during the design development of this segment to address the Shriner's Creek area appropriately. This segment should transition into Segment 1B at Kalar Road via a controlled pedestrian crossing.

Midblock Road Crossings:

- ⚙ **Kalar Road:** Some form of controlled pedestrian crossover (likely Level 2 Type B or C) is anticipated at this location (subject to site review and warranting). Crossing will also support access to nearby transit stop (east side). Distance to nearest controlled crossing is >200m, so no concerns with proximity to nearby traffic control devices.

Trailheads, Parking & Amenities:

- ⚙ Potential trailhead at Garner Road.
- ⚙ Temporary parking along shoulders along Garner Road (except immediately adjacent trail crossing). Explore opportunity to acquire land for small off-road parking lot.
- ⚙ Segment trail surface material might preclude regular maintenance, so potentially avoid bench seating and waste storage.

Implementation

Proposed Phasing: Phase 1 (**Short term:** 1 – 3 years)

Permitting & Key Stakeholders:

- ⚙ **Municipal:** Garner Road and Kalar Road are considered local roads.
- ⚙ **Regional:** The Kalar Pump Station directly east of Kalar Road is a Regional facility. Any potential road crossing should be coordinated with the appropriate Regional sectors.
- ⚙ **Niagara Peninsula Conservation Authority:** The low-lying Shriner's creek and surrounding area are of interest to the NPCA and work within this area may require a permit; at minimum consultation should be sought.
- ⚙ **Utilities/Engineering (various):** Coordination with the existing overhead utilities will likely be required at Kalar Road.

Property Ownership: Trail routing expected to run on municipal property (no property acquisition anticipated)

SEGMENT 1B: KALAR ROAD TO MONTROSE ROAD

Overview

Corridor Limits: Kalar Road to Montrose Road

Length: 1.05 KM

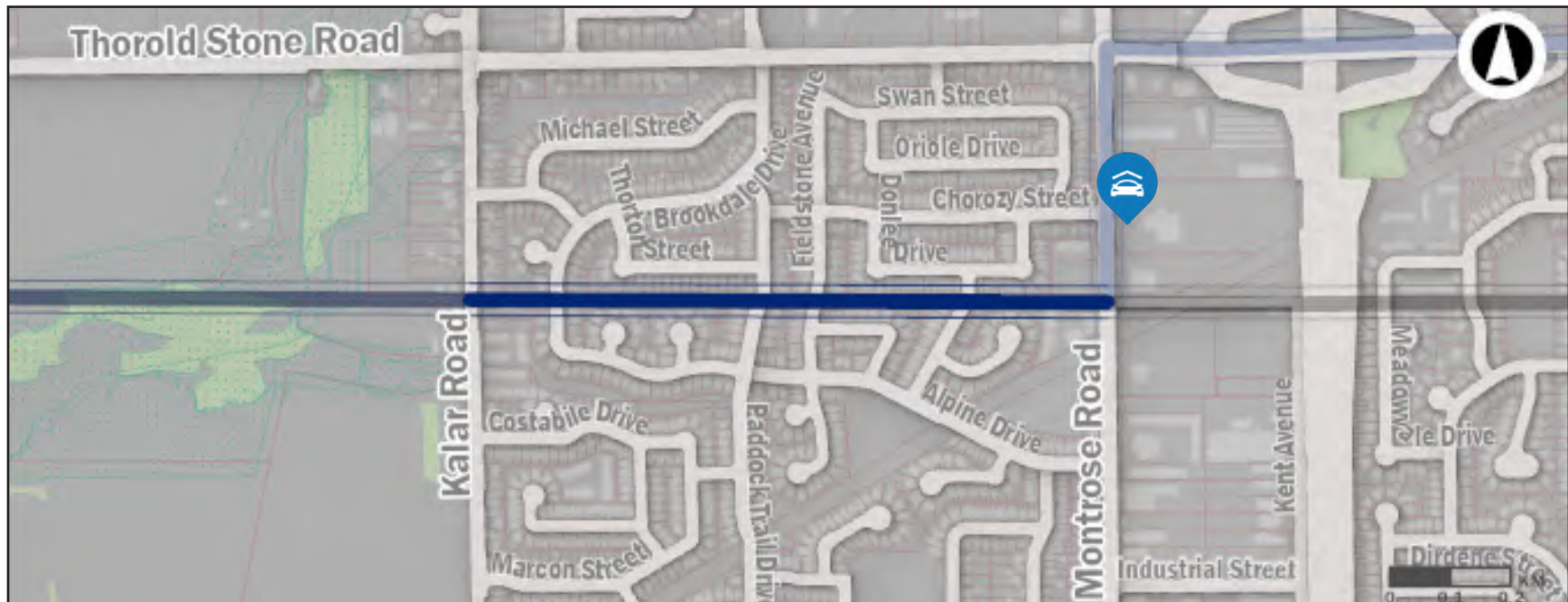
Segment Description: This segment of the corridor is a stark contrast from segment 1A in terms of context; the rural conditions west of Kalar Road transition into suburban residential subdivisions for this roughly 1km stretch. The segment is relatively flat with only sparse trees flanking open space on either side of the corridor right-of-way. An initial coordination item will be with the existing Kalar Road Pump Station – a Regional Facility – which currently uses the corridor for its vehicular driveway.



Potential Parking Location



Trailheads



In addition, four local roads bisect the corridor between the full segment length (Alpine Drive, Paddock Trail Drive, Fieldstone Ave, Kevin Drive), requiring crossing considerations. Overhead utilities run most of the segment distance, and may require coordination for trail alignment, proper clearances, and maintenance. Given the more urban context, this segment of trail should consider a more durable surface of asphalt paving.

Points of Interest: Kalar Road Regional Pump Station

Design Considerations

Trail Classification: Standard Mid-block

Trail Surface Type: Asphalt (preferred type), Granular (acceptable as an interim type to reduce costs)

Topography: Generally flat

Trail Design Notes:

Due to the number of road crossings this segment of trail may feel segmented. A suitable transition, including signage, should be positioned at Kalar Road to address the change in facility conditions from the more rural nature of Phase 1A. Given the surface material, maintenance of the trail will be more manageable, and so trail amenities including accessible seating and waste receptacles should be considered at roughly 200m intervals. Adequate vehicular barriers at crossings and signage should be implemented.

Midblock Road Crossings:

Some form of controlled pedestrian crossover is anticipated (subject to site review and warranting) at:

- ⚙ **Alpine Drive, Paddock Trail Drive, Fieldstone Ave & Kevin Drive:** Each residential road crossing will need to be reviewed against warrants. However, it is likely that these crossing will be lower order PXOs (i.e. Level 2 Type D or C) or uncontrolled crossings (i.e. raised median refuge or raised crossings).
- ⚙ **Montrose Road & Dumont Street:** Assuming a future west side multi-use path along Montrose, a trail crossing near Dumont Street will be needed. Given traffic volumes along Montrose, it is anticipated that a higher order PXO (i.e. Level 2 Type B) or signal are most appropriate (subject to site review and warranting). Given the proximity to the Chorozy Street intersection (~150m), it may be preferred to bring the trail crossing to that location.

