



## **TRANSPORTATION MASTER PLAN**

Appendix C – Trails Master Plan  
June 2019

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2019-06-12

Mr. Tom Reeve  
Senior Infrastructure Planning Program Coordinator  
The City of Barrie  
P.O Box 400  
70 Collier Street  
Barrie, ON L4M 4T5

Subject: Transportation Master Plan  
Technical Memorandum: Trails Master Plan | June 2019

Dear Mr. Reeve

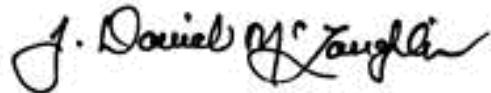
On behalf of WSP Canada we are pleased to provide you with the Technical Memorandum – Appendix C - for the Trails Master Plan component of the City of Barrie's Transportation Master Plan (TMP).

This Trails Master Plan is a key component of the Active Transportation Strategy (ATS). Key components of both documents have been integrated into the TMP. The development of the Trails Master Plan was initiated by request of the City to complement and complete the active transportation strategy to more clearly and specifically identify improvements to the off-road system including routing, design and implementation. The Trails Master Plan was informed by input from City staff, public input received during the preparation of the Transportation Master Plan, and developed based on:

- A review of existing and previously proposed trails found throughout the City of Barrie and to surrounding areas;
- A review of current trail design guidelines and standards and the development of a City-specific trail classification system;
- The identification of proposed trail routing throughout new development areas, established areas, natural areas and environmentally significant areas and the identification of a trail classification for each; and
- The need for a long-term strategy to support the planning, implementation, management and maintenance of trails City-wide.

High level phasing and costing has been prepared for the Trails Master Plan. The phasing and costing have been summarized within the master plan report. More detailed costing assumptions and recommendations for the Trails Master Plan are provided in Appendix 3 of the ATS.

Yours sincerely,



J. David McLaughlin, BA, MES, MCIP, RPP  
National Active Transportation Practice Manager  
Planning and Advisory



# EXECUTIVE SUMMARY

## EX.1 WHAT IS THE TRAILS MASTER PLAN?

The Trails Master Plan was developed as a technical appendix (Appendix C) to the City of Barrie's Transportation Master Plan (TMP) and to complement the City of Barrie Active Transportation Strategy (ATS) (Appendix B of the TMP).

The Trails Master Plan was developed in parallel with the TMP and ATS, though it was an addition to the TMP scope later in the process. As such the study began in fall 2018 and was completed within the delivery schedule for the overall TMP. Because the Trails Master Plan study schedule had to be compressed, some of the research, field investigations, consultations and recommendations will require further development and enhancement as part of the plan's implementation.

The Trails Master Plan is intended to be used as a guide for improving and enhancing Barrie's trails network and to help promote the development of accessible and safe active transportation facilities for all users. Therefore, the trails plan reflects the visions and objectives set forth in the TMP, the ATS as well as unique aspects of trail planning, design and development.

The Trails Master Plan identifies proposed trail design guidelines and standards which are meant to be adopted by the City to ensure that the standards are in-line with the proposed trail classification identified and confirmed through discussions with City staff. Both the trails plan and the ATS provide a foundation for the development of accessible, safe, and connected active transportation and recreation infrastructure and balances the needs of different user groups. They identify long-term objectives and priorities to help encourage positive shifts in active transportation culture which establish a cohesive approach to improving active transportation and recreation.

Together, the ATS and the Trails Master Plan are intended to be used as guides for similar pursuits and purposes, however, the information contained within each will be applicable to different City departments and staff based on their current roles and responsibilities regarding infrastructure planning, design and maintenance as well as promotion, outreach and education.

### **RECREATION TRAILS, AS DEFINED FOR THE TRAILS MASTER PLAN ARE:**

Off-road, and found outside of road rights-of-way. They include trails through natural areas; trails within parks; trails that connect parks to parks; trails that connect parks to transportation corridors, the shoreline, points of interest or other public spaces. They are intended primarily for recreation, with some routes also serving a commuter function. Recreation Trails do not include in-boulevard trails/pathways, these are considered part of the active transportation network as defined in the Active Transportation Strategy.

## EX.2 WHY DEVELOP A TRAILS MASTER PLAN?

The Plan provides long-term recommendations for City Staff and relevant partners to help guide the future design and development of Barrie's trail network. This executive summary provides a summary of key concepts of the Trails Master Plan.

The Trails Master Plan has been developed to achieve the City's vision of:

- Establishing year-round outdoor recreation opportunities for residents and visitors of all ages and abilities;
- Facilitating off-road movement and travel throughout various neighbourhoods; to parks and natural areas; major destinations in the City and neighbouring municipalities; and
- Creating a connected and continuous active transportation system including critical linkages with and to the sidewalk and on-road cycling system.



North Shore Trail – Trailhead sign near Johnson's Beach; Source: WSP 2018

The Trails Master Plan is reflective of and consistent with a number of key municipal, regional and provincial policies, directions and priorities. The rationale for and business case to implement a comprehensive trails network throughout the City has been outlined within the Trails Master Plan – specifically within **Chapter 1.0**. More specifically:

STRATEGIC PLAN GOALS:	POLICIES & PLANS AT ALL LEVELS:	CONSULTATION & ENGAGEMENT:
Barrie's 2018-2022 strategic plan identifies five goals. Local policies and initiatives are intended to fulfill at least one of these goals. It can be rationalized and is documented that the trails plan in some way fulfills all five of these strategic goals.	Policies and plans at the local, county and provincial level provide substantial support for trail development specific in the prioritization of improving quality of life, transportation options, addressing aging communities and environmental impacts.	As part of the TMP the City hosted several engagement opportunities including a public event. Displays related to the Trails Master Plan were included at the event, giving attendees the opportunity to comment on existing trail conditions, future trail development opportunities and priorities.

### EX.3 HOW WAS THE NETWORK DEVELOPED?

Similar to the active transportation network, the trail network was developed using an iterative approach which builds upon existing conditions and integrates input from staff, stakeholders and the public to ensure that the recommendations reflect community priorities and principles. The trail network was developed using a five-step process. Details related to the inputs and outputs of this process are provided in **Chapter 2.0**. A highlight of each of the steps is provided below.

1	BACKGROUND INFORMATION	Develop an understanding of existing and previously proposed trail conditions and route selection principles
2	CANDIDATE ROUTES	Identify a set of potential trail connections and assess those connections based on the principles and input
3	FIELD INVESTIGATION & TRAIL ROUTING	A review of the potential trail connections in the field, the identification of context specific conditions and the confirmation of the proposed trail routing including recommended trail classification
4	TRAIL PHASING & CAPITAL COSTING	The identification of high-level phasing for each of the proposed trail routes and the identification of a preliminary cost for those routes
5	TRAIL PRIORITIES	The identification of potential priority projects within the short and medium-term phases to help guide next steps for implementation.

## EX.3 BARRIE'S TRAIL NETWORK

Upon completion of step 4 of the process noted above, a draft set of trail routes had been identified for the City of Barrie and a trail classification had been assigned to each trail route. The trail classifications were defined for the City of Barrie based on the City's past trail classification system (i.e. the Trail and Pathway Construction Matrix BSD-1274) but to incorporate and include a more user focused approach.

Details of the trail classification system are found in **section 2.3.2** of the Trails Master Plan. The following is a high-level summary of the five types of trails included within the classification. The City has been recommended to adopt this new trail classification system as part of the Parks Standards Drawings in place of the existing BSD-1274.

**Table EX- 1 | Summary of Barrie Trail Classification**

TRAIL CLASSIFICATION TYPE		USER GROUP		
		PED.	CYCLIST	OTHER (1)
1	<b>WATERFRONT TRAIL</b> Key destination to showcase the City's waterfront and attract residents and tourists to events, celebrations, and festivals	◆	◆	◆
2	<b>MULTI-USE TRAIL</b> Provides access to key destinations like community centres, parks, key commercial areas, etc., and promotes recreational or leisurely use of active transportation	◆	◆	◆
3	<b>CONNECTOR TRAIL</b> Typically used for recreation and leisure and meant to provide connections to active transportation routes	◆	◆	◆
4	<b>NATURAL TRAIL<sup>(2)</sup></b> Routes that allow residents to 'escape' the urban environment and participate in recreational and leisure activities in more natural settings within City limits	◆	◆	
5	<b>STORMWATER MANAGEMENT FACILITY ACCESS</b> Stormwater Management Facility Road/service access to unfenced stormwater facilities, and serving as a key connector to the trail network (i.e. Type 2, 3, 4 trails)	◆	◆	◆

*The "other" category typically refers to vehicles for service  
May include special use trails (e.g. hiking/walking-only trails)*

There are approximately 170km of trails – both existing and proposed – identified as part of the proposed trail network. Of those 169km, approximately 70km are new proposed trail connections. As noted above, for each proposed route a trail classification / type has been identified. The following table summarizes the proposed trail network by trail type. The proposed trail network is illustrated in **Map EX-1**.

**Table EX- 2 | Summary of Proposed Trails Network by Trail Type**

	EXISTING (KM)	PROPOSED (KM)	TOTAL (KM)
WATERFRONT MULTI-USE TRAIL (TYPE 1)	8.9	0.0	8.9
MULTI-USE TRAIL (TYPE 2)	45.8	7.5	53.3
CONNECTOR TRAIL (TYPE 3)	14.9	55.1	70.0
NATURAL TRAIL (TYPE 4)	27.7	6.2	33.9
STORMWATER MANAGEMENT FACILITY ACCESS (TYPE 5)	2.0	0.8	2.8
<b>TOTAL</b>	<b>99.3</b>	<b>69.6</b>	<b>168.9</b>

## EX.4 IMPLEMENTING THE TRAILS PLAN

An implementation strategy has been developed to help guide City staff, decision makers and partners in the day-to-day and long-term implementation of the trails plan. The following are some highlights from the strategy which is presented in **Chapter 3.0** of the Trails Master Plan.

### EX.4.1 TRAIL PHASING & PRIORITIES

Implementation of the Trails Master Plan is meant to be undertaken in conjunction with the overall Transportation Master Plan but more specifically the Active Transportation Strategy. A total of three phases have been identified for consideration by the City of Barrie including Short Term (2019 – 2021), Medium Term (2022 – 2031) and Long-term (2031+). The proposed trails phasing plan is illustrated on **Map EX-2**.

The implementation of the trails network will take a considerable amount of budget, time and effort. Effective implementation should be based on a flexible schedule / timeline which can be integrated into day to day decision making. While this report identifies suggested phasing for each route it will be the responsibility of City staff to determine which specific routes to implement on an annual basis based on City priorities and budget available.

**Table EX- 3 |** Summary of Proposed Phasing

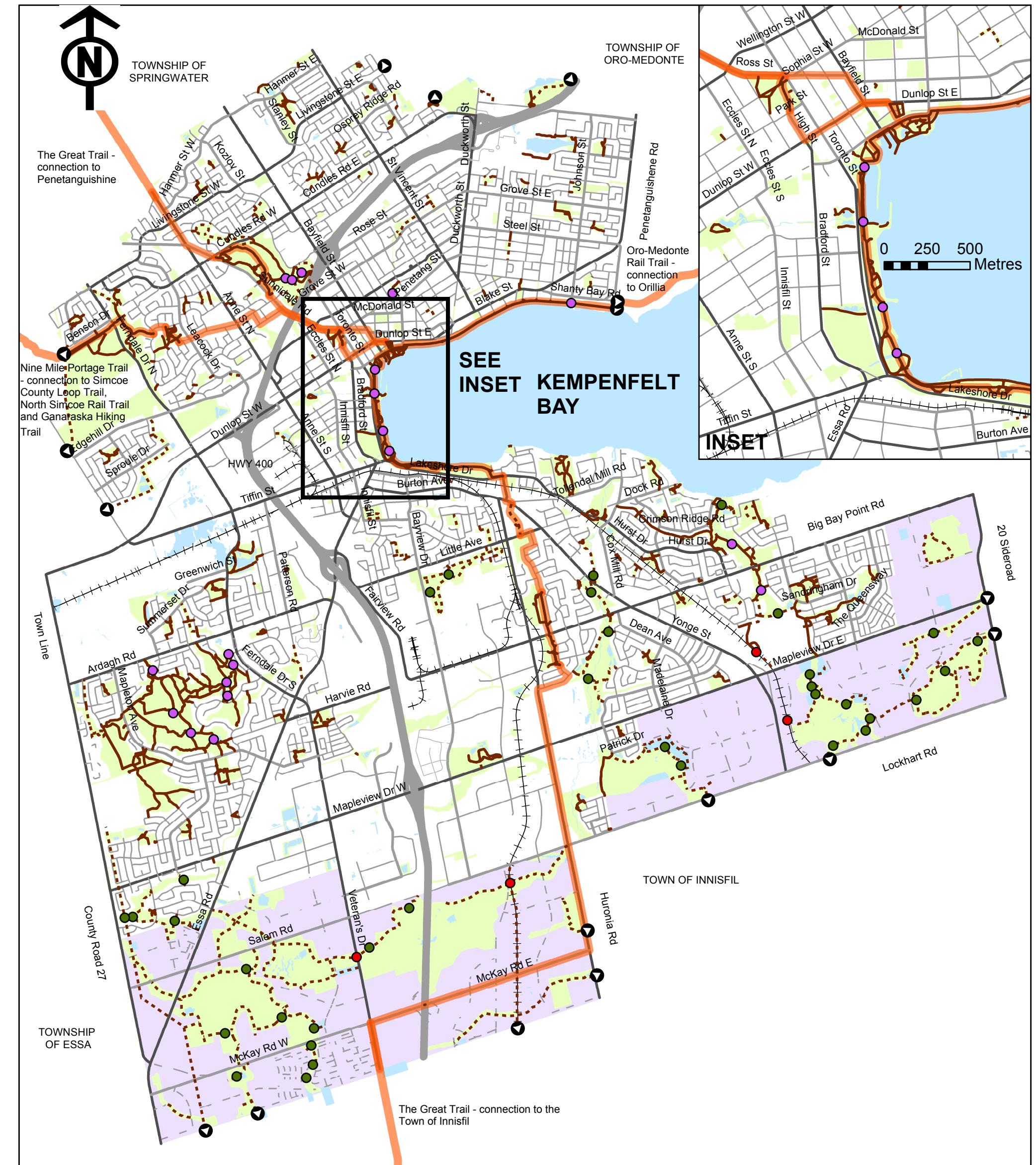
	WATERFRONT MULTI-USE TRAIL TYPE 1 (km)	MULTI- USE TRAIL TYPE 2 (km)	CONNECTOR TRAIL TYPE 3 (km)	NATURAL TRAIL TYPE 4 (km)	STORMWATER MANAGEMENT FACILITY ACCESS TYPE 5 (km)	TOTAL
SHORT	0	0.2	1.2	0.0	0.2	1.6
MEDIUM	0	3.9	27.6	1.8	0.6	33.9
LONG	0	3.4	26.3	4.4	0	34.1
<b>TOTAL</b>	<b>0</b>	<b>7.5</b>	<b>55.1</b>	<b>6.2</b>	<b>0.8</b>	<b>69.6</b>

It is challenging to create a fully connected off-road trail network due to the nature of trail development and lack of fully connected linear open space lands. As such, connectivity as it relates to the trails “network” is more specifically achieved through the implementation of not only the municipal trail system i.e. trails in existing neighbourhoods, trails in new development areas, trails in environmental protection areas and the waterfront heritage trail but is also comprised of the on-road cycling, sidewalk and in-boulevard multi-use components of the active transportation network and regionally significant trail systems such as the Great Trail / Trans Canada Trail and Nine Mile Portage Trail, among others.

As part of the phasing strategy (step 5 of the network development process), proposed trail routes were grouped into short, medium and long-term phases. Within the short and medium-term phases, 7 individual projects were selected as potential priorities for implementation. They are listed in **Table EX-4** for consideration and the City may select to identify additional priorities based on public and stakeholder input in the future based on the proposed routes identified as part of the trails network.

**Table EX- 4 |** Potential Short and Medium-Term Priority Projects

SHORT-TERM (2019 – 2021)	MEDIUM-TERM (2022 – 2031)
<ul style="list-style-type: none"> <li>– West Bayfield Park</li> <li>– Waterfront Trail between Tiffin Street and White Oaks Road</li> <li>– Hollywood Ravine East (Columbia Road to Garibaldi Drive)</li> </ul>	<ul style="list-style-type: none"> <li>– Lovers Creek Ravine from Loon Avenue and Chalmers Park to Country Lane, and Esther Drive</li> <li>– Trail parallel to railway from the Barrie South GO Station to Mapleview Drive</li> <li>– Ardagh Bluffs Natural Area Trails</li> <li>– Hollywood Ravine West and South</li> <li>– Connection to Little Lake Trails via Crompton Drive</li> </ul>



### Off-Road Network

- Existing Trail
- Proposed Trail

### Regional Trail Network

Regionally Significant Trail Routes  
(i.e.: The Great Trail, Oro-Medonte Rail Trail, North Simcoe Rail Trail, Ganaraska Hiking Trail, Simcoe County Loop Trail)

### Supporting Infrastructure

- Existing Trail Bridge
- Proposed Trail Bridge
- Proposed Underpass
- Potential Connection to Surrounding Municipality

### Other Features

- Secondary Plan
- Park / Open Space
- Water / Watercourse

Data Sources: City of Barrie  
Date Updated: April, 2019  
Project: 171-08853-00  
Map Created By: WSP Kitchener

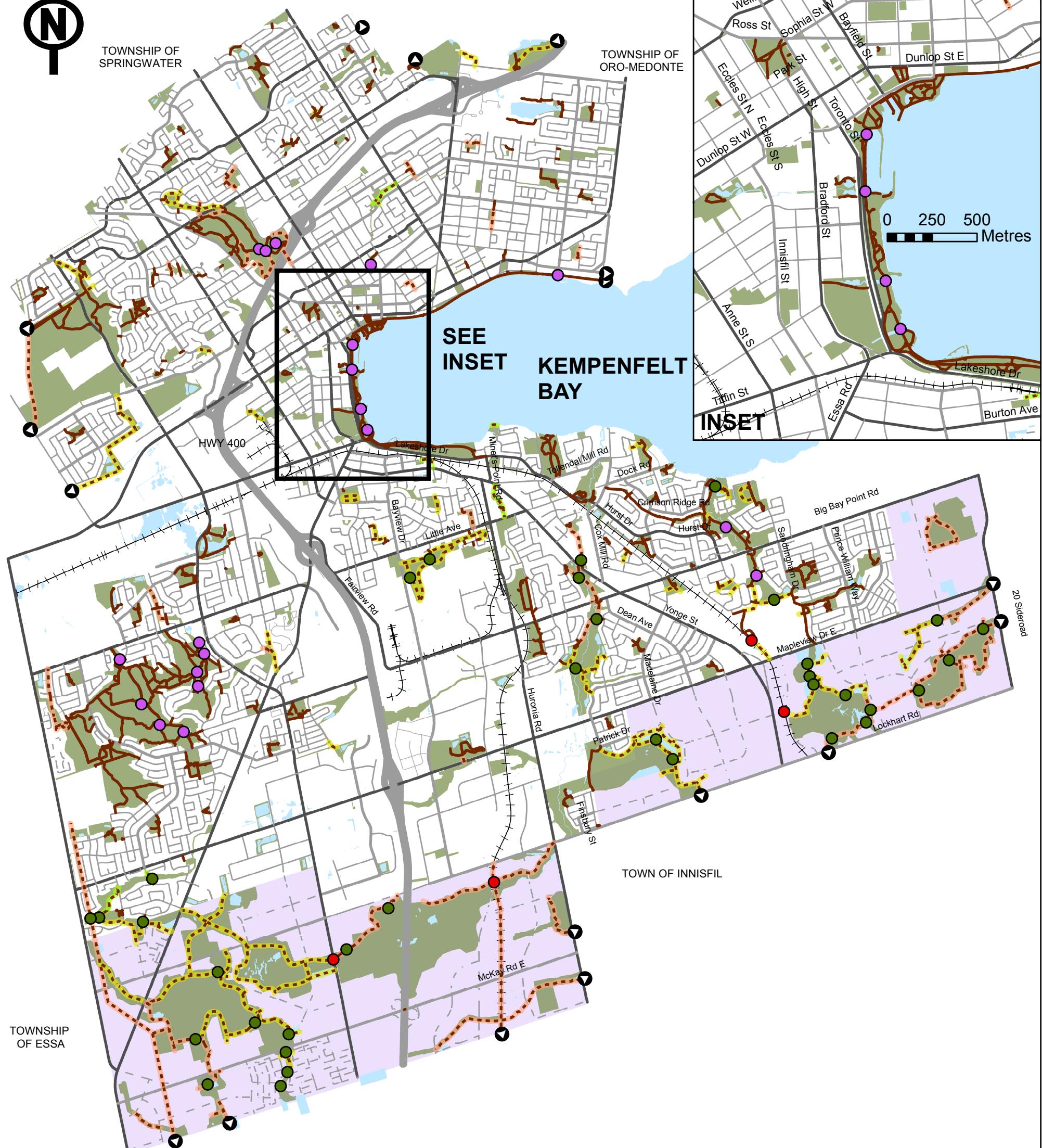
0 500 1,000 1,500 2,000 Metres

Map EX-1

Proposed Trail Network

City of Barrie Trails Master Plan

**WSP**



#### Off-Road Network

- Existing Trail
- Proposed Trail

#### Phasing

- Short-Term (2019-2021)
- Medium-Term (2022-2031)
- Long-Term (2032-2041)

#### Supporting Infrastructure

- Existing Trail Bridge
- Proposed Trail Bridge
- Proposed Underpass
- Potential Connection to Surrounding Municipality

#### Other Features

- Secondary Plan Area
- Water / Watercourse
- Park / Open Space

Data Sources: City of Barrie  
Date Updated: April, 2019  
Project: 171-08853-00  
Map Created By: WSP Kitchener

0 500 1,000 1,500 2,000 Metres

#### EX.4.2 TRAIL NETWORK COSTING

To inform the phasing plan and to help with annual budget allocation the Trail Master Plan provides City staff with unit costs for capital works and cost ranges for maintenance as a reference resource. The unit costs are outlined in **Appendix B3 of the Active Transportation Strategy** and are based on 2019-unit costs and projects from comparable municipalities throughout Ontario. While these unit costs are meant to be used as guidelines the City will need to develop more detailed costs as projects go through the detailed design process. With the application of unit costs for each of the proposed trail link, the following summary of potential costs (rounded to the nearest \$1000) have been developed for the City's reference and consideration as it moves forward with implementation of the trails plan.

**Table EX- 5 |** Summary of Capital Trail Construction Costs

	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
SHORT	\$0	\$96,000	\$327,000	\$1,000	\$86,000	\$510,000
MEDIUM	\$0	\$1,902,000	\$7,813,000	\$145,000	\$247,000	\$10,106,000
LONG	\$0	\$1,671,000	\$7,454,000	\$353,000	\$0	\$9,470,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$3,669,000</b>	<b>\$15,594,000</b>	<b>\$499,000</b>	<b>\$333,000</b>	<b>\$20,086,000</b>

**Table EX- 6 |** Summary of Capital Trail and Bridge Costs

	TRAIL BRIDGE	TRAIL UNDERPASS	TOTAL
SHORT	\$129,000	\$809,000	\$938,000
MEDIUM	\$2,459,000	\$1,618,000	\$4,076,000
LONG	\$1,812,000	\$809,000	\$2,621,000
<b>TOTAL</b>	<b>\$4,400,000</b>	<b>\$3,236,000</b>	<b>\$7,635,000</b>

#### EX.4.3 SUPPORTING IMPLEMENTATION

While phasing and costing can help to inform future budgeting, it does not solve the potential issues of resource limitations, coordination and communication challenges and internal management. As part of the implementation strategy a number of tools and resources have been identified in the trails plan for consideration and use by City staff and partners. The following is an overview of what has been recommended in **Chapter 3.0** to support implementation:

- **Implementation Process (section 3.1.1):** An overview of the steps that will follow the adoption of the Trails Master Plan to move forward to review, assess, design, tender, implement and monitor individual trail projects. It also provides suggested timelines on when and how to integrate and update the Trails Master Plan to ensure it is consistent with other municipal policies and up to date.
- **Management Tools (section 3.1.2):** A set of three tools which have been developed based on the deliverables prepared for the Trails Master Plan with the intent of supporting, tracking, communicating and promoting the implementation of the plan. The tools are meant to be easily updated and maintained by staff and its partners.
- **Partnerships (section 3.1.3):** Coordination is a key element of implementation and an overview of existing and potential partners that the City could consider pursuing is provided. The intent is to provide options and alternatives for various areas of implementation including the network, policies, promotion, outreach, etc.
- **Promotion & Outreach (section 3.1.4):** In addition to implementing the network the City should explore other means of encouraging people to be active. Some high level potential promotion and outreach strategy are identified in the Trails Master Plan; however, the City should refer to the Active Transportation Strategy for a more detailed overview of potential strategies and initiatives.
- **Planning Considerations (section 3.1.5):** An overview of specific planning related trail considerations which could be addressed or integrated into future policy updates including but not limited to the City's Official Plan or Secondary Plans. Suggested direction is provided on how to plan for trails within specific land use contexts i.e. natural areas, utility corridors, new neighbourhoods, and established neighbourhoods.
- **Maintenance Practices (section 3.2):** Suggested direction on how to address the maintenance of existing trail infrastructure as well as how to plan for the maintenance of new infrastructure. High level costs of trail maintenance practices are provided for reference and consideration on an annual basis as the trails network is implemented.
- **Funding Tools (section 3.3):** The reality is that the City will require external sources of funding to support the implementation of the trails network. The plan provides an overview of current potential federal, provincial and regional funding opportunities from which the City could draw upon. These sources change from time to time and with changes in government, therefore should be monitored regularly.

## EX.5 CONCLUSION

The City of Barrie Trails Master Plan has been developed as a long-term blueprint and guide for trail design, development and promotion City-wide. It builds upon excellent trail work that has previously been completed by the City and stakeholders over the past several decades and has been developed in conjunction with the City's Active Transportation Strategy and Transportation Master Plan.

Moving forward in a collaborative manner with quality trail infrastructure and a coordinated trail promotion, outreach and encouragement will add significant value to the unique experiences, opportunities and community that are found within the City of Barrie.

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## 1

## ABOUT THE TRAILS MASTER PLAN



*Trails provide opportunities of recreation and promote liveable communities which enhance quality of life.*

## SECTION CONTENT:

- 1 An overview of the current trail context in the City of Barrie including existing trails and public input / preferences;
- 2 Details of the rationale for developing a trails master plan including supportive policies, guidelines, benefits and community trends;
- 3 Trail master plan principles including the proposed vision and objectives as well as opportunities and challenges for trail enhancement, design and implementation; and
- 4 An overview of the process used to develop the trails strategy and how it was integrated with the transportation master plan.

The City of Barrie Trails Master Plan has been developed as a technical appendix (Appendix C) to the Transportation Master Plan (TMP) report. It is a key complement to the Active Transportation Strategy (ATS - Appendix B) as it targets and addresses improvements to the off-road system and select elements of the active transportation system within the City.

The Trails Master Plan was developed in parallel with the TMP and ATS, though it was an addition to the TMP scope later in the process. As such the study began in fall 2018 and was completed within the delivery schedule for the overall TMP. Because the Trails Master Plan study schedule had to be compressed some of the research, field investigations, consultations and recommendations will require further development and enhancement as part of the plan's implementation.

The Trails Master Plan focuses on building upon existing trails found throughout the City, connecting to surrounding areas and identifies opportunities to expand the trails network throughout new development areas, within established neighbourhoods and through natural and open spaces. The following sections provide an overview of the key foundations of the Trails Master Plan.

## 1.1 CONTEXT

*There are many aspects and considerations regarding the City of Barrie that provides the context from which the Trails Master Plan was developed. The City's structure, demographics, existing infrastructure and initiatives all play a role in its development as outlined in the following sections.*

### 1.1.1 ABOUT THE MASTER PLAN

Off-road trails are typically considered part of a wider-scale, comprehensive active transportation network. They are another “facility type” which can be considered in a spectrum of active transportation alternatives and identified as part of a continuous and connected system of walking, cycling and self-propelled transportation. More commonly, trails may be considered a primary means of accommodating active recreation. Active recreation is defined as...

***“Activities engaged in for the purpose of relaxation, health and wellbeing or enjoyment with the primary activity requiring physical exertion and the primary focus on human activity.”***

For the purposes of the City of Barrie, the Active Transportation Strategy (ATS) (see **Appendix B** of the Transportation Master Plan) has been developed to address primarily on-road and in-boulevard facilities that accommodate walking, cycling and other forms of self-propelled transportation. The Trails Master Plan is intended to complement the ATS providing the City with a more detailed investigation and set of recommendations regarding off-road facilities outside of municipal road rights-of-way. The intent is that together, these systems will establish a continuous and connected network to accommodate people of all ages and abilities for different trip purposes.

#### **RECREATION TRAILS, AS DEFINED FOR THE BARRIE TRAILS MASTER PLAN ARE:**

- Off-road, and found outside of road rights-of-way
- They include trails through natural areas; trails within parks; trails that connect parks to parks; trails that connect parks to transportation corridors, the shoreline, points of interest or other public spaces
- They are intended primarily for recreation, with some routes also serving a commuter transportation function
- They do not include in-boulevard trails, these are considered part of the active transportation network and included in the Active Transportation Strategy.

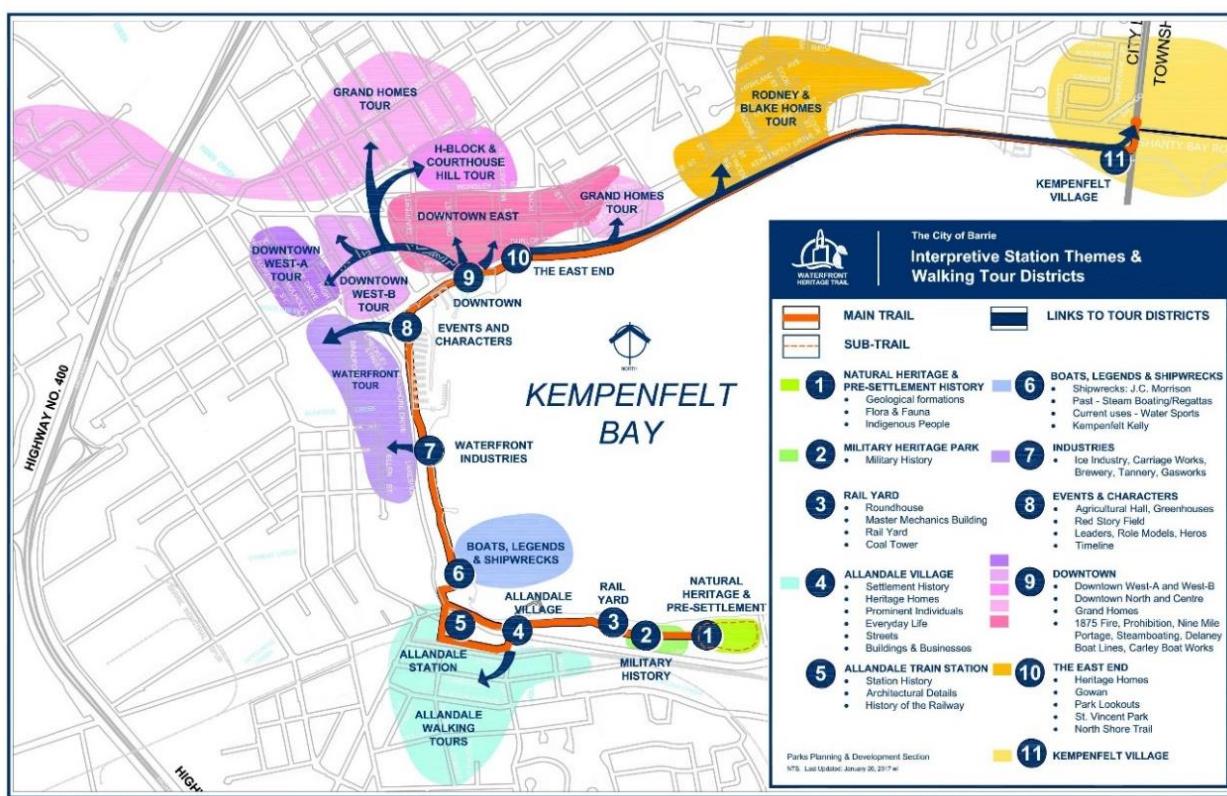
## 1.1.2 ABOUT THE TRAILS

The City of Barrie currently manages and maintains approximately 170km of trails throughout the City, approximately 70km of which are classified as tertiary trails and are not being addressed in this Trails Master Plan. The trails network – in its current state – includes multi-use trails in the urban context as well as off-road trails and pathways within some of the suburban and natural areas.

The waterfront is one of the City of Barrie's most prominent features drawing numerous residents and visitors annually. The Waterfront Heritage Trail connects numerous tourism and recreational features along its 6.0km linkage.

One of the purposes of the Trails Master Plan is to build upon and provide additional linkages to the Waterfront Heritage Trail and other key trails throughout the City.

Some other significant trail attractions include the Ardagh Bluffs, the Nine Mile Portage Trail, North Shore Trail and the Trans Canada Trail now known as the Great Trail. Some of these trails, such as the Ardagh Bluffs, have an associated Park Plan that includes information regarding the social, natural, and physical environment, issues and opportunities, as well as future plans for the trails.



Waterfront Heritage Trail Concept | **Source:** City of Barrie

<https://www.barrie.ca/Living/ParksTrails/Trails/Documents/Heritage-Trail-Concept-Map.pdf>



Top: Ardagh Bluffs Natural Area Trailhead;  
Middle: Nine Mile Portage Trail Signage;  
Bottom: Waterfront Heritage Trail; Source: City of Barrie

Establishing a fully connected and continuous off-road trail network is a challenge in any municipality due to a number of factors including but not limited to the availability of fully linked public park and open space land; topography; linear barriers such as rivers, major roads and highways and railways. Barrie is no exception. As such, the City has also invested in on-road cycling infrastructure, sidewalks, and in some locations, in-boulevard multi-use trails within road rights-of-way to enhance connectivity between off-road trails.

The design and implementation of trails is not only about the physical linkages. There are other elements to a comprehensive trails network which heavily influence their use and the users' enjoyment.

The City has implemented additional trail infrastructure including access barriers, trail and pavement markings, trail and roadway signs, and concrete ramps throughout its trail system to support the needs of various trail users. The City of Barrie also implements changes to roadway or trail alignments, and applies safety measures such as crossings and signals when necessary, to increase the level of safety for all users.

To enhance and encourage the use of the trail system the City has implemented local initiatives to promote and generate interest in trails system. Some of these include the recently launched Discover Barrie Interactive Map which provides users with an illustration of the various existing cultural opportunities found throughout the City. Barrie by Bike is also a comprehensive resource. Launched by Tourism Barrie, it continues to be a hub of information and promotes the infrastructure available and other supportive resources to help with bicycle rentals and repair. Tourism Barrie also partners with the City to release an annual Official City of Barrie map which details all existing trails.

## 1.1.3 SUPPORTING TRAILS

Residents use the trail system. They understand the value and importance of a trail network within a municipality and appreciate the role that it plays in both the transportation and recreation system. While there is a strong basis of understanding, there is still an appreciation for and interest in improvements and enhancements to the existing trail network by residents and a more coordinated and strategic approach to design and implementation by staff and Council.

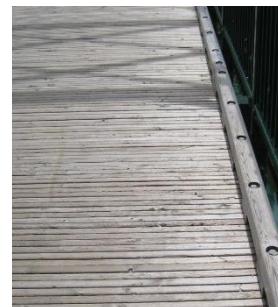
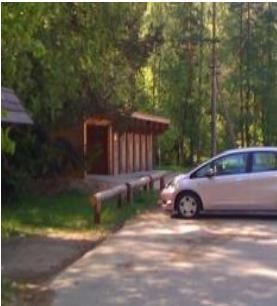


Photographs taken at the Public Open House for the Transportation Master Plan;  
Source: WSP 2018

As part of the development of the Trails Master Plan, a round of consultation with the public and meetings with staff was undertaken. A preliminary version of the proposed trail network was presented at the open house in November 2018. Attendees were asked to provide their input on general transportation elements within the City. Some of the attendees provided comments on the trail network and / or active recreation including:

- 1.** The need for greater trail access including connections with a shuttle from one end of the Waterfront Trail system to the other.
- 2.** Consideration for potential trail upgrades in select locations where the trail is unpaved trail (e.g. Wildflower Trail between Military Park and the end of White Oaks).
- 3.** The need for improved signage in select locations including maintenance of existing signage or integration of new signage.
- 4.** Consideration of safety features along trail connections including the use of more illumination.
- 5.** The need for improved active transportation infrastructure including connections between on and off-road systems.

As noted above, the design of trail routes and facilities is not limited to the trail itself. There are other design considerations which need to be addressed and integrated to enhance overall experience and a users' sense of comfort and safety. As part of the open house; an interactive display board was prepared which asked respondents to provide input on different trail design features. A replica of the board is presented below along with highlights of the responses.

TRAIL BRIDGE	ENTRANCE & GATES	LIGHTING	BOARDWALKS
			
★★★★★	★★★★★	★★★★★★★★★	★★★★★
WASHROOMS	CROSSINGS	PARKING	SIGNAGE & WASTE RECEPTACLES
			
★★★★★★★★★	★★★★★	★★★★★	★★★★★★★★★

**Table 1 | Summary of Input Received at Public Open House**

Based on the input received respondents indicated a significant interest in the integration of washrooms, lighting and signage and waste receptacles. These design treatments were considered as part of the network design process with additional design guidelines described in **section 2.3**.

Additional comments were provided on this display board including inquiries about the design and application of crossings and boardwalks indicating a need for greater education around trail design treatments and their application.

## 1.2 RATIONALE FOR THE TRAILS MASTER PLAN

*The development and implementation of a municipal trails master plan can have a significant impact on the community. There are many reasons why there should be additional consideration for and commitment to trails in Barrie, including broad based community and individual benefits, supportive policies, and guidelines. Each are outlined in more detail below.*

### 1.2.1 BENEFITS OF TRAILS

Trails offer many benefits to a City and its residents and visitors. Those benefits can be experienced at an individual level, as well as at a City-wide level. While trail benefits can be unique to different neighbourhoods in the City, a few common benefits have been outlined below.

#### EDUCATIONAL & COMMUNITY BUILDING

Trails that are located through natural heritage lands offer the opportunity to educate the public on the City's rich environmental landscape. Given trails cannot be accessed by motor vehicles, the trail experience is one that occurs at the human level and allows for a sensory experience. Education may also be provided through signage and plaques along the trail network, informing users of locations of particular significance. Trails that have "trail ambassadors" or community groups tasked with their monitoring and upkeep provide an added benefit in community building by bringing the community together to ensure that the City is made aware of any issues as they may arise. Additionally, these groups may ensure that the trail is maintained in a condition that allows for its continued use by the public.

#### HEALTHY COMMUNITIES & RECREATION

Trails provide residents and visitors with an opportunity to engage in an active lifestyle. Trails provide an off-road opportunity for people to get active, should they not feel comfortable using the on-road active transportation network.

Almost half of Canadians, ages 12 and over, report being physically inactive and 26% of youth between the ages of 2 and 17 years old are overweight or obese (Statistics Canada).

Ontario Ministry of Health and Long-Term Care states that only 30 minutes of brisk walking per day is required in order to maintain one's health, and the most effective fitness routines are moderate in intensity, individualized and incorporated into daily activities. A 5% increase in the walkability of a residential neighbourhood was associated with 32 more minutes of physically active travel per day and a 0.23% reduction in Body Mass Index (BMI). (Frank, 2006) and individuals who have access to trails increase their recreational activity on average by 44% (Irish Trail Strategy, 2006).

## **TOURISM/ECONOMIC DEVELOPMENT**

Trails across North America have created numerous economic benefits and opportunities for the communities that they pass through. Communities benefit from trail development through increases in business activity and by providing services to an increasing number of trail users. Trails provide benefits to the local economy first during construction, through the design, supply and installation of materials, then following construction, trail use generates economic benefits in a variety of forms from direct expenditures such as trail gear, food, lodging (for tourists), and indirect benefits such as jobs.

Barrie provides a unique and special place where residents live, work, and play. The City recognizes the importance of tourism to community prosperity and economic development. Tourism is a proven economic development tool that promotes new business opportunities and new revenues in the local economy.

Tourism generates jobs beyond the base employment levels needed to support the local community. Tourism helps local accommodation, retailers, and food and beverage companies thrive and grow year-round. Barrie's beauty, community assets and geographic location will attract both investors and future residents.

