TOWNSHIP OF NORTH DUMFRIES

Trails/Cycling Master Plan

JUNE 2014 |

MMM GROUP

D16.14.006

NORTH DUMFRIES TRAILS/CYCLING MASTER PLAN DRAFT REPORT (JUNE 2014)

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ACKNOWLEDGEMENTS

The Township of North Dumfries Trails/Cycling Master Plan study team would like to express their appreciation to the following individuals that contributed to the development of this master plan, as well as the many other stakeholders and members of the public who through their input, contributed to its development:

North Dumfries Study Team & Parks, Recreation & Trails Advisory Committee	Consultant Team Members
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1.0 THE HISTORY

1.1 BACKGROUND

Trails and cycling in the Township of North Dumfries have a long history. The community encompasses areas of cultural and natural significance as well as a system of north-south and east-west rural roadways which provide direct connections between the Township's key destinations and communities. This environment makes the Township an ideal location for active transportation (walking, cycling and other forms of human powered activities for short day to day trips) and recreation (the use of trails for fitness and leisure). At the Federal, Provincial, Regional and local municipal level, the stage has been set to move forward with active transportation and recreation initiatives and projects (see Appendix A for a summary of relevant policies and plans that were reviewed to inform the development of this master plan). In the past, trail development and the implementation of active transportation and recreation facilities has been the responsibility of some of the Township's partners e.g. Grand River Conservation Authority and the Region of Waterloo. With the development of the Parks, Recreation and Trails Advisory Committee as the voice for all aspects of leisure and recreation services to Township Council, there has been an increasing awareness and demand for a more strategic approach to trail planning, design, and implementation. As such, the Township identified the need to develop a long-term strategy for on and off-road trail and cycling facility development. Initiated in March 2014, the Trails/Cycling Master Plan was developed collaboratively by municipal staff, members of Council, the Parks, Recreation and Trails Advisory Committee and members of the public, all supported by the MMM Group, a firm that specializes in trail and active transportation planning and design.

THE MASTER PLAN IS...

A long-range, flexible blueprint

A set of tools to facilitate implementation

THE MASTER PLAN IS NOT...

Prescriptive or set in stone

Intended only as a Township initiative

The plan is intended to be used as a blueprint and set of tools to support the Township's future planning, design and implementation of trail and cycling facilities. The information included in the master plan provides a framework for increasing trail and cycling use throughout the Township. It is also intended to help make walking, cycling and other forms of active transportation safer, convenient, comfortable and accessible modes of transportation for residents and visitors. The solutions and recommendations identified in the master plan are based on current best practices, incorporate input from local stakeholders and members of the public, and are intended to be a guide for future planning, engineering, communication, programming and education.

Staging Area for Regional Forest off of Brant Waterloo County Line

1.2 BUILDING ON WHAT HAS BEEN DONE

Developing a Trails/Cycling Master Plan that is tailored to the Township of North Dumfries requires an understanding of the opportunities that can be enhanced and the challenges that require future solutions. Input provided by members of the public (through a set of public open houses and an online questionnaire), the committee members (through committee workshops) and field investigations undertaken by the consultant team helped to highlight the opportunities and challenges associated with walking and cycling in the Township.

WALKING

Opportunities

- Existing destination trails (e.g. Grand Valley Hiking Trail and Paris Rail Trail)
- Existing staging areas and signage
- Support from all levels of government
- Existing involvement and commitment from the Parks, Recreation & Trails Advisory Committee
- Existing on-road sidewalk connections within neighbourhoods
- Community based trail promotion (e.g. Mayor's Dance for Parks & Trails)

Challenges

- Variation between urban and rural traffic patterns
- Lack of information regarding appropriate on-road connections (e.g. use of shoulder by pedestrians)
- Insufficient lighting of off-road trails and urban walking connections
- Unclear crossing area for pedestrians at key intersections and urban areas
- Unclear approach to trail development, design and maintenance

CYCLING

Opportunities

- Existing on-road facilities in urban and rural areas
- Support from all levels of government
- Local interest groups, stakeholders and clubs
- Connections on and off-road to surrounding communities
- Regional promotion and outreach initiatives

Challenges

- Inconsistent application of cycling facility design alternatives
- Limited opportunities for use of destination trails
- Lack of maintenance directive for on-road facilities
- Unclear approach to on-road facility design
- Lack of education regarding safe and comfortable use of cycling facilities

By establishing a more detailed understanding of the walking and cycling opportunities and challenges, the study team was able to explore potential improvements. These improvements were considered when developing the trails/cycling network and master plan recommendations. Some were refined and have been identified as priority projects or actions (see Chapter 4). For others, suggested guidelines or considerations have been identified that the committee may select to investigation further when implementing the plan as funds become available.

Potential Walking Improvements

- Development of Multi-use Trails
- Designated Intersection Crossings
- Strategically Placed Trail Lighting
- Additional Trail and Pedestrian Amenities
- Consideration for Accessibility Concerns
- Clear Wayfinding and Signage

Potential Cycling Improvements

- Application of Consistent Design Guidelines (OTM Book 18)
- Bridging Gaps in the Trail System using On-Road Cycling Facilities
- Implementation of Bicycle Parking
- Development of Trail/Cycling Mapping
- Development of Promotion and Education Initiatives

1.3 HOW CAN NORTH DUMFRIES GROW?

Community growth can come in many forms. An increased investment in active transportation and recreation can benefit many aspects of community growth. People are looking to establish roots in communities where quality of life, comfort and safety and sustainable growth are primary objectives. Research demonstrates that active transportation and recreation can influence and provide value to community development by…

Improving Quality of Life through Active & Healthy Living

Maintaining physical activity levels and healthy lifestyles is becoming a greater challenge. Providing better access to trails and cycling facilities by increasing the number of routes and their distribution in the built-up areas while continuing to establish rural connections throughout the Township may help to increase higher levels of activity. A system of connected facilities, both on and off-road, that are easily followed may help to encourage more people to use the system for leisure and exercise and in some cases for day to day trips. Investing in the development of active transportation and recreation facilities can result in numerous quality of life and health benefits including:

- Reduced the risk of coronary heart disease, cancer and bone loss from osteoporosis;
- Reduced cost of medical care and workplace absenteeism;
- Maintains the independence of seniors and young adults; and
- Enhanced mental outlook and well-being, improved self-image, social relationships and increased self-reliance and independence.

Enhancing Community Safety

Perception of safety and comfort can impact the use of trails and cycling facilities. Studies confirm that as the number of cyclists increase, residents and visitors may be more inclined to engage in cycling. In addition, with more cyclists on the road, motorists may become more considerate or aware of how to safely use the roadway. A study completed by the Thunderhead Alliance compared collision data with the presence of pedestrians and cyclists, fatality data and AT mode share. Results showed a positive correlation between the number of cyclists and pedestrians, the increased safety of users and the lowest per capita fatality rates. Research indicates that with greater separation between motorists and pedestrians and cyclists comes a greater sense of safety and security[1]. Similar trends also occur when facilities are well maintained[2]. The implementation of well-designed and properly maintained infrastructure can increase perceived safety and comfort for user groups.

Improving the Economy & Local Tourism

Investing in trails and cycling facilities has been proven to create numerous economic benefits. By developing trails, some communities may see an increase in business activity, opportunities for future employment and the opportunity for funding and grant support from the provincial and federal government. The benefits that can be realized are two fold increased employment through the design, supply and installation of materials and economic investment from both residents and visitors who use the system. A number of studies have been completed to assess the potential economic impacts of trails and cycling facilities. Locally, the Hanlon West Business Park in Guelph includes a trail system which has attracted new industry to Guelph. In Niagara, Ontario the Region has been pursuing the development of a trail system in partnership with local stakeholders and municipalities. Once completed, the system is anticipated to welcome as many as 2.6 million visitors per year with a local investment of as much as $218M annually to the local economy[3].

Providing Sustainable Transportation Options & Preserving our Environment

Walking, cycling and other non-motorized uses are energy-efficient and non-polluting. The transportation benefits include reduced road congestion and maintenance costs, less costly infrastructure development, increased road safety and decreased user costs. For distances up to 10km in more built up areas, cycling can often be the fastest mode of transportation. In Canada, we continue to rely on the single occupant vehicle as our primary mode of transportation despite its impact on air quality and environmental pollution. Transport Canada (2006) identified passenger travel as the reason for half of the greenhouse gas emissions in the transportation sector. Providing infrastructure that supports alternative modes of transportation can reduce vehicle traffic volumes and emissions and contributes to the development of more sustainable communities.

[1] Thunderhead Alliance. "Bicycling and Walking in the US: Benchmarking Report, 2007". Prescott, AZ: Thunderhead Alliance, 2007
[2] Zeeger, C.V. "Designing for Pedestrians" Washington D.C. Institute for Transportation Engineers (1993)
[3] https://www.biketrain.ca

2.0 THE PROCESS

2.1 HOW THE PLAN WAS DEVELOPED

The Trails/Cycling Master Plan was developed through a collaborative and comprehensive process over a four month timeline. Figure 2-1 illustrates the study process used to develop the Trails/Cycling Master Plan.

Figure 2- 1 – Trails/Cycling Master Plan Development Process

The study process was guided by six overarching study objectives which were formed based on input from the public, Township staff and committee members. The master plan aims to:

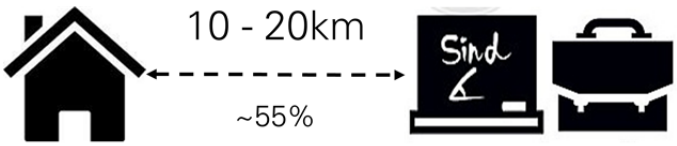
2.2 LEARNING FROM USERS & DECISION MAKERS

An understanding of potential user groups was a cornerstone of the development of the master plan. The report documents and summarizes input received over the course of the study (see Appendix B) through a range of consultation and engagement techniques. Figure 2-2 provides an overview of the engagement activities which were undertaken to establish the trails/cycling network and master plan recommendations.

Taking into consideration the short timeline of the study, the study team embarked on a thorough public and online outreach campaign to increase public input. As part of the public outreach campaign an online questionnaire was developed which was promoted using a study business card, a mobile display board and social media. Promotion of engagement opportunities was a collaborative effort between Township staff, the study consultant and steering committee members. Some highlights from the 109 online questionnaire results include:

- Modes of transportation most typically used include…

- Distance typically travelled from home to work or school…



- How trails are currently navigated (some responses include)…

Memory 73% | Signage 46% | GPS 19% | Mapping 9%

- Where people like to use trails or cycle now…

Ayr, Bannister Lake, Brantford, Cambridge, Dryden Tract, Greenfield, Piper's Glen, Sudden Tract, Paris Rail Trail, Conservation Areas, Northumberland Street

1 Online Questionnaire & Public Outreach

Study Duration

2 Public Information Centre #1

March 24, 2014

3 Steering Committee Meeting #1

April 1, 2014

4 Steering Committee Meeting #2

May 15, 2014

5 Public Information Centre #2

May 22, 2014

6 Steering Committee Meeting #3 & Council Presentation

June 2014

Figure 2-2 – Consultation Activities

2.3 A TOWNSHIP VISION

A vision for Trails/Cycling in North Dumfries was established based on feedback from the community including residents, committee members and stakeholders. It also builds on Township and Regional objectives and strategies (summarized in Appendix A).

The Trails/Cycling vision for North Dumfries informs the overall direction of the plan and is the basis from which the network, recommendations and priority projects / initiatives were developed.

"The Township of North Dumfries supports the development of trails and cycling facilities as a means of connecting important destinations, natural areas, heritage resources and points of interest throughout the community. Making these connections fosters environmentally friendly and strategic community design, and provides residents and visitors with a range of sustainable transportation alternatives. Collaborative and strategic partnerships between the Township, the public and stakeholders will highlight the Township as a destination for tourism, employment and a high quality of life."

The vision is supported by seven objectives:

1: Support Community Growth

2: Build on Work Already Completed

3: Respond to Local Demand

4: Design for a Range of Users

5: Establish a System of Trail Linkages & Cycling Routes

6: Support through Trail/Cycling Promotion & Outreach

7: Facilitate Master Plan Implementation

Over the course of the master plan study it became clear that the Township was looking for a long-term strategic approach to the development of trail and cycling facilities with short-term including potential network priorities, initiatives and tools.

The master plan presents a proposed trails/cycling network and supportive policies and recommendations for planning, design and implementation. These are organized into four "Action Areas" which are considered the cornerstones of the master plan implementation. The process used to develop the network is summarized in Section 3.0 and the next steps, tools and recommendations for the four action areas are presented in Section 4.0.

3.0 THE PLAN

3.1 THE NETWORK

The trails/cycling network was developed using an eight step iterative development process. The process is based on the premise of building upon what is already on the ground, highlighting opportunities, mitigating challenges and bridging gaps in the existing network. Figure 3-1 illustrates the eight steps used to develop the network for the Township.

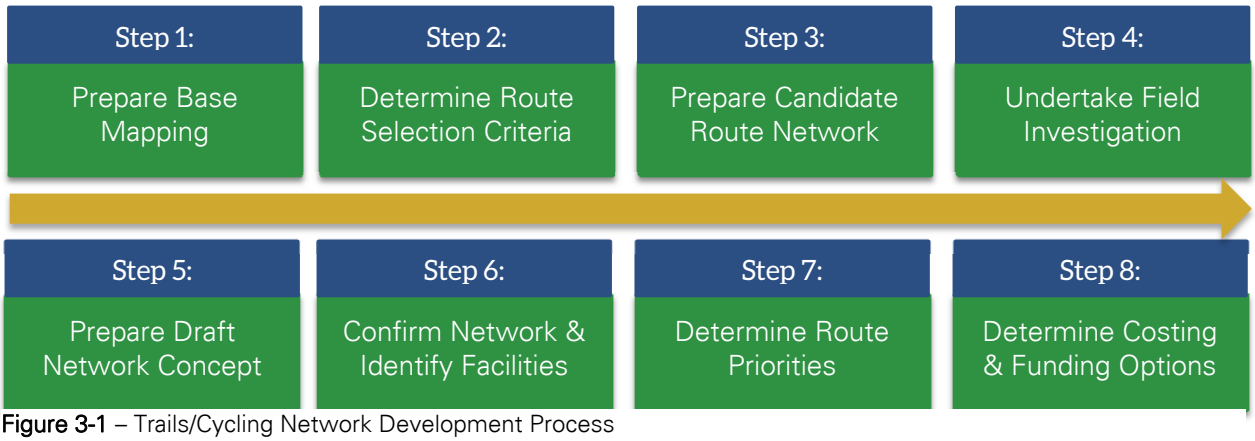


Figure 3-1 – Trails/Cycling Network Development Process

A more detailed description of steps 1 through 6 is provided below. Additional details regarding Step 7 and 8 are presented in Section 3.3 and 4.0.

The Existing Conditions

Step 1
Prepare Base Mapping

Objective:

To consolidate and digitally map previously planned trail and cycling conditions as well as anticipated areas of future development or growth.

The intent of the master plan was to build on existing facilities and routes. GIS and mapping data was provided by a number of sources including the Township (Parks, Recreation and Trails Committee Trail Background Report and Official Plan), the Region (Waterloo Region Active Transportation Master Plan, Cycling Master Plan, Trails Initiative and Official Plan) and Grand River Conservation Authority. The data received was used to document the existing conditions which are illustrated on Map 1. It is important to note that when reviewing the data provided by the Region of Waterloo, the consultant team identified some differences between the definitions used for some of the on-road cycling facility types and currently accepted provincial guidelines. For this master plan we have deferred to the Region's definitions / proposed routes as identified in the AT Master Plan for proposed routes on Regional roadways. However, moving forward, the Township is encouraged to apply the design concepts and considerations outlined Ontario Traffic Manual Book 18: Cycling Facilities (see Appendix C) for proposed linkages on Township roads.

DRAFT JUNE 2014

CITY OF KITCHENER

TOWNSHIP OF WILMOT

TOWNSHIP OF BLANDFORD-BLENHEIM

CITY OF CAMBRIDGE

TOWNSHIP OF PUSLINCH

CITY OF HAMILTON

COUNTY OF BRANT

Connection to Existing Bike Lane on Trussler Rd.

Connection to Existing Bike Lane on Fischer Hallman Rd.

Connection to Existing Bike Lare on New Duncee Rd.

Connection to existing In-Boulevard Multi-Use Trail along Blair Rd.

Connection to Proposed Bike Lane on Dickie Settlement Rd. (Region of Waterloo Active Transportation Master Plan 2014)

Existing Trail part of Trans Canada Trail

Existing Trail part of Walter Bean Grand River Trail

Existing Trail part of Grand River Trail

Connection to Proposed Paved Shoulder on Blair Rd. (City of Cambridge Bikeway Network Master Plan 2008)

Connection to Proposed Paved Shoulder on Blenheim Rd. (City of Cambridge Bikeway Network Master Plan 2008)

Connection to Existing Signed Route on West River Rd. (City of Cambridge Bikeway Network Master Plan 2008)

Connection to Proposed Paved Shoulder on St. Andrew St.(City of Cambridge Bikeway a Master Plan 2008)

Connection to Cambridge to Paris Rail Trail

Connection to Township of Puslinch

Connection to Proposed Paved Shoulder on Gore Rd.(County of Wellington Active Transportation Plan 2012)

Connection to Proposed Paved Shoulder on Clyde Rd. (City of Cambridge Bikeway Network Master Plan 2008)

Connection to Proposed Paved Shoulder on Robinson Rd. (City of Cambridge Bikeway Network Master Plan 2008)

Connection to Proposed Paved Shoulder (City of Cambridge Bikeway Network Master Plan 2008)

Connection to Hamilton

Cornection to Brant and Hamilton

Connection to Paris

Connection to Brant County

Connection to Cambridge to Paris Rail Trail

Trail developed and maintained by private landowner based on agreements with the Township of North Dumfries.