Trailheads, Parking & Amenities:

- ⚙ Explore potential shared parking agreement at Montrose Road/Dumont Street private lots.
- ⚙ Accessible bench seating and waste receptacles every 200m. Consider separate receptacles for dog waste.

Implementation

Proposed Phasing: Phase 1 (**Short term:** 1 – 3 years)

Permitting & Key Stakeholders:

- ⚙ **Municipal:** All road interfaces are with local roads.
- ⚙ **Regional:** The Kalar Pump Station directly east of Kalar Road is a Regional facility. Any potential road crossing should be coordinated with the appropriate Regional sectors. Montrose Road is considered a Regional Road.
- ⚙ **Utilities/Engineering (various):** Coordination with the existing overhead utilities will likely be required.

Property Ownership: Trail routing expected to run on municipal property (no property acquisition anticipated)

SEGMENT 1C: QEW CROSSING

Overview

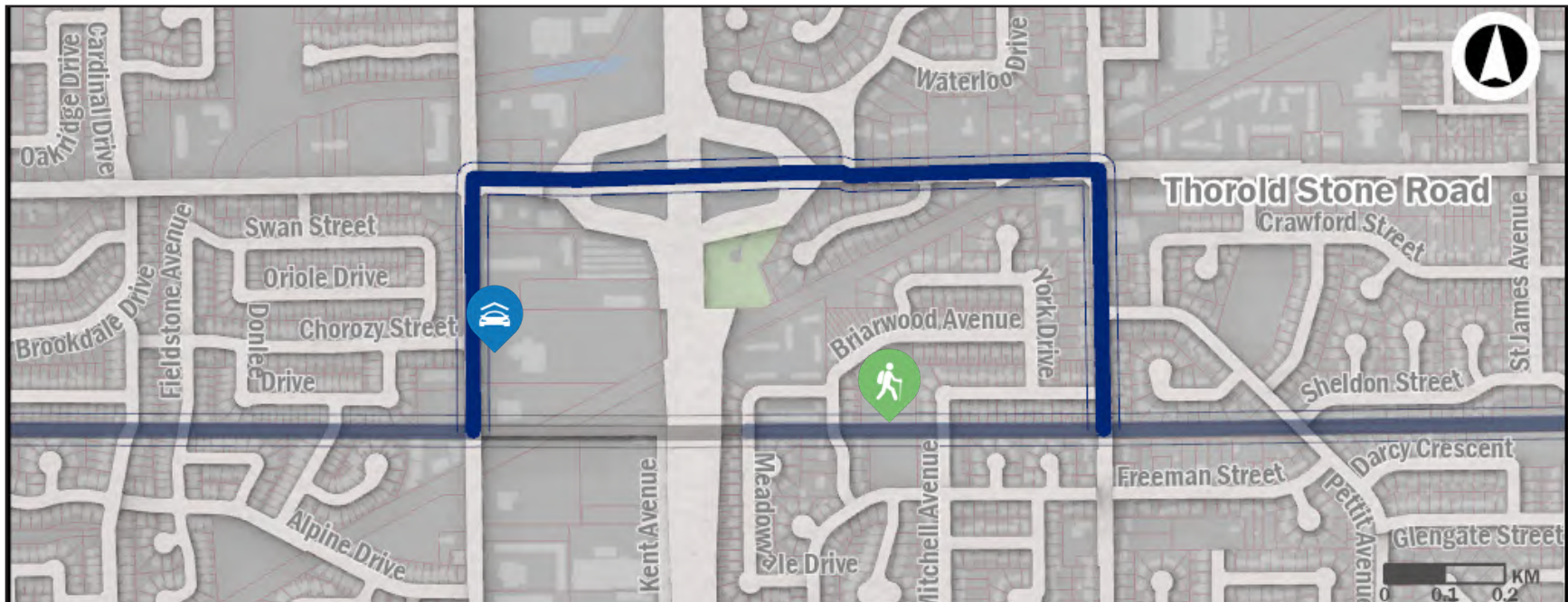
Corridor Limits: Montrose Road to Dorchester Road

Length: 2.5 KM

Segment Description: This segment of trail passes through urban limits through the Queensway Garden neighbourhood. The most notable feature through this segment of the trail is the presence of the QEW. The freeway acts a major barrier to active transportation through the area. Although carrying the trail along the rail routing and providing an overpass or underpass of the QEW is the preferred ultimate trail routing, there are many barriers to implementation.

 Potential Parking Location

 Trailheads



As a result, the recommended alignment for the interim is to detour up Montrose and Dorchester to make use of the existing Thorold Stone Road (TSR) interchange crossing. This requires providing multi-use path facilities along Montrose Road, Thorold Stone Road and Dorchester Road. Extending the trail west from Dorchester Road to Meadowvale Drive is an easy way to include more of the community and provide the connection to and from Meadowvale Park.

Points of Interest:

- ⚙️ QEW
- ⚙️ Meadowvale Park

Design Considerations

Trail Classification: Mid-block – Along Roadway

Trail Surface Type: Asphalt

Topography: Generally flat

Trail Design Notes:

- ⚙️ **Montrose Road:** East side multi-use path preferred along Montrose Road to address existing sidewalk gap between Dumont & Chorozy and to avoid major hydro poles on west side. There are noted property challenges from commercial properties north of Chorozy which may require lane narrowing in addition to boulevard reconstruction to provide a multi-use path
- ⚙️ **Thorold Stone Road:** South side multi-use path preferred to avoid double crossing of TSR at Montrose & Dorchester by replacing the existing sidewalk with a multi-use path. Careful review of design options across the QEW bridge will require coordination with MTO.
- ⚙️ **Dorchester Road:** Multi-use path may not be preferred given land use context (numerous driveways along frontage on both sides); Consider an alternative cross-section with cycle track and sidewalk between TSR and Segment 1D along Dorchester Road
- ⚙️ **Meadowvale Drive:** extension should be treated as a typical mid-block connection, and due to a number of road crossings, should include the appropriate signage and vehicular barriers. Given the existing conditions, neighbourhood context, and presence of the park, the construction and maintenance of this segment should be standard.

Through this segment, the multi-use path will pass through several signalized intersections requiring appropriate upgrades including modified curb ramps, crossrides and appropriate signage/pavement markings:

- ⚙ Montrose Road & Chorozy Street
- ⚙ Montrose Road & Thorold Stone Road
- ⚙ Thorold Stone Road & West QEW Ramps
- ⚙ Thorold Stone Road & East QEW Ramps
- ⚙ Thorold Stone Road & Dorchester Road

Midblock Road Crossings:

- ⚙ **Montrose Road & Dumont Street:** Assuming a future west side multi-use path along Montrose, a trail crossing near Dumont Street will be needed. Given traffic volumes along Montrose, it is anticipated that a higher order PXO (i.e. PXO Level II Type B) or signal are most appropriate (subject to site review and warranting). Given the proximity to the Chorozy Street intersection (~150m), it may be preferred to bring the trail crossing to that location.
- ⚙ **Dorchester Road & Trail Alignment:** Some form of pedestrian crossover is anticipated to provide a crossing at this location (subject to site review and warranting). Proximity to Freeman Street signalized crossing (~100m) likely precludes a signalized crossing.
- ⚙ **Briarwood Ave, Mitchell Ave:** Each residential road crossing will need to be reviewed against warrants. However it is likely that these crossings will be lower order PXOs (i.e. Level 2 Type D or C) or uncontrolled crossings (i.e. raised median refuge or raised crossings).