Trails connect people to destination amenities and businesses in Barrie. Cycling tourism is growing and Barrie's landscape, existing regional trail network, communities and amenities are ideally suited for attracting cycling tourists. The City of Barrie is in a strong position to market trails-related tourism opportunities, contributing to strengthening the City's economy.

## **ENVIRONMENTAL STEWARDSHIP & SUSTAINABLE TRANSPORTATION**

Trails provide public access to Barrie's natural environment. They allow people to observe and enjoy wildlife, as well as forests, wetlands and waterfront. Sensitively constructed trails give residents and visitors an appreciation for Barrie's natural areas and waterfronts throughout the seasons which in turn, helps promote a sustainability ethic.

Trails prohibit use by motor vehicles (with the exception of motorized mobility devices and City service vehicles), which ensures that they remain as linkages for recreational and commuter travel.

## **ACTIVE TRANSPORTATION & SOCIAL EQUITY**

Trails offer a tremendous benefit to the City of Barrie by providing an extension to the on-road active transportation network. In providing this extension, the overall active transportation network is improved and made more useful to residents and visitors. Depending on the location, trails can function as off-road alternatives to the on-road active transportation network and provide residents with another active transportation option when traveling within the City. Trails contribute to social equity by binding neighbourhoods together and allowing for residents to travel within the City regardless of demographic, education or income.

### 1.2.2 POLICY SUPPORT

In the past decade, there has been an increase in support for active transportation and recreation from all levels of government. Provincial, County, and Municipal governments are now working together and establishing policies, research, strategies and initiatives which provide support for investments and improvements which accommodate self propelled forms of transportation and improve the overall community quality of life.

To inform the development of the Trails Master Plan, policies at each level of government were reviewed and summarized. **Table 2** lists relevant policies that have an influence on the Trails Master Plan. A summary of the findings including supportive policies is found in **Appendix B-1** of the Active Transportation Strategy.

PROVINCE OF ONTARIO	SIMCOE COUNTY	CITY OF BARRIE
<ul style="list-style-type: none"> <li>– Ontario Trails Strategy, 2005</li> <li>– #CycleON: Ontario's Cycling Strategy, 2013</li> <li>– Ontario's Cycling Tourism Plan, 2017</li> <li>– Ontario Traffic Manual Book 18: Cycling Facilities, 2013</li> <li>– Climate Change Action Plan, 2016</li> <li>– Provincial Policy Statement, 2014</li> <li>– Bill 51, 2006</li> <li>– Accessibility for Ontarian's with Disabilities Act, 2005</li> </ul>	<ul style="list-style-type: none"> <li>– Official Plan, 2016</li> <li>– Trails Strategy, 2014</li> <li>– Transportation Master Plan, 2014</li> </ul>	<ul style="list-style-type: none"> <li>– Official Plan, 2018 Office Consolidation</li> <li>– Parks and Recreation Strategic Master Plan, 2010</li> <li>– Waterfront and Marina Strategic Plan, 2015</li> <li>– Urban Forest Strategy, 2013</li> <li>– Lackie's Bush Interim Master Plan Report, 2010</li> <li>– Sunnidale Park Master Plan, 2009</li> <li>– The Gables Master Plan, 2008</li> <li>– Little Lake Master Plan, 2007</li> <li>– Ardagh Bluffs Park Plan, 2007</li> <li>– Tyndale Park Master Plan, 2005</li> <li>– North Shore Trail Master Plan, 2002</li> </ul>

**Table 2** | List of Policies Relevant to the Trails Master Plan

### 1.2.3 GUIDELINES

The City of Barrie has developed and adopted engineering standards, policies and guidelines which provide staff and partners with the necessary direction to plan, design and implement services and infrastructure City-wide. Select standards and guidelines refer to the planning, design and construction of trail infrastructure. The following is an overview of those resources.

As part of the development of the Trails Master Plan a review of these guidelines and standards was completed. The review was completed to ensure that the guidelines align with the recommended trail classification identified for the City of Barrie and current best practices in trail design and construction.

STANDARD / GUIDELINE	APPLICABILITY
DEVELOPMENT MANUAL	Developed in 2017, there are numerous references to trail infrastructure to guide the design and development of municipal infrastructure assets. Trails are identified as landscape related elements and require detailed drawings be submitted to the City prior to approval. Both existing and proposed trails are to be included within any plan and profile drawings and pavement marking and signage plan as well as park development master plans submitted to the City. No revisions are suggested for this document at this time.
TRANSPORTATION DESIGN MANUAL	Developed in 2017 the manual reflects current and emerging standards and technology, legislation and best practices and guides transportation specific design and construction. Boulevard pathways are identified as the only trail facility within the manual but are defined as facilities found within the municipal road ROW. There is no reference to trail infrastructure in any other location within the Manual. Additional consideration for trail crossings or features within the municipal ROW should be considered when this manual next updated.
PARK STANDARD: FENCES & GATES	<p><b>STANDARD DETAIL 1274</b> provides an overview of trail design requirements for trail types within various municipal contexts i.e. open space, parkland and stormwater management facilities. The use, surface type, depth, width, clearance and set-back, etc. are all provided. Based on the information contained within the trail master plan, revisions to these standards are suggested.</p> <p><b>STANDARD DETAIL 1350 &amp; 1351</b> address the application of trail lighting and provides direction on the design and construction of lighting specifically within the park space. Depending on the proposed trails and their context the application of these standards is to be considered on a case by case basis.</p>
PARK STANDARD: TRAILS, PATHWAYS & WALKWAYS	<p><b>STANDARD DETAIL 1216 &amp; 1217</b> provide design and construction details for trail bollards and control gates. As part of the plan trail access controls and amenities were considered.</p>

**Table 3 | Overview of Existing Trail Guidelines & Standards**

#### 1.2.4 MUNICIPAL & COMMUNITY INTERESTS

The development of a trail master plan is very much in-line with community priorities and interests. Investment in trail development leading to increased community health, quality of life and economic investment can help to improve sustainable growth and further support the City's strategic priorities. Within Barrie's 2018 – 2022 Strategic Plan Council has adopted five key goals. The Trails Master Plan directly addresses one of these goals and supports the other four, as described on the following page.

\$  
1

**GROWING OUR ECONOMY** One of the primary goals of the City is to make it easier to do business and to help local businesses grow. The Trails Master Plan will support the creation of more stable and diverse jobs by providing access to employment areas for all community members. Improving and developing Barrie's trails network will also provide opportunities for residents and visitors to travel and explore the City, thus supporting tourism and industry growth.

2

**FOSTERING A SAFE AND HEALTHY CITY** Trails support accessible and affordable transportation options and help address social issues experienced by community members. They also promote recreation opportunities for people of all ages and abilities and encourage people to live healthy, active lifestyles. Developing a trails network supports Barrie's focus of becoming a greener City while mitigating and adapting to climate change by preserving green spaces and reducing greenhouse gas emissions.

3

**BUILDING STRONG NEIGHBOURHOODS** Trail development also promotes social interaction between community members and can help develop great public spaces for people to enjoy. By developing a connected network of trails, this can encourage community connections within diverse neighbourhoods. The Trails Master Plan also supports walkable communities where people can reach key destinations on foot, by bicycle or using a mixture of active transportation and public transportation.

4

**OFFERING INNOVATIVE AND CITIZEN DRIVEN SERVICES** Another goal of the City is to use technology to deliver services more effectively and achieve customer service excellence. The Trails Master Plan helps inspire community participation using consultation and engagement strategies.

5

**IMPROVING THE ABILITY TO GET AROUND** Recreational trails complement and provide connections to the active transportation network of sidewalks, in-boulevard trails and on-road cycling routes. In some locations trails provide direct connections to community destinations and may be shorter than following the sidewalk and road network.

## 1.3 MASTER PLAN CONSIDERATIONS

*In addition to the existing trail conditions and support from local, county and provincial policies and initiatives, there are some additional key foundations to the Trails Master Plan including the vision that the plan aims to achieve, the specific community trail objectives as well as opportunities and challenges that need to be addressed. These are outlined below.*

### 1.3.1 TRAIL VISION & OBJECTIVES

A vision statement is typically prepared for a master plan to clearly articulate the anticipated or desired outcome that will be achieved with the implementation of the network and recommendations outlined within the plan.

As part of the development of Trails Master Plan a vision statement was prepared which reflects the input and ideas generated through discussion with staff, from public input received and overall objectives for the project. Six project objectives were defined by City staff early in the study process to help shape the scope of the project.



*Understand the current state of trails in the City of Barrie.*



*Consult with the public and stakeholders.*



*Review local policies, plans and standards influencing trail development.*



*Provide guidelines for trail design and maintenance.*



*Consolidate and integrate plans for new development lands into the overall plan*



*Develop strategies, priorities and costs for improving existing trails and adding new trails.*

The vision statement also builds upon and complements the vision statement developed for the Active Transportation Strategy and provides more trail specific direction and aspirations for the City of Barrie. These vision statements should be considered and referenced together as the City proceeds with implementation of both the ATS as well as the Trails Master Plan.

ACTIVE TRANSPORTATION	TRAILS
<p><i>“The City of Barrie offers a continuous, well-connected and safe active transportation network for residents and visitors that supports recreational and commuter active transportation opportunities, enhances connectivity to key destinations and increases mobility for users of all ages and abilities .”</i></p>	<p><i>“Trails in Barrie provide year-round recreational opportunities for residents and visitors of all ages and abilities to access and enjoy public greenspace through a comprehensive and connected city-wide system. As a part of the active transportation network, trails are linked with sidewalks and on-road cycling routes.”</i></p>

The vision for trails is intended to capture the fundamental recreational nature of trails, yet recognize the capacity for some to also provide a commuter function, depending on their location and design. This distinction is important because recreational movement most often occurs at a much slower pace than commuter focused active transportation movement. The City recognizes the importance of providing facilities for both destination driven, faster paced commuter travel and the slower pace of recreational movement.

### 1.3.2 TRAIL OPPORTUNITIES & CHALLENGES

One of the primary goals of the Trails Master Plan is to identify and address the challenges that are currently being experienced by staff and users of the trail network and to leverage the community opportunities that are available.

Over the course of the development of the Plan, a number of opportunities and challenges were identified for future trail development and design. The information was gathered based on input from City staff, stakeholders and the public as well as general observations from field investigation and background review. The following is an overview of the trail opportunities and challenges for the City of Barrie which were considered as the network, guidelines and recommendations were developed.

**Table 4 |** Summary of Trail Opportunities and Challenges in Barrie

OPPORTUNITIES	CHALLENGES
<ol style="list-style-type: none"> <li>1. Existing trail linkages such as existing and previously proposed trail infrastructure, which provide some connectivity in parts of the City, such as the waterfront.</li> <li>2. Coordination with the ATS provide opportunities to leverage ATS projects and initiatives to further trail implementation</li> <li>3. Local initiatives such as the promotion and development of trail connections by the City (i.e. waterfront) provide a foundation from which to develop other outreach strategies.</li> <li>4. Connecting to and building on regionally significant networks and linkages within and to surrounding areas.</li> <li>5. Active tourism and recreation destinations within the City create a high demand for active recreation opportunities.</li> <li>6. Coordination with new development opportunities (i.e. continuous routing, funding and implementation) resulting from the development of secondary plan areas.</li> <li>7. Barrie's population is expanding, including a growing number of young families with children, and aging adults; two sectors of the population that benefit from trails.</li> </ol>	<ol style="list-style-type: none"> <li>1. Physical features and characteristics of the city, including topography, narrow steep sided valleys, and other barriers such as railways, major roads and highways.</li> <li>2. Other than new secondary plan areas, there is limited availability of linear public land for trail development in some parts of the City.</li> <li>3. Ongoing and consistent communication and coordination is needed between staff to track and maintain implementation.</li> <li>4. Design guidelines and standards to be updated to support the development of a variety of trail types.</li> <li>5. Like other public facilities public risk and liability are inherent with trails. One of the key measures to mitigate risk is proper trail design and maintenance.</li> <li>6. Resources are limited and there needs to be consideration for the impact that trails have on capital and operation resources today, and into the future as the trail network expands. The Trails Master Plan will assist in bringing this challenge to light, and in developing a forward-thinking approach to the delivery and ongoing operation of trails.</li> </ol>

## 1.4 DEVELOPMENT & CONTENT

*The Barrie Trails Master Plan was developed using an approach which complemented the Active Transportation Strategy component of the Transportation Master Plan. The process used to develop the network including key inputs and outputs are presented in the following sections.*

Initiated later in the Transportation Master Plan study process, the Trails Master Plan was identified as a critical component of the project to ensure that consideration was given for the identification, design and implementation of active transportation facilities outside of the road right-of-way on primarily municipal lands. In total, the Trails Master Plan took approximately 6 months to complete between August 2018 and February 2019.

The process was informed by input from City staff through several project meetings and public and stakeholder input through the public information centre hosted for the Transportation Master Plan on November 13<sup>th</sup>, 2018. At the public input session, preliminary information was presented on the Trails Master Plan including:

- 1.** The proposed classification of trail types and an overview of the design considerations for each option.
- 2.** A set of suggested trail design enhancements i.e. signage, wayfinding, crossings, etc. which were used to gather input on preferred design treatments.
- 3.** A network of existing and proposed pedestrian and trail improvements by facility type which were used to gather input on suggested new trails, enhancements to existing trails and potential priorities for consideration by the City.

The study process and the input received through the consultation and engagement process influenced the direction and details of the master plan report. The master plan report provides references, resources and context to help shape the future planning, design, implementation, management and maintenance of trail infrastructure throughout the City of Barrie.

An overview of the sections contained within the Trails Master Plan is provided in the table below along with a brief description of how the content of each section is intended to be used.

<b>1</b>	<b>CONTENT:</b> Chapter 1.0 provides an overview of the context and support for trail development within Barrie including policies, vision, objectives, etc.	<b>PURPOSE:</b> To provide an overview of some of the rationale / business case for future investment in trails within the City of Barrie.
<b>2</b>	<b>CONTENT:</b> Chapter 2.0 provides an overview of the network development process as well as design considerations for the proposed network.	<b>PURPOSE:</b> This chapter is a detailed documentation of the input and outputs of the process and the key recommendations of the plan.
<b>3</b>	<b>CONTENT:</b> Chapter 3.0 outlines the proposed implementation strategy including suggested recommendations, policies and tools.	<b>PURPOSE:</b> The content of this chapter supports the future implementation and operation of the trails as well as future planning and coordination.

## 2

## DEVELOPMENT &amp; DESIGN



*Trails are unique **community resources** which are part of a comprehensive active transportation and recreation system. They **highlight natural areas** and provide **access to community destinations**.*

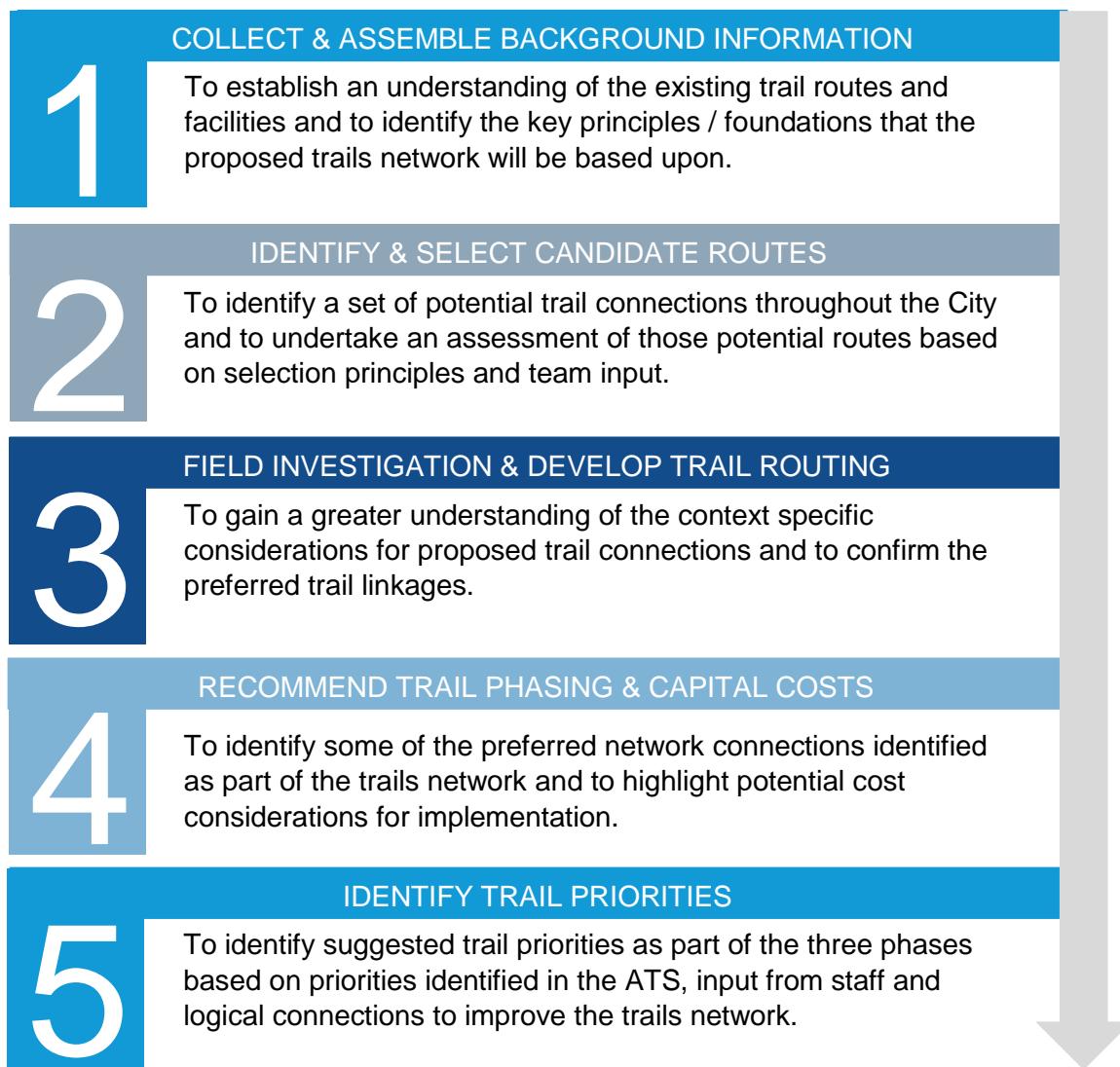
## SECTION CONTENT:

- 1 An overview of the step by step approach used to identify and select the proposed trail network as well as outcomes of the process;
- 2 A detailed description of the proposed trail network for the City of Barrie including an overview of the various components of the network (i.e. trails in new development areas and on-road cycling connections); and
- 3 An overview of the trail design guidelines, standards and considerations that have been identified to guide the design and construction of trail and supportive amenities in the City of Barrie.

## 2.1 DEVELOPING THE NETWORK

The trails network is a core component of the Trails Master Plan and provides the blueprint for the future of trail development and design within the City of Barrie. The following section provides an overview of the process used to identify the proposed trail connections throughout the City.

An iterative five step process was used to develop the City's trails network. The process mimics many of the values and principles used for the ATS with focus on off-road and recreational conditions and considerations. The five steps are illustrated below with details on the inputs, process and outcomes for each documented on the following pages.



## STEP 1: COLLECT &amp; ASSEMBLE BACKGROUND INFORMATION

APPROACH	The study team consolidated and digitally mapped existing previously planned trail facilities, including trails planned in association with the secondary plan areas and new development areas. The base information was developed in tandem with the Active Transportation Strategy for consistency.
INPUT	Information was provided by the City and sourced from other publicly available databases of information. Comments were provided by City staff as well as members of the public from the open house session.
OUTPUT	A map of existing and previously proposed conditions was prepared and provided to City staff along with a set of qualitative route selection principles were developed to guide the selection of trail routes.  The map of existing conditions is presented on <b>Map 1</b> . A summary of the existing trail infrastructure is presented below including regionally significant trail systems found throughout the City which make-up the existing trail system. In addition, the route selection principles used to assess the candidate routes is presented on the following pages.

	TOTAL (KM)
EXISTING TRAILS WITHIN THE CITY OF BARRIE	
EXISTING TRAILS	99.3km
REGIONALLY SIGNIFICANT TRAILS <sup>(1)</sup>	
GREAT TRAIL / TRANS CANADA TRAIL	19.2km
NORTH SHORE TRAIL / ORO-MEDONTE RAIL TRAIL / MARTYRS' SHRINE PILGRIM ROUTE	2.9km
NINE MILE PORTAGE TRAIL	5.2km
SIMCOE COUNTY LOOP TRAIL	7.3km

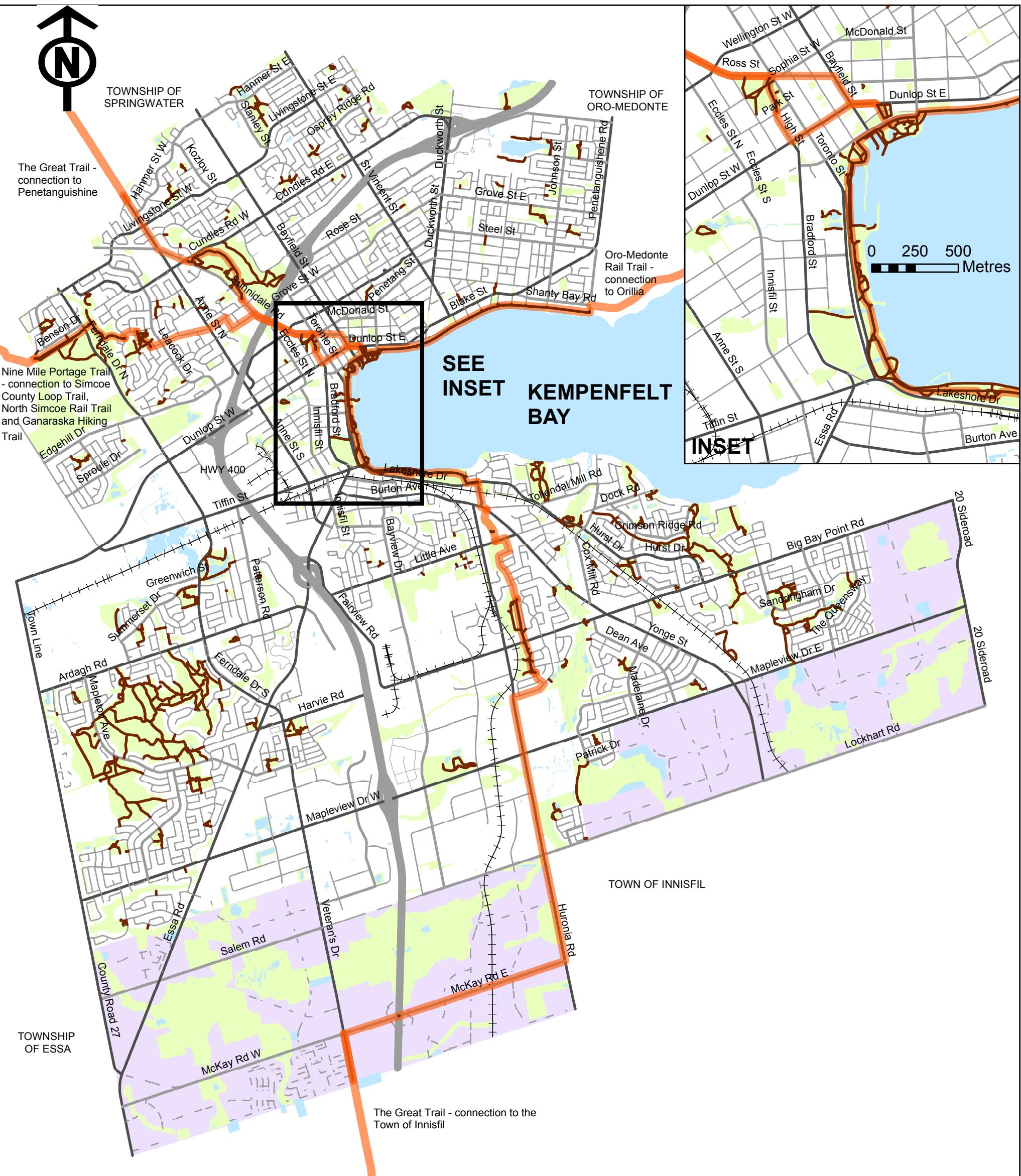
*(1) The length of regionally significant trails reported includes only the portion of these trails within the City of Barrie boundary.*

**Table 5 | Existing Regionally Significant Trails in Barrie**

## ROUTE SELECTION PRINCIPLES

The process of identifying and evaluating trails for inclusion in the recommended network included consideration of a set of key principles. The following principles are intended to reflect the core values and vision for trails in Barrie, as well as common best practices from comparable municipalities. In addition to being used during the development of the Trails Master Plan they should also be referred to from time to time when re-evaluating individual routes and when future trail priorities and opportunities are being considered.

Connected & Linked	<p>Trails will provide residents and visitors with connections to key destinations, various land use types, and complementary active transportation network within the City's boundaries.</p> <p>The trail network will also link to surrounding municipalities by way of regional trails such as the Great Trail/Trans Canada Trail, Oro-Medonte Rail Trail, Nine Mile Portage Trail, North Simcoe Rail Trail, Martyrs' Shrine Pilgrim Route, Ganaraska Hiking Trail and Simcoe County Loop Trail.</p>	Visible	<p>Trails and the trail network will be a visible component of the City's recreation and transportation system.</p> <p>A visible trail system offers opportunities for interpretation, education, marketing and tourism.</p>
Easy to Access	<p>The trail network will be well-marked and easy to find from locations throughout the City, including major community destinations, residential neighbourhoods and natural areas.</p>	Context Sensitive	<p>Trails will be designed be consistent with best practices, however, standard designs may be adjusted to suit locations with unique features or site-specific constraints. In some locations site characteristics or sensitivities may preclude trails.</p>



Map 1  
 Existing Trail Conditions  
 City of Barrie Trails Master Plan

**WSP**



Affordable	<p>Trails and the trail network will be affordable and appropriately scaled for Barrie.</p> <p>Coordinating trails with other public infrastructure projects where feasible and appropriate will provide cost efficiencies.</p> <p>Trails are available for all residents to use and enjoy regardless of age, ability, background and economic status.</p> <p>Monitoring sustainability and affordability will include the collection of performance metrics such as use, user preferences, and costs/benefits.</p>	Diverse, Attractive & Interesting	<p>The trail network will be designed to appeal to a range of users with varying abilities and interests by providing a variety of facility types and experiences. In doing so, they will provide opportunities for sensory experiences to connect people with nature, passive and active recreation opportunities, access to tourist destinations, attractive and scenic areas, views and vistas.</p>
Risk-Managed	<p>Reducing risk to users and promoting safety is paramount. Principles of Crime Prevention Through Environmental Design (CPTED) will be considered when selecting and designing individual trail routes.</p>	Accessible	<p>Where feasible and practicable, trails will be designed to be accessible according to the Accessibility for Ontarians with Disabilities Act.</p> <p>Classification of trails will be used as a guiding tool when addressing accessibility of individual trails.</p>
Green	<p>The trail network will guide access to Barrie's green infrastructure to protect and preserve the diverse natural resources of streams, bluffs, woodlots, parks, ravines, wetlands and shorelines. Future development of trails should minimize impacts to the environmental health of air, land and water natural systems.</p>	Sustainable	<p>Sustainability will be a key consideration regarding trail location, alignment, design, materials, operations and maintenance, so that today's trails can be protected for the enjoyment and wellbeing of future generations.</p>

**STEP 2: IDENTIFY & SELECT CANDIDATE ROUTES**

<b>APPROACH</b>	<p>Candidate routes include those routes which could potentially form part of the proposed trail network. Candidate routes include but were not limited to missing links in the existing system, connections to the wider active transportation network, trails in new development areas, natural areas and corridors under public ownership and previously planned routes identified in other planning documents.</p> <p>The intent was to refine the list to identify only the preferred and most optimal trail options / alternatives.</p>
<b>INPUT</b>	<p>Routes were refined based on the following information:</p> <ul style="list-style-type: none"><li>– Consolidated base mapping;</li><li>– Route Selection Principles;</li><li>– Network routes identified in the Active Transportation Strategy for consistency and connectivity to the cycling and pedestrian network</li><li>– Expertise of the study team;</li><li>– Consultation with the public; and</li><li>– Desktop analysis using the GIS database and aerial imagery provided by City, and with the use of Google Earth.</li></ul>
<b>OUTPUT</b>	<p>A map of candidate routes was prepared and provided to City staff. Once the routes had been reviewed and confirmed a revised trail network concept map was prepared. The candidate routes are illustrated on <b>Map 2</b>.</p>



Map 2  
Candidate Routes  
City of Barrie Trails Master Plan

**WSP**



## STEP 3: FIELD INVESTIGATION &amp; DEVELOP TRAIL ROUTING

APPROACH	The study team examined the candidate routes in the field and collected additional information regarding the route context to help inform the identification of the preferred trail network. It is important to note that this did not include walking any potential trail alignments on privately-owned development lands or secondary plan areas, instead observations were made for key locations from roadsides/within the road right-of-way. The high-level evaluation will require more detailed validation as part of the implementation process for individual routes, which will in some cases / locations involve additional detailed investigations, studies and feasibility analysis to confirm routing and inform detailed design. The candidate routes were further refined to ensure that they connected with / linked to the proposed network identified as part of the ATS.
INPUT	<ul style="list-style-type: none"> <li>— Photographs and waypoints gathered during the field investigation</li> <li>— Route selection principles and input from City staff representatives</li> <li>— Draft active transportation network</li> </ul>
OUTPUT	<p>The trail route network was the primary outcome of this step. The proposed trail network identified for the City of Barrie also identifies each link according to a 5-type trail classification. A more detailed description of the classification is presented in section 2.2.</p> <p>A summary of the proposed trail network is presented in the table below and is illustrated in <b>Map 3</b> (Proposed Trail Network) and <b>Map 4</b> (Trail Classification).</p>

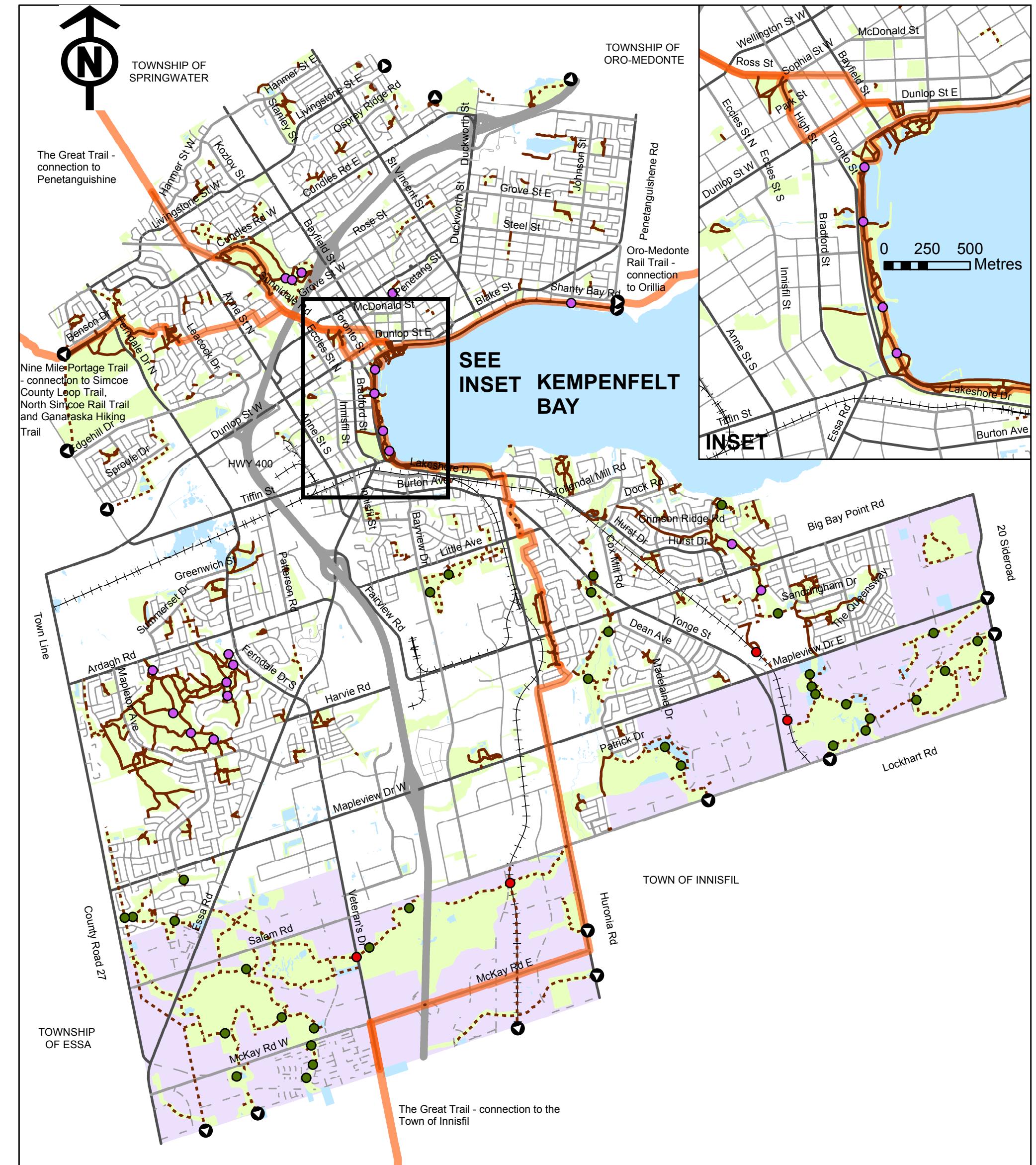
	EXISTING (KM) (1)	PROPOSED (KM)	TOTAL (KM)
WATERFRONT MULTI-USE TRAIL (TYPE 1)	8.9	0.0	8.9
MULTI-USE TRAIL (TYPE 2)	45.8	7.5	53.3
CONNECTOR TRAIL (TYPE 3)	14.9	55.1	70.0
NATURAL TRAIL (TYPE 4)	27.7	6.2	33.9
STORMWATER MANAGEMENT FACILITY ACCESS (TYPE 5)	2.0	0.8	2.8
<b>TOTAL</b>	<b>99.3</b>	<b>69.6</b>	<b>168.9</b>

*The 99.3km of existing trails reported does not include approximately 70km of tertiary trails that are owned and operated by the City.*

**Table 6 |** Summary of Proposed Trail Network by Trail Type

## STEP 4: RECOMMEND TRAIL PHASING &amp; CAPITAL COSTS

APPROACH	<p>In addition, a suggested phase (short 2019 – 2021; medium 2022-2031; and long 2031+) was identified for trail segments that make up the network. In addition, potential priority projects were identified in the short and medium-term phases for consideration by the City. The implementation of the trails network will take a considerable amount of budget, time and effort. Effective implementation should be based on a flexible schedule / timeline which can be integrated into day to day decision making.</p> <p>To guide the implementation of the trails network, high-level unit costs were identified and applied to the proposed trail network. It is important to note that as part of the implementation of individual routes in the future, a more detailed assessment will be needed to confirm/refine the route alignment and a more detailed cost estimate at the appropriate time.</p> <p>Maintenance costs are a key component of the overall life cycle cost for trails. Trail maintenance, including information on cost ranges can be found in section 3.2.</p>
INPUT	<p>Unit costs were identified based on comparable municipalities and used to establish an estimated construction cost for each proposed route. More detailed information regarding the assumed unit costs please refer to Appendix B3 in the Active Transportation Strategy.</p> <p>Preliminary phasing information was gathered from several sources including planned and individual suggested priority projects identified within the TMP, capital projects previously identified by the City, input from the public and stakeholders and timing of planned development. Consideration of necessary next steps was also integrated into the decision-making process.</p> <p>Input was provided by the study team including City staff representatives.</p>
OUTPUT	<p>A phasing map was prepared which illustrates the proposed phase for each recommended route. The phasing map is presented on <b>Map 5</b>. A summary of proposed routes by phase is presented in <b>Table 7</b> and an overview of the high-level costing can be found in <b>Table 8 and 9</b>.</p>



### Off-Road Network

- Existing Trail
- Proposed Trail

### Regional Trail Network

Regionally Significant Trail Routes  
(i.e.: The Great Trail, Oro-Medonte Rail Trail, North Simcoe Rail Trail, Ganaraska Hiking Trail, Simcoe County Loop Trail)

### Supporting Infrastructure

- Existing Trail Bridge
- Proposed Trail Bridge
- Proposed Underpass
- Potential Connection to Surrounding Municipality

### Other Features

- Secondary Plan
- Park / Open Space
- Water / Watercourse

Data Sources: City of Barrie  
Date Updated: April, 2019  
Project: 171-08853-00  
Map Created By: WSP Kitchener

0 500 1,000 1,500 2,000 Metres

### Map 3

Proposed Trail Network  
City of Barrie Trails Master Plan

**WSP**



# TOWNSHIP OF SPRINGWATER

## TOWNSHIP OF ORO-MEDONTE

**SEE  
INSET KEMPENFELT  
BAY**

## INSET

20 Sideroad

Off-Road Network Trail Classification Supporting Infrastructure

— Existing Trail

..... Proposed Trail

— Type 3

— Type 4

— Type 5

- Existing Trail Bridge
- Proposed Trail Bridge
- Proposed Underpass
- ▶ Potential Connection to Surrounding Municipality

## Other Features

## Secondary Plan

## Water / Watercourse

## Park / Open Space

#### Data Sources: City of Barrie

Data Sources: City of Bayonne  
Date Updated: April, 2011

Project: 171-08853-00

Map Created By: WSP Kitchener

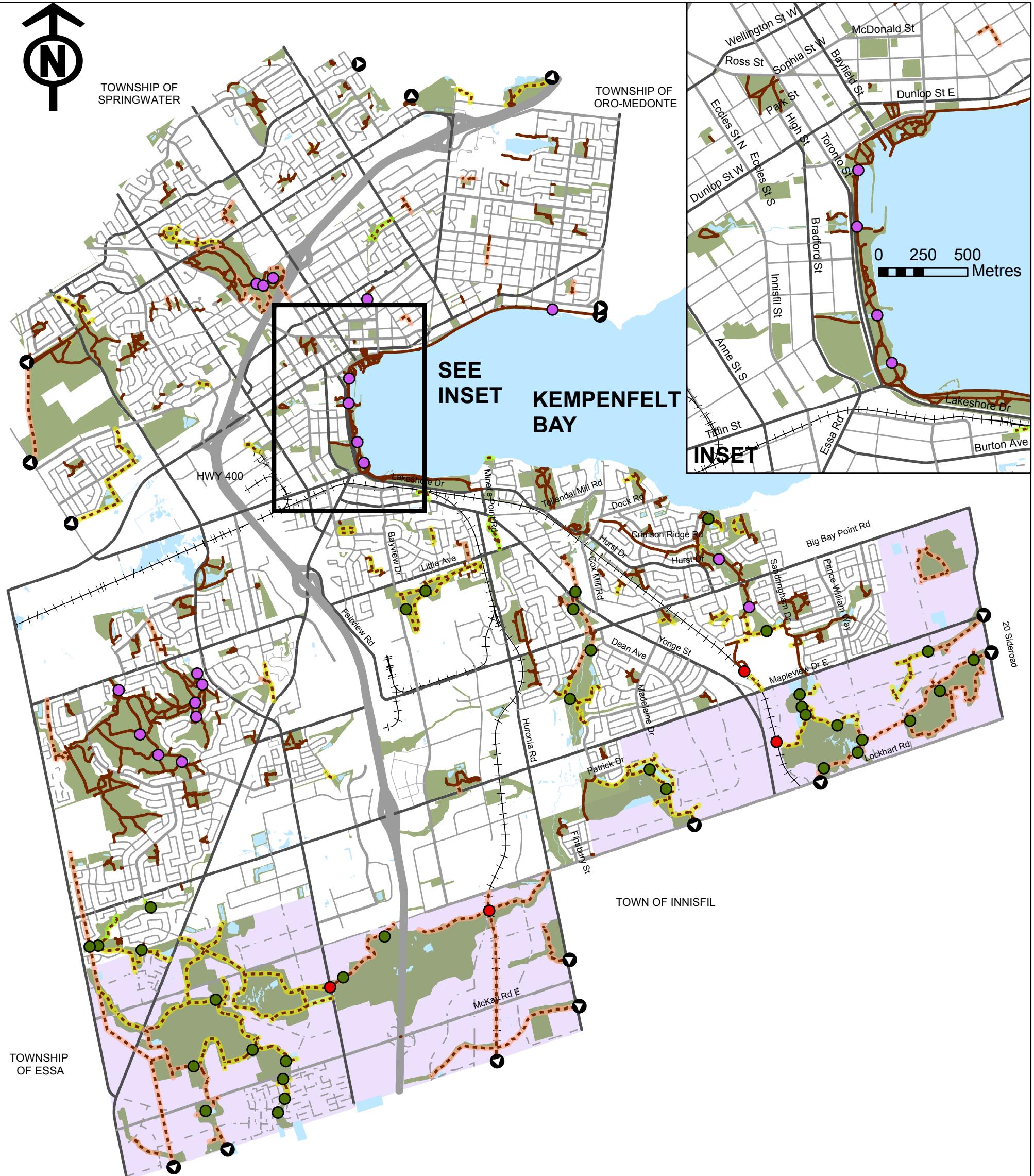
0 500 1,000 1,500 2,000 Metres

# Map 4

## Trail Classification

### City of Barrie Trails Master Plan

WSP



#### Off-Road Network

- Existing Trail
- Proposed Trail

#### Phasing

- Short-Term (2019-2021)
- Medium-Term (2022-2031)
- Long-Term (2032-2041)

#### Supporting Infrastructure

- Existing Trail Bridge
- Proposed Trail Bridge
- Proposed Underpass
- Potential Connection to Surrounding Municipality

#### Other Features

- Secondary Plan Area
- Water / Watercourse
- Park / Open Space

Data Sources: City of Barrie  
Date Updated: April, 2019  
Project: 171-08853-00  
Map Created By: WSP Kitchener

0 500 1,000 1,500 2,000 Metres

Map 5  
Trail Phasing  
City of Barrie Trails Master Plan

**WSP**



	WATERFRONT MULTI-USE TRAIL TYPE 1 (km)	MULTI- USE TRAIL TYPE 2 (km)	CONNECTOR TRAIL TYPE 3 (km)	NATURAL TRAIL TYPE 4 (km)	STORMWATER MANAGEMENT FACILITY ACCESS TYPE 5 (km)	TOTAL
SHORT	0	0.2	1.2	0.0	0.2	1.6
MEDIUM	0	3.9	27.6	1.8	0.6	33.9
LONG	0	3.4	26.3	4.4	0	34.1
TOTAL	0	7.5	55.1	6.2	0.8	69.6

**Table 7 | Summary of Kilometres of Proposed Trail Type by Phase**

As noted above, **Appendix B3** of the Active Transportation Strategy lists unit costs for the construction of various elements of the trail network. These unit costs are based on averages obtained from recent local construction projects as well as others from across Ontario, and were used to develop an opinion of probable cost to construct the trail network. Unit costs (in 2019 dollars) are based on the following assumptions:

- The unit costs assume typical or normal/average conditions for construction. For example, unit prices assume good soil conditions, an average requirement for grading;
- Estimates do not include:
  - Professional/consultant services and/or staff time for additional studies such as natural and cultural heritage impact studies, studies and/or costs related to addressing Species-at Risk requirements, Environmental Assessments;
  - Professional/consultant services for detailed design, tendering and contract administration
  - Costs for property acquisitions, utility relocations, driveway/entrance restorations, permits or approvals for construction;
  - Trail lighting, as only a limited number of trails in the City would be considered for lighting;
  - Upgrades to existing trails;
  - Maintenance and operation of existing and proposed new trails;
  - Costs associated with individual larger/significant site-specific projects such as railway crossings, retaining walls and stairways; (a cost for trail bridges was included based on an average assumed unit cost and the number of bridges indicated in the network)
  - Annual inflation (e.g. increased cost of labour, materials, fuel etc.) and applicable taxes.