Legend Notes

1. Existing routes on Regional Roads are based on the Region of Waterloo's Active Transportation Master Plan (February 2014) and Official Plan (June 2009).

2. Proposed routes on Regional Roads are based on the Region of Waterloo's Active Transportation Master Plan (February 2014) and Official Plan (June 2009).

3. Regionally significant roadways are roads that have been identified by the Region of Waterloo as potential historical corridors which may require additional consideration should they be identified as part of the Trails/Cycling network.

0 1.25 2.5 5 Kilometres

Legend

Existing Routes[1]
- Existing Trail
- Existing Bike Lane / Paved Shoulder
- Existing Paved Shoulder

Proposed Routes[2]
- Proposed Trail
- Proposed Bike Lane / Paved Shoulder
- Proposed Paved Shoulder
- Existing 1m Paved Edge: Proposed Bike Lane

Key Destinations
- Community Centre
- Libary
- School
- Existing Staging Area

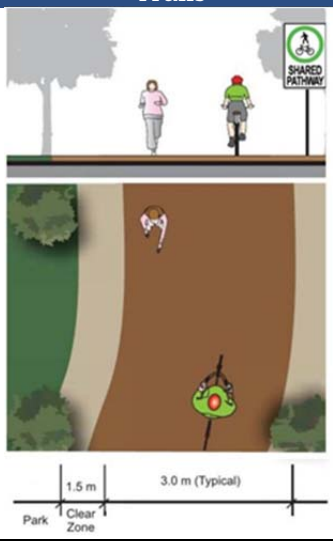
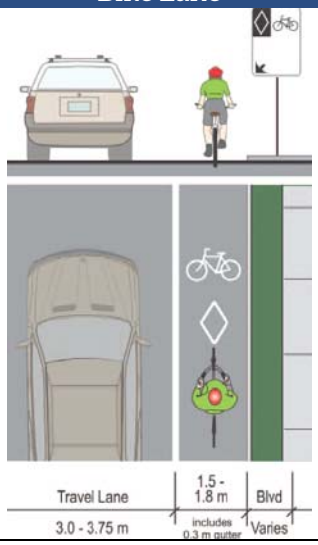
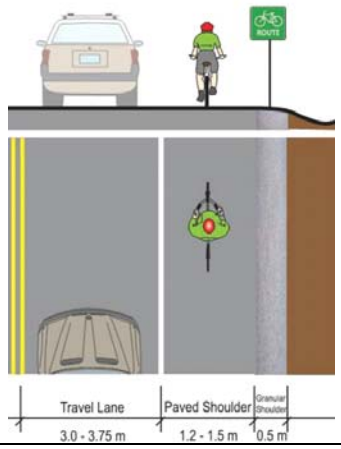
Other
- Provincial Highway
- Regional Road
- Municipal Road
- Proposed Municipal Road
- Highway 401 Crossing
- Connection to Existing / Proposed Facility in Surrounding Municipality
- Regionally Significant[3]
- Active Railway
- Abandoned Railway

Land Use Considerations
- Planned Commercial Area
- Planned Residential Area
- Planned Mixed Use Area
- Utility Corridor
- Park
- Forest
- Regional Forest
- Watercourse
- Property Parcel
- Township Boundary

Map 1
Existing & Previously Proposed Conditions
Township of North Dumfries Trails / Cycling Master Plan

A summary of the existing on and off-road facilities is presented in Table 3.1.

Table 3.1 – Summary of Existing Trail/Cycling Conditions

Trails	Bike Lane	Paved Shoulder
		
Total km: 51.43	Total km: 3.27	Total km: 40.34

The Route Selection Criteria

Step 2
Determine Route Selection Criteria

Objective:

To develop a set of qualitative principles that are used to guide the selection of trails/cycling routes.

A set of route selection criteria was developed and reviewed by Township staff, members of the committee and the public at the first PIC. The criteria are presented in Table 3.2.

Table 3.2 – Summary of Route Selection Criteria

Criteria	Description	Criteria	Description
Comfort & Safety	Reducing risk to users and providing comfortable facilities	Connected / Linked	Provide residents and visitors with connections to communities and key destinations
Attractive & Interesting	Routes take advantage of scenic areas	Diverse	Appeals to a range of user abilities and interests through on and off-road facilities
Visible	Key component of the transportation network	Accessible	Ontarians with Disabilities Act will be considered where applicable
Context-Sensitive	Use industry accepted designed and modify where necessary to suit location	Sustainable	Locate, align and design routes so they can be sustained over the long-term (e.g. useable, cost effective)

Criteria	Description	Criteria	Description
Easy to Access	Easily accessible routes from all areas of the Township	Cost-Effective	Proposed routes are feasible and appropriate in scale for the Township

The Candidate Routes

Step 3
Prepare Candidate Route Network

Objective:
To identify potential trail and cycling connections which require further investigation in the field.

Routes identified as candidate trail/cycling linkages were refined based on a more detailed assessment of the base mapping using the route selection criteria. They were further refined based on input from the public and steering committee, expertise of the study team and a desktop analysis of the Township and Regional data and aerial imagery.

The routes identified by the study team as potential connections that required further investigation in the field included:

- Active and abandoned railway corridors and hydro corridors;
- Publically owned land that has yet to be redeveloped;
- New subdivision development areas;
- Regional Roadways that were identified as part of the Active Transportation Master Plan;
- Direct North-South and East-West connections throughout the Townships;
- Connections to surrounding municipalities;
- Crossings of Highway 401;
- Urban connections in downtown Ayr;
- Desired connections on privately owned lands or lands under the jurisdiction of public agencies e.g. GRCA and rare; and
- Connections into Ward 4 (eastern-most ward in the Township).

The Investigation

Step 4
Undertake Field Investigation

Objective:
To examine the potential routes in the field and collect additional information to further assess and refine routes.

Two days of field investigation were undertaken in March 2014. As part of the investigation the study team gathered information including photographs, measurements and GPS waypoints. A database of over 200 photos and approximately 150 waypoints was established. Findings from the field investigation were supplemented by a desktop mapping exercise for routes that required additional investigation.

The Network Concept

Step 5
Prepare Draft Network Concept

Objective:
To use the criteria and information collected in the field to establish a network of trail and cycling routes.

The proposed Trails/Cycling network is illustrated on **Maps 2** and **3**. It is intended to be used as a guide for future decision making regarding trails and cycling facility development by Township staff. When developing the network, the intent was to identify a system of off-road connections where possible that are linked by on-road routes as necessary.

The Facility Types

Step 6
Confirm Network & Identify Facilities

Objective:
To identify an appropriate facility type for each of the proposed on and off-road routes.

The facility types selected were identified based on a number of key factors including the objective/intent of the route, geographic location, previous Regional or Township recommendations and where applicable, roadway characteristics (e.g. cross-section width, traffic volume, etc.). The routes can be organized into three categories – **the primary system, secondary system** and **desired connections** – which helped to define the route objectives. Additional details regarding these route types can be found in **section 3.2.1**.

Facility types can range from shared or designated routes, where cyclists use the roadway and pedestrians use the sidewalk or a paved shoulder to fully separated facilities such as multi-use trails where cyclists and pedestrians typically use the same space. Additional design guidelines and details for the proposed facility types can be found in **Appendix C** and should be supplemented with the use of **Ontario Traffic Manual Book 18** and **15** as well as the **Provincial Built Environment Standards**.

Table 3.3 is a summary of the existing and proposed trail and cycling facility types.

Table 3.3 – Summary of Proposed Trail and Cycling Linkages

Proposed Facility Types	Existing (KM)	Proposed (KM)	Total (KM)
Trails	51.43	3.4	54.83
Bike Lane / Paved Shoulder	3.27	60.6	63.87
Paved Shoulder	40.34	4.6	44.94
Signed Bike Route with Sharrow	-	2.9	2.9
Signed Only Bike Route	-	74	74
Existing 1m Paved Shoulder (Regional): Proposed Future Bike Lane	-	20.6	20.6
Total (km)	95.04	166.1	261.14

3.2 ESTABLISHING TRAIL & CYCLING ACTIONS

The input received over the course of the study from the public, members of Council, staff and steering committee representatives indicated the need for a focused and strategic approach to the planning, design and implementation of trails and cycling facilities. This section describes strategic directions and actions that set the tone for the master plan initiatives and are intended to help achieve the study vision and supportive objectives.

Four key strategic directions have been identified **Network Connectivity, Accessibility & Design, Planning & Operations** and **Promotion & Outreach** which are intended to be achieved through recommended actions. The directions and actions are summarized in **Table 3.4**.

Table 3.4 – Summary of Implementation Strategic Directions & Action Areas

Network Connectivity	Accessibility & Design	Planning & Operations	Promotion & Outreach
• Establishing Urban & Rural Connections • Completing & Connecting the Network • Establishing a Hierarchy of Routes • Establishing Regional Connections • Land Securement Strategies	• Designing a Comfortable Network • Accessibility • Safe Routes to School • Signage & Branding the Network • Incorporating Complementary Amenities	• Developing Routes in New & Established Neighbourhoods • Trails in Utility Corridors, Abandoned Railways and Unopened Road Allowances • Trails & Cycling & Municipal Policies • Route Maintenance, Risk Management & Liability • Evaluating the Routes	• Trails & Cycling Education • Using Local Events to Promote Use • Encouraging Increased Use • Establishing North Dumfries as a Bicycle Friendly Community • Establishing a Trail/Cycling Map

DRAFT JUNE 2014

TOWNSHIP OF PUSLINCH

CITY OF KITCHENER

CITY OF CAMBRIDGE

TOWNSHIP OF WILMOT

CITY OF HAMILTON

TOWNSHIP OF BLANDFORD-BLENHEIM

COUNTY OF BRANT

Existing Trail part of Trans Canada Trail

Existing Trail part of Walter Bean Grand River Trail

Existing Trail part of Grand River Trail

Trail developed and maintained by private landowner based on agreements with the Township of North Dumfries.

Ayr
Refer to enlargement
Map 3 for detail

Notes:

- Proposed Signed Bike Route with Share the Road Signage
- Bicycle Route Marker Sign
- Reserved Bicycle Lane Sign
- Shared Pathway Sign
- Pedestrian Use Permitted

1. Proposed routes on Regional Roads are based on the Region of Waterloo's Active Transportation Master Plan (February 2014) and Official Plan (June 2009).

0 1.25 2.5 5 Kilometres

Legend

Existing Routes
- Existing Trail
- Existing Bike Lane / Paved Shoulder
- Existing Paved Shoulder

Proposed Routes[1]
- Proposed Trail
- Proposed Bike Lane / Paved Shoulder
- Proposed Paved Shoulder
- Proposed Signed Bike Route with Sharrow
- Proposed Signed Bike Route
- Existing 1m Paved Edge: Proposed Bike Lane

Additional Considerations
- Desired Connection
- Connection to Surrounding Municipality

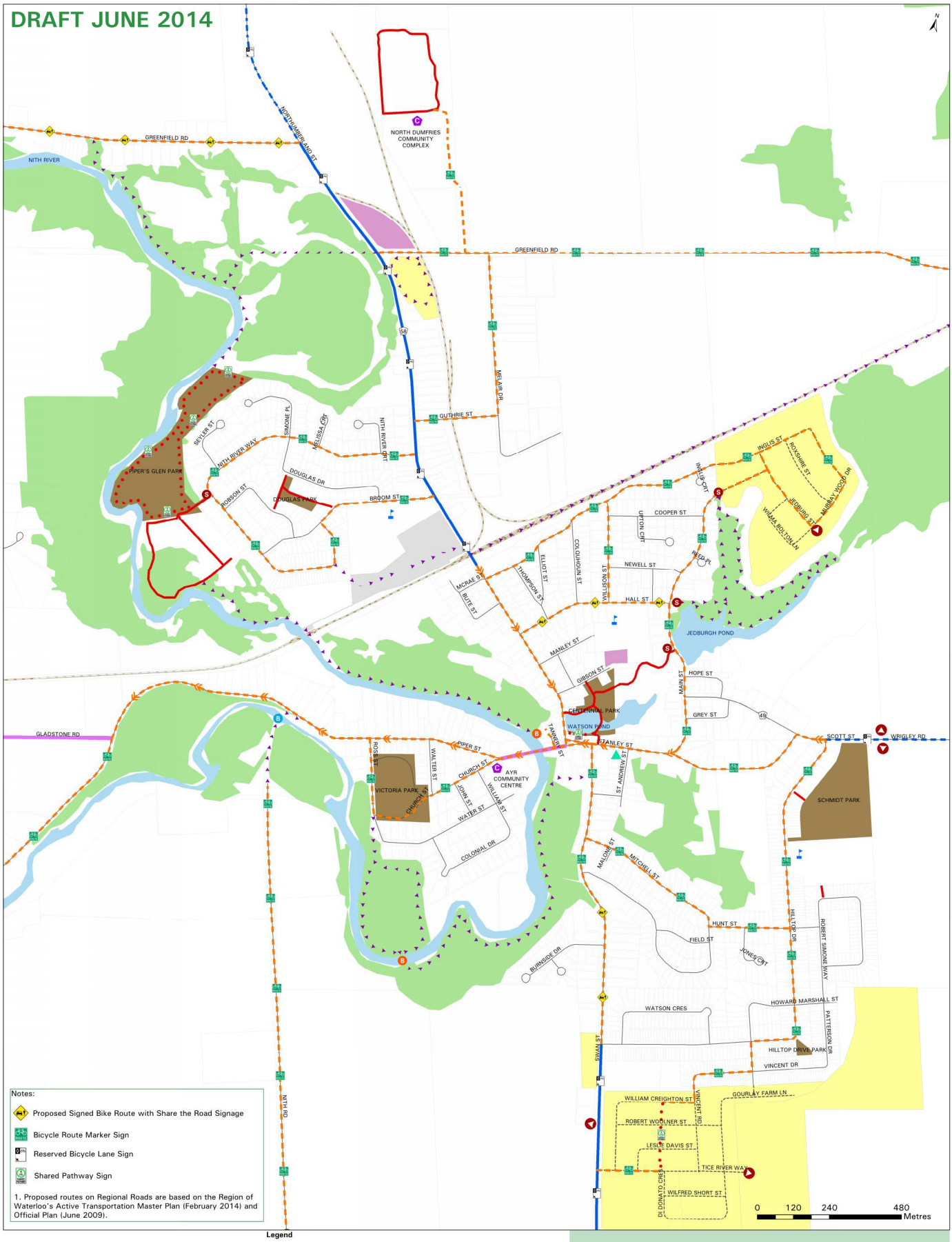
Key Destinations
- Community Centre
- Library
- School
- Existing Staging Area
- Potential Staging Area

Other
- Provincial Highway
- Regional Road
- Municipal Road
- Proposed Municipal Road
- Highway 401 Crossing

Land Use Considerations
- Regionally Significant
- Active Railway
- Abandoned Railway
- Planned Commercial Area
- Planned Residential Area
- Planned Mixed Use Area
- Utility Corridor
- Park
- Forest
- Regional Forest
- Watercourse
- Property Parcel
- Township Boundary

Map 2
Ultimate Proposed Network
(25+ Year Build-out)

Township of North Dumfries Trails / Cycling Master Plan



Map 3
Ultimate Proposed Network - Ayr
(25+ Year Build-out)

Township of North Dumfries Trails / Cycling Master Plan

NETWORK CONNECTIVITY

Developing a continuous and connected system of trails and cycling facilities is a key objective of the master plan. The network builds on existing and previously proposed Regional and local linkages that are both on and off-road accommodate a range of user groups. The existing and previously proposed routes provide a system of destination trails supported by some strategic on-road walking and cycling routes enjoyed frequently by residents and visitors. However, there are still significant gaps in the system. A system that uses a balance of on and off-road facilities to integrate and connect the network will help to improve transportation alternatives thus making walking, cycling and other active forms of transportation more attractive and viable. The following actions should be explored by the Township to improve network connectivity.

Action #1: Establishing Urban & Rural Connections

Proposed routes are identified in urban, suburban and rural areas. In urban and suburban areas, users typically live closer to their destination which increases the possibility of making day to day or short trips by bicycle or walking. These areas may require a higher order of infrastructure, however, the selection of a preferred facility type for these areas should also take into consideration other characteristics including roadway speed, surrounding land uses or traffic volumes. Rural linkages may have fewer designated routes. Where possible, off-road linear trails should be provided.

R1

The Township should make reference to the context sensitive considerations for urban and rural areas when confirming trails/cycling facilities.

Action #2: Completing & Connecting the Network

Though the Township has a number of existing connections linking the local communities as well as surrounding municipalities, there are still missing links in the system that the Township is encouraged to explore in partnership with the Region as well as local partners / agencies. A number of these linkages have been identified as priority projects (see Section 3.3). The majority of existing and proposed Regional routes are found on-road in the form of paved shoulders or bicycle lanes. This provides the Township with an opportunity to explore local signed routes and off-road trail connections to further enhance local connectivity.

The proposed facilities identified in Map 2 and 3 have been selected because of their ability to provide the Township with direct connections for a range of users and should be the primary reference for the Township to complete the network.

R2

The Township should use the hierarchy of routes to investigate future opportunities and to refine potential cycling routes when establishing the network.

Action #3: Establishing a Hierarchy of Routes

Connectivity can be defined on a number of different levels. A hierarchy of trail and cycling facility types has been identified to help define the overall intent of different systems within the Township. They are also intended to help define potential facility types and the prioritization of linkages. The network consists of three systems – primary, secondary and desired connections. A more detailed description of each is provided in Table 3.5.