Trailheads, Parking & Amenities:

- ⚙ The urbanized nature of this trail segment and the freeway crossing likely prohibit opportunities to provide a trailhead or parking area other than considering a trailhead along Montrose Road near Segment 1B
- ⚙ Wayfinding signage will be critical along this segment to guide users through the on-road connection to tie back to the trail alignment along the rail corridor

Implementation

Proposed Phasing: Phase 1 (**Medium Term:** 4 – 7 years)

Permitting & Key Stakeholders:

- ⚙ **Niagara Region:** Close coordination with Niagara Region will be required as both Montrose Road & Thorold Stone Road are regional corridors.
- ⚙ **Ministry of Transportation of Ontario:** Close coordination with MTO will be required for all works near the Thorold Stone Road interchange

Property Ownership:

Trail routing expected to run on public right-of-way (no property acquisition anticipated)

SEGMENT 1D: STAMFORD CENTRE CONNECTOR

Overview

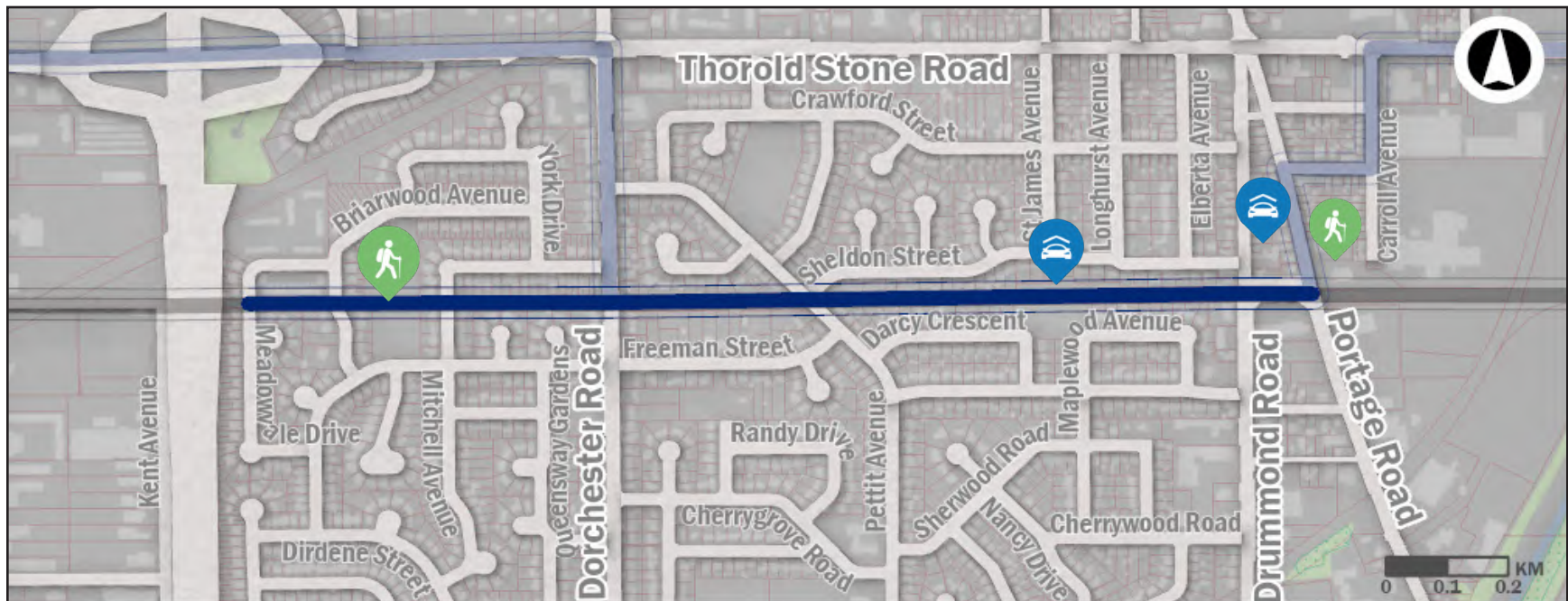
Corridor Limits: Dorchester Road to Drummond Road

Length: 1.05 KM

Segment Description: This segment of trail passes through urban residential subdivisions through the Stamford Centre neighbourhood. A relatively simplistic segment compared to others within the corridor, this segment is relatively flat and gives the impression of being within the 'backyards' of the many neighbouring residences. The segment currently features an open lawn with heavily treed edges as well as private fencing along either side. In its current state, the segment is primarily used for overhead utilities which run the full length of the proposed trail alignment.

 Potential Parking Location

 Trailheads



Points of Interest:

- ⚙ Lind Sommerville Park

Design Considerations

Trail Classification: Mid-block – Along Roadway

Trail Surface Type: Asphalt (preferred type), Granular (acceptable as an interim type to reduce costs)

Topography: Generally flat

Trail Design Notes:

Through this segment, the multi-use path will start and end with signalized intersections requiring appropriate upgrades including modified curb ramps, cross-rides and appropriate signage/pavement markings. Simpler pedestrian crossings could be considered for the interaction with Pettit Street

Midblock Road Crossings:

- ⚙ **Dorchester Road & Trail Alignment:** Some form of pedestrian crossover is anticipated to provide a crossing at this location (subject to site review and warranting). Proximity to Freeman Street signalized crossing (~100m) likely precludes a signalized crossing.
- ⚙ **Pettit Ave:** Some form of pedestrian crossover is anticipated to provide a crossing at this location (subject to site review and warranting). Due to the roadway geometry, it is envisioned that the trail will need to be modified on the approach to Pettit to create a more perpendicular crossing.
- ⚙ **Drummond Road (Inclusive of Gallinger Street and Portage Road):** This crossing requires further study. Opportunities to revise the design of the Gallinger/Drummond and Gallinger/Portage intersections to eliminate the free-flow right turn channels should be investigated alongside trail crossing improvements. A review of the future (currently under construction) roadworks should be conducted to determine feasibility and configuration.

Trailheads, Parking & Amenities:

- ⚙ Potential trailhead at both east and west segment terminus.
- ⚙ Consider reconfiguration of Lind Sommerville Park to include small off street parking lot.

- ⚙ Consider shared parking agreement with commercial properties at Drummond/Portage/Gallinger Street.
- ⚙ Accessible bench seating and waste receptacles every 200m. Consider separate receptacles for dog waste.
- ⚙ Enhanced seating area at Lind Sommerville Park.