Consideration of these items could contribute significantly to costs, depending on factors such as location and existing conditions. More detailed cost estimates would be developed for specific trail segments as they move into the implementation stage. Estimated costs would be developed at the detailed feasibility stage and refined in parallel with any required additional studies and the detailed design. **Tables 8** and **9** provide an estimate of capital costs.

	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TOTAL
SHORT	\$0	\$96,000	\$327,000	\$1,000	\$86,000	\$510,000
MEDIUM	\$0	\$1,902,000	\$7,813,000	\$145,000	\$247,000	\$10,106,000
LONG	\$0	\$1,671,000	\$7,454,000	\$353,000	\$0	\$9,470,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$3,669,000</b>	<b>\$15,594,000</b>	<b>\$499,000</b>	<b>\$333,000</b>	<b>\$20,086,000</b>

**Table 8 |** Summary of Estimated Capital Costs for Proposed Trails by Type and Phase

	TRAIL BRIDGE	TRAIL UNDERPASS	TOTAL
SHORT	\$129,000	\$809,000	\$938,000
MEDIUM	\$2,459,000	\$1,618,000	\$4,076,000
LONG	\$1,812,000	\$809,000	\$2,621,000
<b>TOTAL</b>	<b>\$4,400,000</b>	<b>\$3,236,000</b>	<b>\$7,635,000</b>

**Table 9 |** Summary of Capital Trail Bridge and Trail Underpass Costs by Phase

## STEP 5: IDENTIFY TRAIL PRIORITIES

APPROACH	<p>There are a number of proposed trails identified throughout the City of Barrie which will take years to implement. The identification of a set of trail priorities is intended to help City staff focus their implementation efforts and streamline some of the decision making surrounding which trail linkages to implement when.</p> <p>In some cases, proposed trail linkages are considered critical missing links in the system. These types of projects are considered connectivity priorities. There are other proposed trails that require minimal investment to achieve a key connection. These types of projects are considered “quick wins”. Lastly, there are proposed trails which are considered long range community priorities or connections. These types of projects require significant financial and time investment. Within the short and medium-term potential priority trail projects have been identified for consideration by the City.</p>
INPUT	<ul style="list-style-type: none"> <li>— The trail priorities were identified with input from City staff representatives on the project team.</li> <li>— Other considerations and inputs included the field investigation of potential and proposed routes as well as the identification of next steps needed to design and construct the proposed project.</li> </ul>
OUTPUT	<p>illustrates the proposed priority projects identified throughout the City. The following tables provide an overview of the considerations for each priority including the rationale for its selection, elements that would need to be addressed through implementation and the proposed design and some design considerations unique to each project.</p>

# SECTION 2.0 DEVELOPMENT & DESIGN



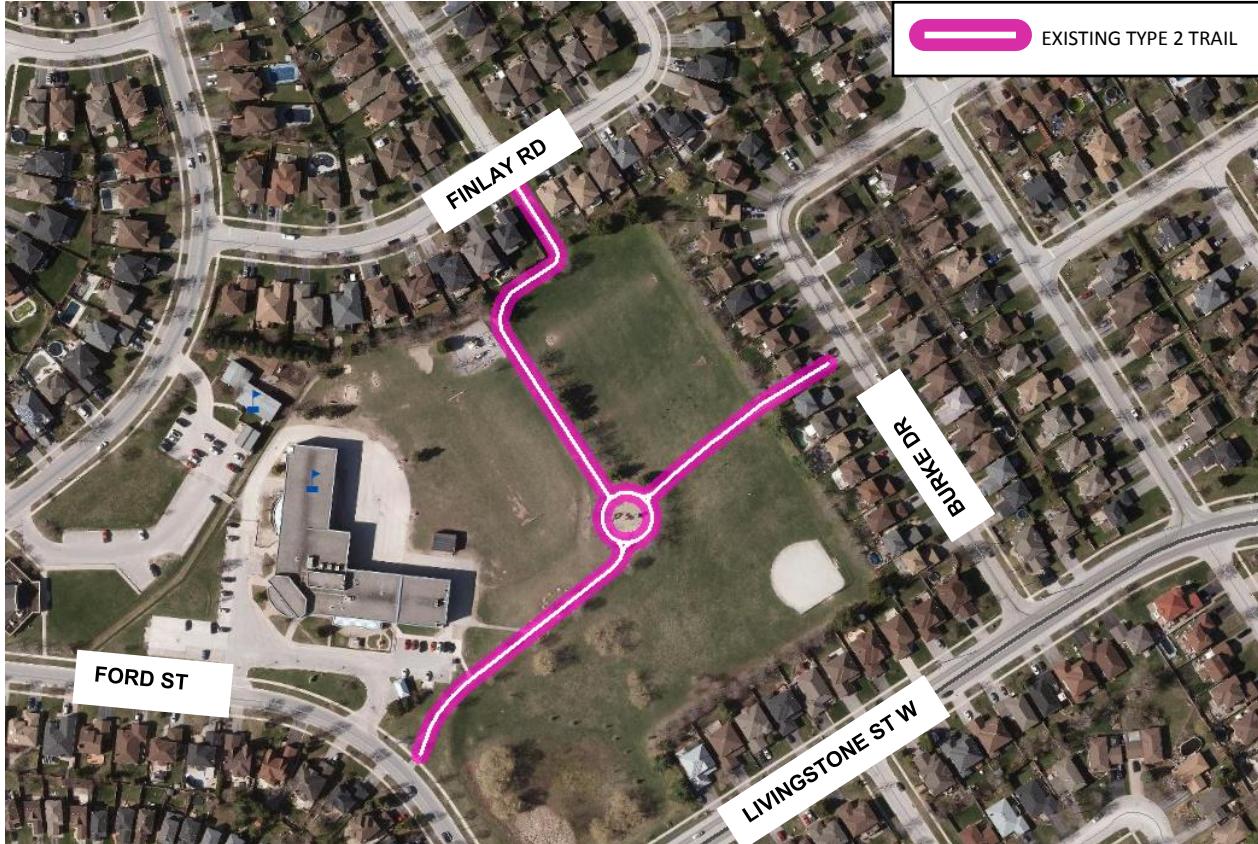
**Figure 1 | Overview of Proposed Short and Medium-term Priority Projects**

### 2.1.1 SHORT-TERM PRIORITIES

PRIORITY #1 DESCRIPTION:	DESIGN APPLICATION:
LOCATION:	RATIONALE:
West Bayfield Park	<ul style="list-style-type: none"> <li>– The existing trail network and lighting infrastructure through West Bayfield Park is in poor condition and in need of replacement</li> <li>– The trail network provides a direct connection from West Bayfield Elementary School to the adjacent residential lands</li> </ul>
DESIGN CONSIDERATIONS:	<ul style="list-style-type: none"> <li>– The existing trail network is made up of Type 2 trails</li> <li>– The City should evaluate the state of the electrical infrastructure currently in place</li> </ul>
SUGGESTED NEXT STEPS:	<ul style="list-style-type: none"> <li>– Modify the design as necessary and construct to the recommended Type 2 trail standards</li> <li>– Retrofit/replace the existing electrical infrastructure that supports the lighting in the park</li> </ul>

# SECTION 2.0 DEVELOPMENT & DESIGN

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Aerial view of West Bayfield Park and the existing trail through the park (Source ArcGIS, 2019)

PRIORITY #2 DESCRIPTION:	DESIGN APPLICATION:
DESIGN CONSIDERATIONS:	RATIONALE:
SUGGESTED NEXT STEPS:	

**LOCATION:** Waterfront Trail between Tiffin Street and White Oaks Road

**DESIGN CONSIDERATIONS:**

- The existing Type 1 Waterfront Trail spans from Tiffin Street in the west to White Oaks Road in the east.
- Key link in the spine trail route from the southern neighbourhoods, connecting them to the waterfront
- Type 1 trail needs to be widened to 3-4m
- Reconstruction of this portion of trail is necessary to accommodate high active transportation user volumes
- Replacement of existing lighting infrastructure to improve night visibility and safety
- Collect any necessary additional background information such as topographic survey, geotechnical in key locations and tree inventory as part of the evaluation to reconstruct and widen the Waterfront Trail
- Develop alignment concept and engage local neighbourhood residents for comments on design
- Determine the infrastructure needs related to the reconstruction of the trail lighting

**SUGGESTED NEXT STEPS:**



Aerial view of the Waterfront Trail between Tiffin Street and White Oaks Road (continuing from Minet's Point Road) (Source ArcGIS, 2019)

PRIORITY #3 DESCRIPTION:	DESIGN APPLICATION:
<b>LOCATION:</b> Hollywood Ravine East (Columbia Road to Garibaldi Drive)	<b>RATIONALE:</b> <ul style="list-style-type: none"> <li>– Connects neighbourhoods north and south of Bear Creek to one another</li> <li>– Provides opportunity to formalize the pathway connection between Columbia and Mapleview (currently a number of informal pathways in this area), close and rehabilitate inappropriate pathways</li> <li>– Provides alternate/optional route to St. Nicholas Elementary School for students on the north side of Mapleview Drive, and to Lougheed Park</li> </ul>
<b>DESIGN CONSIDERATIONS:</b>	<ul style="list-style-type: none"> <li>– Type 3 Trail in Open Space / Environmental Protection Area (EPA) beginning on the north side of the creek, south of Garibaldi Drive</li> <li>– Requires a pedestrian bridge crossing as part of formalizing the connection between Mapleview Drive and Columbia Road</li> <li>– Align trail to follow previously disturbed areas and narrow trail where feasible and avoid removal of higher quality vegetation</li> <li>– Implementation of trail also provides the opportunity to include habitat enhancements and remove invasive species</li> </ul>
<b>SUGGESTED NEXT STEPS:</b>	<ul style="list-style-type: none"> <li>– Consult with conservation authority regarding alignment and any necessary additional study requirements (e.g. Environmental Impact Study)</li> <li>– Collect any necessary additional background information such as topographic survey, geotechnical in key locations, wildlife and tree inventory</li> <li>– Engage local neighbourhood residents, local Councillor and stakeholders in the design process</li> </ul>

# SECTION 2.0 DEVELOPMENT & DESIGN



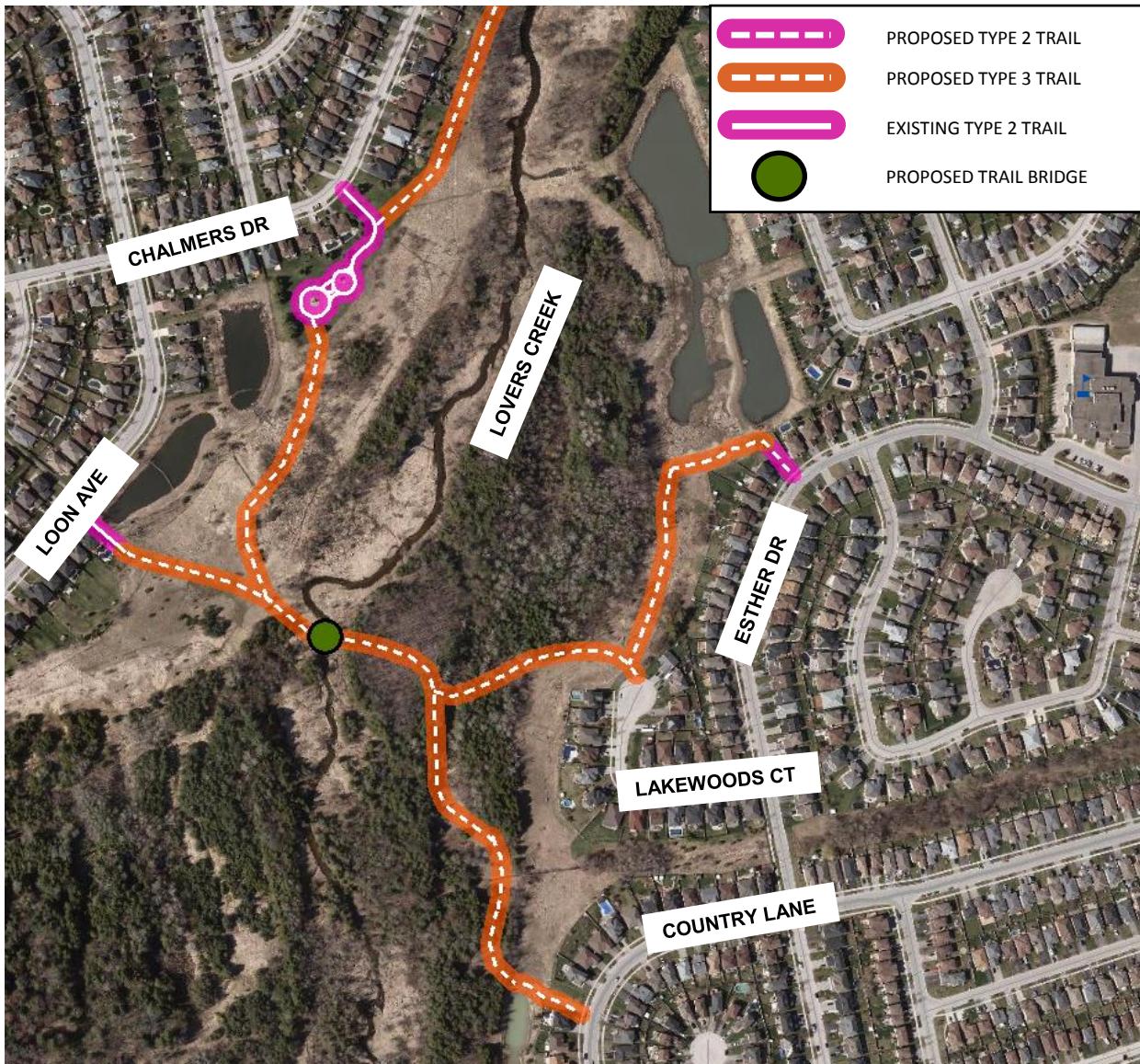
Aerial view of Open Space corridor between Garibaldi Drive and Columbia Road (Source ArcGIS, 2019)

### 2.1.2 MEDIUM-TERM PRIORITIES

The following five suggested Medium-Term trail implementation projects are in addition to any trail implementation that is identified and/ or takes place in Hewitt's and Salem Secondary Plan areas in tandem with phased new development.

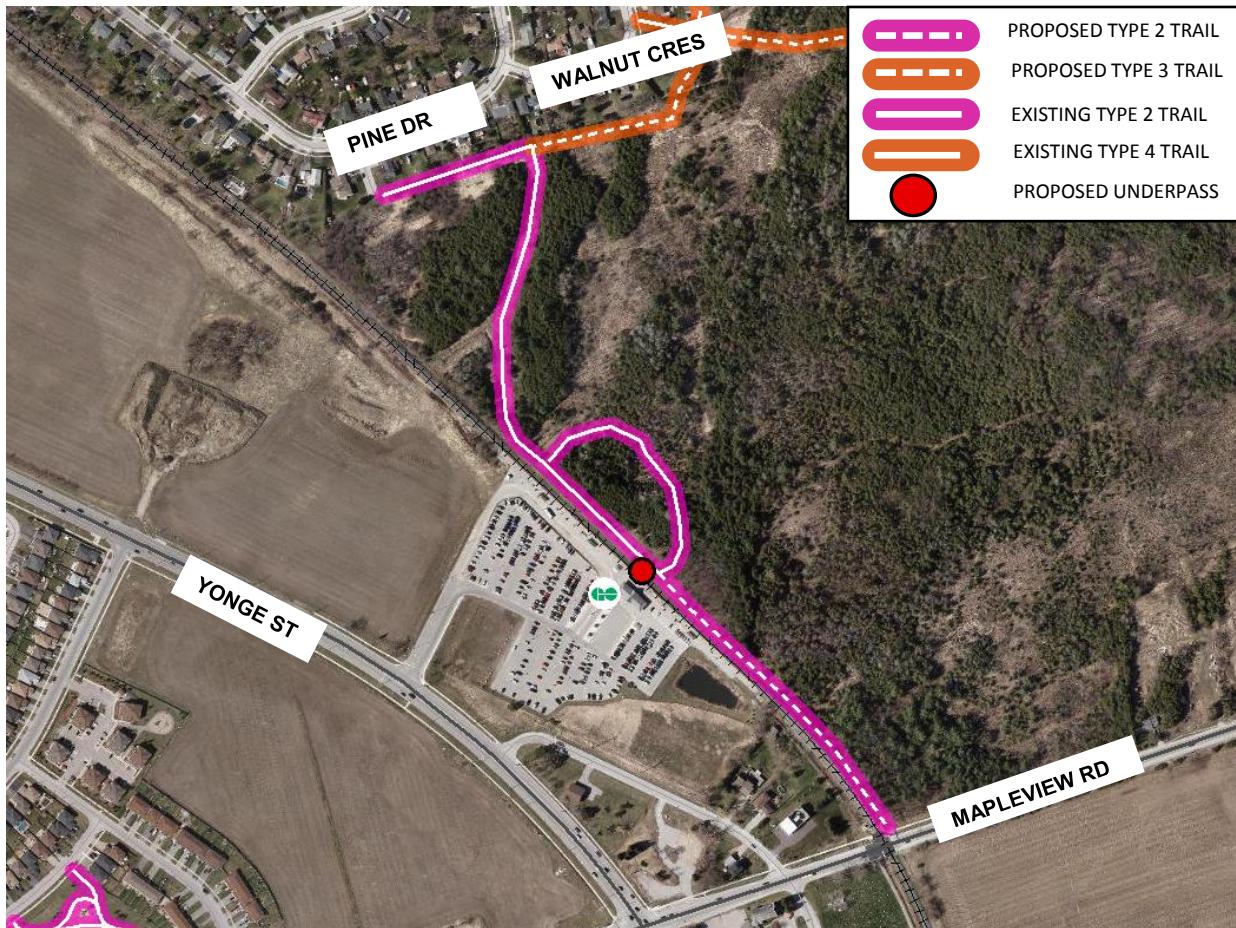
PRIORITY #1 DESCRIPTION:	DESIGN APPLICATION:
<b>LOCATION:</b> Lovers Creek Ravine from Loon Avenue and Chalmers Park to Country Lane, and Esther Drive	<b>RATIONALE:</b> <ul style="list-style-type: none"> <li>– Connects on road routes recommended for short and medium term as identified in the Active Transportation Plan</li> <li>– Continues north south spine connection linked to the Great Trail and the waterfront</li> <li>– Provides opportunity to formalize footpaths in the valley that have evolved over time, and close and rehabilitate inappropriately located pathways</li> <li>– Valley crossing provides connections to three schools in the area</li> </ul>
<b>DESIGN CONSIDERATIONS:</b>	<ul style="list-style-type: none"> <li>– Type 3 Trail in Open Space /EPA</li> <li>– Requires a pedestrian bridge crossing as part of formalizing the connection between Loon Avenue and Country Lane</li> <li>– Align trail to follow previously disturbed areas and narrow trail where feasible and avoid removal of higher quality vegetation</li> <li>– Implementation of trail also provides the opportunity to include habitat enhancements and remove invasive species</li> </ul>
<b>SUGGESTED NEXT STEPS:</b>	<ul style="list-style-type: none"> <li>– Consult with conservation authority regarding alignment and necessary additional study requirements (e.g. Environmental Impact Study)</li> <li>– Collect any necessary additional background information such as topographic survey, geotechnical in key locations, wildlife and tree inventory</li> <li>– Engage local neighbourhood residents, local Councillor and stakeholders in the design process</li> </ul>

# SECTION 2.0 DEVELOPMENT & DESIGN



Aerial view of Lovers Creek Ravine with proposed connections (Source Google Earth, 2019)

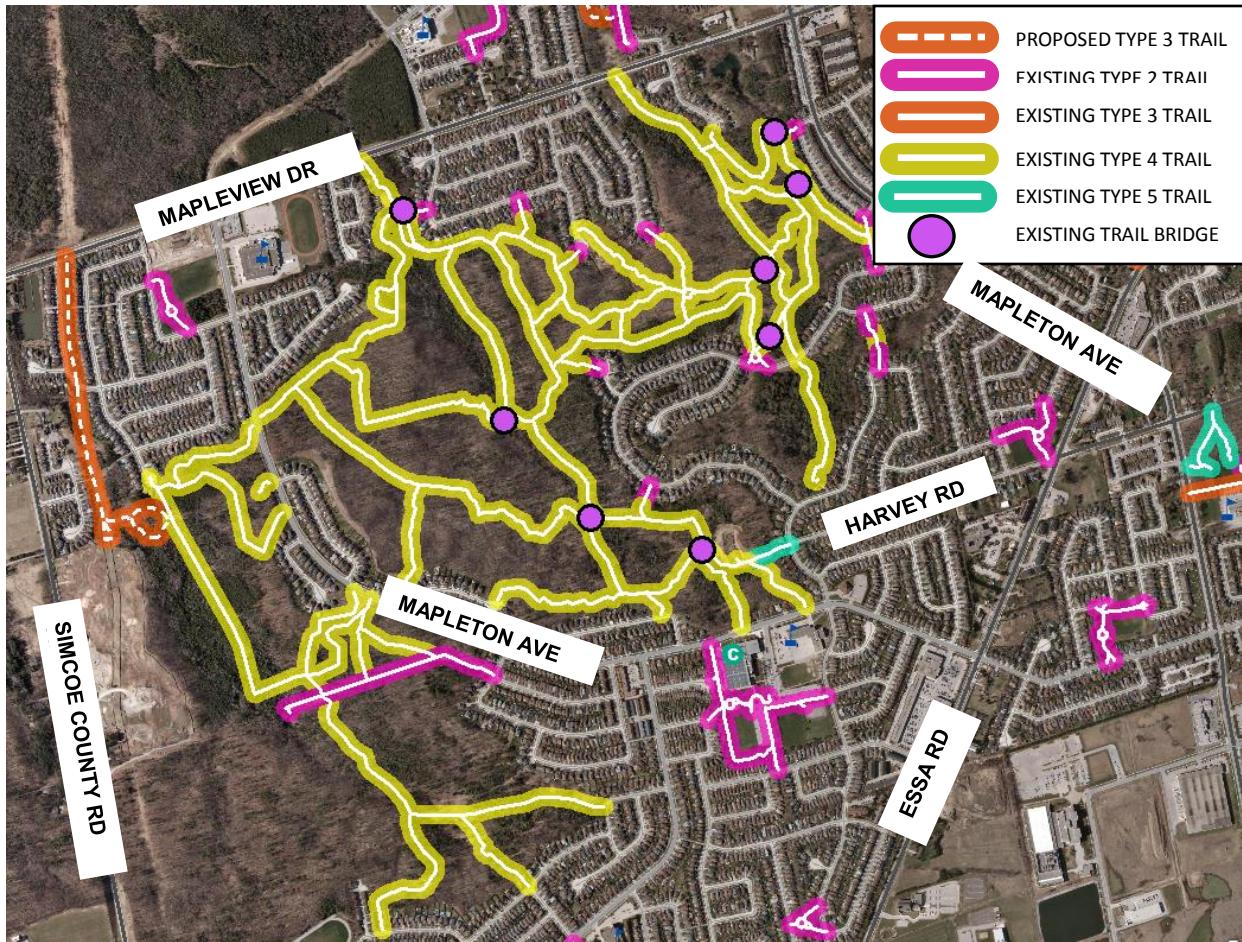
PRIORITY #2 DESCRIPTION:	DESIGN APPLICATION:
<b>LOCATION:</b> Trail parallel to railway from the Barrie South GO Station to Mapleview Drive	<b>RATIONALE:</b> <ul style="list-style-type: none"> <li>Provides connection to GO station from cycling facilities identified in the short and medium term along Mapleview Drive</li> <li>Also connects new residents in the Hewitt's Lands that will be developed over the next 10 years</li> <li>Builds on/adds to the trail link currently under construction from Pine Drive/Bayshore Estates to the Barrie South GO Station</li> </ul>
<b>DESIGN CONSIDERATIONS:</b>	<ul style="list-style-type: none"> <li>Type 2 Trail</li> <li>Requires more detailed feasibility assessment regarding the route alignment, including the collection of any additional background information to inform the alignment and design</li> <li>Implementation of trail also provides the opportunity to include habitat enhancements and remove invasive species</li> </ul>
<b>SUGGESTED NEXT STEPS:</b>	<ul style="list-style-type: none"> <li>Conduct detailed feasibility assessment to evaluate trail route options and select preferred route</li> <li>Collect additional background information to inform concept and detailed design</li> <li>Engage key stakeholders early in the process (e.g. at feasibility stage), then residents and the public during concept and detailed design stage</li> </ul>



Aerial view of the lands between Pine Drive and Mapleview Drive illustrating the potential connection between the trail from the 2019 construction to the Barrie South GO station  
(Source ArcGIS, 2019)

PRIORITY #3 DESCRIPTION:	DESIGN APPLICATION:
<b>LOCATION:</b> Ardagh Bluffs Natural Area Trails	<b>RATIONALE:</b> <ul style="list-style-type: none"> <li>– Identify opportunities to upgrade the existing trail network through the Ardagh Bluffs Natural Area</li> <li>– Improve an extensive network of Type 4 Natural Trails within the City, allowing for a trail experience through a natural area</li> <li>– Trails and bridges may need replacement or additional maintenance based on natural factors (i.e.: erosion, fallen trees, etc.)</li> </ul>
<b>DESIGN CONSIDERATIONS:</b>	<ul style="list-style-type: none"> <li>– Type 4 Trail Network through the Ardagh Bluffs Natural Area</li> <li>– Connectivity to existing sidewalks around the periphery of the Ardagh Bluffs Natural Area</li> <li>– Identify opportunities for additional bridges and crossing structures, where necessary</li> </ul>
<b>SUGGESTED NEXT STEPS:</b>	<ul style="list-style-type: none"> <li>– Consult with the conservation authority regarding alignment and necessary additional study requirements (e.g. Environmental Impact Study)</li> <li>– Collect any necessary additional background information such as topographic survey, geotechnical in key locations, wildlife and tree inventory</li> <li>– Engage local neighbourhood residents, local Councillor and stakeholders in the design process</li> </ul>

## SECTION 2.0 DEVELOPMENT & DESIGN



Existing trail network through the Ardagh Bluffs Natural Area (Source: ArcGIS, 2019)

PRIORITY #4 DESCRIPTION:	DESIGN APPLICATION:
<b>LOCATION:</b> Hollywood Ravine West and South	<b>RATIONALE:</b> <ul style="list-style-type: none"> <li>– Connects to future trails in Salem lands as they are developed in tandem with phased new development over the medium term</li> </ul>
<b>DESIGN CONSIDERATIONS:</b>	<ul style="list-style-type: none"> <li>– Type 2 and 3 Trails in Open Space /EPA</li> <li>– A pedestrian bridge is required as part the connection between new development area and Columbia Road</li> <li>– May also require a structure (e.g. switchback or stairs) to connect from the proposed pedestrian bridge to Columbia Road</li> <li>– Align trail south of Lougheed Road to connect through future Active Park in development plans</li> <li>– Implementation of trail also provides the opportunity to include habitat enhancements and remove invasive species</li> </ul>
<b>SUGGESTED NEXT STEPS:</b>	<ul style="list-style-type: none"> <li>– Conduct detailed feasibility assessment to identify and evaluate trail route options, including consideration of Bear Creek Ridge and surrounding subdivision plans as they continue to evolve</li> <li>– Consult with conservation authority regarding alignment and necessary additional study requirements (e.g. Environmental Impact Study)</li> <li>– Collect any necessary additional background information such as topographic survey, geotechnical in key locations, wildlife and tree inventory</li> <li>– Engage local neighbourhood residents, local Councillor and stakeholders in the design process</li> </ul>

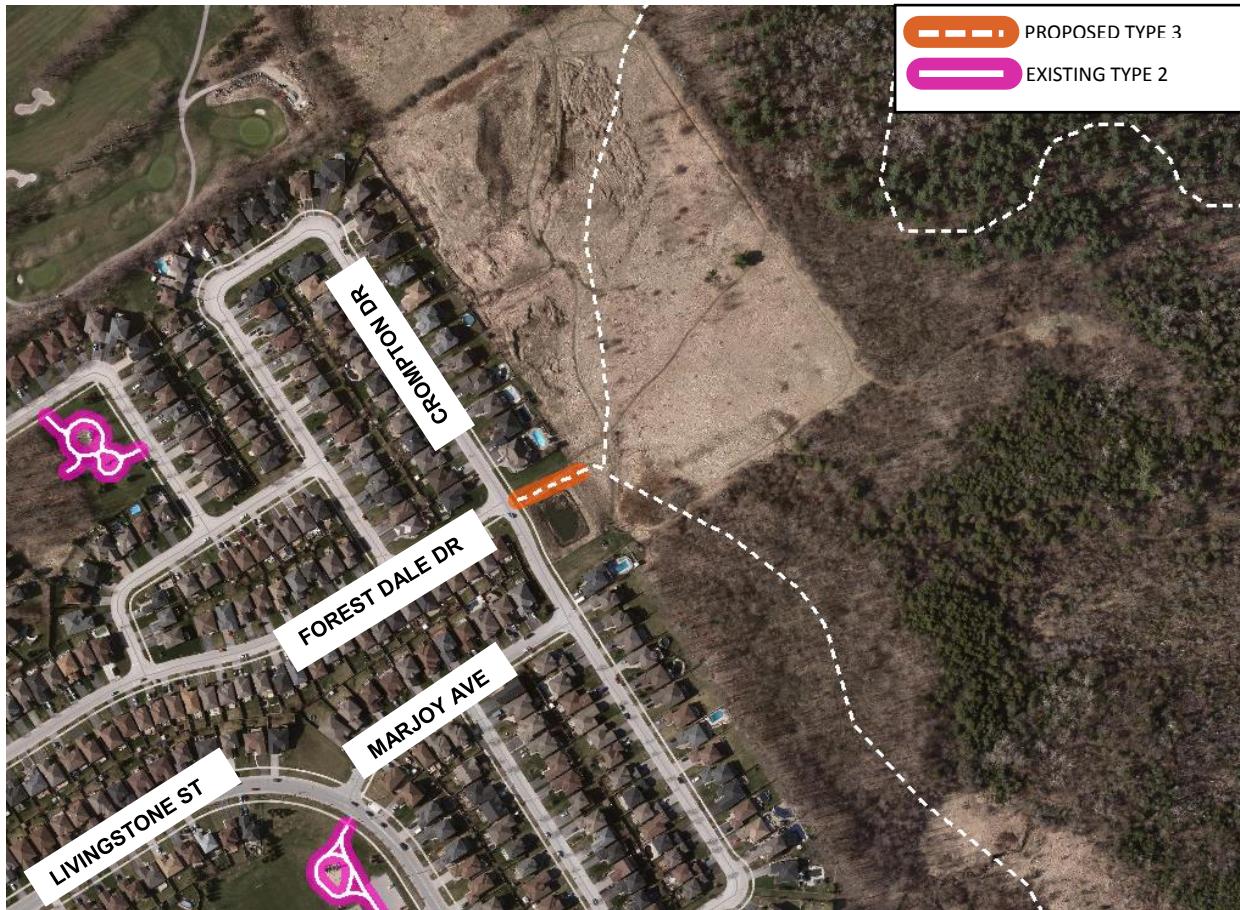
## SECTION 2.0 DEVELOPMENT & DESIGN



Aerial view of Hollywood Ravine West and South illustrating the conceptual trail connection  
(Source ArcGIS, 2019)

PRIORITY #5 DESCRIPTION:	DESIGN APPLICATION:
<b>LOCATION:</b> Connection to Little Lake Trails via Crompton Drive	<b>RATIONALE:</b> <ul style="list-style-type: none"> <li>– Connection provides direct access to Little Lake Park via the City's northeast neighbourhoods</li> <li>– Also connects directly with on road route on Livingstone Street West as recommended for the short term in the Active Transportation Plan</li> </ul>
<b>DESIGN CONSIDERATIONS:</b>	<ul style="list-style-type: none"> <li>– Type 3 Trail</li> <li>– Align trail to follow previously disturbed areas and narrow trail where feasible and avoid removal of higher quality vegetation</li> <li>– Implementation of trail also provides the opportunity to include habitat enhancements and remove invasive species</li> </ul>
<b>SUGGESTED NEXT STEPS:</b>	<ul style="list-style-type: none"> <li>– Coordinate timing with Township. Detailed design and implementation would be dependent of timing of trail development in Little Lake Park</li> <li>– Collect any necessary additional background information such as topographic survey, geotechnical in key locations, wildlife and tree inventory.</li> <li>– Engage residents and key stakeholders in the process should it move forward during the medium term, otherwise Project #6 should be shifted to the long term.</li> </ul>

# SECTION 2.0 DEVELOPMENT & DESIGN



Aerial view of the Osprey Ridge Neighbourhood with proposed trail connection into Little Lake Park (Source: ArcGIS, 2019)

## 2.2 UNDERSTANDING THE NETWORK

*The trails network includes existing and proposed routes. Though it is referred to as a network it is not the nature of trail development of establish a fully connected and continuous system. As such, connectivity relies on other AT facilities and other regionally and provincially significant linkages. The following describes the components that make up the trail network.*

### 2.2.1 MUNICIPAL TRAIL SYSTEM

The City of Barrie will be responsible for existing and proposed trails which can be organized in four categories – trails in existing neighbourhoods, trails in new development areas, trails in environmental protection areas and along the waterfront. Each trail linkage will require a unique planning and implementation process associated with it.

#### TRAILS IN EXISTING NEIGHBOURHOODS

Established neighbourhoods in Barrie include some trails, typically these are found in City parks, public open space and some Environmental Protection Areas (EPA's). In a number of the older neighbourhoods, parks and public open space is much less continuous compared to new and future neighbourhoods, making it challenging to create a fully connected off road network. Therefore, some key linkages will rely on the on-road routes in combination with sidewalk routes for pedestrians to make connections between off road routes in some locations. Additional proposed routes in some of the existing parks in established neighbourhoods are focused on creating loops in these parks, providing trail access to playgrounds and eliminating key gaps in continuity, where feasible.

#### TRAILS IN NEW DEVELOPMENT AREAS

The trail network includes many proposed trails associated with new development areas that are currently being planned for implementation over the next 10 years and beyond 2031. Planning for trails as part of the development of new neighbourhoods provides the opportunity to create a more continuous and linked route network as compared to retrofitting trails in existing neighbourhoods where parks and public open space tends to be more fragmented. The Hewitt's and Salem lands are two large tracts that stretch across the south end of the city where a more contiguous trail system can be designed, and phased in with the construction of new neighbourhoods. Planning for trails at this step in the process also assists in locating connections to neighbouring municipalities in a logical and seamless manner.

#### TRAILS IN ENVIRONMENTAL PROTECTION AREAS

There are a number of existing trails located within Environmental Protection Areas (EPA), which include woodlands and valley lands. Typically trails in these locations are Types 3 and 4 which are more compatible with the setting than trails Types 1 and 2. Some examples include Ardagh Bluffs, Loyalist Forest and Lovers Creek Ravine.

## WATERFRONT HERITAGE TRAIL

The Waterfront Heritage Trail is located along Kempenfelt Bay, starting near the Allendale train station and wrapping around the Bayfront where it connects becomes the North Shore Trail. This signature trail embraces the waterfront, providing residents and visitors with the opportunity to access the waters of Kempenfelt Bay in a number of locations, and includes interpretive stations that profile the history of the City. The trail starts at the east end of Allendale Station Park on the south shore and continues around the waterfront to the end of the North Shore Trail at Penetanguishene Road.