Table 3.5 – Description of Route Network Hierarchy

Primary	Secondary	Desired Connections
Objectives: Routes provide direct north-south and east-west connections linking the Township's rural areas and built-up communities	Objectives: Parallel routes to the primary system predominantly on local roadways throughout neighbourhoods to key destinations (e.g. schools, local stores, etc.)	Objectives: Routes which are to be explored in the future as development occurs or as opportunities for partnerships arise. Are typically off-road linkages within private or local agency ownership
Application & Facility Type: • Bike Lanes or Paved Shoulders on Regional Roads, major Trail systems and signed Routes on North-South and East West Municipal Roads	Application & Facility Type: • Signed Routes on local residential roadways some with wide burn lanes or edgelines and minor Trails in Park Space	Application & Facility Type: • To be determined based on future development and further investigation

Action #4: Establishing Regional Connections

The Township of North Dumfries is located in the southernmost geographic area of Waterloo Region with the City of Cambridge and Wilmot Township to the north, Oxford County to the west, Brant County to the south, County of Wellington to the north east and the City of Hamilton to the south east. This geographic location solidifies the Township's important role in Regional connectivity. The Township is a destination for long-distance cyclists as well as recreational cyclists / hikers who want to explore areas of natural and cultural significance. Establishing a more connected system which links existing and previously proposed pedestrian and cycling connections within these surrounding areas will help to further establish seamless connectivity connections to key areas in the Province of Ontario. Maps 2 and 3 identify potential linkages to these surrounding areas. The element of Regional connectivity was taken into consideration when prioritizing routes. The Township should remain in communication, where possible, with representatives from surrounding communities to ensure that connections are being made and strategic linkages and being identified.

Action #5: Land Securement Strategies

The master plan has been established as guide for future on and off-road facility development on publically owned lands. However, some desired routes have been identified and others may arise that are found on privately owned lands or under other jurisdictions. The Township is encouraged to explore / plan for these connections in the future, should the land become available for sale or if a land owner is willing to enter into an easement and agreement. In these cases, permission for access or a strategy to ensure ownership will be required in advance of construction.

R3

Develop a strategy to secure public lands for trails/cycling routes that are identified under private ownership or under the ownership of public partners.

Other connections have been identified on lands where future development is anticipated. These new development areas or strategically planned secondary plan areas will ultimately become part of the Township's land base once development occurs and should take into consideration the proposed linkages identified.

ACCESSIBILITY & DESIGN

Comfort, safety and accessibility, both perceived and real, are key elements in attracting more people to walk, cycle and engage in active forms of transportation and recreation. When facilities are not designed or maintained properly or are not considered accessible, as per the Provincial Built Environment Standards, users may feel a lack of perceived safety and may be discouraged from engaging in these activities. Designing facilities which repond to the wants and needs of a range of user groups (e.g. pedestrians, cyclists, in-line skaters, cross country skiiers, etc.) as well as people of all ages and abilities where possible will help to develop a system that will be used by residents and visitors of the Township. This, as well as the use of promotion and outreach materials, can help to establish a system that is considered accessible for a range of users where possible. The following actions should be explored by the Township to improve network accessibility and facility design.

Action #1: Designing a Comfortable Network

The proposed trails/cycling network aims to strategically plan for infrastructure improvements where the greatest opportunity to increase the number of active transportation and recreation trips is possible. When considering the different types of users – specifically cyclists – who may use the network, there are four categories that can be assumed, based on level of comfort and skill. Figure 3-2 illustrates the typical distribution of cyclist types.

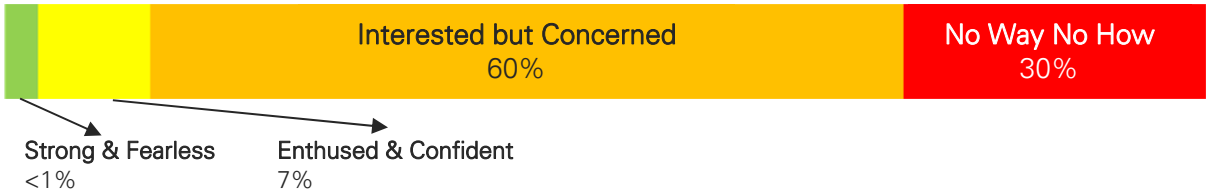


Figure 3- 2 – Groups of Cyclists **Source:** Portland, Oregon

Developed from research completed in Portland, the following assumptions can be made about the cyclist categories and could be used as a guide when selecting facility types:

- Strong and Fearless: Those that are highly committed to cycling, are already cycling regularly and will likely cycle regardless of whether infrastructure is available to use.
- Enthused and Confident: Those that have a high interest in cycling, are confident in their cycling abilities and will make efforts to cycle as long as reasonable facilities are provided.
- Interested but Concerned: A wide cross-section of individuals who have an interest in cycling as part of their regular travel needs, but have some significant concerns regarding safety and convenience that limits their desire and commitment to cycle.
- No way, no how: A wide cross-section of individuals who are unlikely to cycle and are not interested in cycling for a variety of reasons e.g. age, health, disability or other issues.

As noted in Step 6 of the network development process, there are a range of facility types which can be considered in various contexts including – **shared, designated** and **separated** (see **Appendix C**). Additional details are provided in **Table 3.6**.

Table 3.6 – Facility Type Categories

Shared	Designated	Separated
Definition: Facilities where the cyclists share the roadway with motorists and pedestrians use the sidewalk or shoulder.	Definition: Facilities that provide a separated space for cyclists on the roadway where pedestrians use the sidewalk or shoulder.	Definition: Facilities that are separated from motor vehicle traffic where the space is shared by pedestrians, cyclists and other users.
Types of Facilities: • Signed Bike Route on Local Roadway • Signed Bike Route with Sharrow	Types of Facilities: • Signed Bike Route with Paved Shoulder • Bike Lane	Types of Facilities: • Multi-use Trail within the Road Right-of-Way • Multi-use Trail outside of the Road Right-of-Way
Application: Facilities that are comfortable predominantly for those that are enthused and confident. On local roads they may be used for short-distance trips interested but concerned users.	Application: Facilities that are comfortable for many people but predominantly those that are enthused and confident as well as interested but concerned.	Application: Facilities that are comfortable for the greatest number of potential users.

To develop a network that is considered comfortable by the greatest percentage of users, the master plan aims to design facilities that are attractive for "interested but concerned" users while accommodating the "enthused and confident". This can be achieved by identifying and implementing a range of facility types throughout the network including long-distance signed routes to fully separated multi-use trails. For the purposes of the master plan, it has been assumed that when on-road cycling routes are implemented in urban areas the Township should consider the implementation of a sidewalk for pedestrians if it is not already available.

Action #2: Accessibility

Approximately one in eight Canadians suffers from some type of physical disability. Mobility, agility and pain-related disabilities are by far the most common, each accounting for approximately 10% of reported disabilities nationally. The Accessibility for Ontarians with Disabilities Act (AODA) promotes the goal of making Ontario accessible for people with disabilities by 2025. The Accessibility Standards for the Built Environment applies to pathways, trails and sidewalks (see Appendix A for more information on the 2005 AODA). The intent is to help remove barriers to buildings and outdoor spaces.

R4

In consultation with the Township's Accessibility Advisory Committee, the AODA requirements should be met, where possible and used as a primary reference.

The standard only applies to new construction and extensive renovation and is not mandatory for the design of on-road cycling facilities. That said, when designing and implementing off-road cycling facilities and multi-use trails, the Township should refer to the guidelines outlined in the Built Environment Standards to ensure that the needs of all user groups are accommodated. The Township should also strive to satisfy the requirements of the AODA to the greatest extent possible, given the context of each trail's location, the surrounding environment and type of trail experience that is desired. Sections 80.8 and 80.10 of the Accessibility Standards for the Built Environment provide the technical requirements for multi-use recreational trails.

Action #3: Safe Routes to School (SRTS)

Safe routes to school is a growing international movement which is geared towards improving safety for children walking and cycling to school. Research indicates that 42% of children are driven to school and that the majority want the opportunity to walk and cycle more often. The Active and Safe Routes to School program (www.saferoutestoschool.ca) provides support for communities that are looking to establish greater community involvement in the design and use of walking and cycling routes for children. Safe Routes to School programs and initiatives can include:

R5

Work with Waterloo Region District School and Waterloo Region Catholic District School boards to explore potential SRTS programs which could be implemented in the urban and rural areas of the Township.

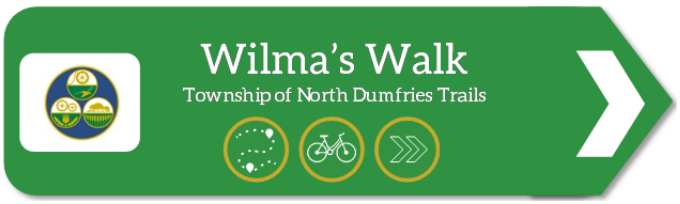
- School travel planning toolkit;
- Walk/wheel on Wednesdays;
- Walking school buses;
- IWALK Club; and
- Idle Free Zones.

These programs, among others, should be explored by the Township in partnership with the Waterloo Region District School Board and Waterloo Region Catholic District School Board to educate and promote walking and cycling to both students and parents.

Action #4: Signing & Branding the Network

An accessible and connected system of trails/cycling facilities will require the implementation of signage with a variety of intents and purposes. The Township should incorporate a hierarchy of signs – also known as a "family" – with unifying design and graphic elements, materials and construction techniques that becomes immediately recognizable to the user.

A branded signage concept has been prepared for the Trails/Cycling network. The following are proposed trail signs that are recommended for consideration as part of the master plan.



Directional Signage

Directional Signage is recommended to be placed in locations within the Township of North Dumfries where additional directional guidance is required, such as locations where a turn is required at an intersection.

Route Marker Signage

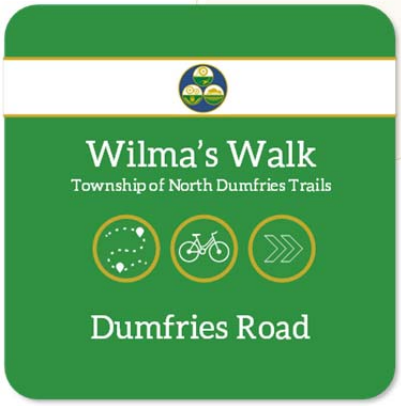
Route Marker Signage is recommended to be installed at regular intervals throughout segments of existing multi-use trails in the Township of North Dumfries. This sign is proposed to be installed on both sides of a post / pole to provide guidance to the bi-directional movement of pedestrians and cyclists. In rural locations the Township may consider adding trail coordinates to the route marker sign.

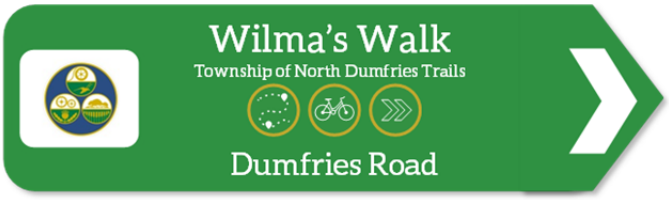
Trail Entry Signage

Trail Entry signage is recommended to be installed on off-road segments of the Trails / Cycling Network and is proposed to be placed along off-road segments and decision points, such as entrances to local trails. This sign is proposed to be installed on both sides of a post / pole to provide guidance to the bi-directional movement of pedestrians and cyclists.

Road Crossing Signage

Road Crossing signage is recommended to be placed on off-road multi-use trails that cross a roadway. The directional sign (top graphic) should be placed when directional guidance is required, such as locations where the trail turns is required at an intersection or crossing. The route sign (bottom graphic) should be place in location where the off-road multi-use trail crosses the roadway.





It is important to note that when confirming the design of trail entry signs that the Township would need to review and incorporate the standards for trail signage as per the Accessibility for Ontarians with Disabilities Act (AODA) Provincial Built Environment Standards to ensure that they are compliant. Additional site specific characteristics would also need to be considered and incorporated into key messaging as necessary when signage is being developed

R6

Review and refine as necessary the proposed trail / cycling route signage and apply branded signage to trail/cycling routes identified as part of the network.

For further information on the application of regulatory signs for trails and bikeways please reference OTM Book 18 – Cycling Facilities and TAC Bikeway Traffic Control Guidelines for Canada (2012) and OTM Book 15 – Pedestrians.

Action #5: Incorporating Complementary Amenities

A trails/cycling network also requires the implementation of complementary amenities such as bicycle parking, rest areas and washrooms. The design of these features along key linkages can help to encourage people to use the system and may increase levels of comfort for some user groups e.g. rest areas for elderly individuals. In the design guidelines, Appendix C, considerations for the design and implementation of bicycle parking as well as staging areas has been described. As a guide, the Township should consider developing a standardized approach to the design of different amenity spaces through the application of a hierarchy of staging area types.

R7

Review and revise the proposed staging area hierarchy and incorporate trail/cycling amenities at key locations along the trails/cycling network.

Figure 3-3 illustrates a proposed staging area hierarchy and Table 3.7 provides additional details regarding the amenities which could be included in each of the designs.

Figure 3- 3 – Hierarchy of Potential Staging Areas

Table 3. 7 – Staging Area Design Hierarchy

Staging Area Amenities	Level 1		Level 2		Level 3		Level 4		Additional Considerations
	Y	N	Y	N	Y	N	Y	N	
Parking		-		-	+		+		
Rest Area		-	+		+		+		
Lighting		-		-	+		+		
Signage	+		+		+		+		
Drop Off Area		-		-		-	+		
Garbage	+		+		+		+		
Washrooms		-	+		+		+		Portable seasonal washrooms for Level 3, in place from May to October
Gates / Barriers		-		-	+		+		
Loading Zones		-				-	+		
Shelter		-				-	+		
Potable Water		-	+			-	+		
Shade	+		+		+		+		
Green Infrastructure	+		+		+		+		

PLANNING & OPERATIONS

Planning and operations are a key element of the implementation process. There are a number of planning requirements that would need to be addressed as the Township proceeds with the design and development of trail/cycling routes. Planning and operation techniques are intended to build on existing municipal processes and in some cases amend existing approaches based on best practices from municipalities of a similar scope and scale. Integrating the development of trail and cycling facilities into existing municipal processes and planning practice will help to clearly define the Township's intent / vision of a trail/cycling supportive community. The following actions should be explored by the Township to improve network planning and operations.

Action #1: Developing Routes in New & Established Neighbourhoods

R8

Updates to the planning, design and construction of trail and cycling projects as part of the development process should be made and clearly communicated.

Trails and cycling facilities should be considered when proceeding with future land development. New developments within the Township should reflect, where appropriate, the network and recommendations in the master plan and should be reinforced in day-to-day planning process / practice. The master plan is intended to be used as a resource when communicating with developers whenever possible. When designing new development areas, the Township should consider the following strategies to promote trail use and cycling:

- Prepare Conceptual / Layout Plans: Developers should prepare and submit conceptual / layout plans including typical details for trail or cycling facilities prior to draft plan approval.
- Prepare Detailed Design Drawings: Developers should be required to prepare and submit detailed design drawings, specifications and cost estimates for construction.
- Prepare Requirements for Developers: Developers should be encouraged to construct trails / cycling routes as part of the installation of other infrastructure e.g. utilities or roads prior to subdivision approval and registration.
- Integrate with the Development Charges: Trails and cycling routes should be considered eligible infrastructure under the Township's development charges by-law.
- Engage in Consultation: No additional consultation beyond what is required for subdivision planning and approvals should be required when trail or cycling infrastructure is being implemented.

Implementing trail and cycling facilities in areas of the Township where there are older neighbourhoods can be challenging. Even if a plan is in place, opposition may arise when a project proceeds to implementation. Members of the public / key stakeholders should be engaged through different methods of consultation as the preferred design of key linkages is selected with the goal of initiating engagement at the earliest possible stage.

R9

The consultation options should be reviewed and applied where appropriate when individual trail or cycling projects are being implemented.

Some suggested engagement opportunities may include:

- Notice of Consultation: Public notice should be developed and published on the Township's webpage and inserted in other local publications. It should include a brief explanation of the project, its relationship to the trails/cycling master plan and details on expected start and completion dates. The notice should be published for at least 30 days. If issues are raised that require further commentary the Township might select to undertake a local neighbourhood meeting.
- Local Neighbourhood Meetings: Would be used to review projects in the final draft design and approvals stage when not yet tendered. The meeting would be used to review the recommended alignment and design concept or to present proposed changes to the solution. If there are significant revisions the Township may proceed to a more focused consultation.
- Focused Consultation for Detailed Design Projects: When there are significant revisions to the design concept the Township may explore additional work to confirm the route alignment and may engage in meetings with staff, Councillors and stakeholders. If there is consensus the Township should proceed with the final design, approvals, tender, notification of construction and construction.
- Broad Consultation for a Class EA or Similar Study: A Class EA is typically not required when a route is being implemented along an existing corridor. However, the Township may select to undertake a major trail or water crossing project as part of a Class EA or an individual EA for another project. This consultation program for the EA should be consistent with the Municipal Class EA consultation requirements.

Action #2: Trails in Utility Corridors, Abandoned Railways and Unopened Road Allowances

R9

Examine the potential use of unopened road allowances, abandoned rail links and utility corridors as potential trail linkages.

Unopened road allowances, abandoned railway corridors and utility corridors are considered excellent opportunities for trails or other active forms of transportation / recreation. In rural areas unopened road allowances and abandoned railways may be an opportunity should the Township identify these linkages as potential routes in advance of disposing of them.