Implementation

Proposed Phasing: Phase 1 (**Short term:** 1 – 3 years)

Permitting & Key Stakeholders:

- ⚙ **Municipal:** Drummond Road is considered a local road.
- ⚙ **Utilities (various):** Coordination with the existing overhead utilities will likely be required. Potential relocation of hydro poles to accommodate trail alignment.

Property Ownership: Trail routing expected to run on municipal property (no property acquisition anticipated)



SEGMENT 2A: PORTAGE CONNECTOR

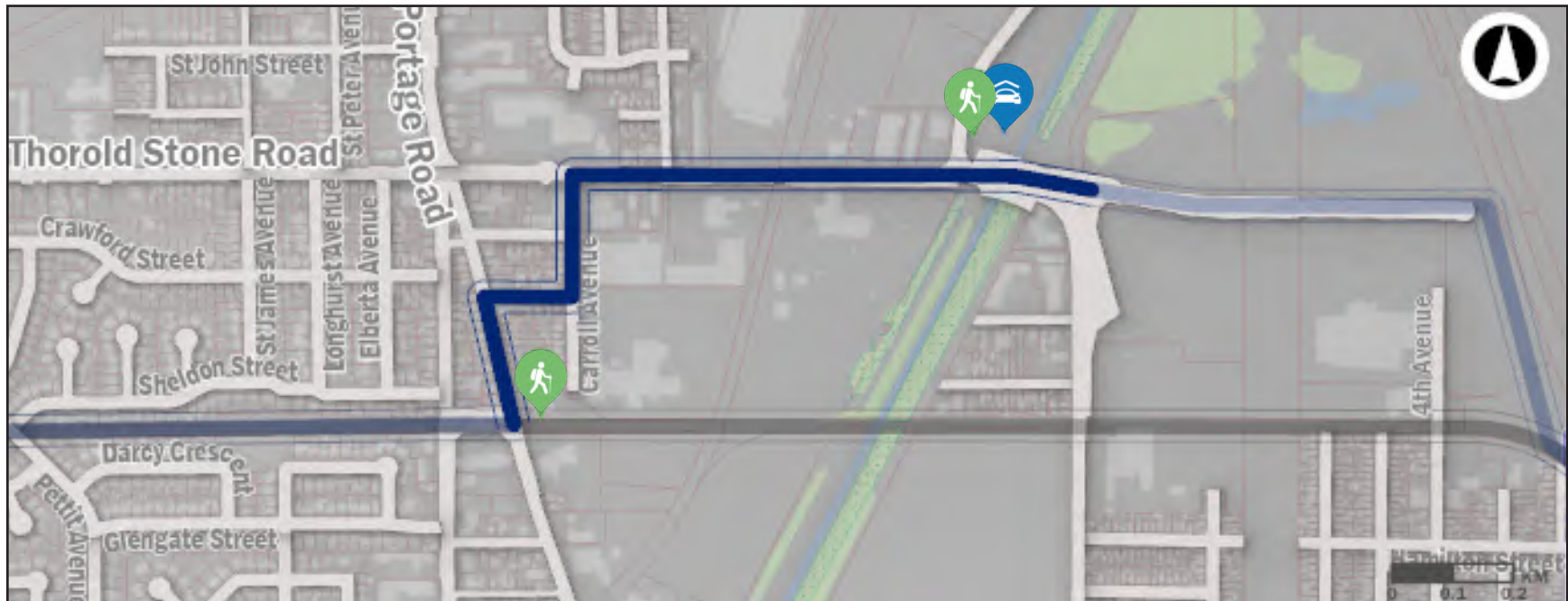
Overview

Corridor Limits: Portage Road to Stanley Avenue (west side)

Length: 1.25km

Segment Description: This segment of the proposed trail routing follows several existing road corridors: Portage Road (Segment 1D to Virginia), Virginia Street (Portage to Carroll), Carroll Avenue (Virginia to Thorold Stone) and Thorold Stone Road (Carroll to Stanley). Facility types for the trail will vary depending on the roadway characteristics, including shared roadways, multi-use path and cycle tracks.

-  Potential Parking Location
-  Trailheads



Points of Interest:

- ⚙ Millenium Recreational Trail trailhead and parking area (Stanley & Thorold Stone Road)

Design Considerations

Trail Classification: Mid-block – Along Roadway (Portage, Thorold Stone); Shared Roadway (Virginia, Carroll)

Trail Surface Type: Asphalt

Topography: Generally flat

Trail Design Notes:

Along Portage Road, the preferred ultimate configuration is multi-use path on the east side. As an interim improvement, improved paved shoulders may be considered given the rural cross-section of the corridor.

Along Virginia Street & Carroll Avenue, a shared use cycling facility is likely appropriate given low speeds and volumes along these roadway segments. Directional sharrows and signage should be used to guide trail users through these residential connectors.

Along Thorold Stone Road, a multi-use path on the south side should replace or supplement the existing sidewalk, to maximize connectivity with the Millenium Recreational Trail and NS&T Segment 2B. Tree impacts are likely along this segment.

Through this segment, the multi-use path will pass through several signalized intersections requiring appropriate upgrades including modified curb ramps, crossrides and appropriate signage/pavement markings:

- ⚙ Thorold Stone Road & Stanley Avenue (west) – crossrides and upgrades on the south side
- ⚙ Thorold Stone Road & Stanley Avenue (east) – crossrides and upgrades on the south side

Midblock Road Crossings:

Portage Road & Gallinger Street: Some form of pedestrian crossover or signalized midblock pedestrian signal is anticipated to provide a crossing at this location (subject to site review and warranting).

Trailheads, Parking & Amenities:

- ⚙ Existing Millenium Trail trailhead & parking area can serve the NS&T route as well

- ⚙ Potential trailhead /small parking area on the east side of Portage (between 4238 & 4256 Portage)
- ⚙ Wayfinding critical through pavement markings & signage to guide trail users through the on-road connections

Implementation

Proposed Phasing: Phase 2 (**Medium term:** 4 – 7 years)

Permitting & Key Stakeholders:

Niagara Region: Close coordination with Niagara Region will be required as Thorold Stone Road is a regional corridor.

Millennium Trail: Coordination with trail committee regarding trailhead and wayfinding integration

Utilities (various): Hydro poles along the south side of Thorold Stone Road may be impacted by the multi-use path.

Property Ownership: Trail routing expected to run along municipal/regional rights-of-way (no property acquisition anticipated)

SEGMENT 2B: THOROLD STONE ROAD



Overview

The identified Phase 2B trail section has already been physically constructed. The asphalt multipurpose trail was constructed during the initial phase of the Phase 1 Thorold Stone Road Extension, temporarily ending north of the Gale centre parking lot.

Corridor Limits: Portage Road to Stanley Avenue (west side)

Length: 480m

Segment Description: This segment of trail is located within the existing Thorold Stone Road right-of-way and uses the existing multi-use path along the south side of the corridor.

-  Potential Parking Location
-  Trailheads



Points of Interest:

- ⚙ Palmer Park
- ⚙ Gale Centre Arena

Design Considerations

Trail Classification: Mid-block – Along Roadway

Trail Surface Type: Asphalt (existing)

Topography: Generally flat

Trail Design Notes: Through this segment, the multi-use path is existing along the south side of the corridor. Only signage, pavement marking and intersection improvements are required.