### 2.2.2 ACTIVE TRANSPORTATION NETWORK

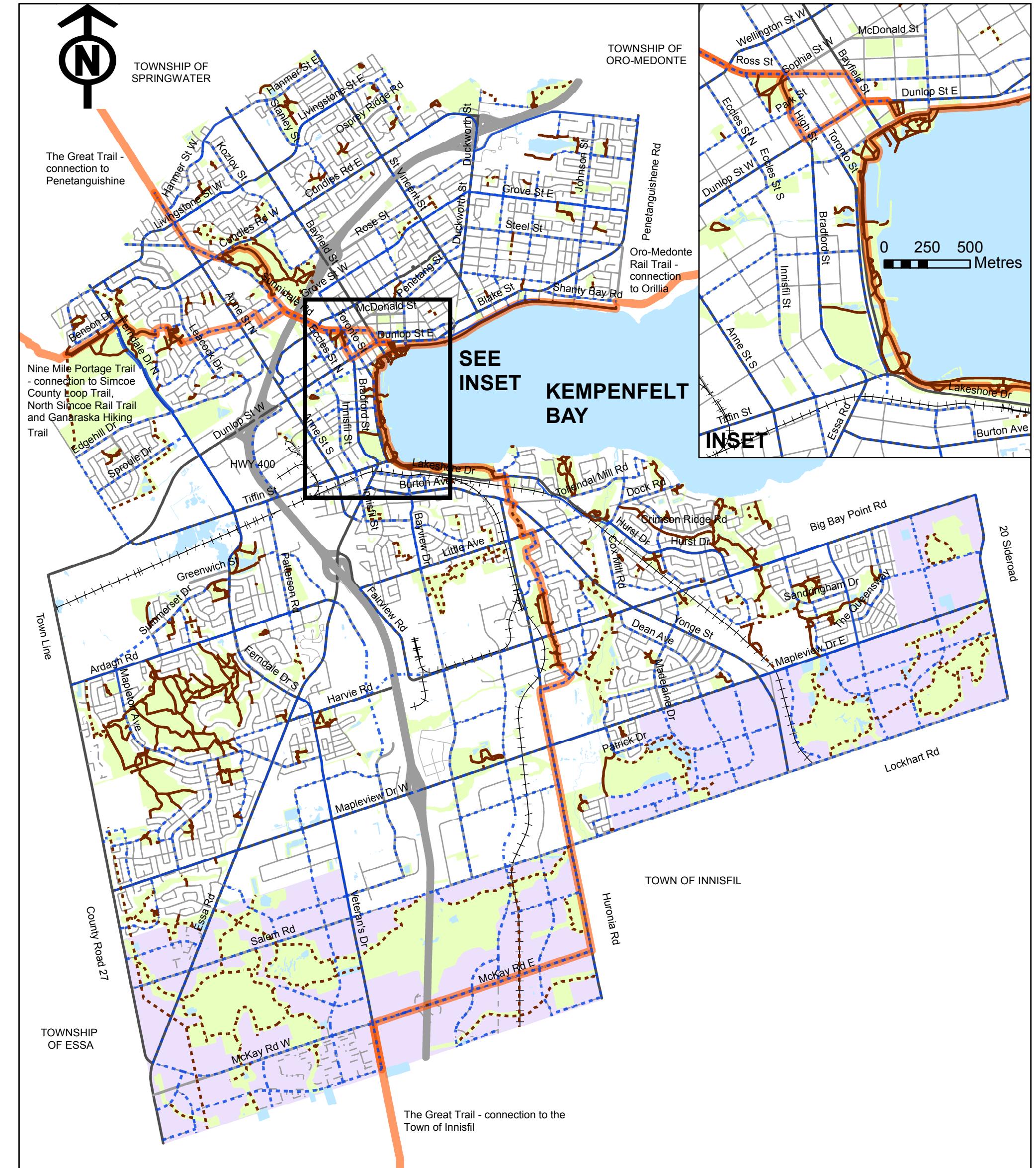
Creating a fully connected network of off-road trails is challenging, particularly in the older parts of the city where parks and public open space have limited connectivity. As such continuity of the trail network will rely on the Active Transportation Network which identifies existing and proposed on road cycling routes, in-boulevard multi-use pathways and sidewalks. **Table 10** summarizes the existing and proposed routes identified as part of the AT network for the City of Barrie, and **Map 6** illustrates the interconnectivity of the trail and active transportation network.

**Table 10** | Summary of Existing & Proposed Active Transportation Network

FACILITY TYPE	EXISTING (KM) <sup>(1)</sup>	PROPOSED (KM)
IN-BOULEVARD PATHWAYS	29.0	36.3
BUFFERED BIKE LANES	2.0	80.2
BIKE LANES	18.4	70.3
SIGNED ROUTES	20.5	36.2
SIDEWALKS	584.5	142.5
<b>TOTAL</b>	<b>731.7</b>	<b>365.5</b>

(1) Lengths based on centreline kilometres

The proposed AT network as well as the trails network should be considered in together as the City moves forward with implementation. Where possible the City should strive to coordinate linkages within similar areas of the City or contexts to ensure that municipal funding is efficiently and effectively used and AT and trail projects are coordinated. Additional details regarding this coordination are outlined in **Chapter 3.0**.



### Off-Road Network\*

- Existing Trail
- Proposed Trail

### On-Road Network

- Existing On-Road Connection
- Proposed On-Road Connection

\* Existing on-road connections illustrated on this map are for context. They have been sourced from the City of Barrie Active Transportation Master Plan (ATMP). Refer to the ATMP for additional information and details regarding on-road network routes.

### Regional Trail Network

- Regionally Significant Trail Routes

(i.e.: The Great Trail, Oro-Medonte Rail Trail, North Simcoe Rail Trail, Ganaraska Hiking Trail, Simcoe County Loop Trail)

### Other Features

- Secondary Plan
- Park / Open Space
- Water / Watercourse

Data Sources: City of Barrie  
Date Updated: April, 2019  
Project: 171-08853-00  
Map Created By: WSP Kitchener

0 500 1,000 1,500 2,000 Metres

### Map 6

Connectivity with the Active Transportation Network  
City of Barrie Trails Master Plan

**WSP**



### 2.2.3 REGIONALLY SIGNIFICANT TRAIL ROUTES

Regionally significant trail systems include loops and routes which provide access to the City of Barrie and other surrounding areas beyond its borders. They typically include longer distance routes which accommodate a range of trip types (i.e. recreation, touring and in some cases commuter trips) and users (i.e. walking, hiking and in select locations ATVs and snowmobiles). The following is a summary of the regionally significant trails which make up part of the trails system in the City of Barrie.

It is important to note that regionally significant trail routes are **designated** routes. Portions of the designated routes may be following existing City trails however some portions may simply be marked with their respective trail brand / route markers. For example, portions of the Great Trail/Trans Canada Trail following Huronia Road and McKay Road East consist of signed-only routes on the road shoulder.

#### GREAT TRAIL / TRANS CANADA TRAIL

Created in 1992 and officially launched in 1994, the Great Trail, formerly known and branded as the Trans Canada Trail is a 24,000km long trail route connecting Canada's provinces and territories, the Atlantic, Pacific and Arctic Oceans. Though national in span and breadth the designated route of the Great Trail typically follows local trail alignments. Local trails that are part of the Great Trail retain their local brand, and this is supplemented with the Great Trail branding. Barrie hosts approximately 20km of the Great Trail, passing through the downtown and along the waterfront, along the Waterfront Heritage Trail connecting the Township of Springwater to the northwest and Township of Innisfil to the south.

#### NINE MILE PORTAGE TRAIL

The Nine Mile Portage Trail is based on an ancient overland portage route created by Aboriginal communities of the area. The trail route generally runs between downtown and Fort Willow in Springwater Township. One of the oldest known European records of the route appears on a 1688 Italian explorer's map, and later became known as the 'Nine Mile Portage' by the British Military.

The trail was opened in 2003 with a number of the segments following sidewalks and roads. The vision for the trail is to ultimately develop it along the original historic route as closely as possible. The Nine Mile Portage Trail provides a connection to the North Simcoe Rail Trail, Simcoe County Loop Trail and the Ganaraska Hiking Trail.

#### NORTH SHORE TRAIL AND ORO-MEDONTE RAIL TRAIL

The North Shore Trail is a multi-use recreational trail following the City's north shore of Kempenfelt Bay. The majority of it is constructed on top of a former railway corridor, and its relatively flat profile makes it easy to navigate by users of all ages and abilities. Starting in Bayfront trail ends at Penetanguishene Road, where it follows Shanty Bay Road to the Township of Oro-Medonte. From this point the trail continues along the former rail corridor, finally terminating in Orillia. The North Shore Trail /Oro Medonte Rail Trail is also a part of the Martyrs' Shrine Pilgrimage Route.

#### NORTH SIMCOE RAIL TRAIL

At approximately 24km in length the North Simcoe Rail Trail passes through Springwater Township. It stretches from Elmvale south towards Minesing. At the northern end the trail connects with the Tiny Trail.

## GANARASKA HIKING TRAIL

Stretching from Port Hope on Lake Ontario to the Bruce Trail near Collingwood, the Ganaraska Trail route passes through natural areas and along roadsides. At close to 500km long it includes side trails to Wasaga Beach and Midland.

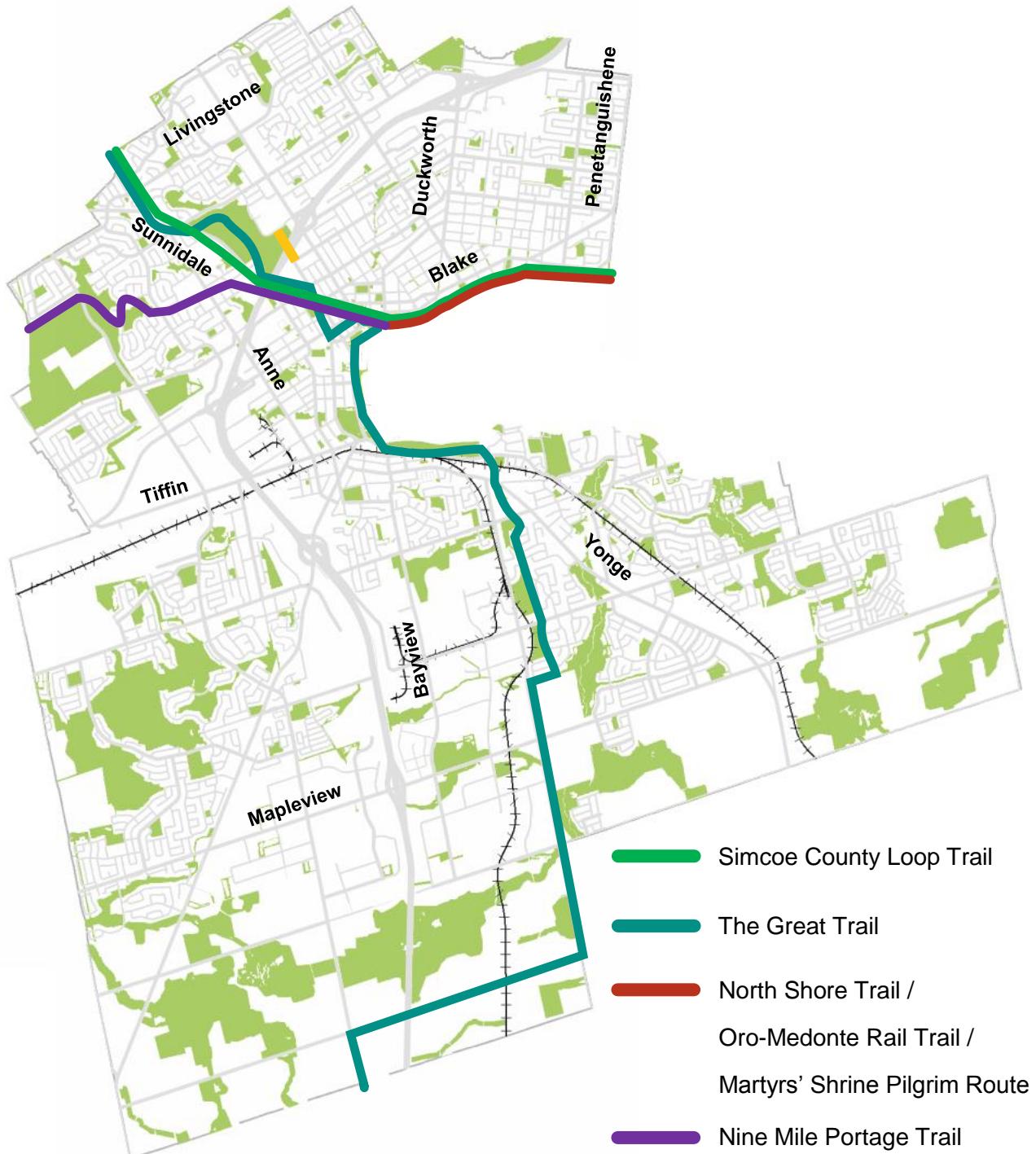
## SIMCOE COUNTY LOOP TRAIL

The Simcoe County Loop Trail is a 160-kilometre loop that travels through nine municipalities including the urban centres of Barrie, Orillia, Penetanguishine and Midland. It also connects Georgian Bay, Lake Simcoe and Lake Couchiching. It is comprised of off-road multi-use trails, some of which are located on former railway lines and unopened road allowances. Portions of the Great Trail, North Simcoe Rail Trail, North Shore Trail and the Oro-Medonte Rail Trail make up parts of the Loop Trail.

Portions of these regionally significant trails found within Barrie are illustrated in **Figure 2**.



Nine Mile Portage Trail in north Barrie; Source: WSP 2018



**Figure 2 |** Regionally Significant Trails within the City of Barrie

## 2.3 DESIGNING THE NETWORK

A critical component of the trails network is the design of components that make up the system. This section provides the City of Barrie with guidelines to establish a consistently designed network of trail linkages and to address the design of other trail elements (i.e. crossings, end of trip facilities, etc.)

The guidelines contained within this section represent current and accepted design practices in North America. They incorporate ongoing research and experience by the team and other trail design professionals while also addressing unique trail experiences and expectations within the City of Barrie.

The information in this chapter is not meant to be prescriptive nor is it intended to replace “sound engineering judgment”. The intent is to have regard for the individual guidelines while considering the context of individual site conditions to arrive at the most appropriate solution.

The guidelines contained within this report should be treated as a reference for the development and construction of trails in Barrie. Although they are meant to provide guidance for a range of typical municipal-wide conditions, they are not intended to address every condition encountered.

### 2.3.1 DESIGN CONSIDERATIONS

The design of the trails network should be based on the user and the user experience where possible as well as other high-level design principles. Prior to the identification of specific trail types (see section 2.3.2), the following general trail design guidelines should be considered by the City of Barrie when designing and implementing trail connections.

## TRAIL USERS

The intent is for the trail system to accommodate a range of users with a specific focus on pedestrians and cyclists of all ages and ability. When designing trails, consideration should be made for the appropriate user group(s) to determine how the facility should be designed, including the amenities to complement and enhance the route and other key features. It is important to consider and balance the various users and their interests and preferences when determining the appropriate design. The following describes the user groups anticipated on the Barrie trail system.

### WALKERS & USERS WITH MOBILITY AIDS:



1

Walkers and users with mobility aids (e.g. wheelchairs and power chairs) have a wide range of interests and motivations (i.e. leisure, relaxation, socializing, exploring, making contact with nature, meditation, fitness, or dog walking). Walkers can be defined by their trip type including recreational or utilitarian (to work, school or most frequent activity). Utilitarian Walkers typically walk within urban areas and tend to use sidewalks, parking lots and plazas as well as trails where they are convenient, well designed and properly maintained. Trails can sometimes provide a convenient “short cut” to traveling the side walk network to get to their destination.

Dog walking in the context of the Barrie Trails Master Plan assumes that this activity takes place along with multiple other uses/users that enjoy the trail system. As such, dogs are required to be on-leash. This plan does not include investigation of, or any recommendations related to off-leash areas or off-leash trails. Additional future studies will be required should the City decide to explore off-leash trails.

### HIKERS:



2

Hikers are often considered the elite of the recreational walking group and may challenge themselves to cover long distances and be willing to walk on sections of a rural roadway shoulder considered less safe or less interesting by occasional leisure walkers. They take trips that may range between 5 and 30 km in length, may be more keenly interested in natural features, are often more adept at map reading, are more self-sufficient than leisure walkers, may expect fewer amenities and are often attracted to challenging terrain and rural areas.

## RUNNERS & JOGGER:



# 3

Although the primary motivation for joggers and runner may be fitness, they may share more in terms of profile characteristics with distance hikers than they do with leisure walkers. This group typically is accomplishment oriented, enjoy travelling on trails at higher speeds for distances

between 3 and 15 km or more, often avoiding hard surfaces such as asphalt and concrete and many prefer to run on granular, natural (earth) and turf surfaces which can provide a more cushioning effect.

## CYCLISTS:



# 4

Some bicycles are designed to travel easily over stone dust and gravel surfaces (e.g. hybrid and all-terrain bikes), whereas, narrow-tired touring and racing bicycles require very compacted granular surfaces or hard surface pavements such as asphalt.

The mechanical efficiency of the bicycle allows users of all ages to travel greater distances at a higher rate of speed than pedestrians, and distances covered vary widely depending on individual's fitness level and motivation for using the trail.

The Barrie Trails Master Plan does not examine or include trails for specific types of cycling such as BMX, downhill or mountain cycling. Should the City decide at a future time to explore the potential to plan and design these types of specialty cycling facilities, additional studies will be required.

The travel speed of an average cyclist on a trail ranges from 15-25 km/h, although speeds in excess of 30 km/h may occur on downhill sections. Where higher speeds are a potential issue on trails, posting speed limits should be considered to warn cyclists, discourage fast riding and encourage appropriate behaviour. Where there are recurring issues of excessive speed or aggressive behaviour on trails, design features may be implemented to slow cyclist down. In some circumstances enforcement may need to be considered.

**Electric Bicycles:** A recent trend in cycling is the electric-assist bike, or e-bike. The electric assist bike requires the operator to pedal to a certain level/speed and then the electric motor can be engaged to assist the operator. They are an attractive form of transportation for several reasons; they are affordable both in terms of the initial purchase cost and cost to operate; they are small, light and can be easily maneuvered; they are easy to park and can travel along very narrow corridors. The assistance they provide helps users maintain a constant pace and eases uphill climbs. Growing in popularity, they are now regularly seen in urban environments traveling in bike lanes, trails and pathways and on sometimes on sidewalks. Although they are defined in provincial legislation, their use is not clearly regulated and municipalities are challenged to address where they should be permitted and how to enforce improper use. Many municipalities are challenged by simply trying to define various types of e-bikes and develop rules regarding their use.

The City of Barrie By-Law 2010-033 definition of bicycle also includes unicycles and tricycles but does not include motor assisted bicycles. Motorized vehicles are prohibited in parks and on trails, other than those owned or operated by the City for the purpose of maintenance or the enforcement of by-laws.

Motorized vehicles are defined in the by-law as “any vehicle drawn, propelled or driven by any kind of power which includes but is not limited to a motor vehicle, trailer, traction engine, farm vehicle, all terrain vehicle or motorized vehicle, but does not include a muscular powered bicycle, wheelchair or motor assisted scooter”

Based on this definition electric assist bikes are not permitted in parks or on trails, nor are “Vespa”-type scooters.

#### OTHER WHEELED USERS:



5

This group includes in-line skaters, skateboarders and other trail users with small-wheeled devices. They have characteristics of both the pedestrian group as they are sometimes traveling at a walking pace, yet sometimes traveling at higher speeds. They use

trails for recreation, exercise and transportation purposes. A key requirement of this group is that they must have a hard-surfaced trail, and cannot operate on natural surfaces or granular/screenings surfaces.

#### OTHER CONSIDERATIONS



6

##### Dedicated Winter Uses:

Except for the Waterfront Heritage Trail the off-road trail system is not maintained during winter months, though trails are available for non-motorized public use.

Destinations offering groomed cross-country ski trails and snowshoeing

opportunities are very popular in and around Simcoe County.

Though not currently part of the winter recreational trail offering in Barrie, the City may at some future time consider dedicated winter uses such as groomed cross-country ski trails. Should the City decide in future explore the potential to develop groomed cross-country ski trails within City limits additional studies will be required.

**Events:** Recreational trails in some parts of the City are popular for, and naturally lend themselves to competitive events, festivals and celebrations. Locations such as the waterfront and portions of the Waterfront Heritage Trail are home events that use the trail and/or spill over from adjacent public spaces onto the trail. These events attract large numbers of users some of whom use the trails to travel to the event, resulting in congestion on the trails.

Depending on the nature of the event and number of participants, special permits may be required by the organizer(s). Additionally, it may be appropriate to temporarily close the trail to through traffic, or require cyclists to dismount and walk their bicycles through the area.

Consideration should be given to providing temporary mass bicycle parking during events (e.g. corral or valet parking) to allow citizens arriving by bike to confidently park their bicycle while participating. This also serves to reduce additional congestion created by cyclists searching for and parking bicycles randomly throughout the event space.



**Maintenance and Emergency Access:**

Trails require maintenance, and therefore, access by maintenance vehicles and equipment. The level of access required and available varies depending on the trail type and location. Higher order trails such as Type 1 and 2, which receive more frequent maintenance than Types 3, 4 and 5 trails are designed to accommodate typical service vehicles with thicker trail bases, greater widths and larger corner radii.

From time to time there may be maintenance emergencies on part of the trail system, such as major erosion or damage to structures following severe storm events. In these situations, emergency vehicles and large equipment may need to travel along or beside the trails. Given that it is impossible to predict exactly where, and what kind of emergencies that may occur, it is not practical to design all trails to meet the needs of large maintenance/emergency repair equipment. Repairs to the trail (and adjacent area – where applicable) are assumed to be part of the cleanup/repair following the emergency.

From time to time emergency vehicles may need to access the trail (e.g. EMS). Most emergency vehicles would have similar width and turning requirements as maintenance vehicles. However, there may be some situations where larger emergency vehicles need to use the trail or adjacent lands to access the emergency site, and collateral damage to the trail and surroundings may be unavoidable. Repairs will be completed as necessary after the emergency has been addressed.

## ACCESSIBILITY & AODA

The Accessibility for Ontarians with Disabilities Act, (AODA, 2005) states that “The people of Ontario support the right of persons of all ages with disabilities to enjoy equal opportunity and to participate fully in the life of the province.” The stated goal of the AODA is “to make Ontario accessible for people with disabilities by 2025.” Ontario Regulation 191/11 (O. Reg 191/11) made under the Accessibility for Ontarians with Disabilities Act, 2005 is the built environment standard, and compliance with the requirements will help remove barriers in outdoor spaces for people with disabilities.

The guidelines and criteria contained in the document apply to new construction and extensive renovation of trails and exterior paths of travel. They do not apply to on-road cycling facilities. O.Reg. 191/11 groups outdoor pedestrian routes into one of three categories as follows:

- **Paths of Exterior Travel;** which includes sidewalks and exterior walkways that connect directly to buildings and facilities. Examples include walkways that connect parking lots to buildings, main walkways in parks that connect to park pavilions, playgrounds and washroom buildings etc.
- **Beach Access Routes;** which are defined as the main connecting walkway(s) and beaches intended for public use.
- **Recreational Trails;** which encompass a range of facility types ranging from hard surface multi-use trails in major urban parks to natural surface walking trails in more remote areas.

Sections 80.8 and 80.10 in O.Reg. 191/11 provides the technical requirements for **Recreational Trails**. Some of the key requirements include:

- A minimum 1.0m wide tread free from obstructions
- A minimum of 2.1m clear head room above trail
- Trail surfaces that are firm and stable
- Any openings in a trail’s surface must not allow passage of an object that has a diameter of greater than 20mm, and elongated openings must be oriented perpendicular to the direction of travel
- Where trails are constructed adjacent to water or a drop-off the trail must have edge protection that prevents users from slipping over the edge. The top of the edge protection must be at least 50mm above the trail surface and it must be designed to not impede the drainage of the trail surface. Edge protection adjacent to water or a drop-off is not required where there is a protective barrier / railing that runs along the edge of the trail
- Where there are gates / barriers at trail entrances they must have an opening of between 850 mm and 1000mm
- Trailhead signage must be provided that indicates the length of the trail; type of surface; average and minimum trail width; average maximum running/longitudinal and cross slope; and the location of amenities (where provided). Signage must have text that has a high tonal contrast with background colours to facilitate visual recognition, and text must use a sans serif font.

- Brochures and media used to describe the trail must convey the same information in the same manner as required for trailhead signs
- Objective information on trailhead signs and brochures (e.g. slope, width etc.), as opposed to subjective information (e.g. level of difficulty rating) about the trail's characteristics allows the user to make an informed decision before they set out, based on their personal level of ability.
- The City should complete a gap analysis of the existing trail system to understand and document key existing features and limiting factors / constraints that need to be improved and / or communicated on trail mapping and trail entrances; including but not limited to average and maximum slope, average and minimum width, surface, rest area locations etc. Methodologies such as the Universal Trail Assessment Process (UTAP) and the more advanced High Efficiency Trail Assessment Process (HETAP) are data collection methods that provide objective information about trail conditions that can be used for asset management and communication of trail conditions to satisfy AODA signage requirements.

Sections 80.14 and 80.15 in O.Reg. 191/11 also recognize exceptions where accessibility requirements can be waived. These include one or more of the following:

- The requirements, or some of them, would likely affect the cultural heritage value or interest of a property identified, designated or otherwise protected under the Ontario Heritage Act, places designated as National Historic Sites, or historic places marked or commemorated under the Historic Sites and Monuments Act.
- The requirements, or some of them, might damage, directly or indirectly, the cultural heritage or natural heritage resources on a property included in the list of United Nations Educational, Scientific and Cultural Organization's (UNESCO) World Heritage sites.
- There is a significant risk that the requirements, or some of them, would adversely affect water, fish, wildlife, plants, invertebrates, species at risk, ecological integrity or natural heritage values, whether the adverse effects are direct or indirect.
- It is not practicable to comply with the requirements, or some of them, because existing physical or site constraints prohibit modification or addition of elements, spaces or features that would be required to meet accessibility requirements.

Organizations that provide trails are obligated to consult with the accessibility community before they construct new or redevelop existing trails. Consultation can take place as part of engagement with the public or through a local accessibility advisory committee. Consultations typically would focus on elements of the design and the need for, location and design of rest areas along the trail and other pertinent trail features.

## SECURITY & CPTED

To the extent possible, trails should be designed to allow users to feel comfortable, safe, and secure. Principles of Crime Prevention Through Environmental Design (CPTED) provide guidance on how to consider and appropriately design with comfort and safety in mind.

CPTED should be considered and appropriately applied to help address security issues concerning the use of these facilities, particularly in locations where trails are infrequently used, isolated or in areas where security problems have occurred in the past.

There are four core CPTED principles which include:

### NATURAL ACCESS CONTROL:

**1** Deters access to a target and creates a perception of risk to the offenders

### NATURAL SURVEILLANCE:

**2** The placement of physical features that provides for natural visibility

### TERRITORIAL REINFORCEMENT:

**3** Defines clear borders of controlled space from public to semi-private to private to understand ownership

### MAINTENANCE:

**4** Allows for the continued use of space for its intended purpose

Understanding how these principles translate to municipal planning and design is important to help inform future next steps. Some specific design considerations that have been employed by municipalities include:

- Providing good visibility by others by having routes pass through well-used public spaces
- Provide the ability to find and obtain help: Signage that tells users where they are along the trail system
- Provide “escape” routes from isolated areas at regular intervals
- Maintain sight lines and sight distances that are appropriately open to allow good visibility by users
- Provide trailhead parking in highly visible areas
- Minimize routing close to features that create hiding places such as breaks in building facades, stairwells, dense shrubs and fences
- Design underpasses and bridges so that users can see the end of the feature as well as the area beyond
- Signs near entrances to isolated areas can be used to inform users that the area is isolated and suggest alternative routes.

### 2.3.2 NETWORK CLASSIFICATION

A key component of the Trails Master Plan's development was the creation of a new trail classification system to help clarify the intents, purposes, uses and design considerations for the various types of trails within the City of Barrie.

To ensure consistency in design, implementation and maintenance, a revised trail classification has been identified and applied to both the existing and proposed linkages. The Recreational Trail Classification System for the Barrie trail system is adapted from the City's Trail and Pathway Construction Matrix (BSD-1274). It includes 5 trail types generally defined by the location and function of the trail in the context of the overall network. BSD-1274 describes and defines trails based primarily on technical criteria; whereas the updated trail classification considers the trail user and incorporates elements of user experience such as ease of use/level of difficulty, accessibility and trail amenities in addition to the technical criteria. The 5 trail types include:

- **Type 1 Waterfront Trail**, which is the showcase waterfront system of very popular, heavily used hard surface trails that are enjoyed by large numbers of residents and tourists
- **Type 2 Multi-use Trail**, which are typically located in parks in table land areas, and sometimes serve as access to park amenities such as pavilions, splash pads and playgrounds
- **Type 3 Connector Trails**; often found in ravine lands and natural areas, and sometimes as a second trail offering in City parks found in table land areas
- **Type 4 Natural Trails** in woodlots and ravine lands that offer the opportunity for users to 'escape' the urban environment
- **Type 5 Stormwater Management Facility Access Trails**, which are specifically designed to provide connections to the trail network while at the same time providing maintenance access to some of the City's unfenced stormwater management facilities.

Within each of the 5 classes there are options for some of the technical criteria, for instance base depth depending on whether the trail segment will need to accommodate maintenance vehicles. The trail classification and associated mapping includes covers existing and planned trail routes in Parkland, Open Space/Environmental Protection Area (EPA) and Stormwater Management Areas.

The Recreational Trail Classification is presented in **Table 11**. The classification:

- Does not include "Tertiary", Cultural (i.e. unsanctioned and unmaintained trails), or former trails which have been closed
- Applies to construction of new trails and existing trails at the time of their reconstruction
- Does not include multi-use trails within road rights-of-way (i.e. In-boulevard Pathways). These are included as part of the active transportation network in the ATS.

It is recommended that the City adopt these as the new trail standards / guidelines and replace the existing Trail and Pathway Construction Matrix (BSD-1274) as part of the Parks Standards Drawings. The City should adopt the proposed trail network in principle and should reinforce the proposed network within other municipal planning documents such as the Official Plan in the form of a schedule or appendix. The network classification should be used as the primary reference related to the design and construction of proposed linkages. Should an additional route emerge or a new trail opportunity arises, the City should refer to the trail classification matrix to determine the most appropriate trail type prior to design and construction.



Informal footpath in the Trans Canada Pipeline corridor off Sundew Drive; Source: WSP 2018

Table 11 | City of Barrie Trails Classification

	Waterfront Multi-Use Trail (Type 1)	Multi-Use Trail (Type 2)	Connector Trail (Type 3)	Natural Trail (Type 4)	Stormwater Management Facility Access (Type 5)
DEFINITION / DESCRIPTION					
GENERAL FUNCTION	Recreation, leisure and active transportation commuting functions. City showcase location providing access to, and along the public waterfront. Key tourism attraction, celebration and event / festival location.	Recreation, leisure and active transportation commuting functions, providing access to key destinations such as community centres, parks key commercial areas, schools etc. Includes loops in neighbourhood parks and access to park facilities (e.g. playgrounds)	Primarily recreation and leisure. Although active transportation is not a key function, Type 3 trails provide connections to active transportation routes	Recreation and leisure providing opportunities to 'escape' the urban environment and experience natural settings within City limits.  Note: this does not include "Tertiary Trails, Cultural or unsanctioned trails, or former trails which have been closed	Stormwater Management Facility Road / service access to unfenced stormwater facilities, and accesses to utility corridors, which also serve as a key connector to the trail network (i.e. Type 2, 3, and 4 trails)
LOCATION	Parkland	Parkland	Open Space / Environmental Protection Area (EPA)	Open Space/Environmental Protection Area (EPA)	Stormwater Management Facility block
USER / USER EXPERIENCE					
EASE OF USE/RATING (GENERAL)	Easy 	Easy 	Easy to Moderate  	Moderate to Difficult  	Moderate 
ANTICIPATED LEVEL OF USE	Very high, especially on weekends, during peak tourist season, during celebrations and events	High	Moderate	Low to moderate	Low to moderate
USERS/USER GROUPS	Accommodates all user groups, all ages and abilities, families, tourists  Pedestrian, mixed uses, vehicular for servicing. Suitable for users with no trail experience	Accommodates all user groups, all users and ability, families  Pedestrian, mixed uses, vehicular for servicing. Suitable for users with little to no trail experience	Some experience / stamina required, families, experienced hikers and cyclists  Pedestrian, mixed use, vehicular for servicing in some locations. Some use may be restricted / prohibited  Suitable for users with some trail experience	Experience/stamina required, experienced hikers  Pedestrian, but may include special use trails (e.g. catering to hiking only, fitness etc.)  Suitable for users with moderate level or trail experience	Primarily vehicular for servicing access, may include mixed uses where the route is a connecting link to other trail network routes  Suitable for users with some trail experience
ACCESSIBILITY	Meets or exceeds minimum accessibility requirements	Meets or exceeds minimum accessibility requirements where feasible	Meets accessibility requirements where feasible. Maintaining natural heritage values takes precedence.	Maintaining natural heritage values takes precedence over accessibility	Function as stormwater service access takes precedence over accessibility

	Waterfront Multi-Use Trail (Type 1)	Multi-Use Trail (Type 2)	Connector Trail (Type 3)	Natural Trail (Type 4)	Stormwater Management Facility Access (Type 5)
WAYFINDING / SIGNAGE	<p>Highest frequency, at trail entry points, trail intersections, key decision points and at regular intervals between intersections.</p> <p>Designed to meet or exceed AODA requirements at trailheads and entrances</p> <p>May include supplemental destination signage to key attractions.</p>	<p>High frequency, at trail entry points, trail intersections, key decision points. At regular intervals where there are long distances between intersections.</p> <p>Designed to meet AODA requirements at trail entrances</p>	<p>Moderate frequency, at all trail entry points, trail intersections and key decision points. Occasional markers where there are long distances between trail intersections.</p> <p>Designed to meet AODA requirements at trail and entrances</p>	<p>Low frequency, at trail entry points and key decision points.</p> <p>May include occasional markers along long stretches between trail intersections (may include simple trail blazes).</p> <p>Designed to meet AODA requirements at trail and entrances</p>	<p>Low frequency, at entry points and connection point to Type 2, 3, 4 trails.</p> <p>Designed to meet AODA requirements at trail and entrances</p>
LIGHTING	Lighting will be provided	Lighting may be considered where use/demand is high (i.e.: heavily used commuter routes)	Lighting not provided	Lighting not provided	Lighting not provided
AMENITIES	<p>Highest frequency of amenities</p> <p>Benches, seating walls, trash receptacles, pavilions, washrooms. Maximum 350m spacing between seating / resting opportunities</p>	<p>Moderate- high frequency of amenities</p> <p>Benches at key locations, trash receptacles located to be easily accessed for service vehicles</p>	<p>Moderate frequency of amenities.</p> <p>Trash receptacles at trail entry points, seating opportunities at key locations. Seating opportunities include benches and natural materials (e.g. flat boulders)</p>	<p>Low frequency of amenities.</p> <p>Trash receptacles at trail entry points. Seating opportunities at key locations (e.g. top of long climb, viewpoint). Natural materials used for seating opportunities</p>	<p>Amenities other than trash receptacles at entry points typically not provided</p>
TECHNICAL					
WIDTH	4.0m width (typical), 3.0m minimum	3.0m typical width (may be narrower in constrained locations- i.e. limited property/parcel width)	2.4m width (typical - may be narrower in constrained locations such as limited property/parcel width, topographic and environmental constraints)	1.0-2.0m (may be narrower in constrained locations such as limited property/parcel width, topographic and environmental constraints)	4.0 -5.0m

## SECTION 2.0 TRAIL IDENTIFICATION

	Waterfront Multi-Use Trail (Type 1)	Multi-Use Trail (Type 2)	Connector Trail (Type 3)	Natural Trail (Type 4)	Stormwater Management Facility Access (Type 5)
SLOPE	5% maximum longitudinal / running slope 2% cross slope	5% maximum longitudinal / running slope (where feasible) Provide rest area (e.g. level area) every 30m for longitudinal slopes between 5% and 8%, every 9m for longitudinal slopes between 8% and 10% (on trails that are designed to be accessible) 2% cross slope where feasible Note: the sum of longitudinal slope and cross slope not to exceed 15% for accessible trails	Longitudinal slope exceeds 5% depending on location/context. Maximum slope 10% over short distances  Note: longitudinal slopes over 12% may be subject to ongoing erosion if runoff is not diverted off trail at regular intervals	Responds to surrounding topography – longitudinal slopes may exceed 20% for short distances (i.e. 20-30m)  Consider an alternate trail route where longitudinal slope exceeds 20%, or a structure (e.g. stairs) where an alternate route is not available	Typical maximum 10% longitudinal to accommodate service vehicle access
CORNER RADII	Determined based on design speed for trail. Minimum 15m for design speed of 30km/hr. Minimum 1.5m to accommodate wheelchair turning movements	Determined based on design speed for trail. Minimum 15m for design speed of 30km/hr. Minimum 1.5m to accommodate wheelchair turning movements	Determined based on design speed for trail. Minimum 15m for design speed of 30km/hr.	Determined based on design speed for trail. Minimum 15m for design speed of 30km/hr. Smaller radii should be used to control speed where cycling is a permitted use	Determined based on design speed for trail. Minimum 15m for design speed of 30km/hr.
EDGE PROTECTION	Refer to Section 2.3.5	Refer to Section 2.3.5	Refer to Section 2.3.5	Refer to Section 2.3.5	Refer to Section 2.3.5
SURFACE	Hard surface: 90mm asphalt (typical), May include concrete, coloured and patterned concrete to suit urban design	Typically, hard surface (i.e. 90mm asphalt, concrete) May include granular surface in context specific locations	Granular surface (i.e. limestone screenings, granite screenings) Granular A, clear stone, wood boardwalk in context specific locations  Limestone screenings should not be used in floodplain areas or where drainage flows directly to watercourses. In these locations trail hardening with asphalt over short distances where erosion is an ongoing issue and cannot be mitigated by re-routing, and for trails within floodplain areas	Natural surface (earthen, grass), woodchips  May include granular (limestone screenings, granite screenings, granular A, clear stone), or wood boardwalk in context specific locations	Topsoil with grass on a granular base  May include granular surface (limestone screenings, granite screenings, granular A) May include asphalt in context specific locations

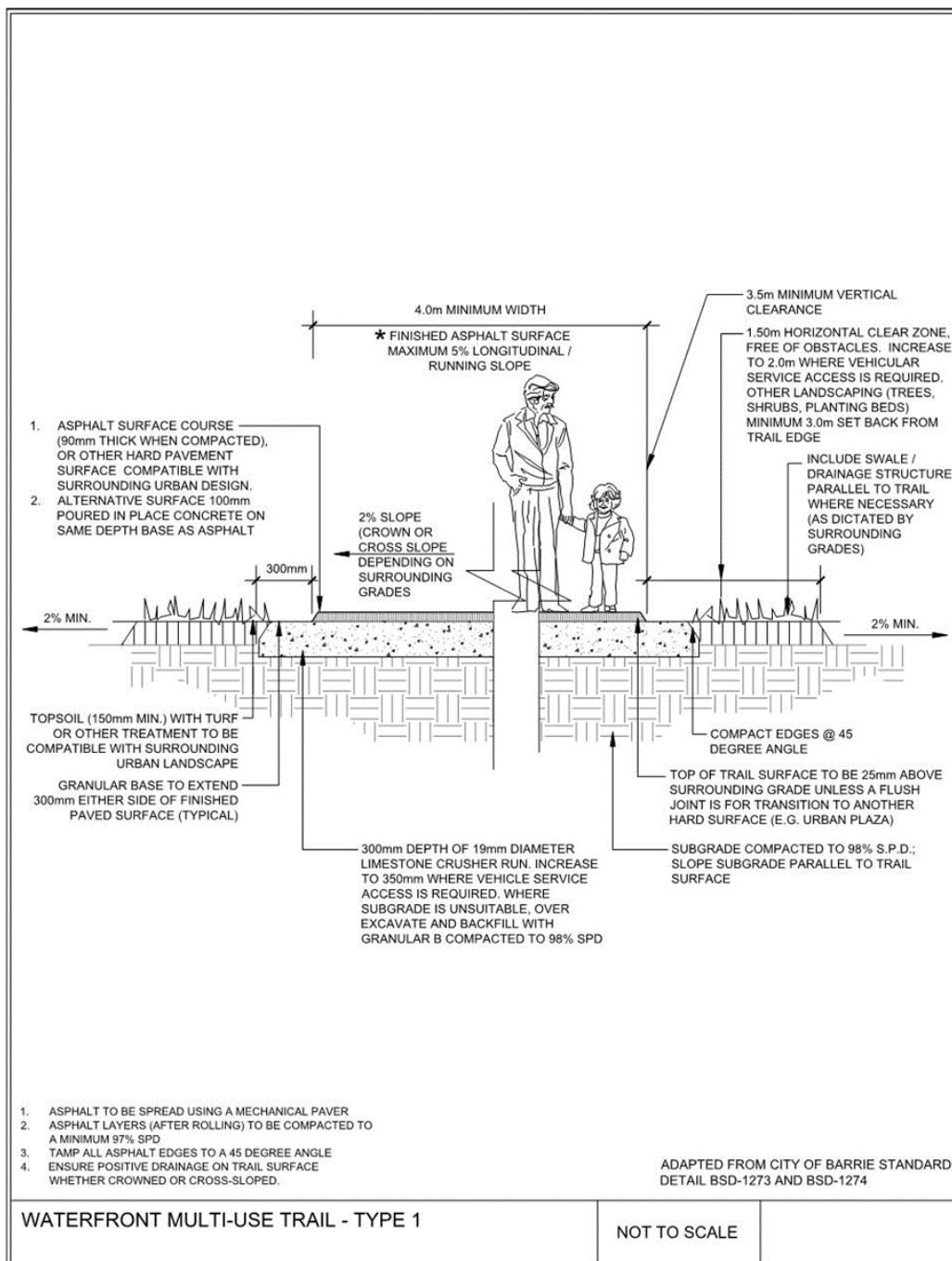
	Waterfront Multi-Use Trail (Type 1)	Multi-Use Trail (Type 2)	Connector Trail (Type 3)	Natural Trail (Type 4)	Stormwater Management Facility Access (Type 5)
BASE DEPTH	300mm  Increase to 350mm for trails intended to include vehicular service / full service access  May include Recycled Concrete Material (RCM) to OPSS 1010 Specification	300mm  Increase to 350mm for trails intended to include vehicular service access  May include Recycled Concrete Material (RCM) to OPSS 1010 Specification	150mm typical, increased to 300-350mm for trails intended to include vehicular service access  May include Recycled Concrete Material (RCM) to OPSS 1010 Specification	0-150mm	300mm-450mm granular  May include Recycled Concrete Material (RCM) to OPSS 1010 Specification
VERTICAL CLEAR ZONE	3.5m minimum	3.0m minimum	3.0m minimum	2.1m minimum	3.0m minimum
HORIZONTAL CLEAR ZONE	1.5m  2.0m for Full Service Waterfront/Bayfront trail	1.5m, may be reduced to 0.6m in constrained areas	1.5m, may be reduced to 0.6m in constrained locations	0.3m -1.5m	1.5m
SETBACKS FOR LANDSCAPING <sup>(5)</sup>	3.0m  4.0m for Full Service Waterfront /Bayfront trail	3.0m	Not applicable	Not applicable	Not applicable
MAINTENANCE <sup>(6)</sup>	Highest level of service in all 4-seasons / highest frequency of maintenance (e.g. weekly)  Ploughing in winter, sweeping as required in other seasons, regular grass mowing and trimming along trail edges, regular trimming, weeding of plant beds  Highest maintenance cost (i.e. range \$10,000/km to \$20,000/km for 3 seasons plus \$6,750 to \$12,500/km annually for winter maintenance).	High level of service in 3-seasons, and moderate frequency of maintenance (e.g. twice per month during spring, summer, fall; and/or as required for emergencies during 4 seasons).  Trail segments identified as key commuter routes are candidates for winter maintenance. Mowing and trimming as per surrounding park maintenance practices and schedule.  High maintenance cost (i.e. range \$2,500/km to \$4,000/km for 3 seasons)  Some sections may be candidates for winter maintenance, an additional \$6,750 to \$12,500/km annually for winter maintenance.	Moderate level of service in 3 seasons and moderate-low frequency of maintenance (e.g. seasonally or as required for emergencies)  Includes topping up of granular surface as necessary, keeping trail envelope free from obstacles (e.g. pruning to maintain clear zone). May include seasonal/annual mowing along trail edges in open areas to stop vegetation encroachment.  Moderate maintenance cost (i.e. range \$1,250/km to \$1,500/km annually)  No winter maintenance.	Lowest level of service (e.g. to remediate significant erosion, remove obstacles on trailbed)  Lowest frequency of maintenance (e.g. annually or as required for emergencies)  Lowest maintenance cost (i.e. range \$750/km to \$1,000/km annually)  No winter maintenance.	Low - moderate level of service, and low frequency of maintenance (e.g. seasonally or as required for emergencies)  Includes keeping trail envelope free from obstacles to enable service access. May include seasonal/annual mowing along trail edges in open areas to stop vegetation encroachment.  Moderate maintenance cost (i.e. range \$1,250/km to \$1,500/km annually)  No winter maintenance.