Depending on the type of utility corridor, in rural areas the lands may still be owned by the utility company or may be leased from a landowner but may still have trail potential. Along hydro corridors trails could also be used as emergency and service accesses to municipal assets if the route is properly aligned and designed. The Township should continue to explore these opportunities – some which have been identified as part of the trails/cycling network – and should consider integrating new linkages into the overall network where appropriate.

Action #3: Trails & Cycling & Municipal Policies

The trails and cycling linkages and recommendations identified in the master plan should be further reinforced by local planning policies and initiatives. The Township's Official Plan (OP) is the guiding document for development and the blueprint for future growth. The policies included in the Township's OP should be consistent with the policies and objectives outlined in the trails/cycling master plan. When the Township next undertakes an update to the OP the policies and recommendations contained in the trails/cycling master plan should be reviewed and incorporated where appropriate. In addition, if the Township explores the development of other planning policies e.g. a strategic plan or makes revisions to their development process, the trails/cycling master plan should be referenced and consistent processes and policies should be incorporated where appropriate.

R10

The Official Plan should be reviewed to highlight areas where revisions or amendments may be necessary to reflect the policies and recommendations found in the trails/cycling master plan. These changes should be considered when the OP is next updated.

Action #4: Route Maintenance, Risk Management & Liability

Funding will be required for the maintenance of infrastructure and programs that have been implemented to ensure that the network elements are sustained over their entire lifespan. Maintenance of facilities is currently undertaken as a joint venture between the public works department and the parks and recreation department depending on whether the facility is within or outside of the road right-of-way. This approach should be continued, however, a more formalized structure for trail and cycling facility maintenance, including annual reviews should be developed and used to help prioritize maintenance projects / approaches.

R11

Undertake a detailed review of existing guidelines for facility maintenance and conduct a regular review (annual) of physical infrastructure conditions.

When revising or determining trail and cycling maintenance practices, the Township should consider different maintenance practices / considerations identified in Section C.4.5 in Appendix C – Trail / Cycling Design Guidelines and for on-road portions of the network Regional guidelines / standards as well as Section C.6 in Appendix C in Ontario Traffic Manual Book 18: Cycling Facilities should be reviewed and considered.

Liability concerns are another key consideration which intrinsically relates to route design and maintenance. On-road facilities typically fall into the same liability criteria as roadways and sidewalks. This means that the Township would be partially liable if the facility is improperly designed, constructed or maintained. Though trails are typically separated from roadways those that permit cycling may still be considered and treated with similar requirements as a highway as bicycles are legally defined under the Highway Traffic Act as a vehicle.

R12

Proposed risk management and liability prevention strategies should be reviewed into day to day decision making at the Township for trails/cycling initiatives.

This is important to note, because should courts make this interpretation, cycling facilities would be covered under many of the same basic immunities as other highways. It also further reinforces the importance of adhering to provincial (OTM Book 18 and the MTO Bikeway Design Guidelines) and national design guidelines and standards as they provide the greatest legal protection.

In addition to the use of guidelines and standards to guide the refinement and development of maintenance practices and the mitigation of risk and liability issues, the Township should review and incorporate the considerations outlined in Table 3.8 into day to day trail and cycling facility design, implementation and maintenance.

Table 3.8 – Suggested Network Maintenance, Risk Management & Liability Considerations

Network Maintenance Considerations	Risk Management & Liability Considerations
• An absolute dollar value for maintenance costs was not calculated for the master plan as the budget will need to grow incrementally along with the growth of the network; • As each new section is implemented, staff should provide a summary of potential impacts to the operations budget. The dollar amount should be calculated and included in updated budgeting information for the year; • Maintenance costs for on-road facilities are estimated to range from $1,000.00 to $3,000.00 per km per year depending on the facility types and economies of scale gained from incorporating facility maintenance into current road maintenance projects and building on Regional maintenance practices; • Annual maintenance can include line and stencil reapplication, sign replacement, replacement of sharrows or bike lanes on local roads, minor asphalt repair, sweeping, snow plowing and replacement of older style catch basin grates with bicycle friendly grates; • Maintenance of mature off-road multi-use trails in urban areas particularly in park spaces and greenways which can range in maintenance cost from $2,000.00 to $6,000.00 per km per year depending on the level of service	• Improve the physical environment, increase public awareness of the rights and obligations of users and improve access to educational programs; • Select, design and designate facilities in compliance with the highest prevailing standards. The design of on-road cycling facilities should be consistent with OTM Book 18. Regulatory signs, consistent with the OTM Book 15, should be used; • Design concepts should comply with all applicable laws and regulations (e.g. Ontario Highway Traffic Act, current Township and Regional by-laws, etc.); • Conform to acceptable standards. If hazards cannot be removed they should be isolated with a barrier or notified by clear warning signs. • Monitor on and off-road facilities through regular patrols and document the physical conditions and operations. All reports of hazardous conditions should be promptly and thoroughly investigated; • Written records of all monitoring and maintenance activities should be documented and maintained; • Avoid using description such as "safe" or "safer" for on or off-road routes when promoting use. Industry practices suggest that users prefer to assess their own capabilities or level of comfort;

Network Maintenance Considerations	Risk Management & Liability Considerations
standard set out by the Township; • Annual maintenance for off-road trail facilities including drainage and storm channel maintenance, sweeping, clearing of debris, trash removal, weed control and vegetation management, mowing of grass along shoulders, minor surface repairs, repairs to trail fixtures and staging areas and other general repairs	• Maintain proper insurance coverage as a safeguard against having to draw payment for damages from the public treasury; • When considering new trail or cycling routes or proposing modifications to the approved network, document the assessment tool used to select the preferred facility similar to the one presented in Ontario Traffic Manual Book 18 and Appendix C of the master plan; and • Consider the use and application of the principles outlined in the Centre for Sustainable Transportation's Child and Youth Friendly Land Use and Transport Planning Guidelines (Ontario) for unique safety and transportation needs of children and youth.

Action #5: Evaluating the Routes

R13

Develop a set of performance measures and a tracking mechanism to document route / facility issues and improvement requirements. Use the tools on annual basis to assess on and off-road facility performance and to make updates to the network and Township budgeting.

Implementation of trail and cycling facilities does not end with construction. Collecting data to evaluate the different and changing aspects of user behaviour will assist in assessing the effectiveness and overall contribution of facilities and programs to the achievement of master plan vision and objectives. Performance measures can be developed and used to examine user preference for facilities, levels of use and other factors. Data will inform decision making and may also contribute to the identification of network and programming priorities as well as appropriate budget allocation.

Performance measures should be identified and used to gather input on a regular basis following the implementation of elements of the network or programming. It is suggested that the Township explore the collection of data every two to three years at a maximum of every 5 years. The collection of data should occur at the same time / season each year to ensure consistency of characteristics.

Potential performance measures which could be considered and used by the Township to assess route performance have been identified. The measures are based on four key principles – **engineering, education** and **encouragement** and **enforcement.**

- Engineering:
  - **Existing Use** – the assessment of the number of different users, proximity to trails, demographics of trail users and duration of typical trail trip
  - **Network Provisions** – an assessment of the amount of the network that has been built and the provision of typical end-of-trip facilities or staging areas
  - **Investment** – the amount of municipal funds made available for the implementation of the master plan
  - **Comfort and Convenience** – the number of trail and cycling facilities on municipal roadways and regional roadways that are plowed as well as the number of Township destinations found along the proposed route
- Education & Encouragement:
  - **Partnership and Recognition** – local events and businesses that help to support trail use and cycling and external recognition for the Township's commitment (e.g. bicycle friendly community status)
  - **Outreach and Provision** – the amount of educational materials that are developed and provided such as maps, newsletters, educational brochures, etc.
  - **Public Engagement** – a range of opportunities for the public to be involved e.g. events, educational programs that have been implemented (at the Regional or local level), the amount of media coverage generated for trail and cycling facilities / experiences, the number of views on local or regional webpages that promote trails and cycling, the amount of community support from local groups and stakeholders and the amount of tourism that is generated by those coming to the Township for trail experiences and the amount that they spend when they visit.
- Enforcement:
  - **Safety** – the overall safety of cyclists assessed by the number of collisions and injuries, the safety of trail users assessed by reported incidents and the use of a Share the Road campaign to promote safe use on facilities in the community.
  - **Citations and Ticketing** – the police services and how many citations or positive reinforcement campaigns they undertake to enforce safe use of the facilities or to recognize positive community impacts.

PROMOTION & OUTREACH

The development of a trails/cycling network is not solely about the provision of infrastructure. It is as much about the development of promotion and outreach initiatives that encourage people to engage in active transportation and recreation activities and to educate them on how to safely and comfortably do so. Promotion and outreach is also known as "soft infrastructure" as there is no engineering or design required. Typically these initiatives use materials such as brochures and maps that illustrate the routes and provide additional educational information on the safe use of facilities. They can also include programs that engage the local community and educate them on how to use walking and cycling for their recreational pursuits as well as for day to day activities. Through spreading information and increasing awareness, the Township can use cost-effective initiatives to encourage increased use of facilities for a range of purposes. The following actions should be explored by the Township to improve network promotion and outreach.

Action #1: Trail & Cycling Education

While it is important to invest in infrastructure, it is as important to ensure that those using the facilities / routes have the skills, information, confidence and support that they need to engage in active forms of transportation and recreation. The Township should explore the development of education and awareness programs that provide users with information on where to safely use trails and cycling facilities and how to confidently operate as a cyclist or pedestrian in these locations.

R14

Work with local partners, interest groups and stakeholders to identify educational opportunities for trail and cycling.

The Township may want to consider implementing a Share the Road safety campaign, cycling skills programs such as bike rodeos, safe routes to school initiatives, explore the trails programs or partner with surrounding municipalities and the Region to undertake a Bike or Hike to Work Week.

The Township should explore partnership opportunities with local agencies and organizations e.g. Explore Waterloo Region - Tourism, Waterloo Region District School Board, Grand River Conservation Authority, rare, Region of Waterloo Public Health, Ontario Cycling Club, Waterloo Region Police etc. to promote education and awareness around walking and cycling within the Township.

Action #2: Using Local Events to Promote Use

At the local and Regional level there are already a number of trail and cycling related programs that are currently in place. The Township should work with the Region and other local agencies to continue to support these programs while exploring other potential programs and events in the future.

Some of the existing events include:

- Township of North Dumfries Mayor's Dance for Parks and Trails – a yearly dance which aims to engage the community and raise money for parks and trail initiatives
- Township's Recreation and Parks month June – which includes walking groups and group rides on the Rail Trail
- Waterloo Region Bike Month (June) – including a range of outreach and promotion programs such as bike-2-work breakfasts, a bike pledge, bus'n'bike with GRT, BikeFest, Share the Road Cycling Forums
- Cambridge Tour de Grand – an annual recreational bicycle event first held in 1998 with a range of different routes passing through North Dumfries along the Cambridge – Paris Rail Trail
- Waterloo Cycling Club Youth Development Road – a training program on Wednesdays and Mondays that helps youth engage in safe and fun road riding
- Waterloo Cycling Club Wednesday Learn to MTB – Kids – where kids aged 8 to 15 are able to learn mountain biking skills to promote fun and fitness through cycling
- Grand Valley Trails Association & Friends of the Grand River – organized hikes and education / maintenance programs along the trails

R15

Work with local interest groups, clubs and the Region to build on existing trail and cycling initiatives and find ways to promote events locally.

Action #3: Encouraging Increased Use

Encouraging trail use is typically aimed at promoting the use of the trails/cycling network as well as engaging in forms of active transportation and recreation. The goal of developing encouragement programs is to overcome barriers that limit the reach of traditional awareness campaigns and to increase the number of recreational as well as day-to-day trail users and cyclists. Many people would walk or cycle to their destination if it was 5km or under, however, many are discouraged because of a lack of amenities, options and convenience.

R16

Explore the identification and initiation of encouragement programs within the Township with specific emphasis on partnering with the Region of Waterloo.

Encouragement programs should be explored by the Township in partnership with local stakeholder, interest groups and public agencies including:

- You and Me - Walk/CycleND - The development of a trail and cycling charter with a community-based pledge to increase levels of active transportation and recreation activities
- Explore our Trails – A senior or youth specific initiative which is organized to engage and encourage people of different ages and abilities to explore and learn about the trail system in the Township

- Celebrate Trails/Cycling: Opening Ceremonies – establish an approach to encourage people and educate residents on how to use new trail and cycling facilities by developing a how-to guide and opening ceremony

Action #4: Establishing North Dumfries as a Bicycle Friendly Community

R17

Explore the application process to apply for bicycle friendly community status following the adoption and implementation of key elements of the master plan.

There are significant economic and tourism benefits which can be realized by developing a connected and continuous trails/cycling network. The Township is already identified as a key destination for long and short-distance recreational and touring cyclists. As a means of further promoting the cycling opportunities as well as future funding and partnership opportunities the Township should explore applying to become a bicycle friendly community.

The program was launched by the Share the Road Cycling Coalition in 2010 and is an award recognition program for Ontario based municipalities. The following are some next steps which could be explored by the Township to apply for bicycle friendly community status:

- Step 1: Collect information needed for the application – application check list can be accessed using this link: http://www.sharetheroad.ca/files/BFC_Checklist.pdf
- Step 2: Review the application yourself to see how bicycle-friendly North Dumfries is today - including but not limited to the presence of a cycling related committee e.g. the proposed Trails and Active Transportation Sub-committee. The online application form can be accessed online and all complete applications must be submitted online
- Step 3: Plan a strategy for pitching bicycle-friendly improvements – depending on the level of political involvement and community enthusiasm the approach may vary. The Township should identify local Council members or stakeholders who will help to promote cycling in the community and pursue cycling related initiatives
- Step 4: Gather support – inquire about a letter of recommendation from an organization that might support cycling within the community e.g. a local bike club, environmental group, businesses or corporate sponsor

There are a number of other steps involved in the suggested process, however, the Township is encouraged to explore these initial steps to see if receiving bicycle friendly community status is an option. Applicants are judged in five key areas, the majority of which have been identified / highlighted in this master plan - **engineering, education, encouragement, enforcement** and **evaluation**. Applications can be submitted by a Township staff member or someone working collaboratively with municipal staff with a letter of support from the municipality. There are a total of 24 communities within Ontario who have already received recognition for their efforts in the promotion of cycling. The Township is well positioned to be another.

Action #5: Establishing a Trails/Cycling Map

Mapping can be one of the most overlooked opportunities to educate people about local trail and cycling opportunities. Maps inform users where the routes are located and can also be a method of distributing information regarding appropriate trail user etiquette and in some cases "rules of the road" or "rules of the trail". Maps can be expensive to first create, but can be updated as the network grows which makes the initial investment pay for itself with time. Once completed, the document can be used as a tool to communicate effective information to residents and visitors about the trail/cycling system and can be used to promote local destinations.

R18

Explore the use of the GIS database from the trails/cycling master plan to prepare a trails/cycling map for the Township to promote the use of trails and cycling routes.

To assist in offsetting the cost of producing the maps, the Township could explore selling advertisement space to local businesses and interest groups. Other municipalities have found great success in this cost-balancing technique and many businesses understand and value the benefits which can be realized with the promotion of trails. Next steps have been identified that the Township should explore to establish a formal trails / cycling map for promotion and outreach:

- Adapt the GIS database in the Township's system and undertake research to identify the target audience as well as potential funding and partnership opportunities.
- Internally discuss the types of user group that the map is intended to target – helps to identify relevant routes and information.
- Engage with local businesses, stakeholders and the public to discuss the development and design of the mapping.
- Determine the locations to make the map available.
- Approach and engage local businesses, local agencies and the Region.
- Discuses messaging to be included on the mapping.
- Determine the timing of development, printing, launch and distribution.

3.3 ESTABLISHING PRIORITIES

The Master Plan is intended to be a guide for short-term trail / cycling infrastructure and programming implementation and a long-term blueprint for the planning, design and development of a Township-wide trails/cycling network. As such, the implementation of the network focuses on two "timelines" – short-term priorities and long-term full build-out.

Maps 2 and 3 illustrate the full build-out of the trails/cycling network which is intended to be completed in 20+ years or as funding becomes available. However, the focus of the master plan are its short-term priorities which are intended to commence or be completed within the first 0 – 7 years (2014 – 2021) of the plan's implementation. Though short-term priorities shave been identified, it should also be acknowledged that some priorities may extend beyond the "short-term" timeline and may require ongoing discussions between the Township and other public agencies / stakeholders.

The priorities which have been selected for the Township were identified based on input from the public, steering committee, Township staff, Regional planning initiatives and local agency input. They have also been strategically selected as potential solutions or mitigation measures for some of the existing network barriers and gaps. Priorities have been organized into four categories:

- Signage: Projects that will require the implementation of signage (either the green bike route sign or share the road signage) to delineate the route.
- Trail: Projects that require the development of a new trail infrastructure.
- Regional: Projects that are identified on Regional roads that will be the responsibility of the Region of Waterloo but make up key components of the trails/cycling network.
- Planning: Projects where the Township should engage in ongoing discussions with public agencies and stakeholders to explore future route opportunities – typically identified as desired connections.

The priority projects are illustrated on Maps 4 and 5. The signage and trail priority projects are found in the Township's jurisdiction and are those that are most likely to be initiated and implemented in the short-term. As such, they should be the focus moving forward. Some additional details regarding the signage and the trail projects have been provided below.

SIGNAGE

There are a number of signed routes identified as part of the trails/cycling network. The majority are proposed on local rural roadways with lower volumes and posted speeds. A set of linkages have been identified that would represent the implementation of 50% of the signed routes which are intended to be completed within the first 0 – 7 years of implementation. The remaining signed routes, which represent completing 100% of the proposed linkages, are to be fully implemented over the long-term (20+ years).