Midblock Road Crossings: N/A

Trailheads, Parking & Amenities:

- ⚙ Potential trailhead at both east segment terminus, to be considered with the design of the Thorold Stone Road extension.

Implementation

Proposed Phasing: Phase 2 (**Medium term:** 4 – 7 years)

Permitting & Key Stakeholders:

- ⚙ **Niagara Region:** Close coordination with Niagara Region will be required as Thorold Stone Road is a regional corridor.

Property Ownership: Trail routing expected to run on municipal property (no property acquisition anticipated)



SEGMENT 2C: THOROLD STONE ROAD EXTENSION

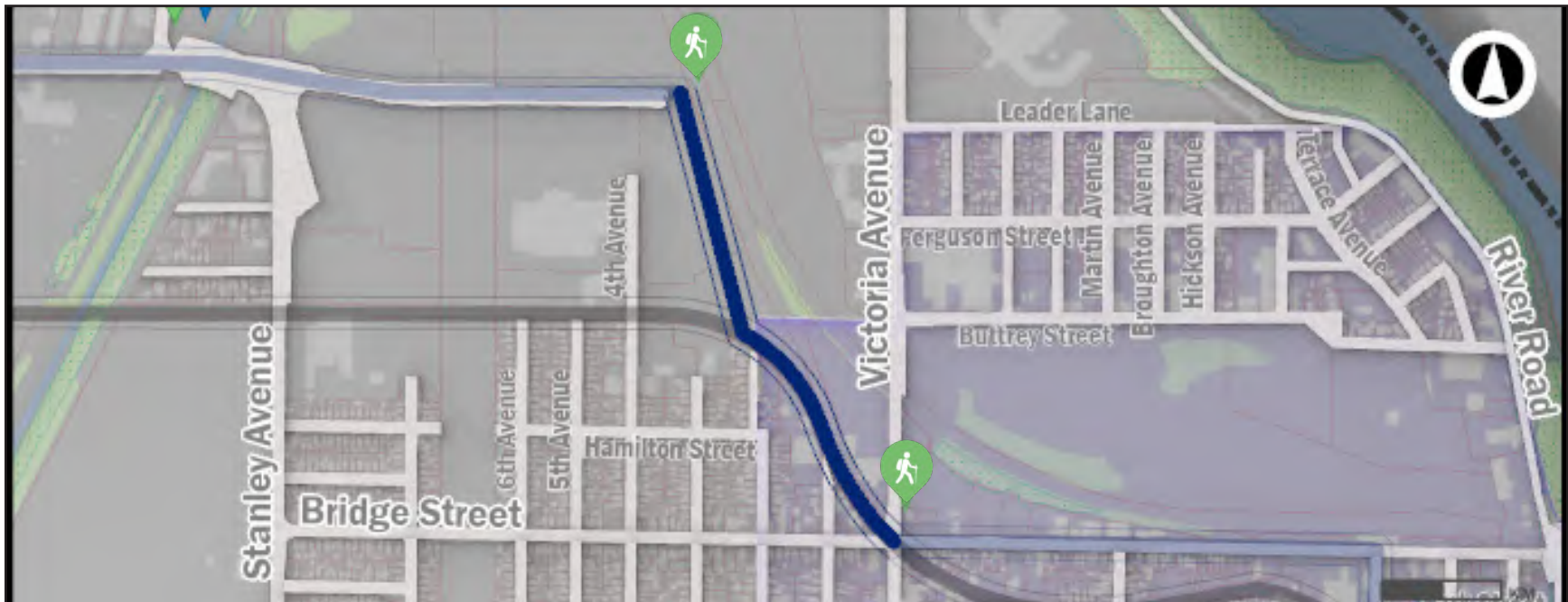
Overview

Corridor Limits: Thorold Stone Road (end) to Victoria Avenue/Bridge Street

Length: ~1.0 km

Segment Description: The trail through this segment follows the proposed alignment of the Phase 2 Thorold Stone Road extension. A multi-use path will run along the south side of the road extension, currently under design by the Region.

-  Potential Parking Location
-  Trailheads



Points of Interest:

- ⚙ Palmer Park / Fourth Avenue Trail Connection

Design Considerations

Trail Classification: Mid-block – Along Roadway

Trail Surface Type: Asphalt

Topography: Generally flat

Trail Design Notes:

Through this segment, the trail alignment will follow the Thorold Stone Road extension on the south side of the new road. Pavement markings & signage will be important to convey that this trail is the continuation of the NS&T Trail route.

Midblock Road Crossings: N/A – no midblock road crossings anticipated

Trailheads, Parking & Amenities:

- ⚙ Potential trailhead at both east and west segment terminus.

Implementation

Proposed Phasing: Phase 2 (**Medium term:** 4 – 7 years)

Permitting & Key Stakeholders:

- ⚙ **Niagara Region:** Close coordination with Niagara Region will be required as Thorold Stone Road is a regional corridor.

Property Ownership:

Trail routing expected to run on municipal property (no property acquisition anticipated)