	Waterfront Multi-Use Trail (Type 1)	Multi-Use Trail (Type 2)	Connector Trail (Type 3)	Natural Trail (Type 4)	Stormwater Management Facility Access (Type 5)
RISK MITIGATION	Highest effort to mitigate risk (i.e. recognizes that users of Type 1 trails have a lower level of experience, skill, endurance and possibly mobility)	Moderate to high effort to mitigate risk	Moderate effort to mitigate risk	Lowest effort to mitigate risk (i.e. recognizes that users of Type 4 trails have a higher level of experience, skill, endurance and mobility, and some risk is part of the experience)	Moderate effort to mitigate risk

Notes:

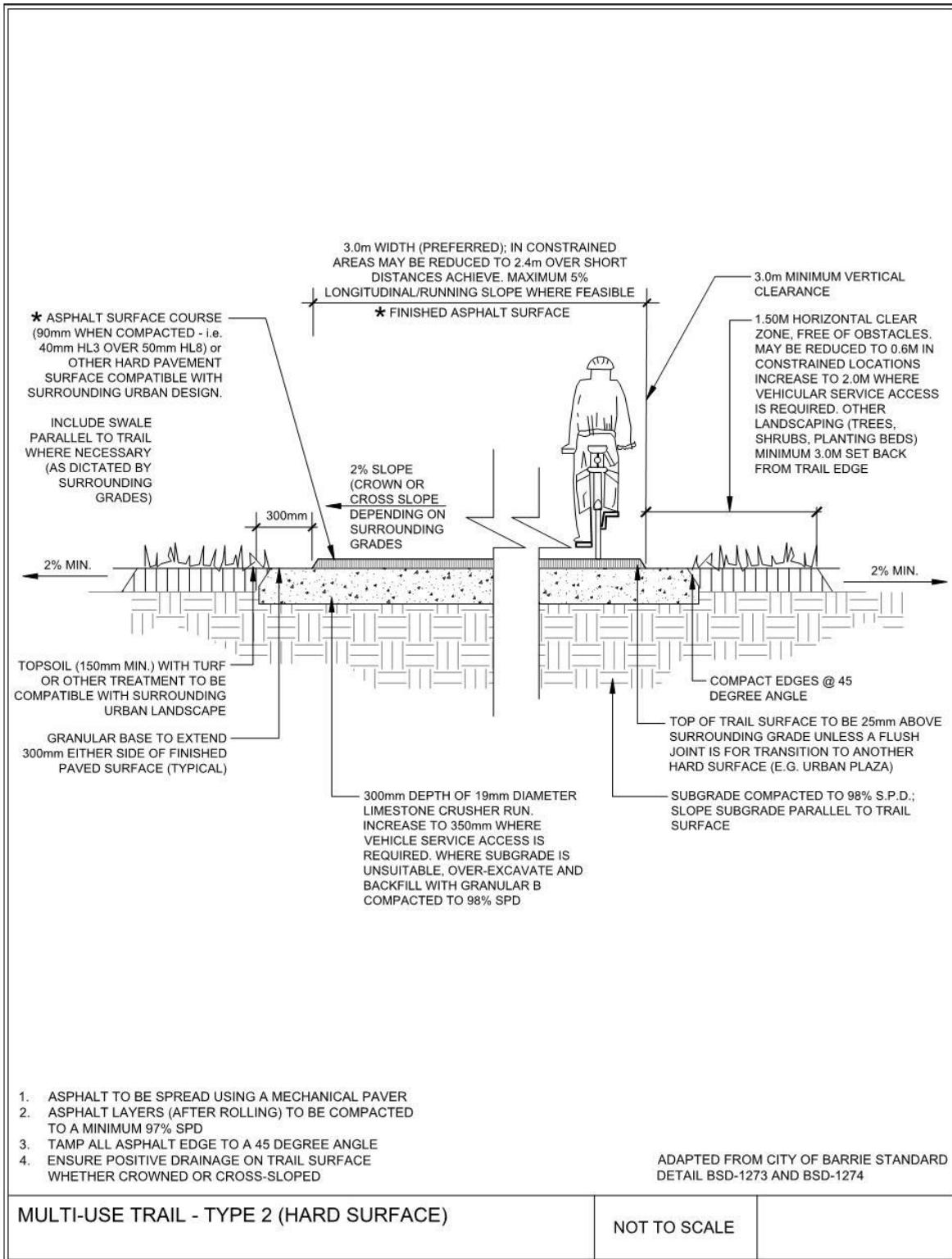
- (1) The classification and associated mapping (**Map 3**) includes existing and planned trail routes in Parkland, Open Space/Environmental Protection Area (EPA) and Stormwater Management Areas.
- (2) Tertiary, Cultural trails (e.g. informal footpaths / unsanctioned / unmaintained trails) and trails which have been closed are not part of the Trail Classification and associated mapping
- (3) Multi-use trails pathways road rights-of-way (i.e. In-boulevard pathways) are not part of the Trail Classification; refer to the City of Barrie Active Transportation Plan for further information regarding In-boulevard Trails.
- (4) The classification applies to new trail construction and existing trails at the time they are reconstructed,
- (5) Setbacks for Landscaping refers to trees, shrubs and planting beds that are deliberately designed and planted. Setbacks for Landscaping does not apply to trees or shrubs in open space and natural areas.
- (6) Refer to **Section 3.2** for further discussion of trail maintenance tasks, frequency and cost ranges.

Typical design details have been prepared for each trail type in the classification. In some cases, details have been based on the City's Development Standard BSD-1273 and 12-74. They are presented in **Figures 3 through 9** on the following pages. These, along with the design standards and guidelines noted in the table above should be included within any municipal policy updates and promoted for use on any trail related infrastructure projects completed by a municipal staff or recommended as a primary reference for municipal partners.

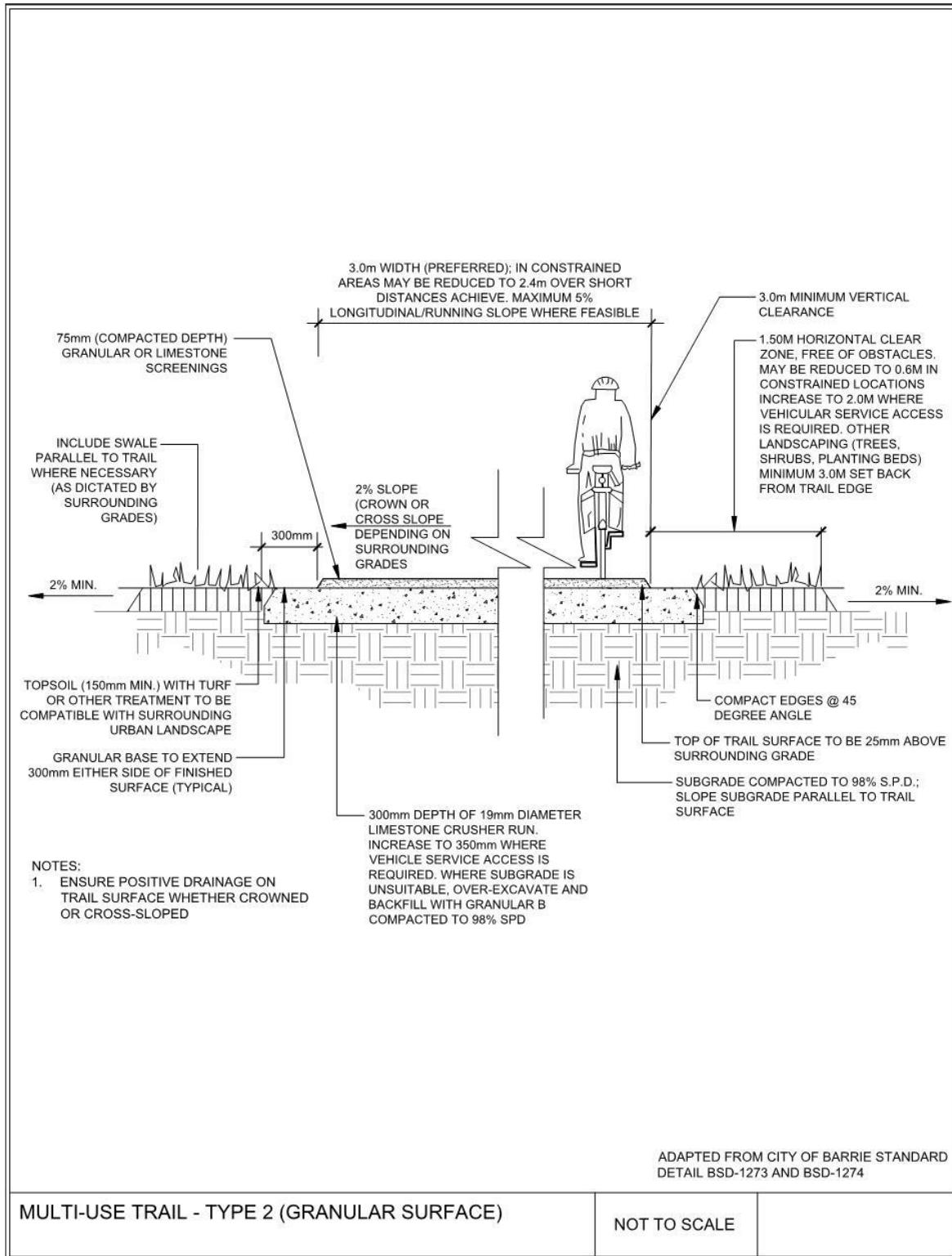


**Figure 3 |** Waterfront Multi-use Trail – Type 1

# SECTION 2.0 DEVELOPMENT & DESIGN

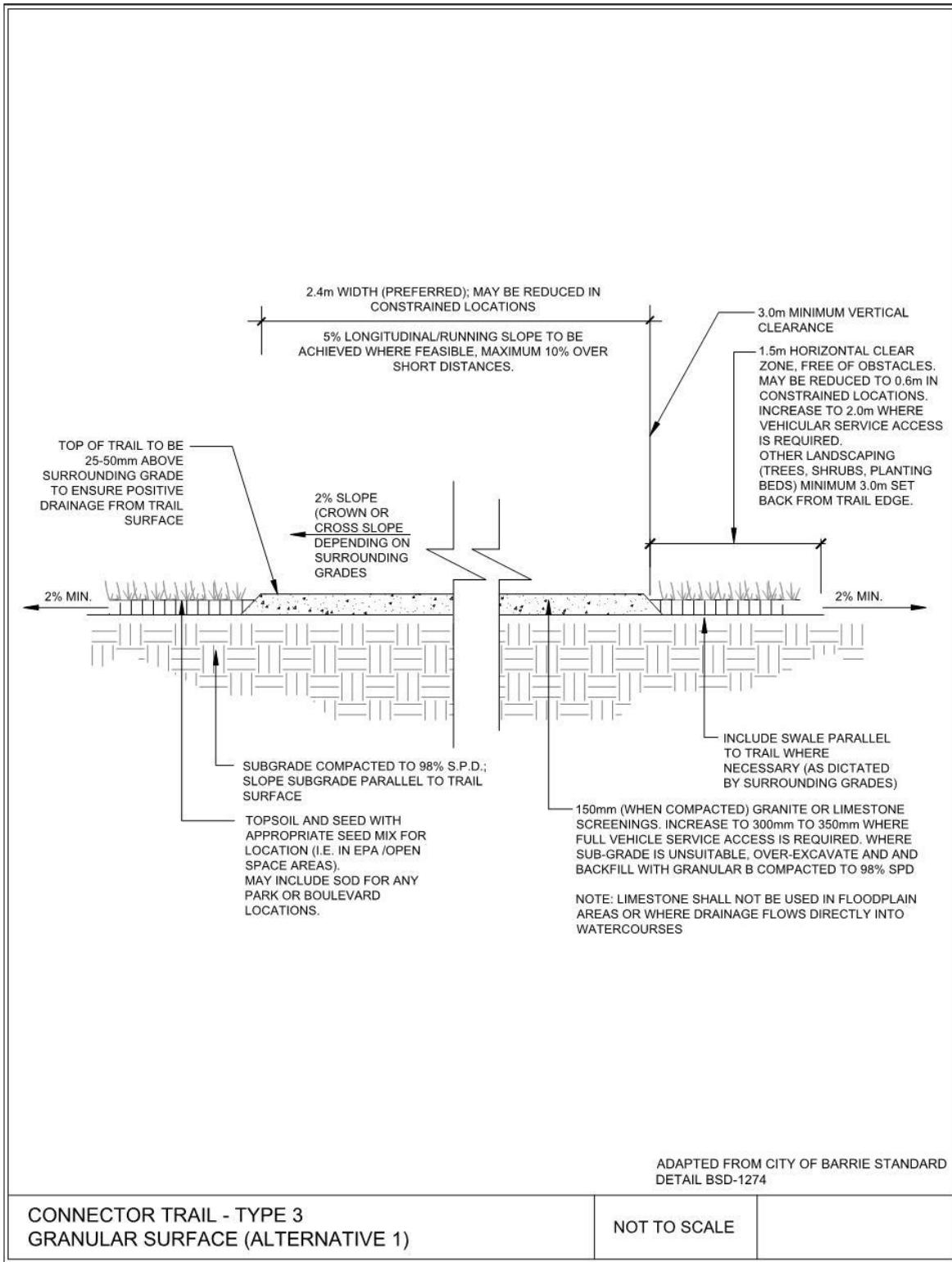


**Figure 4 | Multi-use Trail – Type 2 (Hard Surface)**

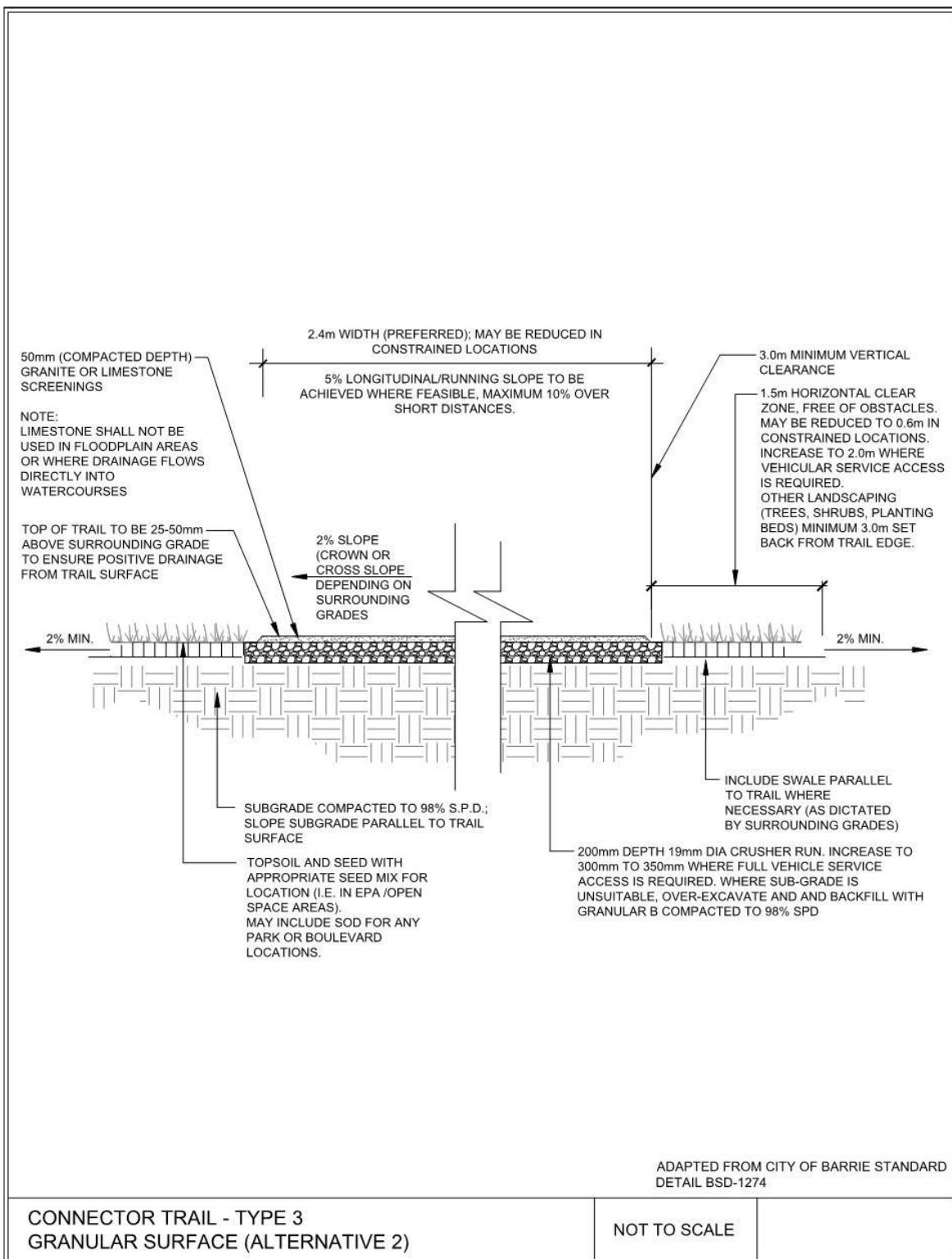


**Figure 5 | Multi-use Trail – Type 2 (Granular Surface)**

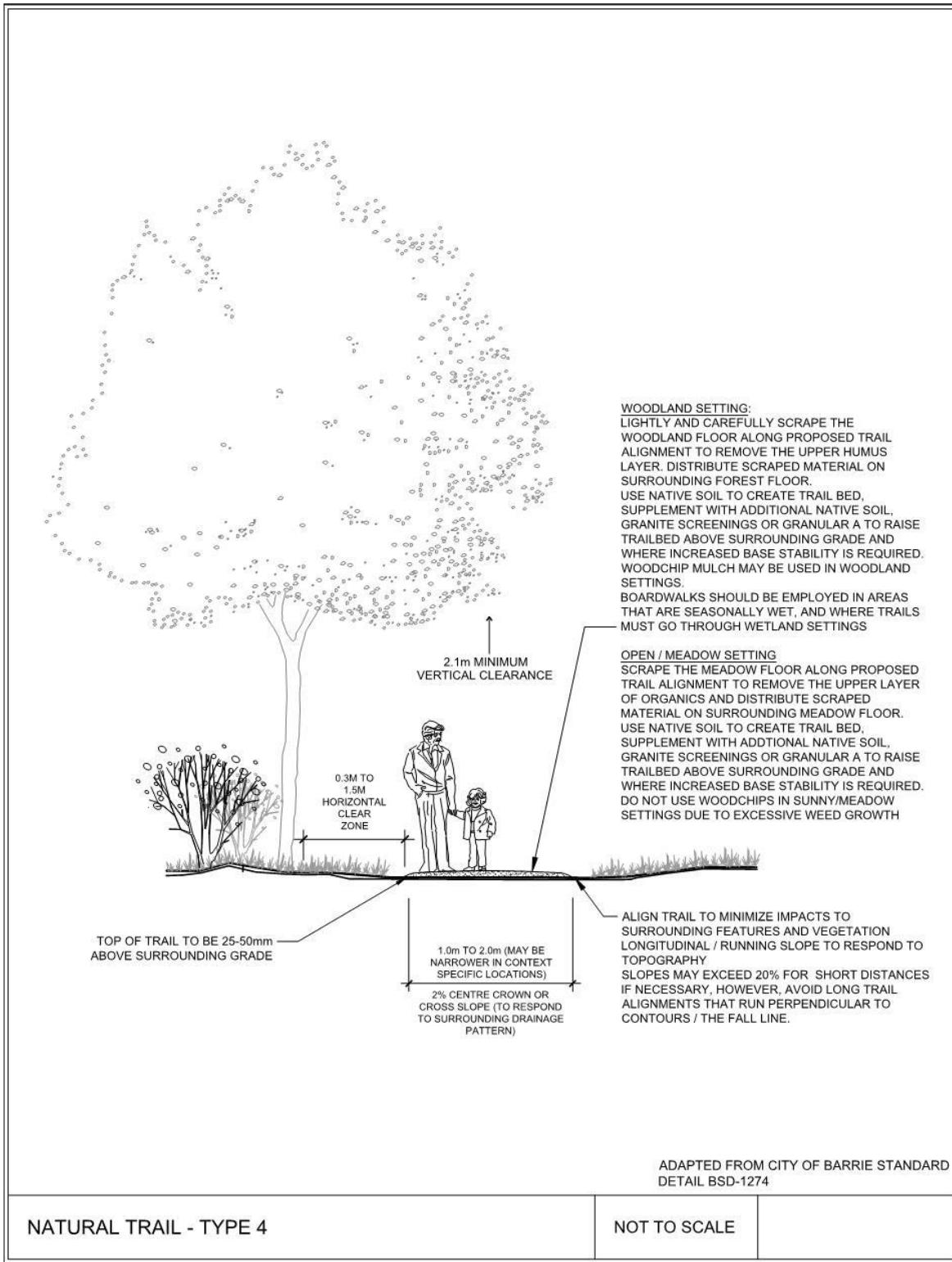
# SECTION 2.0 DEVELOPMENT & DESIGN



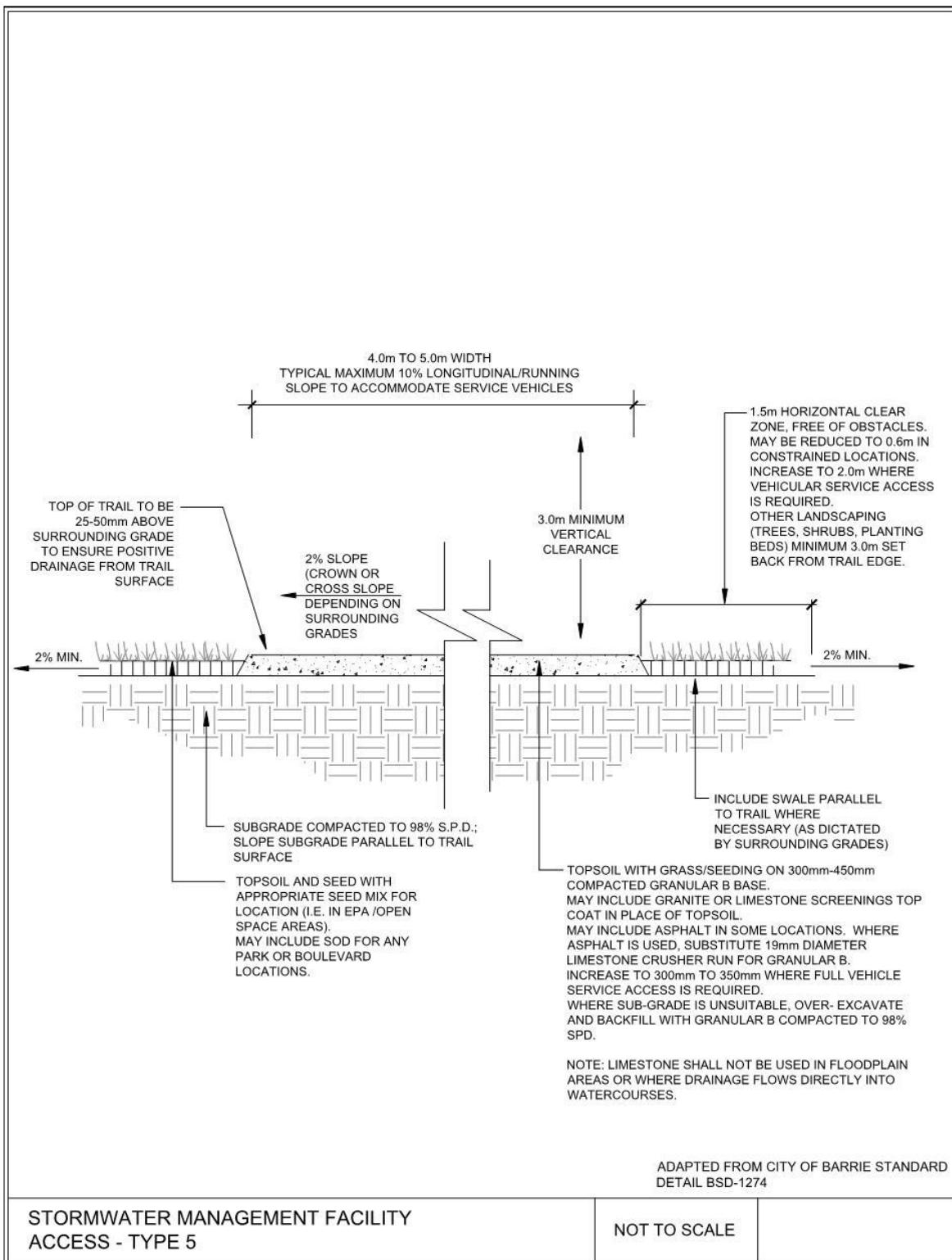
**Figure 6 | Connector Trail-Type 3 Granular Surface (Alternative 1)**



**Figure 7 | Connector Trail-Type 3 Granular Surface (Alternative 2)**



**Figure 8 | Natural Trail – Type 4**



**Figure 9 | Stormwater Management Facility Access – Type 5**

### 2.3.3 TRAIL CROSSINGS & STRUCTURES

Inevitably the trail network will need to cross roads, natural features such as waterways and other physical barriers. In these cases, a design feature would be needed to guide users from one part of a trail to another. By implementing crossings and structures that reflect the design of the trail and the conditions that are being crossed a greater sense of connectivity can be achieved. The following are design guidelines and considerations related to types and conditions of trail crossings. The implementation of these types of trail enhancements can be costly.

Where possible, the trail network should make use of existing bridges, including pedestrian bridges, vehicular bridges and abandoned railway bridges in appropriate locations. In cases where this is not possible a new structure will be needed and the type and design of a structure needs to be assessed on an individual basis.

The following are some general considerations for the implementation of trail structures.

- Bridge designs require approval from the conservation authorities;
- All bridges need to be designed to withstand flooding, and to prevent them from becoming a barrier to flood flows;
- Bridge maintenance needs to include removal of accumulated debris as required;
- Railings should be considered if the height of the bridge deck exceeds 60cm above the surrounding grade;
- With accessibility in mind, an appropriate trail surface should be installed on the trail, and decking should be laid perpendicular to the path of travel, with openings less than 20mm to meet AODA requirements;
- In most situations for Type 1, 2, 3 trails a prefabricated steel truss bridge anchored on concrete abutments or helical piers is a practical, cost effective solution;
- Bridges would not typically be installed on Type 5 trails
- For Type 4 and some Type 3 applications where site access is limited a “low-tech” boardwalk can be designed. Similarly, for short spans (i.e. 5m or less a ‘low tech’ bridge may be considered.

**Figure 10** is a schematic illustration of a pedestrian / trail boardwalk including key design criteria that should be considered.

**Figure 11** illustrates a low-profile boardwalk with various foundation options that can be used on Type 4 and some Type 3 trails, and **Figure 12** illustrates a timber crib bridge that may be used on Type 4 trails.

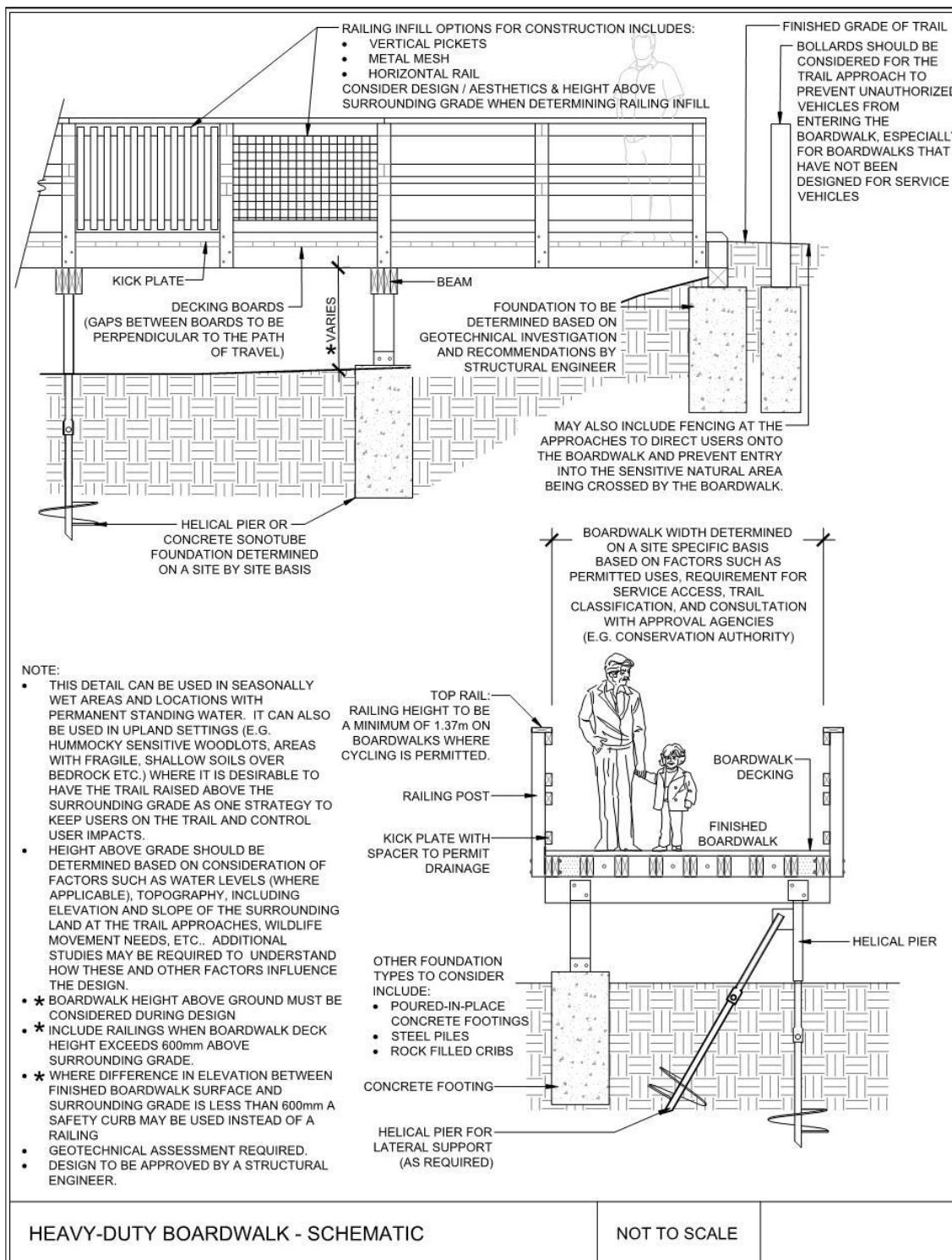
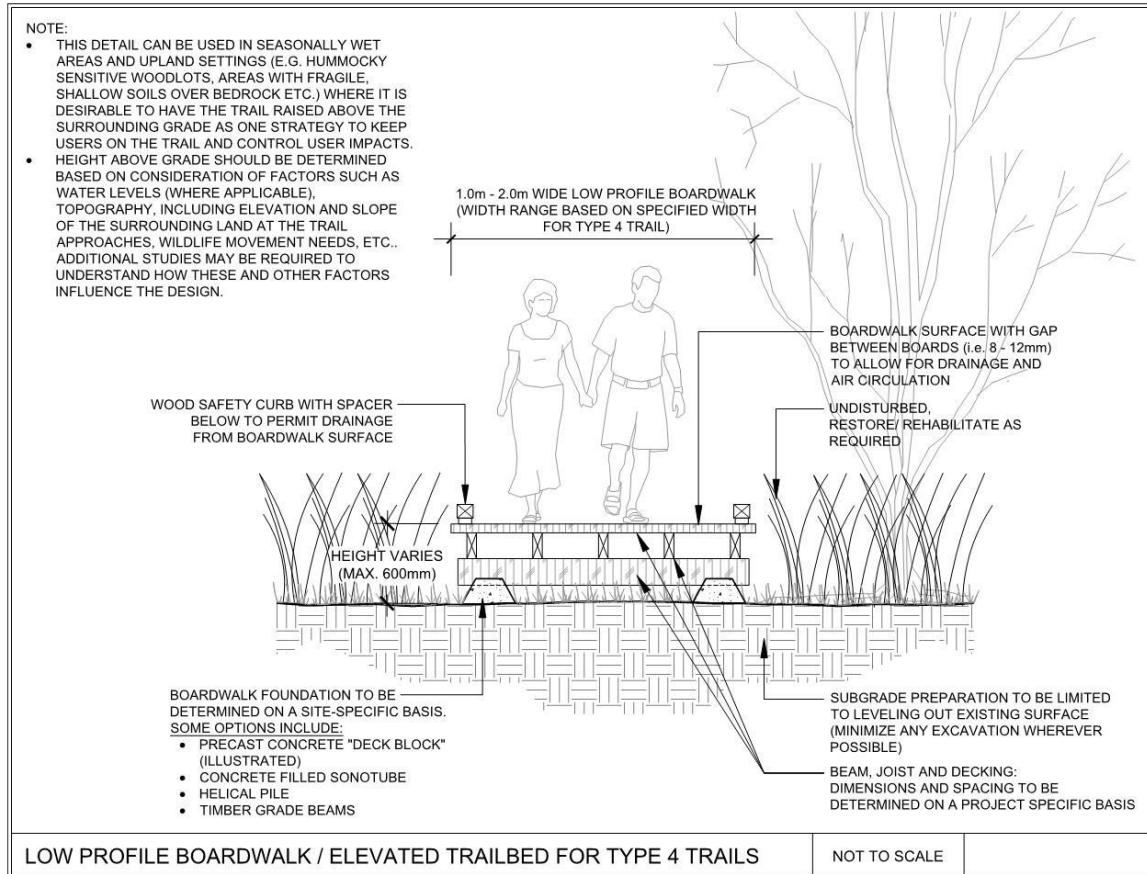


Figure 10 | Heavy Duty Boardwalk - Schematic

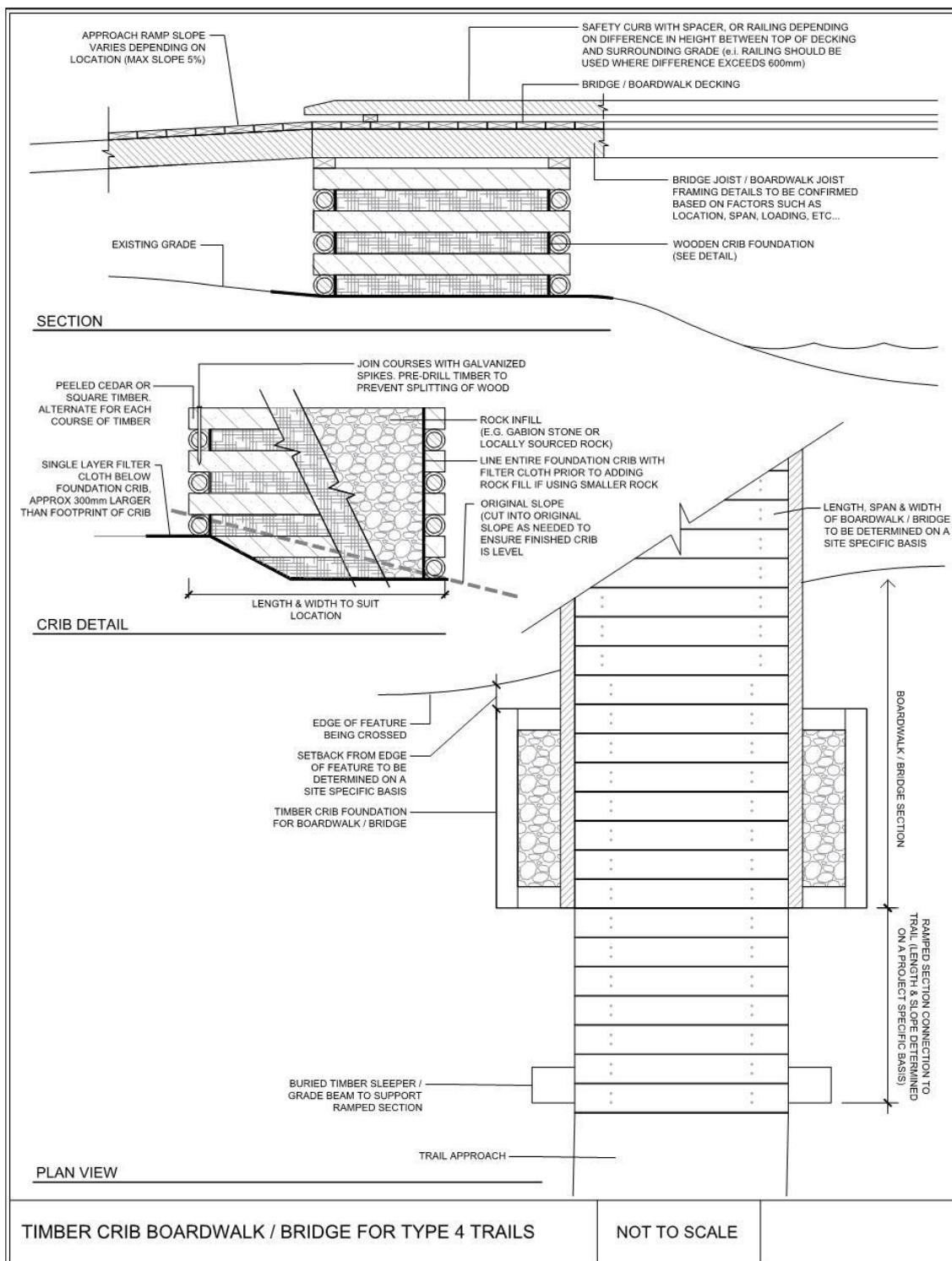


**Figure 11 | Low Profile Boardwalk / Elevated Trailbed for Type 4 Trails**



Low Profile Boardwalk, University of Guelph WSP, 2017

# SECTION 2.0 DEVELOPMENT & DESIGN



**Figure 12 | Timber Crib Boardwalk / Bridge for Type 4 Trails**

Off-road trails intersect with roadways throughout the network. At each of these locations there should be a clearly marked point where the movement of pedestrians, cyclists and vehicles will be managed. Trail crossings or terminus points should be designed to clearly articulate the way in which users are meant to cross the roadway or how they should transition to the next portion of the trail.