Table 3.9 summarizes each of the proposed signed routes that make up the short-term priorities and long-term build-out. This is not intended to be prescriptive but to provide the Township with options based on available funding. If funds become available or additional partnerships are explored, the Township may wish to consider implementing some of the long-term signed routes as part of a more detailed signage strategy.

Table 3.9 – Signed Route Priorities

50% Signed Routes (Short Term)	100% Signed Routes (Long Term)[1]
• Nith River Way / Broom Street (Northumberland Street to Northumberland Street) • Inglis Street (Northumberland Street to Jedburg Street) • Jedburg Street / Main Street (Inglis Street to Stanley Street) • Stanley Street (Main Street to Scott Street) • Hilltop Drive / Howard Marshall Street / Vincent Drive / William Creighton Street (Wrigley Road to proposed trail in planned development area) • Tice River Way (Proposed trail in planned development area to Swan Street • Greenfield Road (Northumberland Street to Dumfries Road) • Maple Manor Road (Brantford Highway to Branchton Road) • Morrison Road (Branchton Road to Hamilton Boundary) • Village Road / Shellard Road / Seaton Road (Puslinch Boundary to Hamilton Boundary) • Clyde Road (Village Road to Hamilton Boundary) • Sangers Lane (Melair Drive to North Dumfries Community Complex)	• Greenfield Road (Northumberland Street to Trussler Road) • Piper Street (Gladstone Road to Trussler Road) • Piper Street (Gladstone Road to Northumberland Street) • Nith Road (Brant Waterloo Road to road terminus) • Mitchell Street / Hunt Street (Swan Street to Hilltop Drive) • Rose Street / Church Street • Hall Street (Northumberland Street to Main Street) • Willison Street (Inglis Street to Hall Street) • Inglis Street (Jedburg Street to Murray Wood Drive) • Murray Wood Drive (Inglis Street to Jedburg Street) • Jedburg Street (Murray Wood Drive to Main Street) • Tannery Street (Piper Street to road terminus) • Reidsville Road (Boida Avenue to Wrigley Road) • Boida Avenue (Reidsville Road to Cedar Creek Road) • Whistle Bare Road / Township Road 1 (Dickies Settlement Road to Roseville Road) • Greenfield Road (Dumfries Road to Shouldice Side Road) • Edworthy Side Road / Shouldice Side Road (Cedar Creek Road to Beke Road) • Beke Road (Spragues Road to West River Road) • West River Road (Beke Road to Cambridge Boundary) • Shellard Road (Gore Road to Morrison Road) • Gore Road (Shellard Road to Robinson Road) • Melair Drive / Guthrie Street (Greenfield Road to Northumberland Street) • Greenfield Road (Shouldice Road to Spragues Road)

[1] The 100% signed routes include those routes identified for the 50% signed route alternative as well as the remaining linkages identified in Map 3

DRAFT JUNE 2014

CITY OF KITCHENER

TOWNSHIP OF WILMOT

TOWNSHIP OF BLANDFORD-BLENHEIM

CITY OF CAMBRIDGE

TOWNSHIP OF PUSLINCH

CITY OF HAMILTON

COUNTY OF BRANT

Existing Trail part of Trans Canada Trail

Existing Trail part of Walter Bean Grand River Trail

Existing Trail part of Grand River Trail

Ayr
Refer to enlargement
Map 5 for detail

Trail developed and maintained by private landowner based on agreements with the Township of North Dumfries.

Notes:

- Proposed Signed Bike Route with Share the Road Signage
- Bicycle Route Marker Sign
- Reserved Bicycle Lane Sign
- Shared Pathway Sign
- Pedestrian Use Permitted

1. Proposed routes on Regional Roads are based on the Region of Waterloo's Active Transportation Master Plan (February 2014) and Official Plan (June 2009).

0 1.25 2.5 5 Kilometres

Legend

Existing Routes
- Existing Trail
- Existing Bike Lane / Paved Shoulder
- Existing Paved Shoulder

Proposed Routes[1]
- Proposed Trail
- Proposed Bike Lane / Paved Shoulder
- Proposed Paved Shoulder
- Proposed Signed Bike Route with Sharrow
- Proposed Signed Bike Route
- Existing 1m Paved Edge: Proposed Bike Lane

Proposed Priority Projects
- Trail Project
- Signage Project (Immediate Build-out)
- Signage Project (Full Build-out)
- Planning Project
- Regional Identified Project

Additional Considerations
- Desired Connection
- Connection to Surrounding Municipality

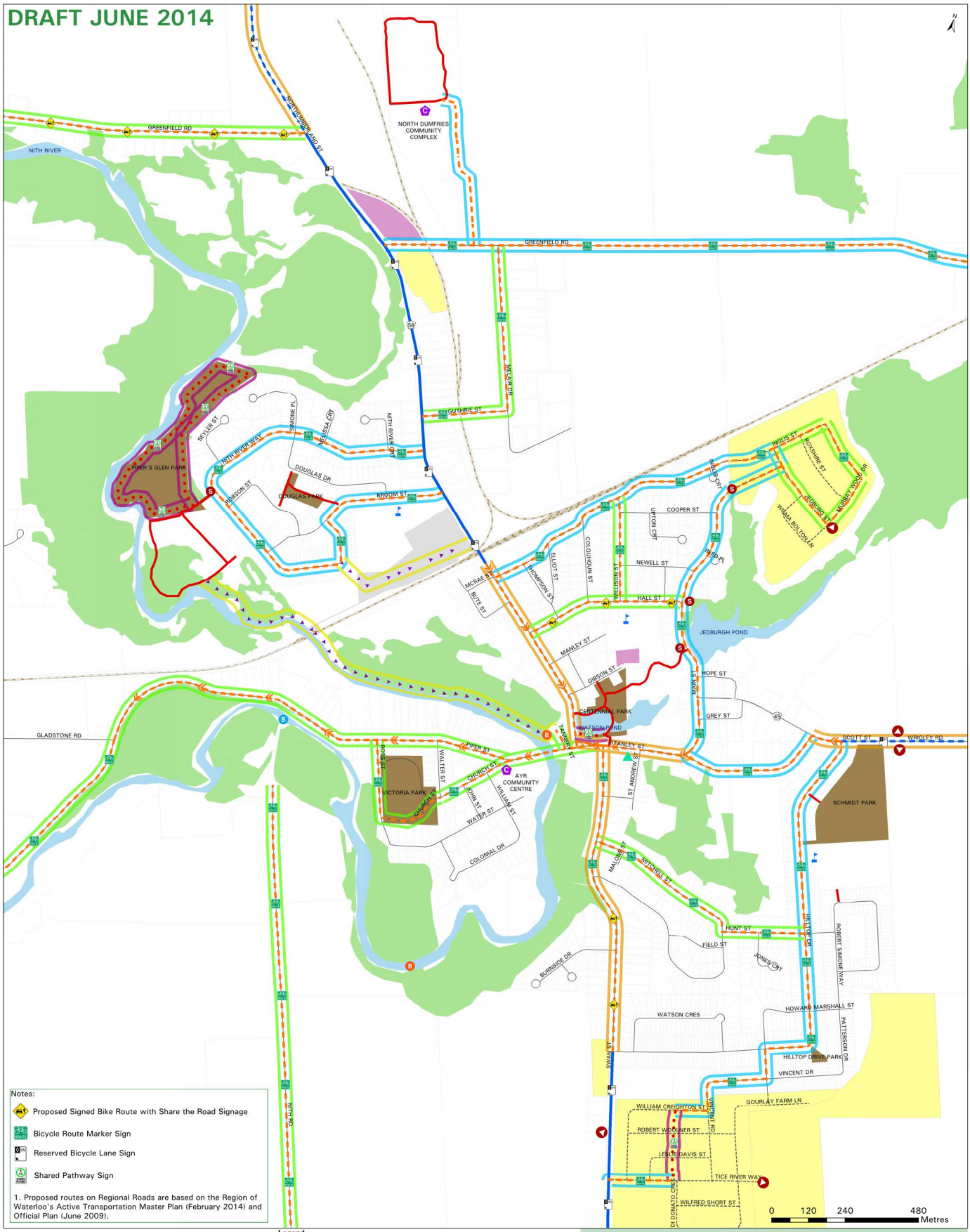
Key Destinations
- Community Centre
- Library
- School
- Existing Staging Area
- Potential Staging Area

Other
- Provincial Highway
- Regional Road
- Municipal Road
- Proposed Municipal Road
- Highway 401 Crossing
- Regionally Significant
- Active Railway
- Abandoned Railway

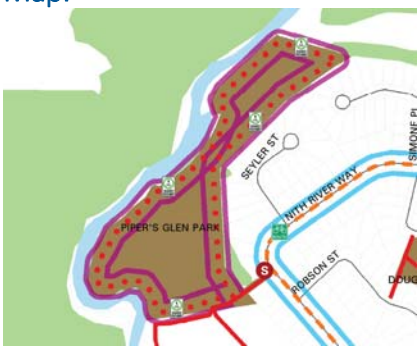
Land Use Considerations
- Planned Commercial Area
- Planned Residential Area
- Planned Mixed Use Area
- Utility Corridor
- Park
- Forest
- Regional Forest
- Watercourse
- Property Parcel
- Township Boundary

Map 4
Proposed Priority Projects
2015-2022 (7 Year Build-out)

Township of North Dumfries Trails / Cycling Master Plan


DRAFT JUNE 2014
NORTH DUMFRIES COMMUNITY COMPLEX
NORTHUMBERLAND ST
GREENFIELD RD
NITH RIVER
GUTHRIE ST
MEARS DR
SEXSMITH CRT
SIMONE PL
NITH RIVER CRT
NITH RIVER WAY
SEXLER ST
PIPER'S GLEN PARK
DOUGLAS DR
DOUGLAS PARK
BROOM ST
ROBSON ST
COOPER ST
UPTON CRT
NEWELL ST
HALL ST
MCRAE ST
BUTE ST
THOMPSON ST
ELLIOT ST
COLQUHOUN ST
WILSON ST
REID PL
MALLORY PL
INGLIS ST
ROXBURGH ST
JEDBURGH ST
AUBREY WOOD DR
WILMA BOLTON LN
JEDBURGH POND
MANLEY ST
GIBSON ST
CENTENNIAL PARK
WATSON POND
HOPE ST
MAIN ST
GREY ST
49
SCOTT ST
WRIGLEY RD
GLADSTONE RD
TANNERY ST
STANLEY ST
ST ANDREW ST
PIPER ST
CHURCH ST
WALTER ST
VICTORIA PARK
JOHN ST
WILLIAM ST
WATER ST
COLONIAL DR
AYR COMMUNITY CENTRE
SCHMIDT PARK
MALONE ST
MITCHELL ST
HUNT ST
FIELD ST
JONES CRT
BURNSIDE DR
HILLTOP DR
ROBERT SIMONE WAY
HOWARD MARSHALL ST
PATTERSON DR
WATSON CRES
SWAN ST
HILLTOP DRIVE PARK
VINCENT DR
GOURLAY FARM LN
WILLIAM CREIGHTON ST
VINCENT RD
ROBERT WOOLNER ST
LESLIE DAVIS ST
TICE RIVER WAY
DI DONATO CRES
WILFRED SHORT ST
0 120 240 480 Metres
Notes:
Proposed Signed Bike Route with Share the Road Signage
Bicycle Route Marker Sign
Reserved Bicycle Lane Sign
Shared Pathway Sign
1. Proposed routes on Regional Roads are based on the Region of Waterloo's Active Transportation Master Plan (February 2014) and Official Plan (June 2009).
Legend
Existing Routes
Existing Trail
Existing Bike Lane / Paved Shoulder
Existing Paved Shoulder
Proposed Routes[1]
Proposed Trail
Proposed Bike Lane / Paved Shoulder
Proposed Paved Shoulder
Proposed Signed Bike Route with Sharrow
Proposed Signed Bike Route
Proposed Priority Projects
Trail Project
Signage Project (Immediate Build-out)
Signage Project (Full Build-out)
Planning Project
Regional Identified Project
Additional Considerations
Desired Connection
Potential Bridge Rehabilitation
Proposed New Bridge
Desired Connection through Future Development Areas
Key Destinations
Community Centre
Library
School
Potential Staging Area
Other
Regional Road
Municipal Road
Proposed Municipal Road
Regionally Significant
Active Railway
Abandoned Railway
Land Use Considerations
Planned Commercial Area
Planned Residential Area
Planned Mixed Use Area
Park
Forest
Watercourse
Property Parcel
Map
Proposed Priority Projects - Ayr
5
2015-2022 (7 Year Build-out)
Township of North Dumfries Trails / Cycling Master Plan

TRAIL

Priority #1: Piper's Glen Park	Map: 	Graphic: 
Existing Conditions: • Existing park space in urban area / neighbourhood which includes a parking areas, signage play space, sports pitch and existing footpath but no tree coverage; • Links up to existing trail system along the river – woodchip surface natural trail		
Recommendation: Upgrade the existing footpath to a 3.0m granular surface multi-use trail		
Priority #2: William Creighton Street to Tice River Way	Map: 	Graphic: 
Existing Conditions: • Proposed connection identified in the approved draft plan of subdivision for the Hilltop Subdivision – Alternative A was selected and approved by Council including a proposed 3.0m wide asphalt multi-use trail and amenity space		
Recommendation: Consistent design – 3.0m asphalt multi-use trail and amenities		

For the regional and planning initiatives, the majority of the linkages are found on lands that are not within the Township's jurisdiction / ownership. Most typically they are found on Regional Roadways or on privately owned or GRCA lands. As such, the Township is encouraged to engage in discussions with relevant stakeholders and agencies to ensure that these linkages are explored in the future. For additional details regarding the priorities as well as the costs associated with these initiatives please refer to section 4.2.

4.0 THE IMPLEMENTATION

4.1 TOOLS

The trails/cycling master plan is more than a network of proposed routes. The plan is made up of recommended next steps and tools that are intended to help facilitate implementation. In addition to the priorities set out in section 3.3, a set of tools have been identified to guide decision making and development. The tools should be considered by staff as well as Township committees and stakeholders and have been developed based on an understanding of existing Township processes and approaches.

R19

The priorities and implementation tools identified in the master plan should be adopted in principle and used to guide network design and development over time.

ESTABLISHING A DEVELOPMENT PROCESS

The trails/cycling master plan is intended to be used as a flexible blueprint / guide for the future development of trails and cycling facilities. Route alignments have been identified which may change with time and will evolve through future planning, design and municipal budgeting decisions.

Priorities should be identified on an ongoing basis and should be updated every five years. A step-by-step process to help facilitate / guide implementation as a proposed linkage moves from the planning to the design and development stage has been identified.

R20

Township staff should review and consider the use of the step-by-step implementation process when undertaking next steps to develop the trails/cycling network.

Figure 4-1 illustrates the proposed step-by-step implementation process proposed for the Township. Table 4.1 summarizes additional details for the steps that the Township is encouraged to use as priority linkages and network connections are implemented.

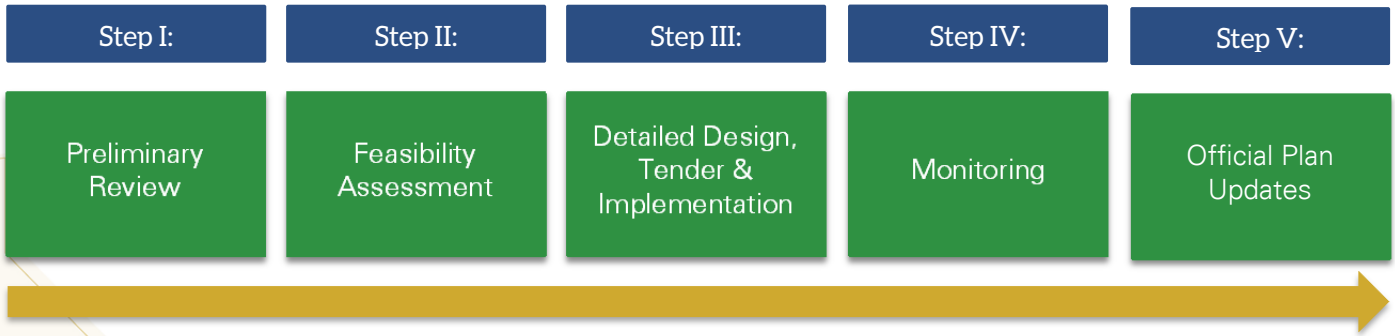


Figure 4- 1 – Step-by-Step Implementation Process

Table 4.1 – Summary of Step-by-Step Process for Implementation

Step	Description

STEP I: Preliminary Review	• When a trails/cycling project is advanced to the planning stage or a new opportunity arises the preliminary review should be undertaken including:
	  ◦ Identification of jurisdictional responsibility;
	  ◦ Comparing timing of the project to master plan priorities;
	  ◦ Assessing whether a trail or cycling facility can be implemented cost effectively; and
	  ◦ Determining whether feasibility assessment is required.

STEP II: Feasibility Assessment	• If confirmed through Step I a brief feasibility assessment should be undertaken;
	• The Feasibility Assessment should consider:
	  ◦ Route Selection Criteria and design principles;
	  ◦ Roadway characteristics – AADT Volumes, collision data and commercial vehicle percentage; and
	  ◦ Context sensitive issues through field checks.
	• A Preliminary Functional Design should be prepared including cost/benefit analysis, timing, costs and efficiencies achieved, less costly alternatives and their relationship to the overall network and next steps.
	• Process may take place in conjunction with a roadway or public works Class EA or functional design.