SEGMENT 3: DOWNTOWN CONNECTOR

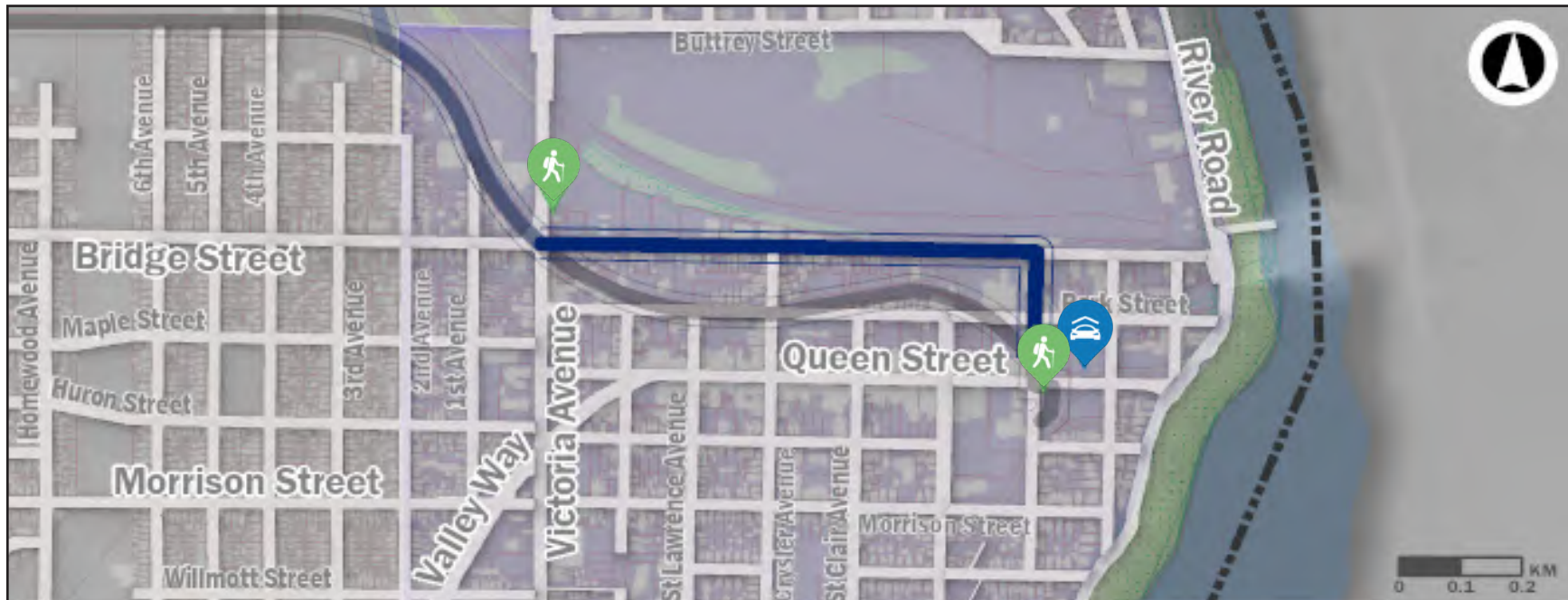
Overview

The identified Phase 3 is subject to active external projects, including Regional works and the Bridge Street EA. It is anticipated that construction of Bridge Street may happen as early as within the next 2 to 3 years.

Corridor Limits: Victoria Avenue/Bridge Street to Downtown Park (Erie Avenue/Queen Street)

Length: ~1km

-  Potential Parking Location
-  Trailheads



Segment Description: This section of trail follows Bridge Street / Erie Street to connect the Thorold Road Extension to the Rosberg Family Park / Olympic Torch Trail. This routing is selected over the historical rail alignment to provide access to major destinations including the GO Train station and Bus Terminal. This routing avoids the introduction of new midblock crossings. (**Note:** Park Street should be considered as a further alternative if Bridge Street is determined as not favourable).

Points of Interest:

- ⚙️ Niagara Falls GO/ViaTrain Station
- ⚙️ Niagara Falls Bus Terminal
- ⚙️ Niagara Falls City Hall
- ⚙️ Niagara Municipal Parking Lot 19
- ⚙️ Downtown Park
- ⚙️ Rosberg Family Park / Olympic Torch Trail

Design Considerations

Trail Classification: Mid-block – Along Roadway

Trail Surface Type: Asphalt

Topography: Generally flat

Trail Design Notes:

Multi-use path to be added along one side of Bridge Street. The north side is preferred due to a lower frequency of driveways, however special mitigation may be required along the frontage of 4533-4629 due to frontage parking. Reduction of lane widths/road narrowing may be required to accommodate the multi-use path within the existing right-of-way. Alternatively, consider one-way cycle tracks and sidewalk configuration. As noted previously, Park Street should be considered as a further alternative if Bridge Street is determined as not favourable.

Along Erie Avenue, a preferred ultimate configuration is multi-use path on one side. However, an interim treatment may be buffered/protected bike lanes and sidewalks to connect to Queen Street/Erie Avenue.

Through this segment, the multi-use path will pass through the several signalized intersections requiring appropriate upgrades including modified curb ramps, cross-rides and appropriate signage/pavement markings:

- ⚙️ Park Street & Erie Avenue
- ⚙️ Queen Street & Erie Avenue

Midblock Road Crossings:

- ⚙️ **Bridge Street & Erie Avenue:** Potential intersection pedestrian signal (preferred) or pedestrian crossover to support north-south crossing from Bridge Street to Erie Avenue

Trailheads, Parking & Amenities:

- ⚙️ Potential trailhead at both east and west segment terminus (existing trailhead at the Downtown Park)

Implementation

Proposed Phasing: Phase 3 (**Medium term depending on Regional and Bridge Street EA works:** 4-7 years.)

Permitting & Key Stakeholders:

- ⚙️ **Niagara Region:** Close coordination with Niagara Region will be required as Bridge Street is a regional corridor.
- ⚙️ **Metrolinx:** Coordination with Niagara GO Secondary Planning Process (Bridge Street is south limit of secondary plan area)

Property Ownership: Trail routing expected to run on municipal property (no property acquisition anticipated)



SEGMENT 4: WESTERN LIMITS

Overview

Corridor Limits: Thorold Townline Road to Garner Road

Length: 2.05 KM

Segment Description: The most remote segment of the trail, stretching to the City's western limit, this segment stretches through rural agricultural land over relatively flat topography. Beechwood Road bisects this segment at roughly the halfway mark. In similar fashion as with segment 1A, the context of this segment has seen vegetation encroach within the corridor space to mask the historic rail bed.

-  Potential Parking Location
-  Trailheads



Points of Interest:

- ⚙ Thorold Townline Road as Western City Limits

Design Considerations

Trail Classification: Standard Mid-block

Trail Surface Type: Limestone Screening (Granular)

Topography: Generally flat

Trail Design Notes:

Consideration for the integrity of the subgrade should be considered because of the current conditions.

This will eventually become the western terminus of the final trail works (Phase 4), meaning the trail will begin/end at Thorold Townline Road. At such time, any trailhead marker instituted at the Garner Road location from Phase 1A, should be relocated here. Vehicular barriers should be implemented at this location. Given the rural and natural context, it may be appropriate to provide a more sensitive trail surface, such as limestone or other granular screening. No significant ecological feature has been identified within this segment, however, at minimum, consultation with the NPCA should be performed during the design development stages of this segment and it is expected that environmental studies would be required within applicable areas. This segment should transition into Segment 1A at Garner Road via a controlled pedestrian crossing.

Midblock Road Crossings:

Thorold Townline Road: Some form of pedestrian crossover is anticipated to provide a crossing at this location to access the trail from the parking area (subject to site review and warranting).

Beechwood Road: High speeds preclude the provision of pedestrian crossings. Review warrants for intersection pedestrian signal, or at a minimum, provide illumination of trail crossing (uncontrolled).

Garner Road: Some form of pedestrian crossover is anticipated to provide a crossing at this location (subject to site review and warranting).

Trailheads, Parking & Amenities:

- ⚙ Eventual trailhead at Thorold Townline Road

- ⚙ Explore opportunity to acquire land for small off-road parking lot.
- ⚙ Segment trail surface material might preclude regular maintenance, so potentially avoid bench seating and waste storage.

Implementation

Proposed Phasing: Phase 4 (Long term: 8+ years)

Permitting & Key Stakeholders:

- ⚙ **Municipal:** Drummond Road is considered a local road.
- ⚙ **Regional:** Thorold Townline Road is considered a Regional Road.
- ⚙ **Niagara Peninsula Conservation Authority:** The surrounding area may be of interest to the NPCA and work within this area may require a permit, or environmental impact studies; at minimum consultation should be sought.
- ⚙ **Utilities/Engineering (various):** Coordination with the existing utilities may be required.

Property Ownership: Trail routing expected to run on municipal property (no property acquisition anticipated). Coordination with single detached residence at Garner Road may be required.