Having trails cross roads at intersections is preferred where feasible, and mid-block crossings are generally undesirable. However, in some locations mid-block crossings are inevitable due to overall configuration of the trail network and functionality / convenience for trail users.

The following are some of the basic elements which should be considered when a trail approaches or crosses a major or minor roadway.

- Creating and maintaining an open sight triangle at the crossing point to allow trail users to see approaching vehicles and for trail users to be seen by drivers in approaching vehicles
- Access barriers on the trail which serve to:
  - o Prevent unauthorized users from entering the trail, and
  - o Act as a visual cue to trail users that they are approaching an intersection with the road
- Caution signs along the roadway in advance of the crossing point to alert motorists to the upcoming crossing
- Caution signs along the trail to alert users of the upcoming roadway crossing



Top to Bottom | Pedestrian Refuge; 2 | Pedestrian Crossover; 3 | Mid-block Pedestrian Signal; 4 | Crossride Source: WSP

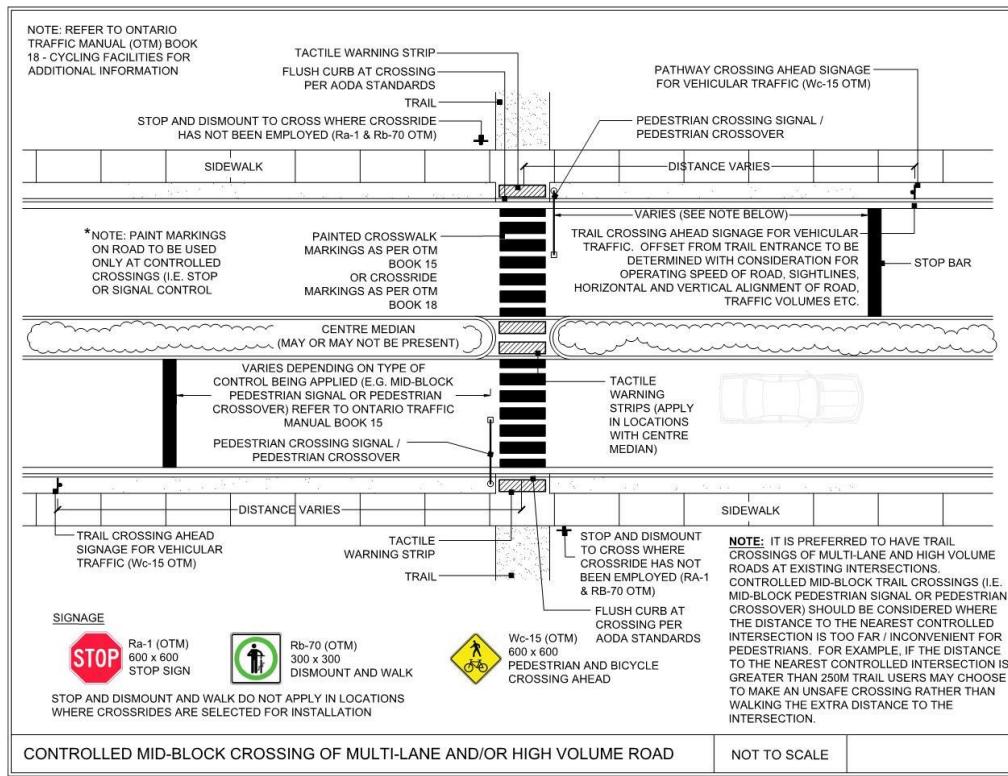
- Aligning the crossing point to achieve as close to possible a perpendicular crossing of the roadway to minimize the time that users are in the traveled portion of the roadway
- A concrete ramp with tactile warning plates in the boulevard and curb ramps on both sides of the road to allow users to enter and cross the roadway efficiently and quickly
- Pavement markings where appropriate:
  - o Pavement markings, to delineate a crossing should only be considered at crossings where there is some form of vehicle control in place (e.g. stop sign, or traffic signal or pedestrian crossover).
  - o Pavement markings should not be used at uncontrolled trail intersections with roads (i.e. free flowing vehicular traffic that is not controlled by a stop sign or traffic signal). Trail users are required to stop and wait for a gap in traffic at uncontrolled intersections. Pavement markings at uncontrolled crossings may give users the false sense that they have the right-of-way over motor vehicles, which is contrary to the Highway Traffic Act.

In some locations signing on the trail may not be enough to get trail users to stop before crossing the road. Under these circumstances or in situations where the

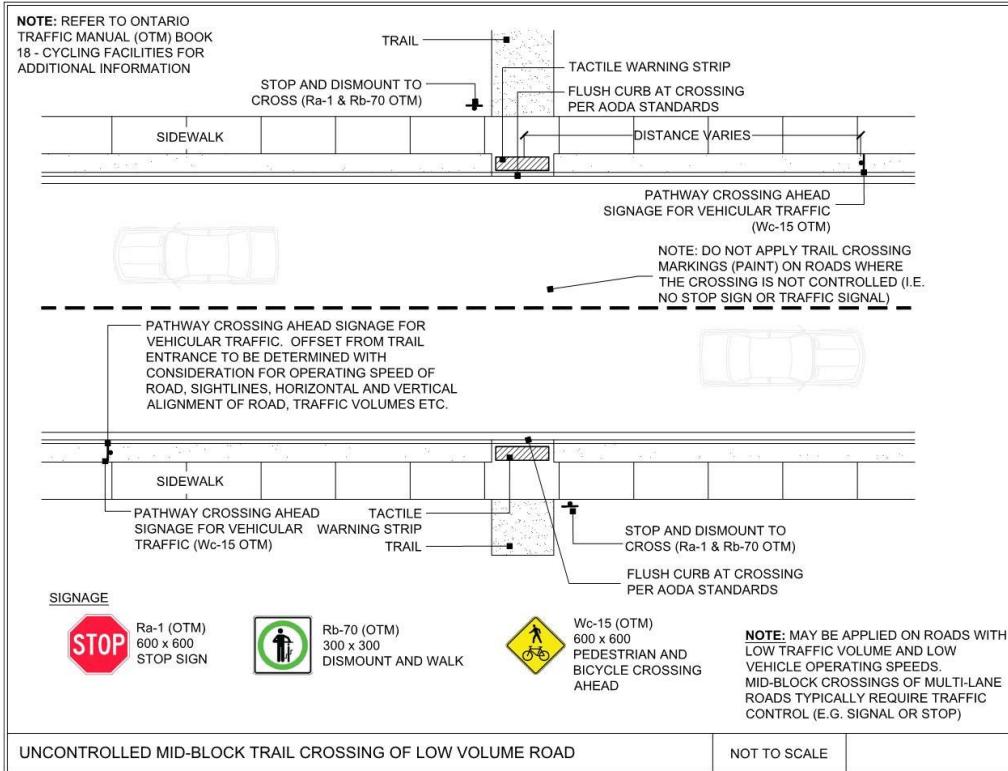
sight lines for motorists are reduced and/or where there is a tendency for motorists to travel faster than desirable, the addition of other elements into the road or trail crossing may be considered. Changing the trail alignment may assist in getting trail users to slow and stop prior to crossing. Changes to the streetscape may also provide a visual cue and traffic calming effect for vehicles. This could include adding bump outs to narrow the road pavement width and raising the pavement elevation (e.g. speed table).

The pedestrian crossover and mid-block pedestrian signal are options that provide full control of vehicle traffic while trail users cross.

**Figure 13** and **Figure 14** illustrate the key considerations for mid-block trail crossings of low volume roads and high volume multi-lane roads.



**Figure 13 | Controlled Mid-Block Crossing of Multi-lane and / or High Volume Road**



**Figure 14 | Uncontrolled Mid-Block Crossing of Low Volume Road**

### 2.3.4 TRAILS ON SLOPES

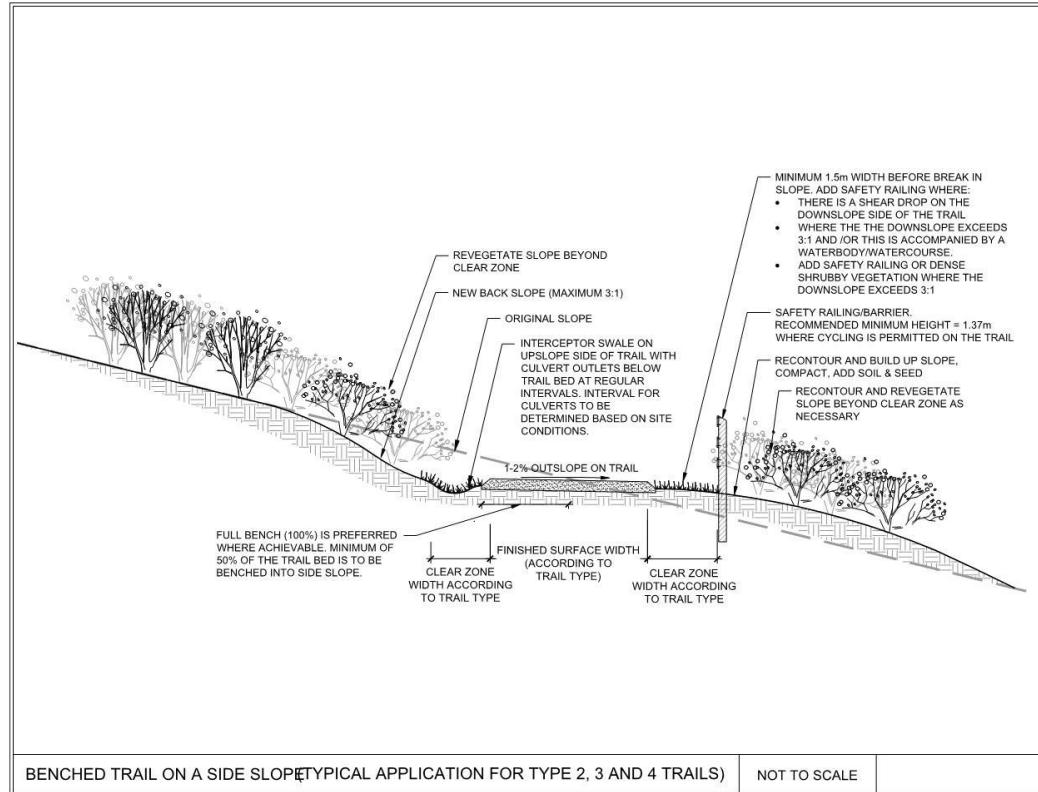
Topography is a significant factor in some parts of the city and it will be necessary to construct trails on slopes. Where trails must traverse slopes they should be aligned to gradually ascend by gently climbing the contours rather than directly perpendicular to the contours. In other words, trails should be “benched”, or built into the side of the slope for maximum stability.

In situations where the downslope is excessive, a safety barrier should be installed between the trail edge and downslope to alert users and provide some protection from the slope. **Figures 15 to 20** illustrate the key principles for trail benching and trail drainage on slopes, and **Figure 21** provides additional design considerations for trailside safety barriers including a “rub rail” to prevent bicycle pedals and handlebars from becoming entangled in railing pickets.

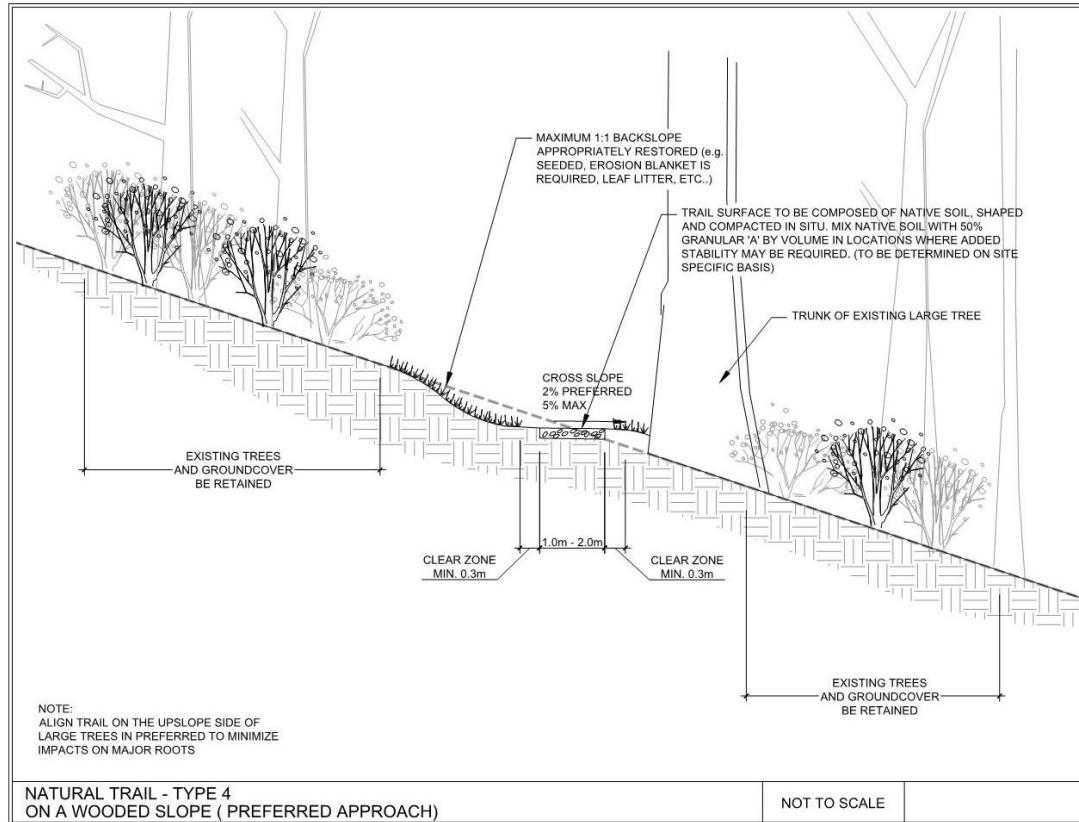
Benching may also require retaining of the slope to either:

- Retain the upslope above the trail, or;
- Retain the downslope and provide structure upon which the trail bed can be constructed.

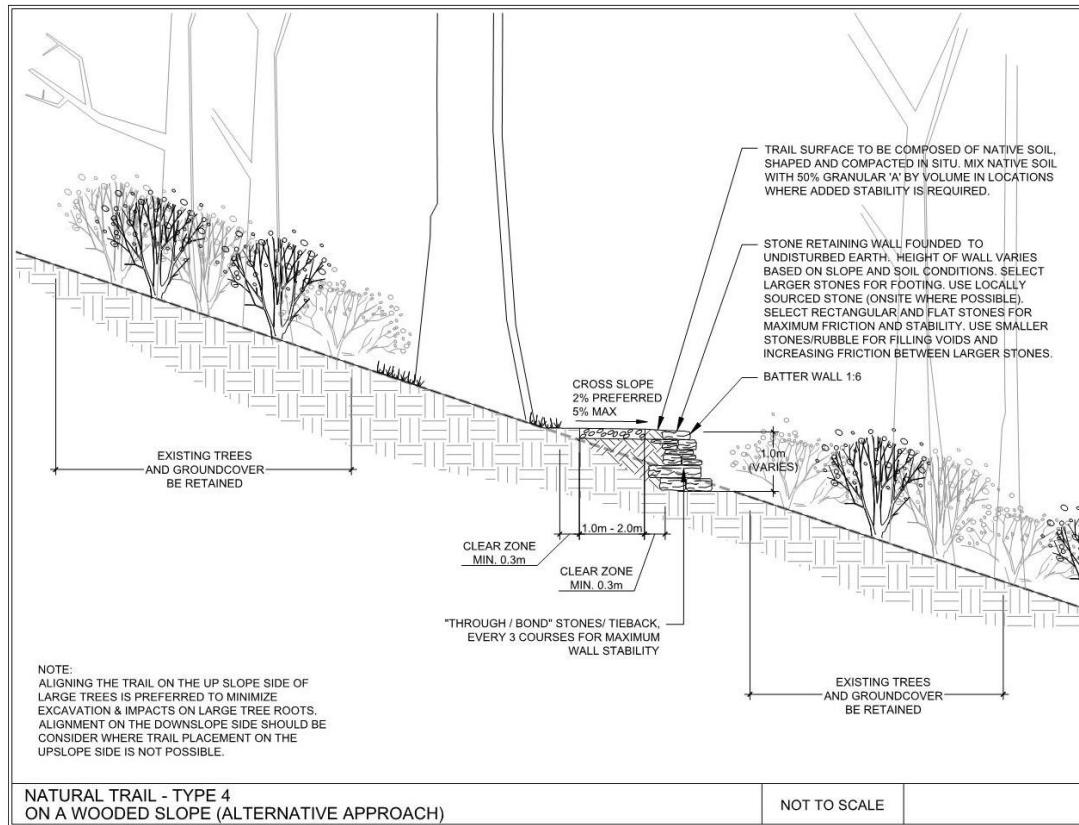
Crib stairs (**Figure 22**) can be used for ascending / descending slopes, typically for Type 3 or 4 trails, in locations where site access is limited. Materials are relatively portable and construction can be completed with hand-held tools. **Figure 23** Crib Wall is one technique that can be used for retaining, particularly for Type 4, and in some cases Type 3 trails. Retaining structures can be constructed from a variety of materials including natural stone, timber, logs and stackable precast retaining wall systems. The location / context, site access and trail type will influence the design approach and material selection.



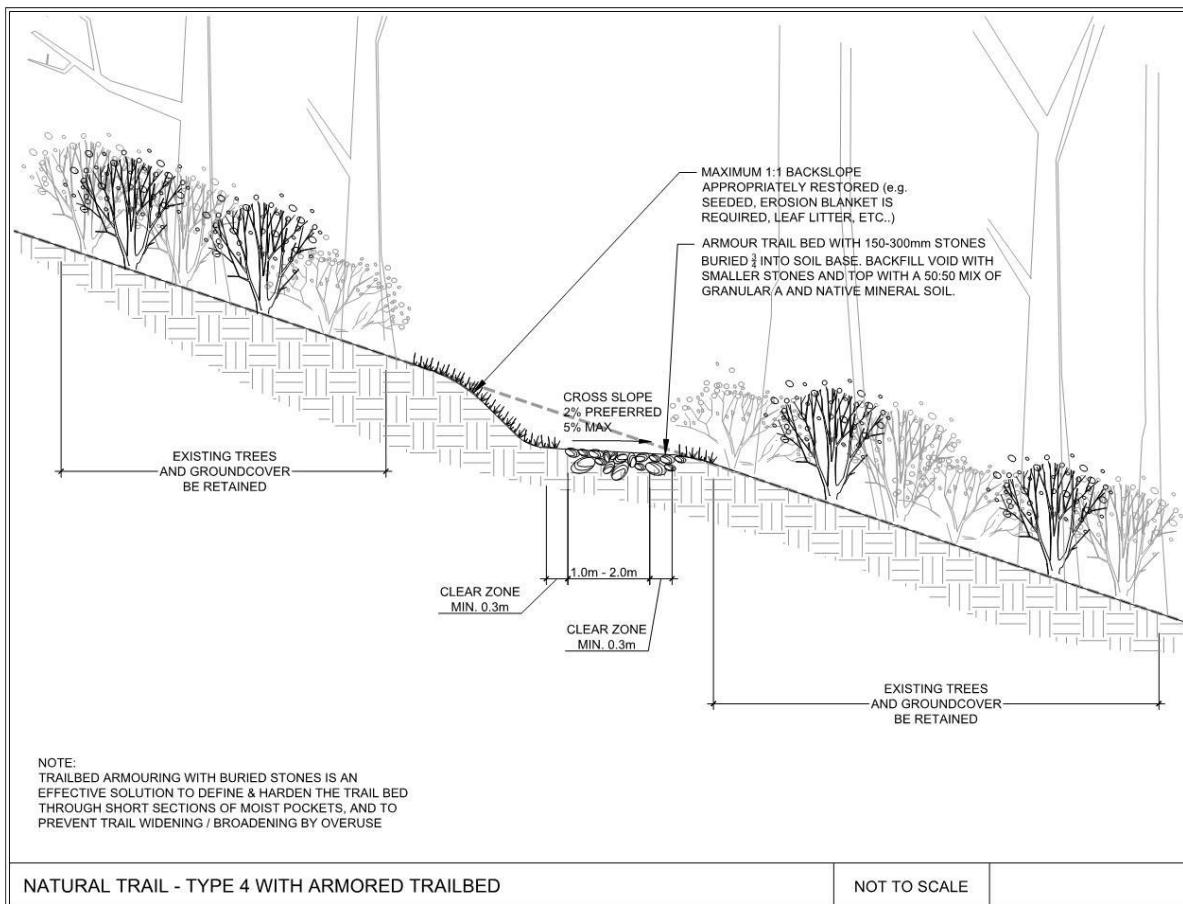
**Figure 15 | Benched Trail on a Side Slope (Typical Application for Type 2, 3 and 4 Trails)**



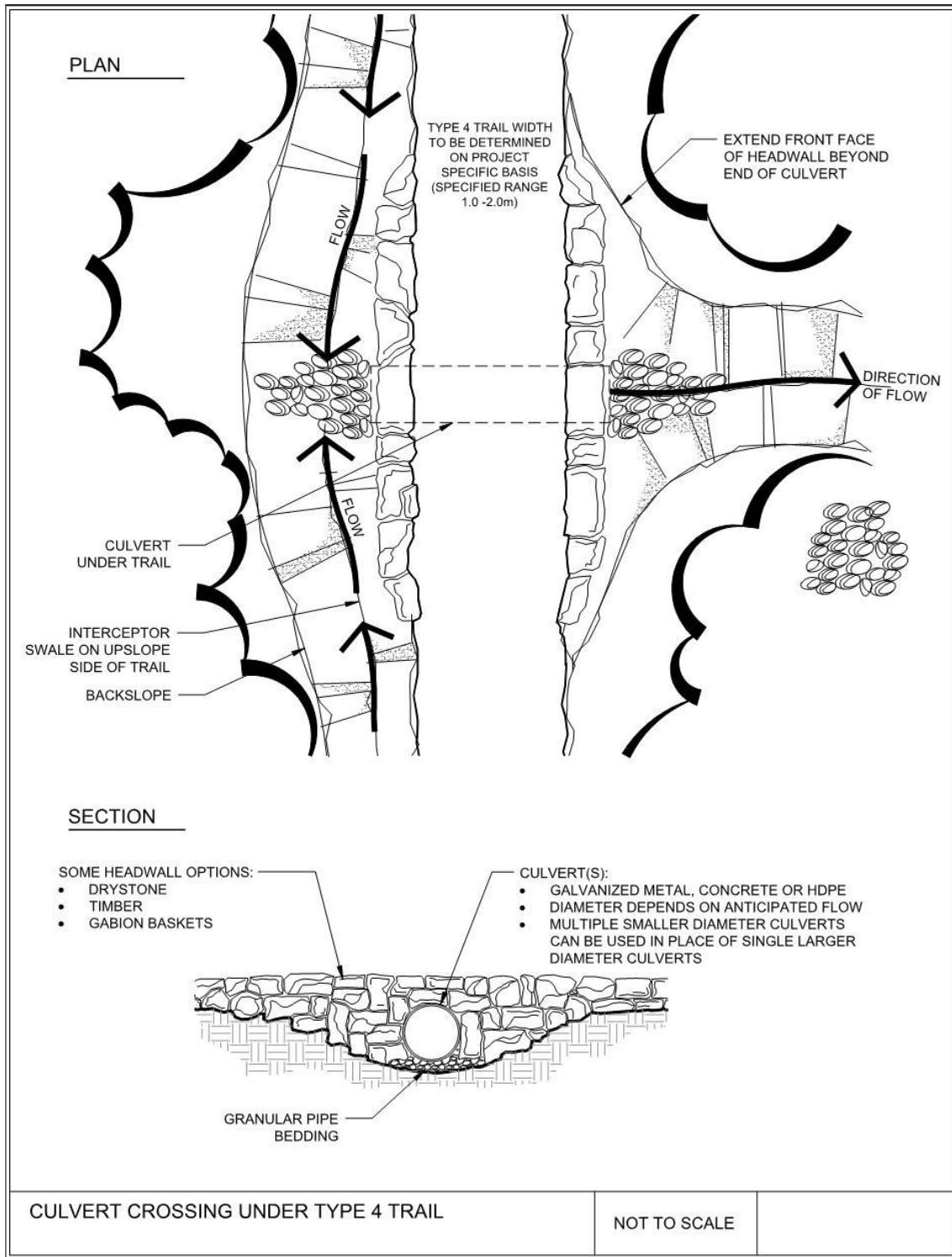
**Figure 17 | Natural Trail – Type 4 on Wooded Slope (Preferred Approach)**



**Figure 16 | Natural Trail – Type 4 on Wooded Slope (Alternative Approach)**



**Figure 18 | Natural Trail – Type 4 with Armored Trailbed**



**Figure 19 | Culvert Crossing Under Type 4 Trail**

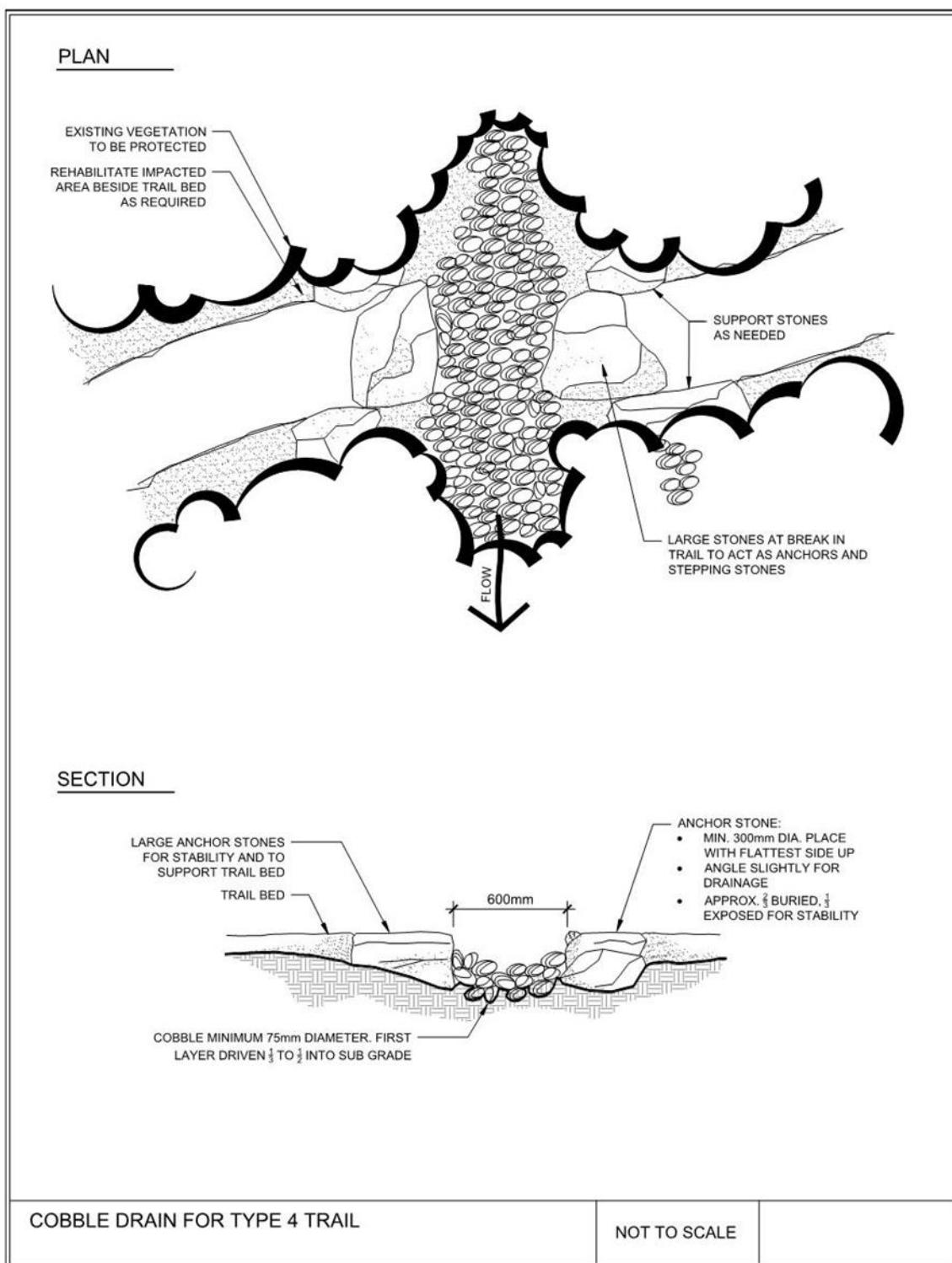
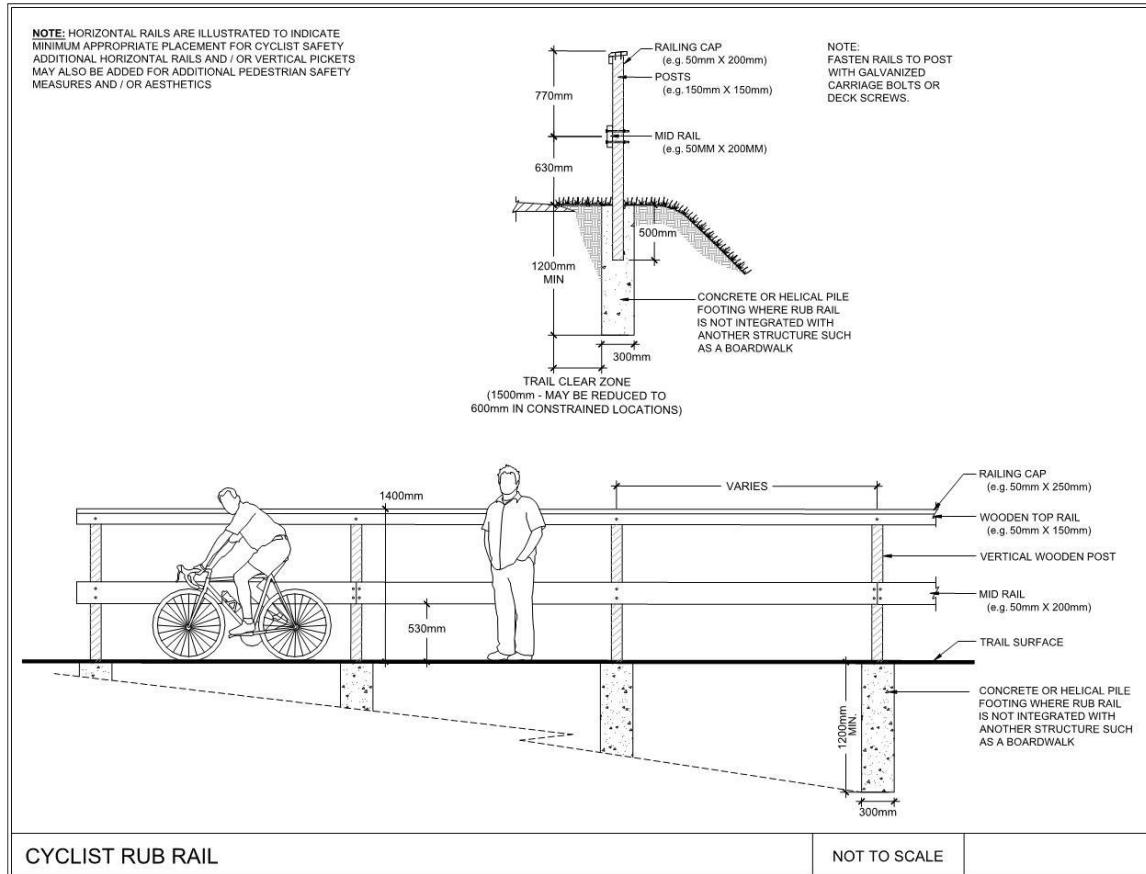


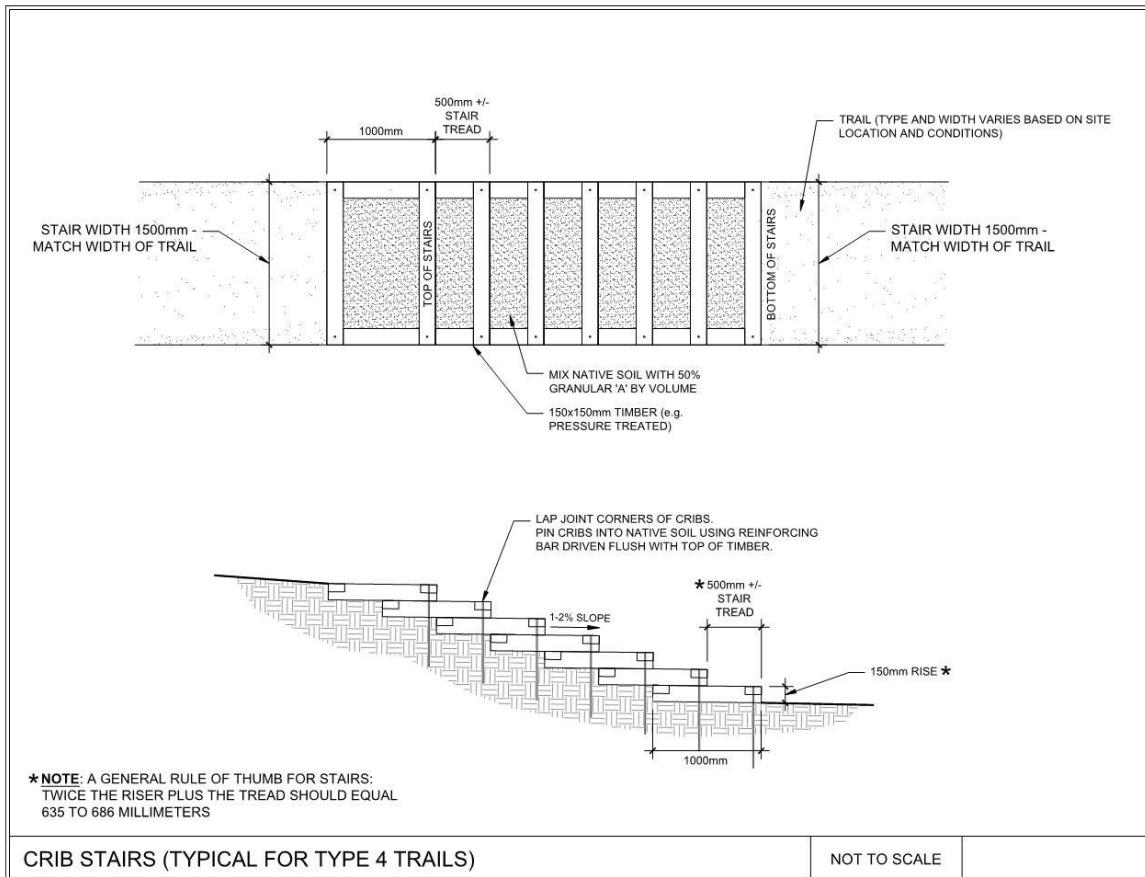
Figure 20 | Cobble Drain for Type 4 Trail



**Figure 21 | Cyclist Rub Rail**



Trail at Sandy Hollow; Source: WSP 2018



**Figure 22 | Crib Stairs (Typical Approach for Type 4 Trails)**



Ardagh Bluffs trail near Bloom Cresc., potential candidate for crib stairs;  
Source: WSP 2018

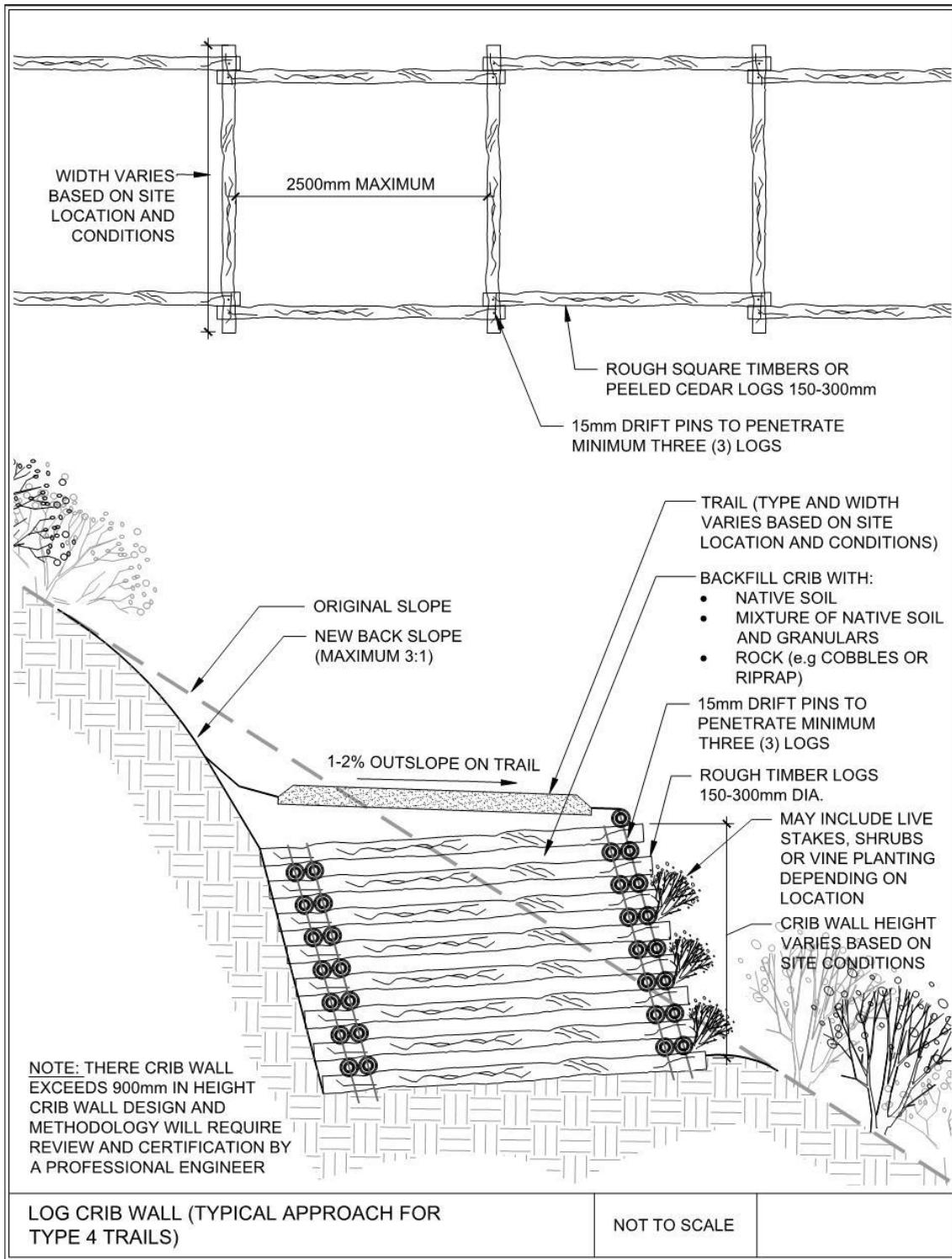


Figure 23 | Log Crib Wall (Typical Approach for Type 4 Trails)

### 2.3.5 EDGE PROTECTION

Where trails are adjacent to slopes edge protection may be needed, depending on trail type and trail location. All Type 1 trails are designed to be accessible, and Type 2 trails are designed to be accessible where feasible. Where these trails are located on or near slopes edge protection may be required.

- Provide edge protection where trails are adjacent to water or a drop-off. This includes boardwalks, bridges, culvert crossings, granular or hard surfaced trails.
- Forms of edge protection can include raised curbs, walls, railings, or other projecting surface that defines the edge of the travel surface that helps to prevent accidental falls over the edge.