STEP III: Detailed Design, Tender & Implementation	• Once approval has been obtained, detailed design should be completed which can be coordinated with primary capital roads projects. • This should also include the exploration of possible partnerships for cost sharing and should be scheduled into roads programs and a budget allocated to proceed to tender. • If, through detailed design, the decision is made not to proceed with the project the network should be updated to reflect this change. • The design of trail/cycling facilities should be completed in accordance with the design guidelines (Appendix C), Ontario Traffic Manual (OTM) Book 18 and 15 as well as the Provincial Build Environment Standards. • Phasing for the master plan should be consistent with the strategy outlined in the trails/cycling master plan with priorities adjusted as necessary based on opportunities that arise, community demand or direction from Township Council.
STEP IV: Monitoring	• Once the facility has been constructed the design and use should be monitored to ensure that they function as intended. • When necessary the facility should be upgraded and maintained.
STEP V: Official Plan Updates	• When necessary the transportation components of the Official Plan should be updated to reflect the trails/cycling network or for the network to be included as a schedule in the OP.

IDENTIFYING ROLES & RESPONSIBILITIES

The implementation of the trails/cycling network will require ongoing communication and coordination between external agencies, internal staff, municipal committees and stakeholders. The master plan will require the efforts of local champions to maximize participation and remove barriers to implementation for those responsible for the master plan's next steps.

Coordinated and effective decision-making can be facilitated through the use of an efficient reporting and implementation structure that is well-managed and involves relevant stakeholders. The study team reviewed existing municipal processes and structures and have identified a reporting structure for the management and implementation of the master plan.

The structure (Figure 4-2) builds on the existing municipal premise of continuous communication between all relevant municipal departments and should be reviewed and adapted as necessary by Township staff and adopted as the preferred approach for decision making.

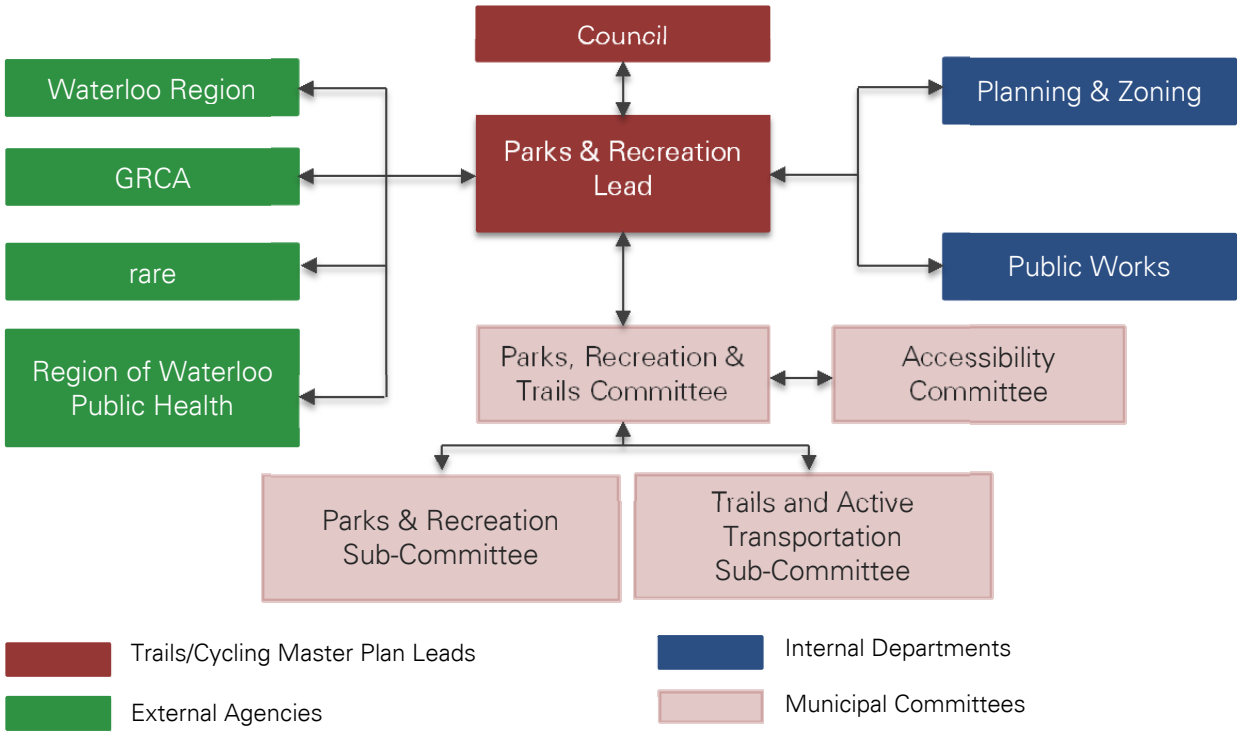


Figure 4- 2 – Trails/Cycling Master Plan Reporting Structure

Some key assumptions regarding the roles and responsibilities identified have been made and are to be reviewed, revised as necessary and adopted by Township staff:

- Staff from the Parks & Recreation department are proposed to lead the implementation of the master plan and will be responsible for coordinating involvement with other municipal staff from planning and zoning and public works for the planning and design of select linkages.
- After a couple of years of implementation, the Township should re-evaluate the coordination of the master plan's implementation and should consider the establishment of a trails and active transportation coordinator or add the role to a current position.
- The Parks, Recreation and Trails Committee will remain a Committee to Council but should be further organized into two sub-committees, the Parks and Recreation Sub-Committee and the Trails and Active Transportation Sub-Committee. The Trails and Active Transportation Sub-Committee will be responsible for leading the selection of key network priorities as well as promotion and outreach initiatives within North Dumfries.
- The staff lead will be responsible or a designate will be responsible for supporting the Parks, Recreation and Trails Committee.
- Once developed, the trails and active transportation sub-committee should establish its representatives as well as a terms of reference which includes the supporting coordination and providing input to the master plan's implementation.
- As necessary, the staff lead will communicate with and involve key external agencies to provide input to the planning, design and implementation of key network linkages (e.g. the Region, Grand River Conservation Authority and rare).
- Local public and private stakeholders should be engaged on a continuous basis as the master plan is implemented. As necessary they should be invited to the trails sub-committee meetings or be invited to provide input on a project by project basis.

R21

The proposed organization structure including roles and responsibilities and key agencies should be adopted as a guide for the implementation of the master plan.

R22

The Township should explore the development of sub-committee, to the Parks, Recreation and Trails Committee – parks and recreation sub-committee and trails and active transportation sub-committee.

R23

Once established, the Township should prepare a terms of reference for the trails and active transportation sub-committee and a structured timeline for meeting e.g. on a quarterly basis.

A NETWORK MANAGEMENT TOOL

The GIS database provided by the Township and Region was updated to reflect the trails/cycling network. The database can be used throughout implementation as a tracking mechanism for the network as well as municipal assets. Once adapted into the Township's database, staff and those responsible for the plan's implementation are encouraged to explore its use for the following purposes:

1. Adapted as a KMZ or KML files which can be overlaid into Google Earth so staff, stakeholders and members of the public can view the network mapping.
2. Used as a tracking tool by Township staff to confirm the feasibility of facilities as well as the network priorities.
3. Used to document the implementation of new segments by updating the "facilities" component of the database which can also help to significantly reduce the cost to update the master plan and associated priorities.
4. Used to establish a trails/cycling map for the Township or to inform future updates of Regional mapping with some additional formatting.

R24

The trails/cycling database should be integrated with the Township's existing database and regularly updated as part of network tracking, management and budgeting.

R25

The GIS information should be used to develop a trails/cycling map for the Township and to update future Regional mapping for promotion and outreach.

ESTABLISHING FUNDING & PARTNERSHIPS

The costs of implementing the trails/cycling master plan should not be the sole responsibility of the Township. The implementation of the plan including budgeting for and paying for the design, implementation and maintenance of facilities should be a collaborative effort based on the pursuit of external funding sources and partnership opportunities.

The Township should regularly explore additional partnership and funding opportunities from all levels of government and pursue all available sources of funding for facility development as well as programming. Table 4.2 highlights some potential funding sources which could be explore at the federal and provincial levels.

R26

Additional funding and partnership opportunities should be explored by the Township to support the implementation and maintenance of the trails/cycling network as well as supportive policies and programs.

Table 4.2 – Funding Opportunities for Trail/Cycling Infrastructure

Funding Opportunities	Additional Details
Federal / Provincial Gas Tax	• For the federal program please refer to: http://www.infrastructure.gc.ca/plan/gtf-fte-eng.html • For the provincial program please refer to: http://www.mto.gov.on.ca/english/service-commitment/gas-tax-program.shtml
Transport Canada's MOST (Moving on Sustainable Transportation)	• For details on the MOST program and the projects that fall in-line with their funding alternatives please refer to: http://data.tc.gc.ca/archive/eng/programs/environment-most-aboutmost-685.htm
ecoMobility (TDM) Grant Program	• For details on the ecoMobility Grant Program please refer to: http://data.tc.gc.ca/archive/eng/programs/environment-ecomobility-menu-eng-144.htm
Federation of Canadian Municipalities Green Municipal Fund	• For additional details regarding the Green Municipal Fund and potential funding alternatives please refer to: http://www.fcm.ca/home/programs/green-municipal-fund.htm
Healthy Communities Fund	• For additional details regarding the Healthy Communities Fund please refer to: http://www.mhp.gov.on.ca/en/healthy-communities/hcf/default.asp
Trans Canada Trail Funding and Federal Fund Matching	• For additional information regarding trail funding alternatives please refer to: http://old1.tctrail.ca/trail_funding.php
Federal and Provincial Infrastructure / Stimulus Programs	• For Federal Government infrastructure stimulus fund details please refer to: http://www.bcfontario.ca/english/isf/guide.html • For Provincial Government infrastructure stimulus fund details please refer to: http://www.moi.gov.on.ca/en/infrastructure/stimulus.asp
Ontario Trillium Foundation	• For details regarding potential funding alternatives please refer to: http://grant.otf.ca/
Corporate Environmental Funds (Shell and MEC)	• For additional details regarding MEC's fund to preserve recreationally significant landscapes please refer to: http://www.mec.ca/AST/ContentPrimary/Community/CommunityContributions/LandAcquisition.jsp
Corporate Donations	• Money or service in kind and have been contributed by a number of large and small corporations over the years

Funding Opportunities	Additional Details
Ontario Trails Strategy Funding	• As part of the Ontario Sport and Recreation Communities Fund: http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/PRDR006918
Ontario Cycling Strategy Funding	• For additional details regarding the #CycleON strategy please refer to: http://www.mto.gov.on.ca/english/pubs/cycling/index.shtml
Tourism Development Fund	• For additional details regarding the Tourism Development fund please refer to: http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/OSAPQA005130
Service Club Support	• Lions, Rotary and Optimist clubs who often assist with highly visible projects at the community level.
Private Citizen Donation / Bequeaths	• Can also include tax receipts for donors where appropriate

4.2 INVESTMENT

The costs associated with the priorities (signage, trail, regional and planning) identified in the trails/cycling master plan are far outweighed by the benefits that can be realized by the community. In addition to the implementation of trails/cycling infrastructure, the Township must also consider the maintenance, promotion and outreach actions identified in section 3.0 to establish a connected and continuous system of recreational and commuter (where appropriate) linkages.

Network costing has been developed based on unit costs from recent design and construction projects throughout Ontario. A summary of proposed as well as potential costs for the construction of trails/cycling facility types and other design treatments and amenities are presented in Appendix D. The costs are presented in 2014 dollars and are based on typical or normal / average conditions for constructions but do not include:

- Cost of property acquisition, utility reallocation, driveway / entrance restorations or permits and approvals for construction;
- Annual inflation including increased cost of labour, materials, fuel, etc.; and
- Applicable taxes.

Costing has been developed for full build-out as well as for each of the priority projects. Table 4.3 summarizes the costs associated with the signage, trail, regional and planning priority projects and the agency that is responsible for the funding of each initiative. Not all of the priorities will be the financial responsibility of the Township. It has been assumed that all signage and trail initiatives will be the responsibility of the Township – "T" in the table.

For the regional priorities it will be the Region's responsibility to fund the design and construction of these linkages - indicated as "R" in the table. For the planning priorities the Township is encouraged to engage in ongoing discussions and explore additional funding and partnership opportunities with key stakeholders including but not limited to the Region, GRCA, rare, private landowners etc. – "O" indicating other agencies in the table.

Table 4.3 – North Dumfries Trails/Cycling Priority Costing 0 – 7 years

Priority Name	Total Length (km)	Total Cost ($)	Responsibility		
			T	R	O
Signage Priorities (50% of the Ultimate Build-out of Signed Routes)					
Nith River Way / Broom Street (Northumberland Street to Northumberland Street)	1.8	$2,700	●		
Inglis Street (Northumberland Street to Jedburg Street)	1.0	$1,500	●		
Jedburg Street / Main Street (Inglis Street to Stanley Street)	1.1	$1,650	●		
Stanley Street (Main Street to Scott Street)	0.47	$705	●		
Hilltop Drive / Howard Marshall Street / Vincent Drive / William Creighton Street (Wrigley Road to proposed trail in planned development area)	1.6	$2,400	●		
Tice River Way (Proposed trail in planned development area to Swan Street	0.2	$300	●		
Greenfield Road (Northumberland Street to Dumfries Road)	5.6	$8,400	●		
Maple Manor Road (Brantford Highway to Branchton Road)	4.1	$6,150	●		
Morrison Road (Branchton Road to Hamilton Boundary)	7.3	$10,950	●		
Village Road / Shellard Road / Seaton Road (Puslinch Boundary to Hamilton Boundary)	7.2	$10,800	●		
Clyde Road (Village Road to Hamilton Boundary)	2.0	$3,000	●		
Sangers Lane (Greenfield Road to North Dumfries Community Complex	0.5	750	●		
Total - Signed Routes:	32.87	$49,305			
Trail Priorities - Township					
Piper's Glen Park	1.5	$180,000	●		
William Creighton Street to Tice River Way	0.23	$57,500			●

Priority Name	Total Length (km)	Total Cost ($)	Responsibility		
			T	R	O
Total – Trail Priorities:	1.73	$237,500			
Regional Priorities (costing total as per the Region's AT Plan)					
Trussler Road (New Dundee Road to Cedar Creek Road)	3.48	N/A		●	
Northumberland Street (Alps Road to Greenfield Road)	1.1	N/A		●	
Northumberland Street (Railway south the Stanley Street)	0.68	N/A		●	
Stanley Street (Northumberland Street to Main Street)	0.37	N/A		●	
Swan Street (Stanley Street to Mitchell Street)	0.31	N/A		●	
Swan Street (Hilltop Drive to Mitchell Street)	0.7	N/A		●	
Wrigley Road (Hilltop Drive to Dumfries Road)	4.1	N/A		●	
Sprague Road (Brant Boundary to Cambridge Boundary)	7.7	N/A		●	
Roseville Road (Edworthy Side Road to Dumfries Road)	3.0	N/A		●	
Branchton Road (Existing Paved Shoulder to Brant Boundary)	1.3	N/A		●	
Total – Regional Priorities:	22.7	N/A			
Planning Priorities – Township / Other (Desired Connections)					
Piper's Glen Park to Tannery Street	1.32	$59,400	●		
Mixed Use Area (Broom Street to Northumberland Street)	0.49	$134,750			●
Abandoned Rail Corridor (Cambridge Boundary to Cheese Factory Road)	5.48	$712,400			●
Upgrade Existing Trail (Cheese Factory Road to Branchton Road)	1.7	$85,000			●
Total – Planning Priorities:	8.99	$991,550			

Table 4.4 includes a summary of the overall costs of the priority projects for short-term implementation and more specifically the costs that will be the responsibility of the Township.

Table 4.4 – Summary of Short-Term Priority Project (0- 7 years) Length and Cost

Priority Project	Total Length (km)	Total Cost ($)
Signage Priorities	32.87	$49,305
Trail Priorities	1.73	$237,500
Regional Priorities[1]	22.7	N/A
Planning Priorities	8.99	$991,550
All Priority Projects (0 -7 years)	66.29	$1,278,355
Priority Projects Under Township Jurisdiction	35.69	$287,955

1Refernece should be made to the Region's AT Master Plan for costs associated with Regional Priorities

The cost to implement the priority projects in the first 0 – 7 years is estimated to cost approximately $1,278,355 for a total of 66.29km of facilities. Of this, a cost of $287,955 is estimated for 35.69 km of facilities that fall on roads currently under the jurisdiction of the Township. In addition to the short-term priorities, an estimated cost for the full build-out (20+ years) of the network has been prepared and is presented in Appendix E. The estimated cost to implement the 20+ year plan is $3,325,385 of which $473,985 fall on lands / roads currently under the jurisdiction of the Township.

R27

To implement the short-term priority projects / infrastructure (projects identified in the first 0 – 7 years) the Township should budget $287,955 which translates to ~$41,136 per year.

Though costs have been developed for the short-term priorities and long-term build-out of the network, when proceeding with implementation, the Township should note that the all costing should be revisited through a five-year review and should be assessed and updated based on available budgets and Council allocated dollars. It is important to note that the costing does not include potential costs or dollars associated with the development and implementation of promotion and outreach initiatives as suggested in section 3.2.

However, It is suggested that the Town allocate $5,000 per year to the development and initiation of potential education, enforcement, encouragement and evaluation initiatives in partnership with local stakeholders and interest groups e.g. Waterloo Region, GRCA, rare, etc.

R28

In addition to the costs to the Township to develop the trail/cycling infrastructure they are also encouraged to allocate $5,000 / year for promotion and outreach for a total of $35,000 over 7 years.

Over the short-term this would equate to an investment of ~$35,000 for promotion and outreach initiatives including but not limited to the development of a Township-wide map, an application for bicycle friendly community status, brochures, signage, etc. which should also be supplemented with additional funding support from external sources.