PLANNING LEVEL COSTS



7 PLANNING LEVEL COSTS

Planning-level opinions of cost were prepared for the recommended route, as described for each individual implementation phase in Sections 6.3. These costs (expressed in 2022 Canadian-dollars) are preliminary only and are likely to change as the trail development progresses into the implementation phases. For the purposes of the Master Plan, the opinions of probable cost are primarily intended to assist with initial budget forecasting and consideration for funding opportunities. They are inclusive of construction, design, permitting, engineering, and project administration costs and carry typical assumptions for inflation given the duration of the phasing time lines.

During the subsequent design and implementation phases of the trail, changes will likely occur which will have cost implications. To combat increases in costs due to site specific conditions and more detailed analysis, opportunities should be sought to reduce cost by design refinement.

Note: Non-construction costs are provided as a typical factor of 25 percent of construction costs and include such things as design development through construction documentation, permitting, construction engineering, and project administration.

Some of the major limitations of planning-level cost estimating include:

- ⚙ **Existing Conditions:** The assessment of existing conditions within the recommended route was based on aerial information, property data gathering and basic site inventory, covering surface conditions only rather than utilizing detailed survey, geotechnical, or existing utility information. The railbed conditions will be a key factor in the cost of the trail and therefore baseline existing conditions could dramatically change the cost.



- ⚙ **Sensitive areas:** Regulated areas, streams, wildlife habitat and their associated buffers were identified and identified at a high-level only rather than using formal methods of assessment. The extent and character of these features should be more completely evaluated in the design phase, and could have significant impact on the trail plans and associated costs for considerations including revised alignment, materiality (or use of special structures such as a raised boardwalk or wildlife culvert), among others. These factors would have financial and potentially scheduling implications.
- ⚙ **High-level design:** The recommended route, as well as the proposed trail types and applications are completed at a preliminary design level only and assume ideal conditions. Finer level estimates for both hard and soft costs including utility coordination, temporary facilities, vegetation management, traffic control are conservative and will likely change significantly. For this reason, the design contingency is presented to account for any unforeseen costs during design and implementation. In a general sense, the opinions of probably costs reflect unit pricing and base-line standards for typical trails as designed herein.
- ⚙ **Contextual Integration:** These planning level costs do not include contextual integration items such as greater regional trail connections, or unique design considerations which follow other planned areas such as the portion within the Regional GO Station Secondary Plan area. Moreover, property and/or land acquisition costs are not included and should be considered on a phase by phase basis; however, at this time no acquisitions are expected to be required.
- ⚙ **Recommended Route vs. Alternatives:** The cost estimate covers the recommended route as identified in section 6.3. It does not consider potential future costs associated with modifying or reconfiguring the route or trail configurations if required to accommodate such things as planned infrastructure or development changes.



The potential costs for the Preferred Alternative have been presented in high level form on a phase-by-phase basis below.

7.1 Trail Maintenance and Management

It is the intent that the City will provide operational maintenance for the trail, including vegetation and general property management, winter maintenance, and waste management. These uses include but are not limited to, landscaping, fencing, and trail access. Where applicable, the City will also be responsible for reviewing and deciding on requests for special use permits, for example requests from the general public or entities to use public property for private purposes.

7.1.1 Asphalt vs. granular surfaces

In situations where there are shared interests in parts of the trail, such as road crossings, shared parking, or regional or private ownership interaction, a coordinated approach should be sought.



The following cost summaries provide a high level budgetary estimate according to the implementation planning outlined in this document, and is inclusive of both design and construction fees (also includes permitting and administration):

- ⚙ **Short Term (1-3 years):** \$2,585,000
- ⚙ **Medium Term (4-7 years):** \$8,200,000
- ⚙ **Long Term (8+ years):** \$1,550,000



MASTER PLAN SUMMARY



8 MASTER PLAN SUMMARY

This feasibility Master Plan provides a framework for the intended trail implementation, determined through a high-level planning design process. It provides the foundation for the recommended development of a 9.3km recreational link across the City of Niagara Falls.

The trail serves to repurpose an underutilized asset within the City to create a connected, accessible, safe and sustainable recreational opportunity for City's residents and visitors while offering future connective opportunities within the greater Niagara Region. Once complete, the trail will enhance the aged rail corridor to promote connectivity, activity, conservation, and tourism.

To develop this Feasibility Master Plan, various data gathering exercises were completed including field and site reviews, background research including policy and plan reviews, public and stakeholder engagement, and project mapping. An iterative study process was undertaken with key stakeholders to identify a recommended route as informed by feasibility considerations, environmental impacts and other active and planned initiatives within the City and greater Region.

Through the development of this Feasibility Master Plan, each project phase was reviewed individually assess such things as existing conditions and appropriate trail configuration, pedestrian crossings, amenities, stakeholders, branding, etc. An implementation strategy was developed and discussed, including a high-level opinion of probable costs.



8.1 Next Steps

This feasibility study should mark the first of a series of steps in the process for implementing the NS&T trail. Subsequent steps will generally include pre-design and master plan refinement (such as further consultation, soliciting required studies, permitting, preliminary design development), followed by detailed design, tendering and construction implementation. This master plan provides the guiding vision and should be consulted as the trail becomes a reality. To realize the implementation of the trail, the following non-exhaustive list of steps are advised:

- ⚙️ Coordination with stakeholder agencies for planned and forecasted initiatives, including active and planned road reconstruction projects within the forecasted implementation periods.
- ⚙️ Yearly budgeting, planning and implementation review on a phase-by-phase basis;
- ⚙️ Active coordination with stakeholders during design development, to facilitate optimal relationships and trail integration.
- ⚙️ Further develop wayfinding and branding strategies to provide a unique trail identity and wayfinding strategy.
- ⚙️ Further studies in key locations where environmental concerns are prevalent, infrastructure (existing or potential) is a concern, where existing conditions may suggest the railbed has been compromised, where pedestrian crossings are required, or where other studies and permits have been identified in the project sheets; and
- ⚙️ General and periodic review of the Feasibility Master Plan (recommended every 2-4 years) to evaluate, plan and coordinate future phases and budgeting.



REFERENCE

9 REFERENCES

9.1 Terminology

- ⚙ **Active Transportation:** Active Transportation describes all human-powered forms of travel, such as walking, cycling, in-line skating, skateboarding, skiing, canoeing, and more.
- ⚙ **Circulation:** The movement patterns of people and vehicles through a community.
- ⚙ **Controlled Crossing:** A form of pedestrian crossing that gives priority to pedestrians or cycles crossing a road.
- ⚙ **Crime Prevention Through Environmental Design:** A strategy that uses design to eliminate or reduce criminal behaviour
- ⚙ **Crossrides:** A crossride is a pavement marked area at a vehicular intersection. It is used for cyclists to be able to legally ride their bicycle through an intersection without dismounting.
- ⚙ **Street Cross-Section:** A street cross-section is a diagram showing street details including building frontage, street edge, footpaths, verges, curbs, services, below ground infrastructure and road space.
- ⚙ **Edge Condition/Zone:** A transition area or interface of a public space with its adjacent land uses, and structures
- ⚙ **Node:** Is a central hub, connecting areas in a neighbourhood or city. It is characterized by having high levels of activity and circulation with a mix of uses including residential, commercial and institutional buildings.