**Table 12 | Edge Protection for Accessible Trails**

ADJACENT SLOPE ON OUTSLOPE SIDE OF TRAIL	SAFETY SHOULDER, SETBACK AND EDGE PROTECTION	OTHER CONSIDERATIONS
10:1 or Less (10% or Less) Adjacent to Water	<ul style="list-style-type: none"> <li>– Not required</li> </ul>	<ul style="list-style-type: none"> <li>– Not required</li> </ul>
10:1 or Less (10% or Less) and Adjacent to Water	<ul style="list-style-type: none"> <li>– Safety Shoulder optional</li> <li>– Edge Protection minimum 100mm height</li> </ul>	<ul style="list-style-type: none"> <li>– Edge protection must not impede drainage from trail surface, and have tonal contrast with trail surface</li> </ul>
Between 10:1 And 3:1 (10% To 33%) <sup>(1)</sup>	<ul style="list-style-type: none"> <li>– 300mm (minimum) wide safety shoulder <b>or</b>,</li> <li>– Edge Protection minimum 100mm height</li> </ul>	<ul style="list-style-type: none"> <li>– Edge protection must not impede drainage from trail surface, and have tonal contrast with trail surface</li> </ul>
Between 3:1 And 2:1 (33% To 50%)	<ul style="list-style-type: none"> <li>– 300mm (minimum) wide Safety Shoulder <b>and</b>,</li> <li>– Edge Protection minimum 100mm height</li> </ul>	<ul style="list-style-type: none"> <li>– Edge protection must not impede drainage from trail surface, and have tonal contrast with trail surface</li> </ul>
Greater Than 2:1 (50%)	<ul style="list-style-type: none"> <li>– 1000mm (minimum) wide Safety Shoulder/setback between trail edge and Guard <b>and</b>,</li> <li>– Guard minimum 1070mm height</li> </ul>	<ul style="list-style-type: none"> <li>– Guard must not impede drainage from trail surface</li> <li>– Guard height of 1370mm should be considered where cycling is permitted on trail</li> </ul>
Grade Differential / Drop Off 200mm to 600mm	<ul style="list-style-type: none"> <li>– Edge Protection minimum 100mm height</li> </ul>	<ul style="list-style-type: none"> <li>– Edge protection must not impede drainage from trail surface, and have tonal contrast with trail surface</li> </ul>
Grade Differential / Drop Off Greater Than 600mm	<ul style="list-style-type: none"> <li>– 1000mm (minimum) wide Safety Shoulder/setback between trail edge and Guard <b>and</b>,</li> <li>– Guard minimum 1070mm height</li> </ul>	<ul style="list-style-type: none"> <li>– Guard must not impede drainage from trail surface</li> <li>– Guard height of 1370mm should be considered where cycling is permitted on trail</li> </ul>

Notes:

1. Accessible trails directly adjacent to water require some form of edge protection.

Type 3 and 5 trails may be designed to be accessible, and where this is the case edge protection would follow the same guidelines as noted above for Type 1 and accessible Type 2 trails.

Type 4 trails are not designed to be accessible. Consideration for edge protection and their design includes the following:

- Dense plantings can be used in place of a guard where slopes are not too steep or long (i.e. 3:1 to 2:1)
- Guards should be considered for slopes greater than 2:1, guard height should be a minimum of 1370mm high where cycling is permitted
- Guards should be used where there is a vertical drop of greater than 900mm directly adjacent to the trail.

#### 2.3.6 TRAIL SIGNAGE & WAYFINDING

The use of trails requires clear information on how to use the trail infrastructure, where to go and how to interact with other users, among other things.

When designing a trail system, every effort should be made to provide users with sufficient information to feel both safe and comfortable. This can be achieved through the design and implementation of trail signage. The design and construction of the network should incorporate a “family” of signs each with a different purpose and message.

This family” contains unifying design and graphic elements and materials. The unified system becomes immediately recognizable by the user and can become a branding element.

Consistent with this approach is the correct use of signage, which in-turn reinforces the trail’s identity. A family of signs typically includes:

## TRAILHEAD SIGNS



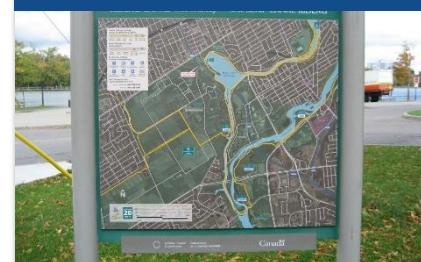
Typically located at key destination points and major network junctions, these provide orientation to the network through mapping, other appropriate network information as well as trail etiquette. Where network nodes are visible from a distance, these can be a useful landmark. In some municipalities, orientation signing has also been used as an opportunity to sell advertising space. This not only provides information about local services that may be of interest to trail users, but it may also help to offset the cost of signs and trails.

## ETIQUETTE SIGNS



Should be posted at public access points to clearly articulate which trail uses are permitted, regulations and laws that apply, as well as trail etiquette, safety and emergency contact information. Reminder signs may be needed at some locations such as "Please stay on the Trail". At trailheads, the user etiquette information can be incorporated into trailhead signs. In other areas, this information can be integrated with access barriers.

## TRAIL GATEWAY SIGNS



May be considered where trails cross the municipal boundary from surrounding municipalities. The gateway sign is a smaller version of the trailhead sign and includes elements such as route mapping, "Welcome to Barrie", trail branding/logos, and user etiquette and emergency contact information.

# SECTION 2.0 DEVELOPMENT & DESIGN

## DIRECTIONAL SIGNS



Directional signs should be located at trail intersections and at regular intervals along long, uninterrupted sections of trail. The purpose of route marker signs is to provide a simple visual message to users that they are travelling on the designated trail network. Where the trail network must use an on-street connecting link, clear direction to the next available segment of the off-street trail network should be provided. This includes directional markers and a small map board (i.e. 60cm x 60cm) clearly illustrating the location of the next available off-street segment.

Trails that are not part of the network, such as trails which have been closed, cultural / informal / unsanctioned trails should be signed to indicate they are not official trails and are not maintained.

## INTERPRETIVE SIGNS



These inform users about points of interest such as key natural and cultural heritage features and points of interest. They should be located carefully in highly visible locations to minimize the potential for vandalism.

## REGULATORY SIGNS

Regulatory /warning or cautionary signage should be used throughout the trail system on an as-needed basis. Where traffic control signs are needed (stop, yield, curve ahead etc.), it is recommended that scaled-down versions of recognizable road traffic control signs be used. These caution signs may be location or purpose specific and will need to be customized.

**Playgrounds:** Caution signage should be placed at the approaches to these areas to alert faster moving trail users such as cyclists they are approaching a playground area and remind them to slow to 10km/hr. and be aware of children playing and possibly crossing the trail.

**Temporary Trail Closures:** Some locations along the trail network will also be used by festivals and events that attract large numbers of users, some of whom use the trails to travel to the event which may result in congestion on the trails. It may be appropriate to temporarily close the trail to through cycling traffic, and require cyclists to dismount and walk their bicycles through the event area.

## MEETING AODA REQUIREMENTS

Based on AODA requirements (O.Reg. 191/11) and drawing from local best practice sources the following technical considerations need to be incorporated into signs at designated trailheads and trail entrances.

### Placement

- Surfacing on sign boards should be glare free, and the signs should be positioned on site to avoid shadows and glare where possible.
- The centre of signs (main message area) should be mounted at eye level; between 1370mm and 1525mm above ground level.

### Information Provided

- Objective / factual information regarding trail conditions when it was constructed or when it was last assessed, such that users can understand the trail's characteristics and make a personal informed decision about using the trail prior to setting out. This information needs to include:
  - The date of construction or assessment
  - Trail length – this should be described in metres or kilometres as a minimum. Additionally, describing the route length based on time at an average walking pace may be more relatable to users (4.0 to 5.0km/hr.)
  - An objective description of the typical trail bed and surface conditions, including average and minimum width, average and maximum running slope and cross slope, and type and firmness of surface
  - A description of any obstacles or extreme conditions such as steep slopes, narrow widths, or rough surfaces that occur on the trail. The location of these should be illustrated and specifically labelled/identified on trailhead mapping
  - The location of amenities such as rest areas, benches, lookouts, washrooms etc., illustrated on trailhead mapping. Universal symbols on the map and in the map legend will help to minimize the need for too much text on the map
  - Illustrate accessible parking area distance and direction sign and major trail intersections (note these distance markers are to be placed along the trail as well)
  - The location of the trail user in the context of the trail route / network (i.e. a “you are here” marker)
  - Where possible, provide a tactile map (e.g. map with a raised outline) of all trails and features at the start of the trail.

### Text Style and Contrast

- Use letters that are universal, specifically sans serif font upper and lower case (do not use all caps), with a stroke width to height ratio between 1:5 and 1:10
- Use numbers that are universal, specifically Arabic font and have a width to height ratio between 3:5 and 1:1
- Letter and number font sizes that are appropriate based on distance from which the sign is being viewed

Select text colour that has high tonal contrast (minimum 70%) from the background colour(s).

**Figure 24** Excerpted from the Accessibility Guidelines for York Regional Forest Trails provides an of applying the guidelines on a trailhead sign.



**Figure 24 | Example Accessible Trailhead Mapping**

As the City of Barrie continues to improve the existing trail network and builds new proposed trails, a comprehensive and cohesive trail signage template consistent with AODA requirements, communication and creative protocols should be developed.



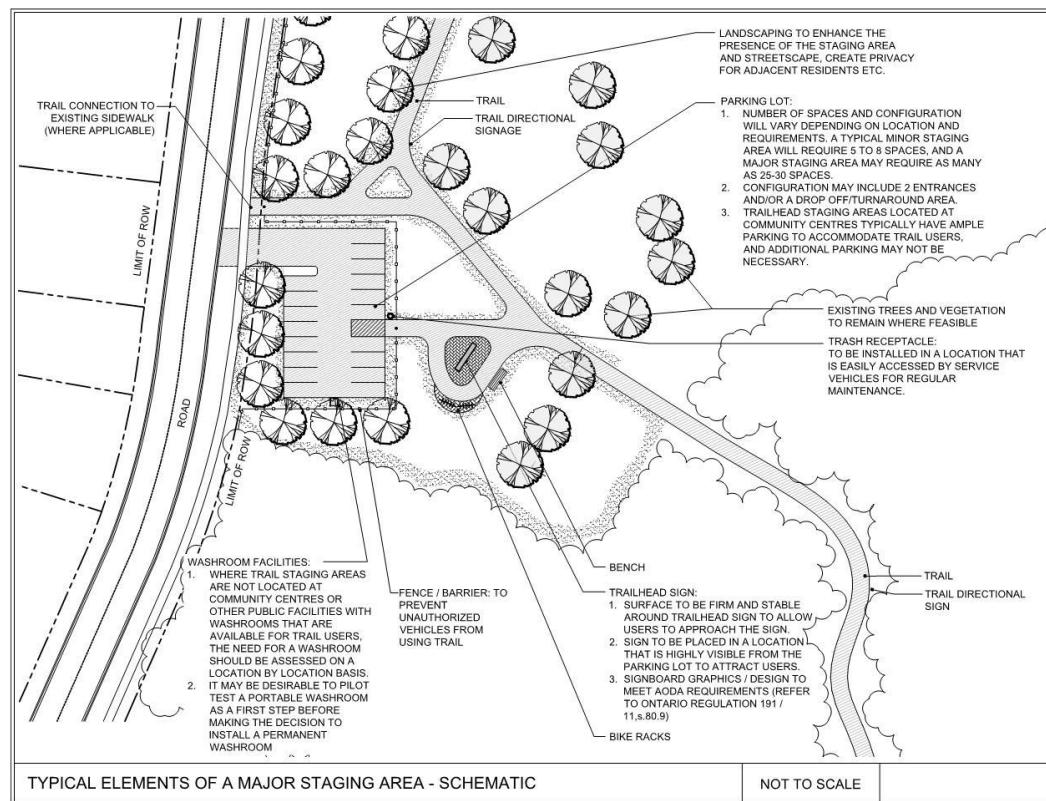
North Shore Trail near Johnson's Beach Source: WSP 2018

### 2.3.7 END OF TRIP FACILITIES

Network continuity, connectivity and feasibility are further enhanced through the implementation of network amenities. In some cases, amenities can have a significant impact on the overall experience and enjoyment of a trail user. The implementation of trail amenities along proposed trail linkages or at the end and beginning of the trail can reinforce the City's commitment to promoting active transportation and recreation. When addressing end of trip facilities, the conversation typically focuses on the potential implementation of various trail amenities such as lighting, seating / rest areas, parking areas, signage, bicycle parking, loading or unloading areas, garbage receptacles, washroom and amenity buildings and gates / access barriers.

Trail network amenities can be implemented individually or as a grouping of amenities commonly referred to as a staging area. They meet a critical need for trail users and are also significant opportunities for the City and those responsible for the implementation of the trail network to engage in partnerships with local organizations, services and businesses.

Where there are major trailheads or start and end points which provide access to major community hubs the City should consider the design and implementation of a staging area. In addition, existing park spaces and tourism destinations are also considered viable candidates. Once the trails plan has been adopted the City should explore the identification of specific locations where a staging area may help to enhance overall trail network experience and interest. **Figure 25** illustrates the key elements of a typical trailhead staging area.



**Figure 25 | Key Elements of a Typical Trailhead Staging Area**

In order to help and inform future decision making and provide guidance regarding the design of these locations the following table has been identified which outlines different amenity recommendations based on the “level” of staging area that is selected. For Types 1 and 2 of the trail classification, the City may wish to consider designing a staging area consistent with Level 3 or 4 whereas for Types 3 and 4, staging area level 1 or 2 may be considered more appropriate.

**Table 13 | Proposed Staging Area Hierarchy**

	LEVEL 1		LEVEL 2		LEVEL 3		LEVEL 4	
	YES	NO	YES	NO	YES	NO	YES	NO
PARKING	•		•		•		•	
REST AREA	•		•		•		•	
LIGHTING	•		•		•		•	
SIGNAGE	•		•		•		•	
DROP OFF AREA		•		•		•		•
GARBAGE		•		•	•		•	
WASHROOMS		•		•	•		•	
GATES / BARRIERS		•		•	•		•	
LOADING ZONES		•		•		•		•
SHELTER		•		•		•		•
POTABLE WATER		•		•			•	

**The City should consider the staging area hierarchy as a guide to select appropriate, feasible and cost-effective facilities at trailhead locations.**

Seating provides the opportunity to pause along the trail at points of interest or just to rest. Young children, older adults and those with disabilities will need to rest more frequently than others. Benches are the most common form of seating, but walls of appropriate height and width, large flat boulders, and sawn logs are some alternatives depending on the trail type and setting. The design of seating areas and lookouts should include a level area beside the bench with a curb or other appropriate wheel stop for mobility-assisted devices.

For heavily used routes (e.g. Type 1 trails) it is reasonable to provide some form of seating every 350m, whereas Natural Area trails (Type 4) will have fewer types of amenities and they will be located much less frequently along the route. The Trail Classification introduced in Section 2.3.2, provides guidance on the type and frequency of trail amenities according to trail class.

### 2.3.8 LIGHTING THE TRAIL NETWORK

Lighting of the trail system must be carefully considered. Very few municipalities make the decision to light their entire trail system for a variety of reasons, including:

- Energy consumption and light pollution, especially in residential rear yards and adjacent to natural areas, though high efficiency LED lighting reduces power usage and light spillage can be mitigated with shielding;
- Detrimental effects on wildlife in natural areas;
- The potentially false sense of personal security created by lighting in the nighttime environment;
- The cost of initial installation can be prohibitive. General budget figures range from \$150 to \$180/m (almost as much as the trail itself);
- Staff time and material cost to properly monitor, maintain lamp fixtures and replace broken and burned out bulbs on an ongoing basis. This can be exacerbated as lights on trails may be targets for vandalism, especially in locations where undesirable activities are known to take place.

Although lighting of trails is generally not recommended there may be some locations where it is appropriate including:

- Main connections to important attractions such major parks;
- Celebratory spaces and waterfront promenades that have regular activity after dusk; and
- Trails that serve as important commuter and school routes, where lighting may be needed to provide guidance during periods of low light (e.g. fall and winter when days are shorter) – see section 3.2.2 and 3.2.3 for further discussion on winter trail maintenance considerations;
- At mid-block crossings so the visibility of pedestrians / cyclists is enhanced.

Based on the considerations above, the Trail Classification introduced in Section 2.3.2 provides guidance on lighting of the trail network. Specifically, the classification recommends that lighting will be provided for Type 1 trails, and may be considered for Type 2 trails where use / demand is high. Lighting will not be provided for Types 3, 4 or 5. The feasibility of solar and battery-operated lighting systems may also be considered as this technology becomes more reliable over time.

**The City should assess the need for lighting on Type 1 and candidate Type 2 trails where none is currently provided.**

# SECTION 2.0 DEVELOPMENT & DESIGN

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## 3 IMPLEMENTATION



*Trails will require ongoing funding and coordination by the City and its partners. Implementation considerations and tools to support next steps are essential to achieve long-term success.*

### SECTION CONTENT:

- 1 An overview of design considerations which should be addressed at the time a trail moves from the planning through to the design and implementation stage;
- 2 A set of tools and strategies to support the implementation of the trails network including but not limited to maintenance, management, funding, partnerships and coordination; and
- 3 Additional planning and policy considerations to help facilitate future planning and design of trail linkages within the City.

## 3.1 IMPLEMENTATION STRATEGY

The City of Barrie Trails Master Plan is intended to be used as a guide for future decision making, implementation, design and planning of trail infrastructure. The Plan should be used as a resource by stakeholders involved in the decision-making process and should continue to support the city's overall vision of a more active population.

The recommendations identified throughout the Plan have been included to provide direction to City staff and its partners to ensure that planning and implementation of the trail network is coordinated and managed on an annual basis.

It is important to note that the Barrie Trails Master Plan is meant to be a long-term strategy and guide that is implemented in coordination with the TMP and ATS.

Many of the core recommendations around the timing and cost of the proposed trail network have been directly influenced or integrated into the active transportation strategy to ensure consistency and coordination.

This Plan identifies recommendations which have been designed to improve Barrie's trail network that will take time to design and deliver. The City of Barrie should consider the adoption and integration of the plan recommendations into existing and future planning policy for the City.

To help guide the implementation of the trails plan an implementation strategy has been developed and is intended to be used as a guide for annual budgeting, coordination, maintenance and management of the network and plan recommendations. The intent is for this section to be used by staff and decision makers for day to day coordination and as a communication tool to partners who will support the implementation of the plan.

### 3.1.1 IMPLEMENTATION PROCESS

There are two key processes that need to be considered following the completion and adoption of the trails master plan including the implementation process and the future planning process. A recommended process to guide the next steps specific to implementing the proposed trails network has been identified to support day to day decision making by staff and Council and a suggested approach to updating the trails plan – when appropriate – has been identified.

#### GUIDING IMPLEMENTATION

Once the plan has been completed and adopted the City of Barrie will be responsible for taking the proposed network and supportive recommendations and identifying those that will be implemented on an annual basis. A high-level master plan such as the trails plan does not address all of the necessary considerations and requirements to see a proposed trail constructed. As such, a four-step implementation process has been identified which is intended to help City staff move from the master planning stage through to construction and evaluation. In addition, the City should also consider the following when going through trail design processes:

- Policies and plans (e.g. Official Plan) may need to be updated to reflect information contained within the Trails Plan to ensure consistency;
- The City must continue to work alongside stakeholders who will be affected by the recommendations contained within the Trails Master Plan. For example, conservation authorities may be involved in the trail design process, and must therefore engaged in future implementation; and
- When City or county roads and other capital infrastructure projects are proposed, the Trails Plan should be reviewed to determine any necessary changes.

1	<b>PRELIMINARY REVIEW</b> <ul style="list-style-type: none"> <li>– When a project moves to the planning stage or a new opportunity arises, a preliminary review should be completed to consider responsibility, timeline, cost effectiveness, and feasibility</li> </ul>
2	<b>FEASIBILITY ASSESSMENT</b> <ul style="list-style-type: none"> <li>– Feasibility should consider route selection principles, design guidelines, site characteristics and context specific considerations</li> <li>– Prepare preliminary functional design – could be as part of an Environmental Assessment</li> </ul>
3	<b>DETAILED DESIGN, TENDER &amp; IMPLEMENT</b> <ul style="list-style-type: none"> <li>– Proceed with construction – explore partnerships for cost sharing and update the GIS database to reflect the status of the project</li> <li>– Design should be completed based on best practices and guidelines/standards and phasing should be consistent with the plan</li> </ul>
4	<b>MONITOR AND EVALUATE</b> <ul style="list-style-type: none"> <li>– Following construction and use, the facility should be monitored to ensure functionality</li> <li>– Facility should be properly maintained and upgraded when necessary</li> </ul>

## UPDATING THE PLAN

The intent is for the Trails Master Plan to be a flexible document that is considered up to date and reflective of the current policies and practices of the City of Barrie. Just as existing municipal policies or new municipal policies should consider or address the status of the trails plan (i.e. network, recommendations, policies, etc.), the content of the trails plan should continue to evolve as planning policy, environmental assessment processes, design and construction practices are adapted and budgeting decisions are made.

A typical master plan is updated every 5 – 10 years as stipulated by the Planning Act; the City of Barrie should follow these regulations and suggested practices for the trails plan following its adoption to ensure that the recommendations and policies contained within the document remain relevant and up to date.

### 3.1.2 IMPLEMENTATION MANAGEMENT

Implementation of the Trails Master Plan should be managed and coordinated in a way that is consistent with the current practices of City staff and integrated into other related implementation processes i.e. the TMP and ATS.

Coordination and management of the implementation process can be challenging when municipal staff are being asked to undertake numerous assignments. The development and use of tools to support implementation can be a helpful solution to these challenges. When developing implementation tools, it is important to consider their use. They serve three primary functions:

**1. Communication:** The development of materials or messages that help to support communication around the trail plan with internal staff and decision makers, members as well as with members of the public and stakeholders with the purpose of disclosing status, recommendations and next steps.

**2. Tracking:** To support the confirmation of trail feasibility and priorities and their inclusion within future capital costs and budgeting as well as providing a means of efficiently updating the network i.e. GIS to reduce the need for plan updates / revisions.

**3. Promotion:** The development of tools and strategies to encourage the use of the trails network or improve community understanding regarding existing and future trail linkages and opportunities.

The following three implementation management tools have been identified for consideration by the City of Barrie to support next steps and day to day management of the trail plan's implementation.

## GEOGRAPHIC INFORMATION SYSTEM DATABASE

1



- A geographic Information System (GIS) database contains all information related to the development of trail network mapping and trail management. Various stakeholders provided information for the development of the database including staff from the municipality, the county, and other partners. The GIS database contains current information with regards to routes and facility types that are included in the trails network.
- It is recommended that the City of Barrie share the GIS database with the necessary partners to ensure consistency of information. By sharing the database, it will allow other organizations to benefit from the information it provides, and allow for more effective communication regarding project outcomes and management of municipal assets.

## PHOTOGRAPHS &amp; WAYPOINTS

2



- GPS waypoints and photos were taken which identify some context specific considerations and characteristics. The waypoints and photos along with the information contained within the GIS database can then be used to develop a KML file which geographically positions the photos and waypoints in Google Earth to highlight their location more clearly. As more photos are collected over time the database can be enhanced.
- This tool can be used during different project phases such as the feasibility assessment and to assist in better understanding community questions/concerns than arise throughout the project design and implementation.

## MANAGEMENT SPREADSHEET

3



- Since many staff do not have access to GIS programs and/ or resources, spreadsheets may be used as an alternative tool. Excel network management spreadsheets can be developed from GIS and can display the same content as a GIS database.
- Once created, network management spreadsheets should be updated correspondingly with GIS databases. Spreadsheets can also contain additional information like route costing, and can be used as an additional implementation resource.

### **3.1.3 COORDINATION & PARTNERSHIPS**

The effort to implement Barrie's Trail Master Plan will require coordination and collaboration. Relationships with existing partners should continue to be enhanced while new partnerships should be explored and fostered. The following is an overview of potential partnerships that should be continued or considered to facilitate the implementation of the study.

#### **SIMCOE COUNTY**

Simcoe County is applauded for demonstrating its commitment to active transportation and trail development. The County has undertaken significant work to promote, encourage and identify trails throughout the various municipalities including the City of Barrie. Regionally significant trail linkages are further outlined and strategies to encourage trail use are outlined in the County's trails strategy. The importance of county-wide connectivity is reflected in a number of the regionally significant trail systems found throughout the City of Barrie many of which are managed and maintained by Simcoe County and its partners.

Simcoe County is considered a significant and considerable partner in the development of trail infrastructure and the promotion of trails within Barrie. More specifically, any routes that have been proposed along County roads or on County lands would need to be implemented through coordinated efforts between the City of Barrie and Simcoe County.

The County should also be consulted when the City is developing implementation plans / forecasts so potential synergies with County trail implementation can be realized.

#### **TOURISM SIMCOE COUNTY**

Tourism Simcoe County has been working with Simcoe County and other local partners to support the promotion of trail development with a specific tourism focus. Their most comprehensive method of promotion is their website which contains significant mapping information on existing trails and trail opportunities throughout the County. Developed and distributed throughout the County is the trail guide which also contains key information about safety and use of the trail infrastructure. While Tourism Simcoe County has no ability to help implement or maintain trails they are considered a key partner in encouragement and education around trail opportunities and use.

#### **SIMCOE MUSKOKA DISTRICT HEALTH**

The district health group for Simcoe Muskoka has been working with County staff and partners to promote existing trail resources and references through their website. In addition, they have also published and promoted a number of health-related tools and references documenting the connection between individual and community health and parks and trails. The intent is for municipal staff to use the resources and toolkits to design trails *"that promote physical activity, reduce street, and provide environmental benefits"*. Their resources and tools could be used going forward for public education as well as demonstrating the value of trail investment.

## SURROUNDING MUNICIPALITIES

In addition to the County, the municipalities which share a common boundary with the City are key partners when it comes to developing seamless linkages and coordinating implementation, so that potential synergies may be realized.

## ONTARIO TRAILS COUNCIL

The Ontario Trails Council (OTC) is a member driven-volunteer led, non-profit charity, that promotes the creation, development, preservation, management and use of recreational trails. Established in 1988 it is now the largest trail association of its type in Canada, with a membership consisting of over 220 economic development, tourism, planning, recreation, park and club organizations, municipalities, and conservation authorities.

OTC's goals include continuing to increase the number, length, variety and accessibility of trails throughout the province; providing an informed, credible voice in support of trails; promoting the safe and responsible use of trails; and acting as a provincial resource centre for trail information and promotion.

Within Barrie and surrounding areas there are many members of the OTC from which information should be gathered and used to inform future decision making regarding trail promotion and development. The City is a member of the OTC and should continue to do so.

While the City has been assumed as the lead for the implementation of the Trails Master Plan implementation should not happen in isolation and the partnerships identified above should be engaged on an ongoing basis to support City staff. **The City should continue to explore partnerships as a method of leveraging trail implementation, management, maintenance, communication, promotion and outreach.**

## LOCAL DEVELOPERS

Considering the number of proposed trails that are identified within new development areas / secondary plan areas there is a strong need for the City of Barrie to continue to foster and encourage relationships with local developers. Establishing high quality and connected trail facilities throughout residential development areas helps to improve quality of life and can have a positive impact on housing prices. Demonstrating that values as well as opportunities to implement trail infrastructure as part of a parkland dedication program could be a communication tool and opportunity for City staff when exploring and enhancing partnerships with developers.

## CONSERVATION AUTHORITIES

Lake Simcoe Region Conservation Authority and Nottawasaga Valley Conservation Authority are key partners in the development of sustainable trails on their lands with the City and lands they regulate.

## LOCAL TRAIL GROUPS

Local trail groups have contributed significantly to the development of trails within and surrounding Barrie. Going forward they remain as key partners in the development and promotion of trails.

**The City should consider establishing a community-based working group or advisory committee, chaired by a City staff person with representatives of various stakeholder groups and members of the public with an interest in trails.** The City staff / chair could be an additional role for an existing staff person, or could be a new role / position with a variety of responsibilities related to trail planning, coordination, promotion and outreach, volunteer coordination (i.e. Trail Coordinator). The community-based working group would have a role in providing input / a 'sounding board' regarding priority projects, assist with the delivery of trail messaging and promotion, and assist in some aspects of trail maintenance such as helping to organize, promote, and mobilize their respective members to participate in trail cleanup days. Some communities have more recently included a trail working group within an active transportation committee with a broader mandate.

**The City should explore the development of an intermunicipal working group with representatives from surrounding municipalities, the County and conservation authorities.** This group would maintain an open dialogue on trail initiatives, challenges and opportunities, and to coordinate implementation of trails where applicable.

## VOLUNTEERS

Volunteerism builds community capacity and benefits both the volunteers/volunteer organization and the recipient of the volunteer's work. Contributions by volunteers can help to offset some costs for the owner. Volunteer opportunities will require the appropriate staff levels to help coordinate, lead and advise on trail opportunities and activities.

In Barrie there are a number of channels for volunteers to become involved with regard to trails. Some potential avenues for volunteerism on Barrie's trails include:

- Trail Ambassadors;
- Adopt-A-Trail Programs;
- Trail Stewards/Stewardship Teams; and
- Corporate and Public Volunteer Events.

## TRAIL AMBASSADORS

Ambassadors can be volunteers or seasonal staff (e.g. summer students). Travelling throughout the trail system the ambassadors' roles include disseminating information such as trail code of conduct, safety, trail conditions, upcoming events, new projects and stewardship opportunities. Equipped with basic tools they can also offer minor mechanical assistance to trail users (e.g. cyclists).

Another key role is observing and reporting on trail conditions, hazards and maintenance needs. These inspections do not replace the City's responsibility to conduct annual inspection, but can help to proactively identify trail issues between annual inspections.

## ADOPT-A-TRAIL PROGRAMS AND TRAIL STEWARDSHIP TEAMS

Adopt-A-Trail agreements are typically made with incorporated not-for profit groups or unincorporated groups with a similar mandate and structure as a not-for-profit. Typically, they undertake minor maintenance tasks on trails in relatively good condition through routine activities on a specified section of trail. If a significant trail issue is encountered they would identify it to City staff who make the assessment and complete the necessary work. Volunteers would be under the guidance of group leaders who have received training on trail building/maintenance as well as first aid and CPR.

Trail Stewardship Teams typically would have some training related to trail construction and maintenance and can perform more complex tasks under the supervision of a trained crew leader or City staff and based on a specific work program / location provided by City staff.

Activities may include:

- Planting, mulching, watering of trees, shrubs and other herbaceous plants for the purpose of ecological restoration
- Removal of invasive species
- Installation or removal of snow fencing (i.e. for trail closures, protection of regeneration areas, etc.)
- Fixing degraded trails and minor drainage issues using hand tools (i.e. on Type 4 trails)
- Trimming obstructing vegetation from trail sightlines or around signage
- Removing unauthorized features in woodlots and natural areas
- Cleaning up litter along the trail
- Closing or narrowing of trails using natural materials existing on site (Typically on Type 4 trails)
- Act as trail ambassadors (i.e. educate users about trail code of conduct, assist users with minor bicycle maintenance issues, give people directions, etc.).

## CORPORATE AND PUBLIC VOLUNTEER EVENTS

Corporate and public volunteer events are another potential opportunity for the public to contribute to maintenance and enhancement of the trail system. Often less familiar with trails and skills required for trail work, corporate and public volunteers are most appropriate for trail cleanup days and planting. Events would be coordinated by City staff and take place at a targeted location for a short duration (e.g. half day or full day).

**The City should explore the potential for volunteers / volunteerism to build pride of ownership and stewardship in the trail system, and to assist with some routine maintenance tasks.**

### 3.1.4 TRAIL PROMOTION & OUTREACH

As part of the Active Transportation Strategy there are a number of proposed encouragement and education based initiatives for the City's consideration. Similarly, the success of a trail plan goes beyond the implementation of infrastructure. Initiatives and activities to encourage people to become more active and use trails and tools to educate people on safe and responsible trail use are critical to establishing long-term community and behavior change.

The City of Barrie has a strong connection to high quality and active living with its access to natural areas, waterfronts and forested areas. The City's tourism draws are increasing in popularity and it is becoming an increasingly more desirable community for young families and working professionals outside of the GTHA and downtown core.

This provides the City with an audience from which they can continue to enhance and grow trail interest, exposure and use. To do so, the City should consider the implementation of encouragement and educational initiatives for active transportation and trail use. Utilizing promotion and marketing opportunities to leverage interest is another avenue which could be explored by staff and partners.

Some high-level outreach, promotion and encouragement suggestions are listed below. In some cases, these initiatives may be partially underway or previously identified by City Staff. Where this is the case, these initiatives should be reviewed and enhanced where appropriate.

- On-line trail resource hub linked to County and Partners' websites or building on the County's interactive mapping and trail resource tools
- Maps and materials at local venues
- Promoting at industry trade shows such as outdoor and tourism shows
- Tourism marketing in partnership with Tourism Simcoe County
- Attendance and promotion at festivals, events and fairs
- Education and partnering with other agencies such as school boards, conservation authorities and Ontario Parks
- Continued membership in the Ontario Trails Council
- Encouraging participation and active lifestyles
- Celebrating trail openings
- Deploying trail counters and user satisfaction surveys
- Developing consistent trail branding and signage
- Adopt-a-Trail program to encourage public volunteers to assist with / help to offset trail maintenance
- Collecting trail metrics to document levels of use (e.g. employing trail counters), user preferences and satisfaction. Metrics related to trail use could also include projected use once baseline levels have been established; as this will help to support the need for capital and operations investment
- Developing and delivering targeted information campaigns related to trails – some possibilities include:
  - The benefits of trails
  - Trail user 'Code of Conduct' / etiquette
  - Profiling aspects of natural heritage and cultural history

- Education related to ecosystems, native plants, invasive species and water quality
- Trail basics for new users
- Impacts of dogs off-leash
- Impacts of inappropriate activities such as illegal dumping of yard waste.

**The suggested promotion, outreach and encouragement initiatives as well as those identified in the ATS should be reviewed to confirm preferred initiatives and to explore next steps for implementation.**

**City staff should refer to the ATS for a recommended annual budget for the promotion and outreach associated with both the AT system and the trail network.**



Trail to Wilkins Beach, off Camelot Square Source: WSP 2018

## 3.1.5 PLANNING PROCESS

The way in which trails are planned is driven by the policies that are in place. Without a strong foundation of supportive planning policies, it can be difficult to integrate or justify trail development as part of future Municipal projects and initiatives. The Trail Master Plan has been developed as a component of the Transportation Master Plan and is intended to be implemented concurrently to the active transportation strategy.

The fact that the trail master plan is embedded in a high-level planning policy document provides some additional support and consistency for implementation; however, it does not guarantee success. There are a number of trail supportive policy considerations that should be reviewed and incorporated into other planning policies such as the Official Plan, Secondary Plans, Development Charges, the Strategic Plan, etc. to provide additional support for future trail investments and improvements. The following section provides an overview of some of those policy considerations and processes which are intended to help streamline decision making and implementation.

## TRAILS IN NEW DEVELOPMENT AREAS

Trails are an integral part of the community fabric and an important part of the land development process. Developers should be expected to work through an iterative process with City staff, beginning early in the planning stages to create an appropriate network within their development area that reflects the intent of the Trails Plan.

As part of the Barrie Trails Master Plan the majority of the proposed trails are identified within secondary plan areas / planned new developments. Land Developers typically recognize the value of integrating trails into their projects and often use them as a selling feature.

Providing the development industry with information about the trail network, desired connections and design expectations will help to improve communication among all parties involved. It is expected that proposals for new development will contain trails that reflect the density, variety, hierarchy and character consistent with the Trails Plan.

The preliminary proposed trail linkages identified within these new development areas will need to be confirmed through the secondary planning process but should be used to confirm the preferred trail system linking the community.

Ultimately, proposed networks should provide opportunities to overcome physical barriers; make appropriate connections to important destinations and enhance connectivity with the overall trail and AT system; and incorporate trails that are sensitive to, and take advantage of natural and cultural landscape features.

A careful examination of a variety of factors including topography and drainage, slopes, soil conditions, plant and animal communities, microclimate and human comfort, historic/cultural resources, public education opportunities, significant views and vistas should be part of the process to confirm trails within these areas.

Ideally, trails should be constructed prior to or concurrently with the construction of other infrastructure and homes. When deferred there can be the potential for conflict or confusion even if this intention has been clearly indicated in municipal planning documents.

Developers are encouraged to be proactive about notifying prospective buyers where trails are to be located at the time they are selling lots. Providing information at sales offices, including information in sales packages and erecting signs in locations where trails are to be constructed will alleviate challenges at a future time.

## TRAILS IN ESTABLISHED NEIGHBOURHOODS

It can be very challenging to upgrade existing and / or implement new trails in established neighbourhoods, even if the intent to do so has been clearly documented in planning policy and process such as the transportation master plan or the trails plan. Challenges can also arise if there is a misunderstanding regarding the use of public lands behind or beside private properties for municipal trail connections.

Even with extensive consultation efforts at the master plan stage it can be difficult to obtain public opinion related to specific trail segments until a project reaches the implementation stage. Also, as properties change hands current owners will need to be informed as they may not have been involved in, or even aware of the plans and previous consultation.

In many cases adjacent land owners who perceive themselves as being directly affected can become more concerned and involved at the time of design and pre-construction. Real and perceived concerns include increased pedestrian traffic, access to rear yards, invasion of privacy, and an increased potential for vandalism and theft.

It is important to engage adjacent residents in an open, public consultation process at the earliest possible stages of a trail implementation project. Sometimes the most vocal opponent can become the greatest supporter if the process provides an effective avenue to address concerns. Some keys to success include:

- Notifying adjacent landowners early in the process and taking the time to understand and respond to their concerns
- Encouraging their participation in the design process through events such as local design workshops to determine trail layout, design, materials and privacy features, as well as site meetings to examine and refine proposed layouts
- Emphasizing the benefits of multi-use pathways for their neighbourhood and community, including themselves and their children
- Emphasizing successful examples and effective solutions where similar problems were overcome.

## TRAILS IN NATURAL AREAS

Recreational trails in natural areas provide opportunities to enjoy and appreciate nature, and to pursue some trail activities that are not possible in more traditional parks. Striking the balance between providing public access to natural areas and the need to conserve / protect the resource itself can be difficult.

Properly planned, designed, constructed, and maintained trails, coupled with public education can help to the balance and provide many benefits including:

- Introducing residents to natural areas and increasing awareness of natural environment issues through user experiences and interpretive programming
- Improving the user experience by providing a stable trail bed
- Fostering a sense of stewardship and ownership
- Minimizing the trail footprint and encourage users to stay on designated trails, in some cases using design techniques to keep them on the trails
- Minimizing trail proliferation and the development of multiple parallel trails and braided trails
- Minimizing vegetation trampling, soil compaction and changes in vegetation composition from trampling
- Preserving existing trees and vegetation, and assist with efforts to prevent the spread of invasive plant species
- Reducing conflict between wildlife and human activities
- Contributing to disruption / blockage of natural water movements and managing water off trail surfaces, thereby minimizing erosion and trampling of surrounding vegetation

- Enabling a portion of the City's resources allocated to natural areas to be directed on management and removal of invasive species, properly closing and rehabilitating unauthorized and improperly located trails, restoring, enhancing and expanding natural areas.

Where trails are identified within these areas it is important that they be properly aligned and designed, and that the area be monitored for the effects of inappropriate use and/or overuse. For example, a boardwalk with railings can be an effective design treatment in areas with seasonally wet or prolonged moist soils. The elevated tread eliminates foot contact with the moist soils and railings encourage users to stay on the designated route, minimizes trail proliferation and vegetation trampling.

Regular monitoring will alert trail managers to locations where users may be straying off the trail or taking short cuts so that mitigation strategies can be developed before significant damage to soils and vegetation occurs.

If trails are not carefully planned, designed, constructed and maintained in these areas, users will create their own desire line foot trails, sometimes in sensitive locations where it would be preferable not to have trails at all. Highly sensitive vegetation and narrow, constrained wildlife corridors are two examples where recreational trails may not be appropriate. In these cases, it is advisable to provide alternative trail routes and information (e.g. signing, public information campaigns, etc.) explaining the management decision to exclude trails from the area.

Natural area designations are one of the triggers to consider if recreational trails should be provided or not within all or part of a natural area, and if so where they should be located.

Areas designated as Environmental Protection Areas (EPA), Areas of Natural and Scientific Interest (ANSI), Provincially Significant Wetlands (PSW), and areas with known Species at Risk (SAR) require special consideration when making decisions to provide trails and if so, where they should be located. Some designations carry legal requirements that must be adhered to.

In most cases, the implementation of a trail within sensitive areas will require an Environmental Impact Study (EIS) to assess the potential impact of the trail and to identify design and construction requirements prior to approval. The need for an impact study should be identified on a case by case basis at the time a trail moves forward to design and construction.

## ENVIRONMENTAL BUFFERS

Planning for trails early in the development process ensures that linkages are in the best locations.

One solution to the challenge of building trails within environmental buffers is to assign dedicated linear trail blocks parallel to environmental buffers in plans of subdivision. This eliminates the challenge of constructing trails in protected buffers during subdivision development because grading is not permitted in buffers, but allowed in dedicated trail blocks.

Dedicated trail blocks also enable prospective homebuyers to clearly see planned trail locations and think about implications a trail adjacent to their future home may have on the use/enjoyment of their property prior to making their purchase.