4.3 CONCLUSION

The Trails/Cycling Master Plan has been developed as a strategic plan and blueprint for the Township which identifies short-term infrastructure and programming initiatives as well as long-term build-out. The proposed linkages have been identified with the goal of achieving the Township's trails/cycling vision and key master plan objectives. The Township and its partners are encouraged to use this document as a resource and set of tools to guide the planning, design and implementation of the network. The tools included in the report as well as the recommendations have been designed to provide direction on how to initiate the development of the trails/cycling network in a feasible and realistic manner.

The information included in the report reflects the input received from members of the public, steering committee representatives and Town staff and aims to build on the excellent work which has already been undertaken. The study team would like to thank all of those who were involved in the development of the master plan that helped to lay the ground work for a made-in-North Dumfries system of trail and cycling facilities.

APPENDIX A

Background Information Summary

APPENDIX A SUMMARY OF BACKGROUND INFORMATION

A.SUMMARY OF BACKGROUND INFORMATION

A successful trails / cycling master plan needs to be founded on policy at all levels of government. The summary found in this appendix provides the existing policy framework for trails and cycling at the federal, provincial and municipal level.

A.1 FEDERAL POLICIES & PLANS

A.1.1 TRANSPORT CANADA

In 2005, Transport Canada developed the "Strategies for Sustainable Transportation Planning: a review of practices and options" report. It identifies guidelines for incorporating sustainable transportation into municipal transportation plans. Strategies and policies which could be considered by the Township as potential policies or initiatives include:

Land Use Planning	• Encourage desirable land use form and design (e.g. compact, mixed-use, pedestrian / bike friendly) through transportation plan policies
Environment and Health	• Strategies to mitigate the air quality and noise impacts of transportation activities. • Set goals and objectives for reducing the need to travel, improving transit mobility, and preserving minimum levels of service on roadways. • Address the transportation needs of persons with disabilities, notably public transit service and barrier-free design in public rights-of-way.
Modal Sustainability	• Identify strategies, policies, facilities and services to increase walking, cycling, other active transportation, transit, ridesharing and teleworking. • Recognize synergies and tensions among different modes (e.g. potential for multimodal cycling-transit trips, potential for modal shift from transit to ridesharing). Address possible implications for transportation objectives. • Include objectives, strategies, policies, facilities and services to make transit operations more sustainable.

The repot and strategies within it illustrates the federal government's commitment to developing national standards and practices which can be used to help improve conditions for walking and cycling in a consistent and coordinated manner.

A.1.2 FEDERATION OF CANADIAN MUNICIPALITIES

The Federation of Canadian Municipalities (FCM) fosters the development of sustainable communities enjoying a high quality of life by promoting strong, effective and accountable municipal government. FCM recently developed the "Communities in Motion: Bringing Active Transportation to Life Initiative". A key resource for all Canadian municipalities, it sets out goals for promoting active transportation and eliminating barriers to different travel modes. A key consideration for active transportation presented in the initiatives includes:

Some pedestrians and cyclists stick to city streets to reduce travel time and distance. Others, however, prefer less stressful off-road routes that let them connect with nature. Lighting on trails improves safety and security, wayfinding systems help people get where they're going, bike ramps let cyclists get up and down staircases with ease, and dedicated bridges help everyone cross waterways, ravines and railway lines. Off-road routes are also important for recreation, and many communities are expanding their trails systems to boost tourism.

The promotion of the design and development of walking and cycling facilities including both on and off-road alternatives is reinforced through this policy. Local municipalities are encouraged to use these findings to help guide the development of individual routes, systems and linkages which highlight natural areas, promote community connectivity and help to realize economic benefits community-wide.

A.2 PROVINCIAL POLICIES & PLANS

A.2.1 PROVINCIAL POLICY STATEMENT UPDATE (2014)

The 2014 Update of the Provincial Policy Statement (PPS) sets the foundation for regulating land use planning and development within the Province of Ontario while supporting provincial goals and objectives. The PPS sets out guidelines for sustainable development and the protection of resources of provincial interest. The PPS promotes transportation choices that facilitate pedestrian and cycling mobility and other modes of travel. "Transportation systems" as defined in the PPS are systems that consist of corridors and rights-of-way used for the movement of people and goods as well as associated transportation facilities, including cycling lanes and park'n'ride lots. Policies pertaining to alternative modes of transportation are dispersed throughout the PPS. Policies which specifically address the development of active transportation infrastructure and programs include Section 1.1.3.2, 1.6.7.4 and 1.5.1.

A.2.2 BILL 51 PLAN REFORM

Bill 51 was approved in January of 2007 and reforms the Planning Act. The Planning Act provides the legislative framework and is the guiding document for land use planning in Ontario. The document outlines changes to the planning process intended to support intensification, sustainable development and the protection of green space. This is facilitated by increasing municipalities' power and flexibility and providing them with the tools to efficiently use land, resources and infrastructure. Bill 51 is consistent with Ontario's recent policy shift towards sustainable land use development and planning. For instance, Bill 51 allows municipalities to require environmentally sustainable design for individual buildings as well as entire neighbourhoods. It has also identified sustainable development as a provincial goal and objective as part of the Provincial Policy Statement.

A.2.3 MUNICIPAL ACT (2001)

The Municipal Act (2001) gives municipalities flexibility when dealing with issues which influence municipal development. It also requires municipalities to react quickly to economic, environmental or social changes. It recognizes that municipal governments are responsible and accountable when addressing matters within their jurisdictions and sets out policies pertaining to municipal jurisdiction over municipal highways and the maintenance of those highways which, in turn, has significant impact on the design and development of cycling facilities identified within the road right-of-way.

A.2.4 HIGHWAY TRAFFIC ACT

Bicycles are recognized as a vehicle under the HTA. They can operate on public roadways with the same rights and responsibilities as a motor vehicle. However, bicycles are not permitted on controlled access freeways such as the 400 series highways or any roadway restricted for cycling by a municipal by-law. The HTA contains a number of cycling related policies including bicycle lanes on municipal roadways, vehicles interacting with bicycles, bicycles being overtaken, and regulating or prohibiting bicycles on highways. The Ministry of Transportation is in the process of reviewing and possibly amending cycling related policies in the HTA. As the Act is updated, the Township should be aware of how these changes impact the implementation of enforcement of safe cycling.

A.2.5 MINISTRY OF HEALTH PROMOTION

The former Ministry of Health Promotion was integrated into the Ministry of Health and Long-Term Care in 2011 and leads the majority of trail development in Ontario. The Ministry of Health and Long-Term Care's mission is to champion health promotion in Ontario, and inspire individuals, organizations, communities and governments to create a culture of health and wellbeing; provide programs, services, tools and incentives that will enhance health and wellbeing; make healthy choices easier; harness the energy and commitment of other ministries, other levels of government, community partners, the private sector, the media and the public to promote health and well-being for all Ontarians and make Ontario a leader in health promotion within Canada and internationally. A number of years ago, the Ministry of Health Promotion drafted a vision for Ontario's trails which encourages the province to explore the development of: "A world class system of trails that capture the uniqueness and beauty of Ontario's vast open spaces and natural and built cultural/heritage resources. People and places are connected through quality, diverse, safe, accessible and environmentally sensitive urban, rural and wilderness experience trails for recreational enjoyment, active living and tourism development."

A.2.6 ACCESSIBILITY FOR ONTARIANS WITH DISABILITIES ACT (2005)

The Accessibility for Ontarians with Disabilities Act (AODA) was passed on June 13, 2005. The policy calls on the business community, public and not-for-profit sector and people with disabilities to develop, implement and enforce mandatory standards. The policy makes Ontario the first jurisdiction in Canada to develop, implement and enforce accessibility standards applied to both private and public sectors. These guidelines provide directives on how businesses in Ontario can identify, remove and prevent barriers to accessibility. The Built Environment is the most relevant standard that can be applied to trail planning, design and construction.

Recently a revision and update of the Built Environment Standard was undertaken and released in early 2013. *"The goal of the Accessibility Standards for the Built Environment is to remove barriers in public spaces and buildings. This will make it easier for all Ontarians — including people with disabilities, seniors and families — to access the places where they work, travel, shop and play".* The standard applies to new construction and redevelopment of existing facilities. The standards for public spaces cover: Recreational Trails and Beach Access Routes, Outdoor Public Use Eating Areas, Outdoor Play Spaces, Exterior Paths of Travel, Accessible Parking and Obtaining Services.

Some highlights of the technical requirements for recreational trails under the new regulation 80.8(1) include a minimum clear width of 1,000 mm; a clear height that provides a minimum head room clearance of 2,100 mm above the trail; a firm and stable surface type; and where trail is constructed adjacent to water or a drop-off, it must have edge protection that constitutes an elevated barrier that runs along the edge of the; a top edge of at least 50 mm above the trail surface; a protection barrier that does not impede the drainage of the trail surface; a clear opening of between 850 mm and 1,000 mm, whether the entrance includes a gate, bollard or other entrance design; and trail head signage that provides relevant accessibility information (the length of trail; the type of surface of which the trail is constructed; the average and the minimum trail width; the average and maximum running slope and cross slope and the location of amenities, where provided).

A.2.7 ONTARIO TRAILS STRATEGY

The Ontario Trails Strategy was developed in response to the increasing popularity of trail use. Growing demand for trails increased the need for government leadership, protection of provincial investment and the mitigation of significant trail issues or challenges. The strategy is a long-term plan that establishes a Provincial direction to develop a healthier and more prosperous province through the planning, management, promotion and use of trails. The strategy supports continued cooperation among governments and the not-for-profit and private sectors. There are five strategic directions that are outlined in the Trails Strategy including improving collaboration among stakeholders; enhancing the sustainability of Ontario's trails; enhancing the trail experience; educating Ontarians about trails; and fostering better health and a strong economy through trails. More specifically the Strategy recommends that trail organizations develop common standards to guide the development and use of trails and establish more effective tools and better ways of distributing information to Ontarians.

A.2.8 TRANSIT SUPPORTIVE GUIDELINES (2012)

In 1992, the Ontario Ministries of Transportation and Municipal Affairs and Housing published the Transit-Supportive Land Use Planning Guidelines which was recently updated to reflect continued progress in the development of more compact, transit-supportive communities. The updated report documents the most current thinking on transit-supportive urban planning and design in addition to current best practices in transit planning and the delivery of custom-oriented transit service throughout the Province of Ontario. The documents builds upon the policies, plans and initiatives developed by the Ministry over the past 10 + years and consists of over 50 guidelines and approximately 450 specific strategies to guide urban and transit planners, developers etc. in creating communities that support transit and transit ridership. The document also supports the development of pedestrian and cycling connections throughout urban and rural communities to help enhance transit infrastructure and usage.

The approach includes the provision of safe and accessible pedestrian and cycling connections to and from transit stops and stations. Recommendations set out on the transit-supportive guidelines will help to inform the development of proposed network linkages and recommendations which facilitate connectivity to transit and other modes of transportation. Specific reference is also made to the design and development of complete streets.

A.2.9 ONTARIO CYCLING STRATEGY #CycleON

In November 2012 the Ministry of Transportation Ontario (MTO) published the Draft Cycling Strategy. The strategy acknowledges the importance of developing cycling infrastructure to help reduce GHG emissions, ease gridlock, enhance the economy, increase tourism and increase quality of life for Ontario residents. The strategy was developed based on increasing demand from local municipalities for direction from the province on the development of cycling facilities and responds to recommendations in the Coroner's report published in 2012. The province's vision is to ultimately *"develop a safe cycling network that connects the province, for collision rates and injuries to continue to drop, and for everyone from the occasional user to the daily commuter to feel safe when they get a bicycle in Ontario".* The strategy outlines recommended cycling infrastructure, legislation changes and enhancements including a set of proposed changes to The Highway Traffic Act. In August 2013 the final version of the Ontario Cycling Strategy – #CycleON was released by the MTO along with a clear set of action plans

A.3 REGIONAL POLICIES & PLANS

A.3.1 REGION OF WATERLOO OFFICIAL PLAN (2010)

The Official Plan is the Region's guiding document for growth and development of a balanced community structure over the next 20 years. The plan includes policies which pertain to infrastructure planning and strategic investment to support community and economic growth and emphasizes the importance of alternate modes of transportation. There are a number of specific policies and references to the development of trail / cycling infrastructure. This is reflected through one of the plan's a key objectives: *"establish a network of continuous sidewalks, community trails and bicycle pathways that provide direct, safe and comfortable and convenient linkages within the neighborhood and externally to other neighborhoods, including linkages to transit stops, employment areas, school sites, food destinations and community facilities."* The Plan recommends the development of active transportation infrastructure to accommodate different trip types including commuting, workplace travel, recreation and destination oriented trips. Local municipalities are also encouraged to *"enhance pedestrian and cycling environments so residents and visitors have more opportunities to walk and cycle for convenient travel, recreational, health, environmental and economic reasons".*

The Plan also makes reference to the development of a balanced multi-modal transportation system through policies, programs and services which support the development of pedestrian routes, cycling facilities and trails.

A.3.2 REGION OF WATERLOO ACTIVE TRANSPORTATION MASTER PLAN

In February 2014, the Region of Waterloo completed their first Active Transportation Master Plan. The plan is a guide for the planning and development of pedestrian and cycling facilities through the promotion and development of active forms of transportation. The plan intends to achieve the Region's vision for a sustainable and liveable Region consistent with the OP. It is supported by a vision to *"plan and manage integrated, accessible and safe multi-modal transportation systems that provide transportation choice, and promote sustainability, a healthy population and the effective movement of goods".* The plan also identifies a network of on and off-road AT routes that provide users with safe and accessible connections. The document outlines specific design guidelines and also highlights an implementation strategy for the development of AT facilities and sets out a long-term implementation strategy.

A.3.3 REGION OF WATERLOO STRATEGIC FOCUS (2011 – 2014)

In 2011, the Region adopted the Region of Waterloo Strategic Focus which guides priority setting and facilitates the development of programs and services that address the changing needs of growing communities. The strategy outlines recommendations and policies pertaining to five focus areas including environmental sustainability; growth management and prosperity; sustainable transportation; healthy and inclusive communities; and service excellence. The Strategic Focus identifies objectives for each focus area as well as action items which address how the Region will achieve these objectives. The Plan also reinforces policies, objectives and strategies from Regional Plans. The plan corresponds to the annual budget process to reflect informed decision making regarding resource allocation.

A.3.4 REGION OF WATERLOO TRANSPORTATION MASTER PLAN (2011)

The Transportation Master Plan is the Region's guiding document for the development of a connected and multi-modal transportation system including public transit, cycling and pedestrian infrastructure. The Plan reflects increasing public interest for greater transportation choices, which was an outcome of the public and stakeholder consultation and engagement efforts which were used to inform the plan's recommendations. Study goals include:

- Optimizing the transportation system – Make the most of what exists: preserve and maximize the use of facilities and services—avoid or defer the need for new infrastructure that does not support the other goals;

- Promoting transportation choice – provide and maintain a transportation system that offers competitive choices for moving people and goods in an integrated and seamless manner while minimizing single occupancy vehicle trips;
- Fostering a strong economy – provide a transportation system that supports the retention of existing businesses and attraction of sustainable economic activity; and
- Supporting sustainable development – provide and maintain a transportation system that supports sustainable growth in both urban and rural areas and reduces transportation contributions to climate change.

The Region has identified walking, cycling and public as potential target areas to foster a wider sustainable transportation system. The Plan identifies increased walking and cycling as a focus for future development throughout the Region. It also provides policies to support the development of trails and cycling facilities including recommendation for planning the system, developing supportive policies and plans for new development areas and developing / maintaining design standards for pedestrian and cycling facilities.

A.3.5 REGION OF WATERLOO GROWTH MANAGEMENT PLAN (2003)

The Region adopted the Growth Management Strategy as a long-term strategic framework to identify the where, when, and how future residential and employment growth will be accommodated. The Plan is structured around six goals and contains recommendations which speak to the protection of rural areas from urban sprawl, the revitalization of downtown core areas, the protection and preservation of environmentally sensitive lands and the enhancement of economic prosperity for communities. One of the key goals of the plan is to provide greater transportation choice to create pedestrian-friendly environments as part of a balanced transportation system. Immediate actions that may be undertaken to achieve this include amending *"the Regional Official Plan to establish policies which facilitate the increased use of transit and cycling facilities, and pedestrian movement through the development approval process"*.

A.3.6 REGION OF WATERLOO TRANSPORTATION CORRIDOR DESIGN GUIDELINES (2013)

The guidelines were developed to identify context-sensitive solutions that reflect a variety of road types and conditions within the Region. The document is intended as a guide for project design teams as they work through the integrated design process for public road allowances. They are also intended to be used as a tool to evaluate and select the preferred design alternative for road allowances that best addressed the transportation needs. The guidelines set out clear goals including: *"enhance, develop, promote and integrate sustainable and active forms of transportation (public transit, cycling and walking) by the provision of a comfortable environment"*. Design guidelines are provided for on and off-road facilities as well as buffer zones, site furnishings, roadway shoulder design, curb design and curb / shoulder lanes.