- ⚙ **Micro-Climate:** Any climatic condition in a relatively small area, that is influenced by temperature, humidity, wind and turbulence, dew, frost, heat balance, and evaporation
- ⚙ **Plant Buffer:** Buffer plantings are linear strips of vegetation that have been either retained or purposefully planted in urban environments to separate land uses
- ⚙ **Placemaking:** A concept that uses the physical, cultural, and social identities that define a place to support its ongoing evolution. It focuses on strengthening the connection between people and the places they share.
- ⚙ **Public Realm:** Refers to the publicly owned places and spaces that belong to and are accessible by everyone including but not limited to municipal streets, lanes, squares, plazas, sidewalks, trails, parks
- ⚙ **Refuge Islands:** A small section of pavement or sidewalk, surrounded by vehicular roads, where pedestrians can stop before finishing crossing a road.
- ⚙ **Revitalization:** The action of improving and imbuing a city, site, community etc. with new life and vitality
- ⚙ **Right-of-Way:** The part of the street space that is publicly owned and lies between the property lines.
- ⚙ **Stormwater Management:** A design strategy that minimizes and reduces the flow of runoff into lakes, streams, streets, etc. for the improvement of water quality and flood mitigation.
- ⚙ **Street Furniture:** Equipment placed along streets, including light fixtures, fire hydrants, telephones, trash receptacles, signs, benches, mailboxes, newspaper boxes and kiosks.

- ⚙ **Streetscape:** The distinguishing elements and character of a particular street as created by its width, degree of curvature, paving materials, design of the street furniture, pedestrian amenities, setbacks and massings of surrounding buildings
- ⚙ **Transit-oriented or Transit-supportive:** Describes a relationship between urban growth and transit. It aims to increase public transport ridership by reducing the use of private cars and by promoting sustainable urban growth.
- ⚙ **Uncontrolled Crossing:** A pedestrian crossing that does not give priority to pedestrians, typically takes the form of subtle road markings.
- ⚙ **Urban Fabric:** Describes the physical characteristics of urban areas including the streetscapes, buildings, landscaping, street furniture roads and other infrastructure.
- ⚙ **Wayfinding:** Refers to information systems that guide people through a physical environment and enhance their understanding and experience of the space. They are visual, auditory and sensory cues such as maps, directions, and symbols to help guide people to their destination.

9.2 List of Key Stakeholders

- ⚙ City of Niagara Falls (Inter-departmental)
- ⚙ Region of Niagara (Inter-departmental)
- ⚙ Park in the City Committee
- ⚙ Mayor's Accessibility Advisory Committee
- ⚙ General Public
- ⚙ Niagara Peninsula Conservation Authority (NPCA)
- ⚙ Ministry of Transportation (MTO)
- ⚙ Canadian National Railway (CN)
- ⚙ Ontario Power Generation (OPG)



Appendix A

DETAILED CORRIDOR MAPPING

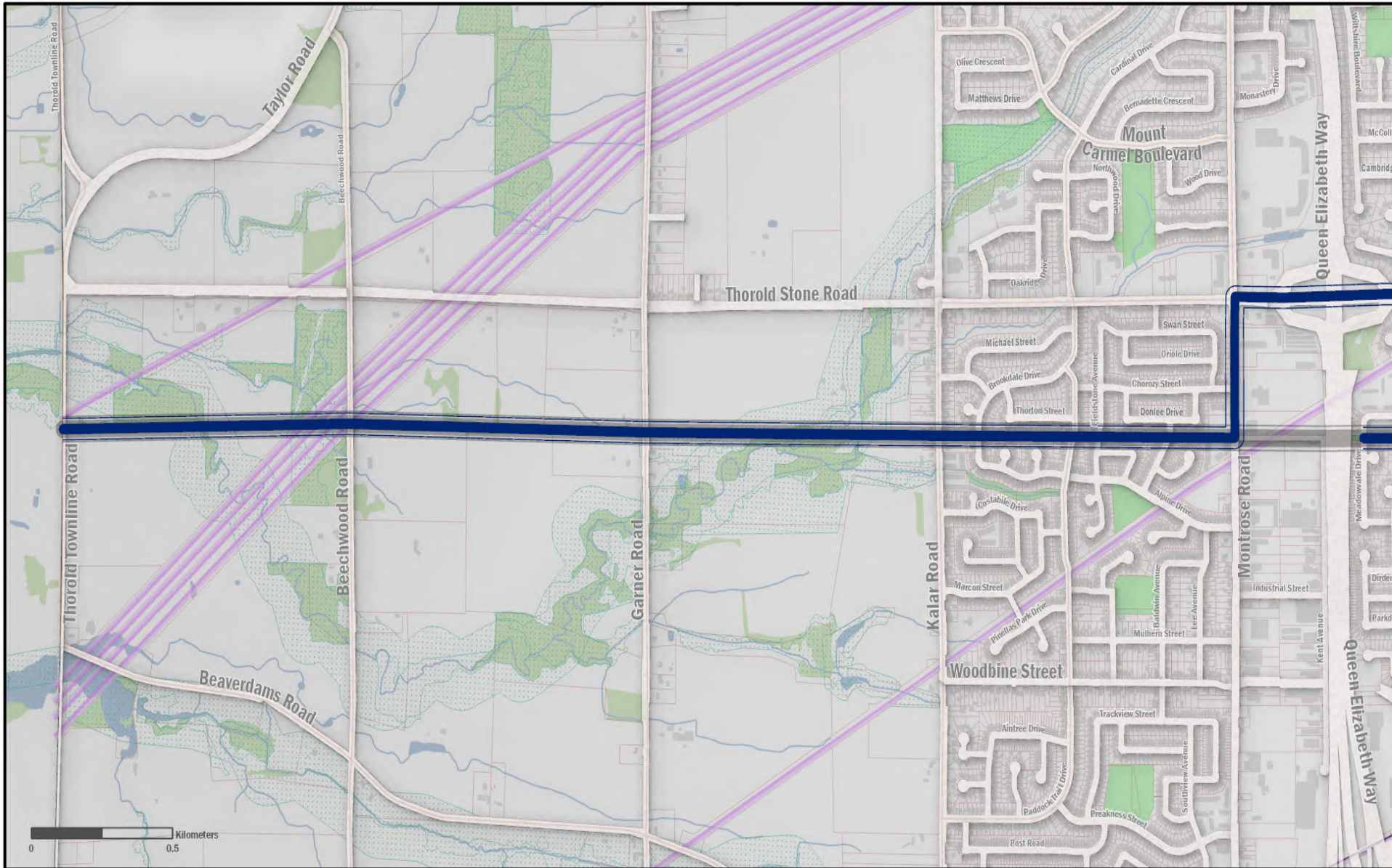


Exhibit 12 - Full Roll Plan of Trail Map