## PRINCIPLES FOR TRAILS IN NATURAL AREAS

When designing trails through sensitive or protected some considerations should include:

### Route Planning:

- Avoid environmentally sensitive and/or significant areas where possible. Evaluate alternative routes and design treatments. If avoidance of is not possible minimize disturbance and implement mitigation measures to restore other areas, resulting in no net loss of habitat
- Use previously disturbed areas / corridors where appropriate and feasible
- Identify areas of high sensitivity to disturbance and plan trail routes accordingly, and/or reroute existing trails to avoid the most sensitive and/or critical habitats
- Identify areas of invasive species during the planning process and include appropriate measures in construction plans and documents to minimize disturbance in these zones and restrict movement of these species to other areas
- Adequately plan and consult with appropriate stakeholders in the natural environment community including ecologists, biologists, ornithologists, hydrologists, geologists and natural environment enthusiasts

- Avoid routes that impact wildlife species known movement corridors and critical breeding habitat
- Avoid critical habitat of rare or fragile plant species, and where interpretation / public education about sensitive species is planned, interpret sensitive species away from their known location(s) to avoid unintentional damage or loss
- Avoid placing trails in flat areas as these can lead to poor water drainage, trail widening and erosion
- Minimize soil disturbance as much as possible by avoiding extremely steep areas. Greater displacement of soil is required when bench cutting trails on steeper slopes from the higher back slope required

## Designing

- Ensure trail type is consistent with trail use, thereby minimizing trail width requirements
- Avoid routing the trail too close to another trail section to prevent trail proliferation or shortcuts between trails from developing
- Avoid trail alignments that encourage users to take shortcuts where an easier route or interesting feature is visible. If an interesting feature exists, locate the trail to provide the desired access
- Use landforms or vegetation to block sightlines and potential shortcut routes
- Align trails to the uphill side of larger trees to minimize impacts to roots
- Route trail beds on bedrock or hard packed mineral soil surfaces and avoid areas where deep organic soil layers exist
- Avoid aligning trails through wet areas such as ponds, marshes and seasonal drainages features

- Use structures such as raised trailbeds, bridges and boardwalks to facilitate travel over wet areas, to avoid erosion, vegetation trampling and sedimentation

## Constructing

- Provide adequate tree root protection, and avoid cutting down trees and unnecessary trampling of vegetation
- Implement proper trail building standards and techniques, and use proper equipment during construction to build trails efficiently and minimize collateral damage to surround vegetation
- Ensure minimal importation of materials, and use 'clean' and 'local' sustainable sources for materials including rough cut timber
- Rescue and relocate plants located in the construction corridor prior to construction activity

## Monitoring and Maintaining

- Close and restore informal trails, trails are being removed or temporarily decommissioned
- Monitor trails for signs of overuse, unanticipated impacts, trail widening and proliferation, and inappropriate/unauthorized uses
- Develop and implement an action plan to address areas where problems are noted.

**The principles for trails in natural areas should be considered during planning, designing, constructing, monitoring and maintaining trails in natural settings.**

## TRAILS IN UTILITY CORRIDORS

Pipeline and hydro corridors, are examples of linear corridors that provide excellent opportunities for trail development and have been investigated and should continue to be identified as potential opportunities within the City of Barrie. Service lines and utility lines in urban areas often have a substantial easement, and in many cases, are used informally as trail routes as they tend to provide direct connections to a variety of destinations over a long distance. While there are few opportunities within the City of Barrie for these types of trail improvements, in future, the existing opportunities have been identified and investigated and the potential should be tracked and maintained by City staff. Within these areas, when the alignment and design details are properly considered trails can also serve as emergency and service access routes to assets within the corridor. For example, some municipalities have adopted policies and practices to make emergency service

access to utility access covers mandatory along sanitary sewer lines in river valleys in the event of an emergency such as a sewer line blockage.

Trails in corridors that are owned or leased by major utilities such as Hydro One Networks, gas and oil pipeline companies can have strict policies and processes for permitting trails within, or crossing their corridors. Also, several departments within an agency might be required to approve a project or identify terms and conditions associated with the implementation, including those responsible for real estate, asset management, capital works, maintenance and distribution of the service or commodity. Submission requirements and review processes / schedules can add a significant level of effort and time commitment to the planning and design process, which needs to be factored into applicable projects.

## ABANDONED RAILWAY CORRIDORS

Railways played a major role in shaping the communities across the country. Villages, towns and cities grew up around railway lines as they were the main transportation arteries of the time. Consolidation in the railway industry led to a decline in viability and use of some rail lines, and railway operators gradually disposed of rail corridors that were unprofitable. Many corridors were sold in pieces to adjacent landowners, while some remained intact. Intact corridors provide a significant opportunity for recreational trails and other public infrastructure possibilities including future roadway, new / revitalized railways, public and private utilities such as hydro, water/wastewater and communication lines.

Assembling land for a lengthy linear corridor in today's environment would be extremely challenging, time consuming and costly. Apart from the cost to acquire lands, the time and expense associated with route identification, evaluation and selection as part of an Environmental Assessment would require a lengthy process with no guarantee of a successful outcome. There are numerous examples former railway corridors have been acquired and repurposed into successful recreational trails and/or protected them for other future linear infrastructure. Although there currently are no abandoned railway corridors in Barrie, consideration should be given to acquiring any (or sections of them) if abandonment is scheduled to take place. Some of these corridors may also provide opportunities for future connections to regional trail systems.

## 3.2 MAINTAINING THE NETWORK

*Following implementation, there needs to be consideration for ongoing maintenance of the existing and proposed routes. User experience can be significantly impacted by insufficient maintenance.*

Once construction has been completed there is ongoing work which needs to be done related to the trail system. The City will need to consider how to maintain the existing and future trail system to ensure that the trail and associated facilities are monitored and maintained to a level that is considered suitable for those managing the trail and effectively communicated to those using the trail.

### 3.2.1 RISK MANAGEMENT & LIABILITY

Liability concerns are becoming a key consideration due to the potential for lawsuits. Adhering to widely accepted design, construction and maintenance are one of a number of strategies to manage risk. Aside from proper design, signage and operation of on and off-road active transportation and recreation facilities steps should be taken to address potential hazards including accidents, theft, vandalism, and other problems. Insurance coverage is often added to the liability insurance Municipalities already carry for their other public parks and open space.

Some general strategies which could be used to reduce risk and to help minimize the liability associated with providing designated trail facilities are listed below:

- Improve the physical environment, increase public awareness of the right and obligations of users and improve access to educational programs
- Maintenance operations should follow accepted / best practices, and a maintenance program that is achievable for the municipality should be developed, documented and acted on
- If hazards cannot be immediately removed, they should be isolated with a barrier or identified with warning signs
- Monitor trails on a regular basis to document the physical conditions and operations of the route. All reports of hazardous conditions received should be promptly and thoroughly investigated
- Written records of all monitoring and maintenance activities should be documented and maintained
- Avoid using descriptions such as “safe” or “safer” when describing trails when promoting their use. Identify practices that enable users to assess their own capabilities or level of comfort and make their choices accordingly
- Ensure signage, mapping and promotional materials associate the term ‘Recreational’ with trails and the trail network
- Consider a “trail hotline” where trail users have a platform to identify trail locations that need attention to maintenance
- Maintain proper insurance coverage as a safeguard against having to draw payments for damages from the public treasury.

Through the Ontario Trails Act, there were amendments to various Acts that have a bearing on recreation trails, including the Occupiers Liability Act, and Trespass to Property Act which help to protect owners of properties that contain public trails as well as adjacent land owners, and also provide stiffer penalties for those that trespass on private property (i.e. go off trail property onto private lands), vandalize or cause damage.

- The Occupiers' Liability Act has been amended to clarify that the lower standard of care (responsibility) applies to occupiers of trail property which are not-for-profit or public-sector organizations, even if there is an incidental fee related to access onto or use of the land, such as for parking; or if a public benefit or payment is given to a not-for-profit trail manager.
- The Trespass to Property Act has been amended to raise the maximum fine for trespassing from \$2,000 to \$10,000 and remove the limit on the amount of damages that could be recovered in a prosecution.

**The risk management and liability prevention strategies identified above should be reviewed and incorporated into day to-day decision making processes where applicable when planning, designing and operating trails within the City of Barrie.**

### 3.2.2 TRAIL MAINTENANCE STRATEGIES

Accurate trail logs are an important resource for documenting maintenance activities, determining maintenance budgets for individual items and tasks, and in determining total maintenance costs for the entire trail. In addition, they are a useful source of information during the preparation of tender documents for trail contracts, and to show the location of structures and other features that require maintenance. The City of Barrie currently uses "Cityworks" as an effective tool to track and manage infrastructure assets.

The Province recently updated the Minimum Maintenance Standards for Municipal Highways (O.Reg 239-02), which apply to facilities within road rights-of-way. There are no equivalent regulated maintenance standards for trails beyond the road right-of-way, and municipalities must create their own maintenance standards for trails.

**Table 14** provides an overview of trail maintenance strategies based on the recommended Trail Classification System. It has been developed by combining the City's Standard Operating Procedures with trail maintenance practices from other jurisdictions. It also considers cost ranges for maintenance of trails based on trail type.

In comparison to capital costs for construction it is much more challenging to derive unit costs for trail maintenance, as these figures are much less readily available and maintenance costs are tracked in many different ways by various organizations. The ranges presented in Table 14 were developed from information available through research on other jurisdictions, where information is available.

Maintenance also needs to take staffing levels (FTE's) into consideration to ensure that there is sufficient capacity to complete the required maintenance work.

One of the most important messages about trail maintenance at the master plan level is that municipalities must consider the ongoing cost of trail maintenance as a critical part of delivering high-quality, safe and reliable trail facilities. Trail maintenance budgets and staff resources must be increased over time in parallel with the expansion of the trail network.

**Table 14 | Trail Maintenance Strategies**

	Waterfront Multi-Use Trail (Type 1)	Multi-Use Trail (Type 2)	Connector Trail (Type 3)	Natural Trail (Type 4)	Stormwater Management Facility Access (Type 5)
<b>GENERAL</b>					
RISK MITIGATION	Highest effort to mitigate risk (i.e. recognizes that users of Type 1 trails have a lower level of experience, skill, endurance and possibly mobility)	Moderate to high effort to mitigate risk	Moderate effort to mitigate risk	Lowest effort to mitigate risk (i.e. recognizes that users of Type 4 trails have a higher level of experience, skill, endurance and mobility, and some risk is part of the experience)	Moderate effort to mitigate risk
LEVEL OF SERVICE	Highest level of service in all 4-seasons / highest frequency of maintenance	High level of service in 3-seasons, and moderate frequency of maintenance (e.g. twice per month during spring, summer, fall; and/or as required for emergencies during 4 seasons).	Moderate level of service in 3 seasons and moderate-low frequency of maintenance (e.g. seasonally or as required for emergencies)  Includes topping up of granular surface as necessary, keeping trail envelope free from obstacles (e.g. pruning to maintain clear zone). May include seasonal/annual mowing along trail edges in open areas to stop vegetation encroachment.	Lowest level of service (e.g. to remediate significant erosion, remove obstacles on trailbed)  Lowest frequency of maintenance (e.g. annually or as required for emergencies).	Low - moderate level of service, and low frequency of maintenance (e.g. seasonally or as required for emergencies)  Includes keeping trail envelope free from obstacles to enable service access. May include seasonal/annual mowing along trail edges in open areas to stop vegetation encroachment.
GENERAL INSPECTION FREQUENCY	Monthly, 4 seasons	Monthly during 3 or 4 seasons depending on winter maintenance or not	Every second month during 3 seasons of the year	As required or requested	Every second month during 3 seasons of the year
RESPONSE TIME BASED ON HAZARD CLASS IDENTIFICATION	<p><b>Class A</b> = Review and mark within 24hrs of becoming aware, full repair or make safe within 3 business days until proper repair can be made</p> <p><b>Class B</b> = Review within 5 business days, schedule on a priority basis</p> <p><b>Class C</b> = Review when time permits and add task to regular maintenance schedule / cycle</p>				
<b>MAINTENANCE TASKS</b>					
TRAIL SURFACE GROOMING	Sweeping (hard surface) to remove leaves, and accumulated debris leftover grit from winter maintenance  Frequency = Seasonally or as per Hazard Class Identification	Sweeping (hard surface) to remove leaves and accumulated debris  Grading / grooming, topping up (granular surface)  Frequency = Seasonally or as per Hazard Class Identification	Grading / grooming (granular surface)  Frequency = Seasonally or as per Hazard Class Identification	Schedule grooming not applicable  Repairs to trail surface as per Hazard Class Identification	Sweeping (hard surface) to remove accumulated debris within main trail tread area and on corners  Grading / grooming (granular surface)  Frequency = Seasonally or as per Hazard Class Identification

	Waterfront Multi-Use Trail (Type 1)	Multi-Use Trail (Type 2)	Connector Trail (Type 3)	Natural Trail (Type 4)	Stormwater Management Facility Access (Type 5)
VEGETATION TRIMMING AND TREE REMOVALS	<p>Keep trail envelope (horizontal and vertical clear zone)</p> <p>Remove invasive species and poisonous plants based on approved Vegetation Control procedures</p> <p>Windfalls, broken limbs, snags and dead standing trees within the fall zone of the trail</p> <p>Frequency = Annually, unless suggested otherwise by Hazard Class Identification (e.g. Class A tree hazards addressed within 24hrs.)</p>	<p>Keep trail envelope (horizontal and vertical clear zone)</p> <p>Remove invasive species and poisonous plants based on approved Vegetation Control procedures</p> <p>Windfalls, broken limbs, snags and dead standing trees within the fall zone of the trail</p> <p>Frequency = Annually, unless suggested otherwise by Hazard Class Identification (e.g. Class A tree hazards addressed within 24hrs.)</p>	<p>Keep trail envelope (horizontal and vertical clear zone)</p> <p>Post warning signs for poisonous plants where necessary</p> <p>Windfalls, broken limbs, snags and dead standing trees within the fall zone of the trail</p> <p>Frequency = Annually, unless suggested otherwise by Hazard Class Identification (e.g. Class A tree hazards addressed within 24hrs.)</p>	<p>Keep trail envelope (horizontal and vertical clear zone)</p> <p>Post warning signs for poisonous plants where necessary</p> <p>Windfalls, broken limbs, snags and dead standing trees within the fall zone of the trail</p> <p>Frequency = As required or as per Hazard Class Identification (e.g. Class A tree hazards addressed within 24hrs.)</p>	<p>Keep trail envelope (horizontal and vertical clear zone)</p> <p>Post warning signs for poisonous plants where necessary</p> <p>Windfalls, broken limbs, snags and dead standing trees within the fall zone of the trail</p> <p>Frequency = Annually, unless suggested otherwise by Hazard Class Identification (e.g. Class A tree hazards addressed within 24hrs.)</p>
TRIP HAZARDS	<p>Includes but not limited to cracks and step joints on hard surfaces, ruts along trail edges and corners, heaved utility access covers</p> <p>Trip hazards reviewed and addressed as per Hazard Class identification</p>	<p>Includes but not limited to cracks and step joints on hard surfaces, ruts along trail edges and corners, heaved utility access covers</p> <p>Erosion ruts on granular trails, protruding roots and rocks</p> <p>Trip hazards reviewed and addressed as per Hazard Class identification</p>	<p>Erosion ruts on granular trails, protruding roots and rocks</p> <p>Trip hazards reviewed and addressed as per Hazard Class identification</p>	<p>Erosion ruts on granular trails, protruding roots and rocks</p> <p>Trip hazards reviewed and addressed as per Hazard Class identification</p>	<p>Includes but not limited to cracks and step joints on hard surfaces, ruts along trail edges and corners, heaved utility access covers</p> <p>Erosion ruts on granular trails, protruding roots and rocks</p> <p>Trip hazards reviewed and addressed as per Hazard Class identification</p>
GRASS CUTTING	As per mowing schedule for the surrounding park	As per mowing schedule for the surrounding park	Seasonally as needed, as dictated by surroundings (mowing may not be applicable)	Not applicable	As per mowing schedule or seasonally as needed
LIGHTING / RELAMPING	As required, or re-lamp all fixtures based on a set schedule	Where applicable only (i.e. lit trails)	Not applicable	Not applicable	Not applicable
BRIDGES AND STRUCTURES	<p>Annual inspection for pedestrian bridges, any vehicular bridges on trail to be inspected after winter or significant flood event</p> <p>Includes super structure, fasteners, rust / rot, decking (loose, missing, broken, rotting boards, protruding fasteners), substructure (abutments footings), expansion joints and bearings where applicable</p> <p>Addressed as per Hazard Class identified for items inspected</p>	<p>Annual inspection for pedestrian bridges, any vehicular bridges on trail to be inspected after winter or significant flood event</p> <p>Includes super structure, fasteners, rust / rot, decking (loose, missing, broken, rotting boards, protruding fasteners), substructure (abutments footings), expansion joints and bearings where applicable</p> <p>Addressed as per Hazard Class identified for items inspected</p>	<p>Annual inspection for pedestrian bridges</p> <p>Includes super structure, fasteners, rust / rot, decking (loose, missing, broken, rotting boards, protruding fasteners), substructure (abutments footings), expansion joints and bearings where applicable</p> <p>Addressed as per Hazard Class identified for items inspected</p>	<p>Annual inspection for pedestrian bridges</p> <p>Includes super structure, fasteners, rust / rot, decking (loose, missing, broken, rotting boards, protruding fasteners), substructure (abutments footings), expansion joints and bearings where applicable</p> <p>Addressed as per Hazard Class identified for items inspected</p>	<p>Annual inspection for pedestrian bridges, any vehicular bridges on trail inspected annually after winter</p> <p>Includes super structure, fasteners, rust / rot, decking (loose, missing, broken, rotting boards, protruding fasteners), substructure (abutments footings), expansion joints and bearings where applicable</p> <p>Addressed as per Hazard Class identified for items inspected</p>

	Waterfront Multi-Use Trail (Type 1)	Multi-Use Trail (Type 2)	Connector Trail (Type 3)	Natural Trail (Type 4)	Stormwater Management Facility Access (Type 5)
GARBAGE / LITTER	<p>Pickup from trash cans and small litter items as per schedule for surrounding park</p> <p>May include annual trail cleanup day using volunteers</p> <p>Unauthorized Dumping addressed as a Class B Hazard</p>	<p>Pickup from trash cans and small litter items as per schedule for surrounding park</p> <p>May include annual trail cleanup day using volunteers</p> <p>Unauthorized Dumping addressed as a Class B Hazard</p>	<p>As needed</p> <p>May include annual trail cleanup day using volunteers</p> <p>Unauthorized Dumping addressed as a Class B Hazard</p>	<p>As needed</p> <p>May include annual trail cleanup day using volunteers</p> <p>Unauthorized Dumping addressed as a Class B Hazard</p>	<p>As needed</p> <p>May include annual trail cleanup day using volunteers</p> <p>Unauthorized Dumping addressed as a Class B Hazard</p>
SIGNAGE	<p>Repair or replace as required based on Hazard Class identified</p> <p>Safety Regulatory signs (e.g. Stop, sharp curve, dead end, sharp drop etc.) to addressed as Class A Hazard</p>	<p>Repair or replace as required based on Hazard Class identified</p> <p>Safety Regulatory signs (e.g. Stop, sharp curve, dead end, sharp drop etc.) to addressed as Class A Hazard</p>	<p>Repair or replace as required based on Hazard Class identified</p> <p>Safety Regulatory signs (e.g. Stop, sharp curve, dead end, sharp drop etc.) to addressed as Class A Hazard</p>	<p>Repair or replace as required based on Hazard Class identified</p> <p>Safety Regulatory signs (e.g. Stop, sharp curve, dead end, sharp drop etc.) to addressed as Class A Hazard</p>	<p>Repair or replace as required based on Hazard Class identified</p> <p>Safety Regulatory signs (e.g. Stop, sharp curve, dead end, sharp drop etc.) to addressed as Class A Hazard</p>
SITE FURNISHINGS	Repair or replace as required based on Hazard Class identified	Repair or replace as required based on Hazard Class identified	Repair or replace as required based on Hazard Class identified	Repair or replace as required based on Hazard Class identified	Repair or replace as required based on Hazard Class identified
EROSION / DRAINAGE	<p>Mark areas where granular base has undermined hard surface</p> <p>Clear blocked culverts</p> <p>Frequency: Based on Hazard Class Assessment</p> <p>Flooding to be addressed as a Class A Hazard – review and barricade within 24hrs.</p>	<p>Grade and, or fill washouts</p> <p>Clear blocked culverts</p> <p>Frequency: Based on Hazard Class Assessment</p> <p>Flooding to be addressed as a Class A Hazard – review and barricade within 24hrs.</p>	<p>Grade and, or fill washouts</p> <p>Clear blocked culverts</p> <p>Frequency: Based on Hazard Class Assessment</p> <p>Flooding to be addressed as a Class A Hazard – review and barricade within 24hrs.</p>	<p>Grade and, or fill washouts</p> <p>Clear blocked culverts</p> <p>Frequency: Based on Hazard Class Assessment</p> <p>Flooding to be addressed as a Class A Hazard – review and barricade within 24hrs.</p>	<p>Grade and, or fill washouts</p> <p>Clear blocked culverts</p> <p>Frequency: Based on Hazard Class Assessment</p> <p>Flooding to be addressed as a Class A Hazard – review and barricade within 24hrs.</p>
WINTER MAINTENANCE	Ploughing and gritting in winter as per sidewalk maintenance protocol	<p>Ploughing and gritting in winter as per sidewalk maintenance protocol</p> <p>Only applies to select trail segments identified for winter maintenance.</p>	No winter maintenance	No winter maintenance	No winter maintenance
MAINTENANCE COST (RANGES)	Highest maintenance cost (i.e. range \$10,000/km to \$20,000/km for 3 seasons), plus \$6,750 to \$12,500/km annually for winter maintenance).	<p>High maintenance cost (i.e. range \$2,500/km to \$4,000/km for 3 seasons)</p> <p>Some sections may be candidates for winter maintenance, an additional \$6,750 to \$12,500/km annually for winter maintenance</p>	Moderate maintenance cost (i.e. range \$1,250/km to \$1,500/km annually)	Lowest maintenance cost (i.e. range \$750/km to \$1,000/km annually)	Moderate maintenance cost (i.e. range \$1,250/km to \$1,500/km annually)

### 3.3.3 CANDIDATES FOR WINTER TRAIL MAINTENANCE

Except for the Waterfront Heritage Trail the off-road recreational trail system in Barrie is not maintained during winter months. Trails are available for non-motorized public use during winter.

Winter ploughing entire municipal recreational trails networks is an uncommon practice. The most common approach is to clearly sign them at entrance points indicating that trails are not maintained during winter. Winter maintenance of off-street trails is challenging. Unlike sidewalks which are linear and easy to locate, trails are often non-linear and it is difficult to know the exact alignment of these trails through parks and hydro corridors when snow covered. Without adequate markers operators will have difficulty clearing the snow effectively and could risk wandering off the trail and striking an obstruction or impediment that is covered in snow.

Salting of trails is likely ineffective because of the relative infrequency of cycling use and the weight and width of bicycle tires and weight of pedestrians do not assist the effectiveness of salt in melting snow and ice.

With the increasing demand for year-round active transportation and the contribution that off-road trails typically make towards a connected and complete active transportation network, there is growing demand for municipalities to maintain parts of their off-road trail networks during winter. Municipalities that are developing winter active transportation networks are including select segments of their overall networks.

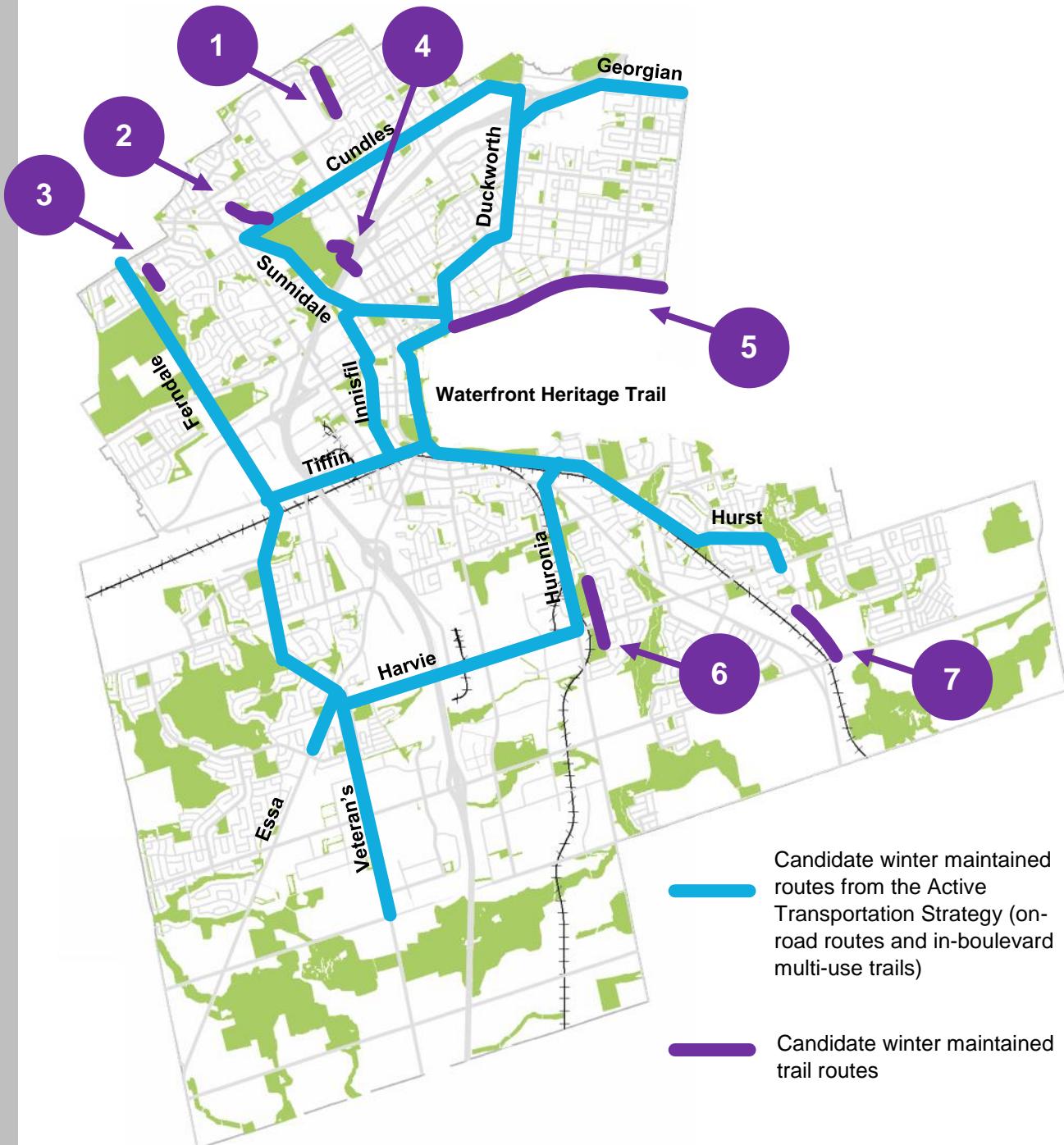
**Figure 26** illustrates active transportation routes suggested for winter maintenance consideration. These routes include both on-road cycling routes and in-boulevard multi-use trails. To complement these routes seven off-road trail routes are suggested for winter maintenance consideration. Criteria used to suggest these routes include:

- Hard surfaced (i.e. Type 1 or Type 2 trails)
- Connects to or is nearby the suggested winter active transportation network routes as suggested in the City's Active Transportation Strategy
- Provides a connection to schools or other key destinations such as community centres and transit hubs
- Provides a connection across a major barrier.

Each of the seven trail segments for consideration is further described in **Table 15**.

**Should the City decide to proceed with winter maintenance of select off-road recreational trails, consideration should also be given to lighting of these routes to provide visibility for early morning and early evening trail use, an to ensure health and safety of equipment operators who often work during the night.**

## SECTION 3.0 IMPLEMENTATION



**Figure 26 | Candidates for Winter Trail Maintenance**

## CANDIDATES FOR WINTER TRAIL MAINTENANCE

Table 15 | Candidates for Winter Trail Maintenance

TRAIL SEGMENT:	RATIONALE:	ROUTE LENGTH (m)
Trail Segment #1: East Bayfield Community Centre/Park	<ul style="list-style-type: none"> <li>Provides a north-south linkage between Hanmer Street East and Livingstone Street East</li> <li>Existing trail provides connectivity to East Bayfield Community Centre/Park, Terry Fox Elementary School and Sister Catherine Donnelly YMCA</li> </ul>	860m (excludes trail segments that connect to tennis courts and baseball diamonds)
Trail Segment #2: Victoria Woods Trail Network	<ul style="list-style-type: none"> <li>Off-road connection between Cundles Road West with Lillian Crescent</li> <li>Cundles Road West is an on-road corridor that is recommended to receive winter maintenance</li> </ul>	1,390m
Trail Segment #3: Trail between Cundles Road West and McVeigh Drive	<ul style="list-style-type: none"> <li>Connectivity between Cundles Road West and McVeigh Drive</li> <li>Formalize a connection to the Emma King Elementary School within the surrounding neighbourhood</li> </ul>	300m (excludes trails leading to the playground)
Trail Segment #4: Coulter Street (Bayfield Mall) to Toronto Street	Significant barrier-crossing connecting neighbourhoods to the north and south of Highway 400 without directing users through an interchange	580m
Trail Segment #5: North Shore Trail	<ul style="list-style-type: none"> <li>Significant east-west trail linkage connecting Downtown Barrie with neighbourhoods east of Mulcaster Street</li> <li>North-south linkages feed into the North Shore Trail from neighbourhoods in the northeast section of the city</li> </ul>	2,900m
Trail Segment #6: Trans Canada Trail between Leggott Avenue and Widgeon Street	<ul style="list-style-type: none"> <li>Segment of the Trans Canada Trail connecting residential neighbourhoods, Willow Landing Elementary School and Saint Michael the Archangel Catholic Elementary School</li> <li>1.1km segment of Trans Canada Trail that provides an off-road, north-south connection leading commuters toward Downtown Barrie</li> </ul>	1,170m
Trail Segment #7: Barrie South GO Station Trail between Pine Drive and Mapleview Drive East	<ul style="list-style-type: none"> <li>Provides a direct link between the Barrie South GO Station and residential lands to the north</li> <li>Opportunity for GTA-bound commuters to access the GO station without needing to drive</li> </ul>	1,130m
<b>TOTAL</b>		8,330m

## OTHER WINTER USES

Destinations offering groomed cross-country ski trails and snowshoeing opportunities are very popular in and around Simcoe County. Though not currently part of the winter recreational trail offering in Barrie, the City may at some future time consider dedicated winter uses such as groomed cross-country ski trails.

**Should the City decide in future to explore the potential to develop groomed cross-country ski trails within City limits additional studies will be required to understand the opportunities, select appropriate location(s), acquire any specialized maintenance / grooming equipment, develop the program(s) and allocate appropriate resources.**

**The maintenance strategies outlined in the Trails Master Plan in combination with current City maintenance practices specific to trail infrastructure should be used as a starting point to develop an updated trail specific maintenance plan, budget and staff complement.**

**As the proposed trail network is implemented trail maintenance budgets and staff complement must increase to address the increasing number / length of trail facilities that have been implemented.**

### 3.3 FUNDING THE TRAIL PLAN

*The implementation of the Trails Master Plan carries a significant cost for the infrastructure, for the supportive initiatives and for the staff time and effort. Identifying external funding opportunities to support implementation will help to offset the cost for the City.*

The proposed trail network as well as the operation, planning and maintenance recommendations will require funding. It is not realistic or possible for the cost to be the sole responsibility of the City. Potential external funding opportunities building on existing partnerships should be explored regularly and pursued wherever feasible to offset local costs.

The following are some current potential external funding sources that could be explored to support the implementation of trails and trail programs. The funding programs highlighted below were available at the time the Trails Master Plan was prepared. It is not an exhaustive list and subject to change; therefore, potential funding programs should be monitored regularly.

**Table 16 | Potential External Funding Sources**

OPPORTUNITY	ADDITIONAL DETAILS
UPPER TIER GOVERNMENT FUNDING SOURCES	
Federal Gas Tax	<ul style="list-style-type: none"> <li>– <a href="https://www.infrastructure.gc.ca/plan/gtf-fte-eng.html">https://www.infrastructure.gc.ca/plan/gtf-fte-eng.html</a></li> </ul>
Federation of Canadian Municipalities Green Municipal Fund	<ul style="list-style-type: none"> <li>– <a href="https://fcm.ca/home/programs/green-municipal-fund.htm">https://fcm.ca/home/programs/green-municipal-fund.htm</a></li> </ul>
Federal and Provincial Infrastructure / Stimulus Programs	<ul style="list-style-type: none"> <li>– For Federal Government: <a href="https://www.canada.ca/en/office-infrastructure.html">https://www.canada.ca/en/office-infrastructure.html</a></li> <li>– For Provincial Government <a href="https://www.ontario.ca/page/ministry-infrastructure">https://www.ontario.ca/page/ministry-infrastructure</a></li> <li>– <a href="https://www.ontario.ca/page/infrastructure-funding-small-communities">https://www.ontario.ca/page/infrastructure-funding-small-communities</a></li> </ul>
Ontario Trillium Foundation	<ul style="list-style-type: none"> <li>– <a href="https://otf.ca/">https://otf.ca/</a></li> <li>– Grants that broaden access, improve community spaces to achieve a Priority Outcome</li> <li>– From \$5,000 to \$150,000, available to charitable organizations</li> </ul>
Ontario Sport and Recreation Communities Fund	<ul style="list-style-type: none"> <li>– As part of the Ontario Sport and Recreation Communities Fund: <a href="http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/PRDR006918">http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/PRDR006918</a></li> </ul>
Tourism Development Fund	<ul style="list-style-type: none"> <li>– <a href="http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/OSAPQA005130">http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/OSAPQA005130</a></li> </ul>

OPPORTUNITY	ADDITIONAL DETAILS
Environment Canada Habitat Stewardship Program for Species at Risk	<ul style="list-style-type: none"> <li>– HSP allocates funds to projects that conserve and protect Species at Risk (SAR) and their habitats</li> <li>– Land must be located in a priority area and targeting a priority species</li> <li>– A strong proposal for land acquisition must have confirmed SAR on the property or a property that is identified as Critical Habitat for a SAR listed species</li> <li>– <a href="https://www.canada.ca/en/environment-climate-change/services/environmental-funding/programs/habitat-stewardship-species-at-risk.html">https://www.canada.ca/en/environment-climate-change/services/environmental-funding/programs/habitat-stewardship-species-at-risk.html</a></li> </ul>
Ministry of the Environment, Conservation & Parks Ontario Community Environment Fund	<ul style="list-style-type: none"> <li>– Payments from environmental penalties are available to the community impacted by environmental violations to support eligible projects within that affected community</li> <li>– Projects can include acquisition but restoration projects will be given priority</li> <li>– Available for Ontario municipalities</li> <li>– <a href="https://www.ontario.ca/page/ontario-community-environment-fund">https://www.ontario.ca/page/ontario-community-environment-fund</a></li> </ul>
Ontario – Ministry of Tourism, Culture and Sport Support for Ontario's Tourism Regions - Partnership Funding	<ul style="list-style-type: none"> <li>– Regional Tourism Organization will be eligible to receive additional funds where they can demonstrate that they have received funds from other sources in support of regional activities.</li> <li>– Partnership funding will be capped at a maximum of 20 per cent of the proportional allocation to a maximum of \$1.5 million.</li> <li>– <a href="http://www.mtc.gov.on.ca/en/regions/funding.shtml">http://www.mtc.gov.on.ca/en/regions/funding.shtml</a></li> </ul>
FOUNDATION FUNDING SOURCES	
TD Friends of the Environment Foundation Grant	<ul style="list-style-type: none"> <li>– Supports a wide range of environmental initiatives, with a primary focus on environmental education and green space programs</li> <li>– Eligible projects include schoolyard greening, park revitalization, community gardens, park programming and citizen science initiatives</li> <li>– <a href="https://www.td.com/corporate-responsibility/fef-grant.jsp">https://www.td.com/corporate-responsibility/fef-grant.jsp</a></li> <li>– Includes Municipalities and First Nations</li> </ul>
K.M. Hunter Foundation Environment Grants	<ul style="list-style-type: none"> <li>– Supports three areas: protection of wildlife species, stewardship of land, and organizations that fight to change the laws so that environmental areas can be protected</li> <li>– <a href="https://www.kmhunterfoundation.ca/environment.html">https://www.kmhunterfoundation.ca/environment.html</a></li> </ul>

OPPORTUNITY	ADDITIONAL DETAILS
Weston Foundation Land Conservation	<ul style="list-style-type: none"> <li>– Protecting Critical Habitats, Environmental Education, Revitalizing Urban Green Spaces</li> <li>– Does not accept unsolicited proposals</li> <li>– <a href="http://www.westonfoundation.org/our-initiatives/land-conservation/">http://www.westonfoundation.org/our-initiatives/land-conservation/</a></li> </ul>
Gosling Foundation	<ul style="list-style-type: none"> <li>– Provides grants for land protection including acquisition and unsolicited proposals that fit within the mandate of the Foundation</li> <li>– <a href="http://www.goslingfoundation.org/index.cfm?page=GrantPrograms">http://www.goslingfoundation.org/index.cfm?page=GrantPrograms</a></li> </ul>
FOUNDATION FUNDING SOURCES (CHARITABLE ORGANIZATIONS ONLY)	
Echo Foundation Environment Grant	<ul style="list-style-type: none"> <li>– Grants focus on Eastern Canada (Ontario, Quebec and the Atlantic provinces), with a priority given to the protection of natural areas of ecological importance</li> <li>– Also support, on a case-by-case basis, a variety of other concrete endeavors designed to promote and enhance sustainable environmental practices</li> <li>– Available to Charitable Organizations</li> <li>– <a href="http://www.fondationecho.ca/">http://www.fondationecho.ca/</a></li> </ul>
Mclean Foundation Environment Grant	<ul style="list-style-type: none"> <li>– May consider land securement</li> <li>– Provides grants with particular emphasis on projects showing promise of general social benefit but which may initially lack broad public appeal</li> <li>– Available to Charitable Organizations</li> <li>– <a href="http://mcleanfoundation.ca/donation_policy.html">http://mcleanfoundation.ca/donation_policy.html</a></li> </ul>
Mountain Equipment Co-Op Community Grants	<ul style="list-style-type: none"> <li>– Planning, construction and maintenance of facilities or infrastructure such as trails and skills-parks</li> <li>– <a href="https://www.mec.ca/en/explore/spring-and-fall-grants">https://www.mec.ca/en/explore/spring-and-fall-grants</a></li> </ul>
Rotary Club	<ul style="list-style-type: none"> <li>– Rotary members contribute their skills, expertise, and resources to help solve some of the world's toughest problems. Foundation grants bring service project ideas to life</li> <li>– <a href="https://www.rotary.org/en/our-programs/grants">https://www.rotary.org/en/our-programs/grants</a></li> </ul>
Local Service Clubs	<ul style="list-style-type: none"> <li>– E.g. Lions, Optimist etc.</li> </ul>

Not all funders will be an exact fit. For example, some may not fund trail securement but they will fund land securement for environmental conservation. This still may fit within the objectives of this strategy by utilizing securement partners, such as Conservation Authorities and land trusts. They can ensure the bulk of the land is protected in perpetuity while accommodating a trail network in the least environmentally sensitive areas of the land. Additionally, some funders support trail acquisition but municipal government may be ineligible. Partnerships with profit organizations with an interest/trail mandate may help to leverage funding from sources that may not be typically explored for trails.

**As the City identifies budgets and implementation priorities on an annual basis, additional external funding sources should be reviewed and considered to support funding and implementation.**

### 3.4 CONCLUSION

The City of Barrie Trails Master Plan has been developed as a long-term blueprint and guide for trail design, development and promotion City-wide. It builds upon excellent trail work that has previously been completed by the County, City and stakeholders over the past several decades and has been developed in conjunction with the City's active transportation strategy and transportation master plan.

It was developed in parallel with the Transportation Master Plan (TMP) and Active Transportation Strategy (ATS), added to the original TMP scope later in the process. The study began in fall 2018 and was completed within the delivery schedule for the overall TMP, and as such the Trails Master Plan study schedule was compressed. Some of the topics introduced in the Trails Master Plan will require additional research, field investigations and consultations as part of the plan's implementation.

Moving forward in a collaborative manner with quality trail infrastructure and a coordinated trail promotion, outreach and encouragement program will add significant value to the unique experiences, opportunities and community that is found within the City of Barrie.



Waterfront Heritage Trail in Heritage Park. Source; Google Maps, 2019

## 3.5 SELECT REFERENCES

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## SECTION 3.0 IMPLEMENTATION

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