A.4 MUNICIPAL POLICIES & PLANS

A.4.1 TOWNSHIP OF NORTH DUMFRIES OFFICIAL PLAN (OP) (2008)

The Official Plan establishes a policy framework for the Township to address maintaining and enhancing the physical, agricultural, environmental, social, economic, natural and heritage resources while promoting sustainable growth until the year 2016. The OP acts as a link between polices recommended in the Region's OP and municipal objectives. The Township's OP emphasizes the importance of pedestrian and cycling facilities and highlights key policies to support the development active transportation infrastructure specifically in section 3.3.2.4

A.4.2 TOWNSHIP OF NORTH DUMFRIES – ROAD NEEDS ASSESSMENT & ROAD CONSTRUCTION WORK REPORT (2011 – 2020)

In January 2010, the Township developed a Road Needs Assessment Study to evaluate roadways in the Village of Ayr and prioritize work to be undertaken within the next 15 years. Route criteria (e.g. road surface conditions, storm water and summary costs) were assessed to rank the roadways which were organized into three priority groups: high (0-5 year plan), medium (5-10 year plan) and low (10-15 year plan). The Study identified 29 roadway projects to be undertaken within the next 15 years, including roads which are recommended for road maintenance and construction, reconstruction, road widening, resurfacing and rehabilitation.

A.5 CONSERVATION AUTHORITY

A.5.1 GRAND RIVER CONSERVATION AUTHORITY

The Grand River Conservation Authority (GRCA) was formed in 1932 and contains lands within the Township's rural and urban areas. The GRCA aims to develop and implement programs to improve and preserve water quality, facilitate watershed planning, protect natural areas and biodiversity, and provide environmental education to the communities living within North Dumfries. The GRCA owns and maintains the Cambridge to Paris Rail Trail along the abandoned rail corridor west of Grand River in North Dumfries.

A.6 SURROUNDING REGIONAL /MUNICIPAL POLICIES & PLANS

A.6.1 BRANT COUNTY

The County of Brant has highlighted trail and cycling opportunities in County documents, such as the County of Brant Transportation Master Plan, but does not currently have any which specifically addresses trail development or cycling facilities.

A.6.2 CITY OF CAMBRIDGE

The City of Cambridge has recently developed policies and plans to support the development of trails and cycling facilities including the City of Cambridge Bikeway Network Master Plan.

A.6.3 CITY OF HAMILTON

The City of Cambridge has recently developed policies and plans to support the development of trails and cycling facilities including their Cycling Master Plan - Shifting Gears (2009).

A.6.4 CITY OF KITCHENER

The City of Kitchener has been a long standing supporter of the development of trails and cycling infrastructure. Supportive trail / cycling policies and plans adopted by the City of Kitchener include the Cycling Master Plan, Parks Master Plan and Trails Master Plan.

A.6.5 OXFORD COUNTY & BLANDFORD BLENHEIM

Oxford County and its local municipalities have recently adopted policies to support the development of trails and cycling facilities including the County's Trails Master Plan, the Township of Blandford-Blenheim Parks and Recreation Master Plan and other trail and cycling related initiatives in the Towns of Ingersoll and Tillsonburg.

A.6.6 TOWNSHIPS OF WELLESLEY, WILMOT & WOOLWICH

The Townships of Wellesley, Wilmot and Woolwich have highlighted trail and cycling opportunities in a number of documents, such as the Township of Wellesley Draft Official Plan, Township of Wilmot Strategic Plan and the Township of Woolwich Transportation Policy, but these Townships do not currently have any which specifically addresses trail development or cycling facilities.

A.7 RELEVANT INTEREST GROUPS & STAKEHOLDERS

Trans Canada Trails Association - A not-for-profit organization that promotes and assists provinces and territories with the development and use of the Trans Canada Trail.

Ontario Trails Council (OTC) - A not-for-profit organization that promotes the development of trails in Ontario. In some cases representatives from the Council can help to mobilize trail representatives and efforts.

Share the Road Coalition - A cycling advocacy organization created to unite cycling organizations from across Ontario and work with and on behalf of municipalities to make communities more bicycle-friendly.

Ministry of Health Promotion and Sport - Which serves as one of the lead Ministries for trail development. A number of years ago, the Ministry of Health Promotion and Sport drafted a vision for trails province-wide described in additional detail in the provincial policies above.

Ministry of Health and Long-Term Care - Which strives to enable Ontarians to lead healthy, active lives and make the province a healthy, prosperous place to live, work, play, learn and visit. Part of the ministry's mission is to champion health promotion in Ontario and make Ontario a leader in health promotion within Canada and internationally. The Ministry has developed the Healthy Communities Fund (HCF) Program provides non-capital funding to organizations for the delivery of integrated health promotion initiatives across Ontario.

Health Promotion Division of the Ministry of Health and Long-Term Care - Which serves as one of the lead Ministries for trail development in Ontario. A number of years ago, the former Ministry of Health Promotion drafted a vision for trails province-wide which states that the province should explore the development of "a world class system of trails that captures the uniqueness and beauty of Ontario's vast open spaces and natural and built cultural/heritage resources..."

Ministry of Tourism, Culture and Sport – Which supports three important sectors of Ontario's economy to directly promote economic growth and job creation and enhance the quality of life for Ontarians. These include the tourism sector, the cultural sector, and the sport and recreation sector. The Recreation and Community Programs Division promotes participation in sport and recreation activities including the use of Ontario trails. One of the division's main initiatives includes the Trails Open Ontario program which celebrates Ontario's trails by providing an opportunity for the public to experience trails through free local events.

Ministry of Transportation of Ontario (MTO) – Who recently completed a survey of road users which suggested that about 1.2 million adults in Ontario ride a bicycle daily during spring, summer and fall and 2.8 million ride at least once a week. However, there are many communities in Ontario where few people cycle. For additional details regarding the policies and action items developed by the MTO please review section A.2.9. In addition, in 2013 MTO along with 13 municipalities and regions and the Ontario Traffic Council (OTC) completed the final draft of Ontario Traffic Manual (OTM) Book 18: Cycling Facilities.

Local and Regional interest groups related to cycling and trail development within the Township of North Dumfries and Waterloo Region include but are not limited to the Region of Waterloo Active Transportation Advisory Committee and the Township of North Dumfries Parks, Recreation and Trails Advisory Committee.

APPENDIX B

Consultation Input Summary

APPENDIX B SUMMARY OF CONSULTATION ACTIVITIES

B. SUMMARY OF CONSULATION ACTIVITIES

B.1 THE APPROACH

Between March 2014 and May 2014 the Township undertook a three phase study to complete a Trails/Cycling Master Plan for the Township of North Dumfries. The study was completed as a collaborative effort between Township staff, the Parks, Recreation and Trails Steering Committee, interest groups (e.g. the GRCA, the City of Cambridge, Region of Waterloo and RARE) and a consulting team from MMM Group. One of the key objectives of the study was to develop a master plan based on…

THE WANTS AND NEEDS OF...

- Those involved in the design and development of trails and cycling
- Those who will be using the trails/cycling network
- Stakeholders and agencies that could partner with the Township in the future

The study included a strong focus on consultation and engagement within a short timeline. In advance of the study's initiation, the study team developed a formal consultation strategy to guide the preparation for and execution of consultation activities over the course of the study. The strategy was founded on the key principle of:

Consulting with residents, stakeholders, local interest groups, the Region of Waterloo, surrounding municipalities, Council and other partners that could have a role in facilitating and promoting trail and cycling facility development and to seek their input on infrastructure and programming.

In addition to the overarching consultation goal, consultation goals / objectives were identified for each unique phase of the study. These goals and objectives helped the study team strategically select the most appropriate activities.

A summary of the consultation goals and objectives as well as the activities which were undertaken are presented in Table B.1. They have been organized based on study phase.

Table B.1 - Summary of Consultation / Engagement Activities by Phase

Phase 1: Trails and Cycling Development	
Consultation Goal	To provide members of the public and stakeholders with key background information and study findings from Phase 1 and to gather input regarding network opportunities and barriers.
Activities Undertaken:	• Public Awareness Campaign • Public Information Centre #1 • Online Questionnaire • Study Team / Steering Committee Meetings / Roundtable Discussions
Phase 2: Identification of Priority Links	
Consultation Goal	To give the Steering Committee the opportunity to "work" collaboratively with the study team to inform key study deliverables including the trails / cycling network, priority links and master plan recommendations.
Activities Undertaken:	• Ongoing Public Awareness (through Public Awareness Campaign) • Public Information Centre #2 • Ongoing Online Questionnaire • Study Team / Steering Committee Meetings / Roundtable Discussions
Phase 3: Management Process, Implementation & Master Plan Report	
Consultation Goal	To provide public representatives with the opportunity to comments on the proposed network and study findings and to work collaboratively with the Steering Committee and Township staff to develop and finalize the Trails/Cycling Master Plan.
Activities Undertaken:	• Ongoing Public Awareness (through Public Awareness Campaign) • Ongoing Online Questionnaire • Study Team / Steering Committee Meetings / Roundtable Discussions • Presentation to Council

It is also important to note that the consultation process was intended to be flexible in nature. As opportunities arose e.g. events, social media, additional meetings, the study team made the best possible effort to take advantage of these opportunities.

B.2 WHAT WE HEARD: A SUMMARY OF INPUT RECEIVED

Opportunities to provide commentary were given to members of the public and stakeholders over the course of the study. The responses provided valuable input which was documented and incorporated in the master plan report. The following sections provide an overview of the comments received at each public / stakeholder event.

B.2.1 PUBLIC OUTREACH CAMPAIGN

The intent of the public outreach campaign was to increase study awareness. The campaign was made up of outreach and promotion techniques including the development of:

- A Study Webpage: which was frequently updated by Township staff with relevant study information. Key study deliverables were uploaded for the public to review and provide commentary.
- Study Notices: including a notice of study commencement, notice of public information centres (for both #1 and #2) and a notice of study completion. Notices were published in local newspapers and online. Notices also suggested additional opportunities for involvement (e.g. online questionnaire or submission of comments to the study team). The study notices were also posted on the Township's Front Page for the duration of the study (since March 11th, 2014).
- Social Media: The Township's existing Twitter and Facebook were used to promote the online questionnaire and public information centres. Updates were made throughout March and April 2014.
- Media Blasts: As the study webpage was updated, media blasts were used to promote public commentary and input.
- Study Promotional Business Card: which was used to distribute key study information. (e.g. study contact information and a link to the online questionnaire and study webpage). The card was distributed at Township events and at the community complex.
- Mobile Display Board: which was developed using the study brand and was placed at the community complex along with the business cards and hard copies of the online questionnaire. Included on the mobile display was background information for the study, a QR code that linked to the online questionnaire using a smart-phone, contact information for study representatives and information on other means of staying engaged such as Public Information Centres.
- E-blasts: of the online questionnaire (March 14th, April 8th and April 22nd, 2014).
- Coordination with Stakeholders: including the GRCA and Tour De Grande as well as the Parks, Recreation and Trails Advisory Committee, Economic Development Advisory Committee and Seniors Advisory Committee Meetings to promote the study and the completion of the online questionnaire.

Though no input was gathered directly from these materials / outreach mechanisms they helped to increase awareness which promoted increased attendance at the public information centres and responses to the online questionnaire.

B.2.2 STEERING COMMITTEE / STUDY TEAM MEETINGS

Meetings and workshop style engagement sessions with the steering committee were used to provide study updates, submit key deliverables and to engage in ongoing discussion the development of the master plan. In total there were three meetings held over the course of the study. Meeting dates, objectives and key outcomes are identified in Table B.2

Table B.2 – Study Team / Steering Committee Meetings Overview

Date	Objectives
Study Team Meeting #1 / Kick-off Meeting	
March 6th, 2014	A kick-off meeting to introduce the members of the consultant team to members of Township study team. The meeting was used to review the consultation strategy and draft materials. Initial study objectives, opportunities and challenges and key considerations for master plan were discussed.
Input Received	• Master plan should include short-term initiatives as well as long-term build-out for implementation; • Urban and rural connections should be addressed with specific consideration in Ward 4; • Liability, maintenance and safety concerns should be considered as part of the master plan report; • Address trails found on lands within private land ownership and provide details on potential land acquisition; • Explore barriers and key connections including destination trails, Highway 401, linkages to surrounding communities, etc.
Parks, Recreation and Trails Advisory Committee Meeting #1	
April 1st, 2014	The meeting was used to comments the draft table of contents and existing conditions mapping. Existing and potential consultation activities were also discussed. The attendees were asked to provide their input on potential opportunities and barriers associated with the development of the network.
Input Received	• Attendees were enthused about the potential consultation activities and agreed that promotion and outreach would be necessary; • Comments were provided regarding potential routes and existing route refinement. • Committee members suggested the development of potential signage alternatives as a key initiative of the plan
Parks, Recreation and Trails Advisory Committee Meeting #2	
May 15th, 2014	The meeting was used to review and discuss the draft trail/cycling design guidelines and the draft trails/cycling network. Attendees were asked to provide their comments on short and long-term priorities.
Input Received	• Comments to the design guidelines were provided including additional consideration for the rails with trails design concept, surface type treatments and maintenance. • Refinements to the network and suggested priorities included a connection

Table B.2 – Study Team / Steering Committee Meetings Overview

Date	Objectives
	to the community complex and the use of new street to connect to the downtown core. • Additional considerations should be made for seniors as well as those with mobility issues / limitations where possible.
Parks, Recreation & Trails Advisory Committee Meeting #3	
June 10th, 2014	The meeting was used to present and comment on the draft trails/cycling master plan in advance of the submission of the master plan report to Council.
Input Received	• TBD

B.2.3 PUBLIC INFORMATION CENTRES

Ward 4 Town Hall Meeting Public Information Centre (PIC) #1 – March 25th, 2014

The first Public Information Centre (PIC) was hosted on Tuesday March 25th, 2014 at the Clyde and Scott Women's Institute Hall (1459 Sheffield Road, Cambridge). A presentation regarding the trails/cycling master plan was made as part of Ward 4 Town Hall meeting at 7:00 p.m. The presentation was followed by a question and answer period and one-on-one discussion between the study team and members of the public. Approximately 50 people attended Ward 4 Town Hall Meeting / PIC #1.

GOALS OF PIC #1

1. Introduce the study by outlining the study vision and the process being undertaken in developing the trails/cycling network
2. Provide some samples of existing trails/cycling facilities currently available in the Township
3. Introduce route selection criteria
4. Gather input on level of comfort with respect to facility types
5. Provide information on how members of the public and interested stakeholders can stay connected and provide input

Not many comments were received at the Town Hall meeting as many of the attendees were only hearing about the study for the first time. The discussion was positive and many of the attendees expressed their support for the development of the master plan to increase walking and cycling throughout the community.

Ward 1 Town Hall Meeting Public Information Centre (PIC) #2 – March 22nd, 2014

A second and final Public Information Centre (PIC) was hosted on Thursday May 22nd, 2014 at the North Dumfries Community Complex (2958 Greenfield Road) as part of Ward 1 Town Hall meeting at 7:00 p.m. Similar to PIC #1, a brief presentation was given followed by a question and answer period. In total approximately 45 people were in attendance at the Town Hall Meeting.

Member of the Public at the Ward 1 Town Hall Meeting / PIC #1

GOALS OF PIC #2

1. Update attendees on the study progress
2. Provide a summary of online questionnaire results to date
3. Review the study vision, process and route selection criteria
4. Provide a summary of opportunities and challenges observed during field investigations
5. Present the Draft Proposed Trails/Cycling Network and obtain feedback from attendees

Similar to the first Town Hall meeting the majority of the comment and questions received were supportive in nature. Mayor Robert Deutschmann noted that Council members (Sue Foxton, Ben Benninger, Gord Taylor and Neil Ritchie) had been updated on the study progress and outcomes during its development and there was significant support from council members for the study. He also noted that the Master Plan is important for the community which will be used as a guide for future decision making regarding trails and cycling in the Township.

Before and after the meeting, attendees had the opportunity to review study display boards and maps and engage in one-on-one discussions with representatives of the study team. Some key themes/comments that arose during discussions included:

- The Master Plan should include some guidance on on-road cycling specifically on shared roadways where cyclists and motorists are travelling side-by-side.
- The Master Plan should propose a strategy to educate residents and school children on the use of off-road trails and on-road cycling facilities.

- The trails/cycling network should focus on new connections to existing trails and urban areas.
- The network should improve trails/cycling connections to the new community centre.
- External funding for the implementation of the trails/cycling network should be pursued where possible.

In addition to gathering information at the second public information centre the display boards were left at the Community Complex the of May 23rd and used to gather additional input at the Mayor's Dance for Parks and Trails on May 24th, 2014. There were approximately 100 people in attendance at the dance. A number of attendees engaged in discussions with Town staff regarding the study and also provided their comments onto the proposed trails/cycling network.

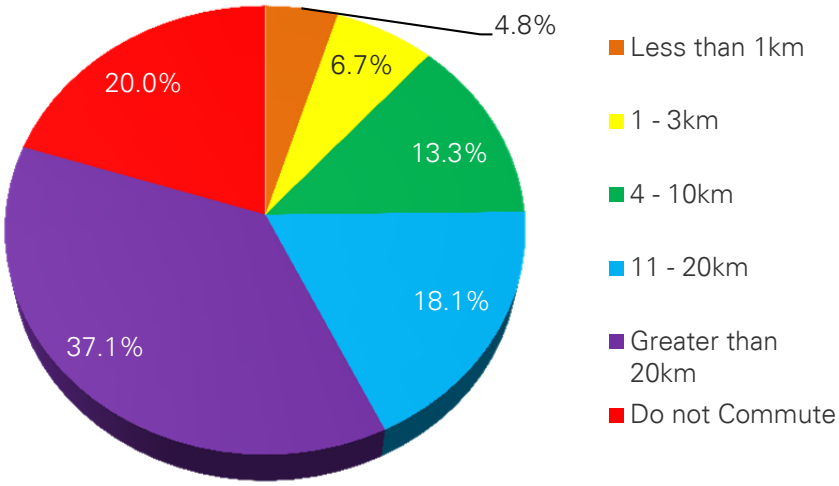
Draft Township-wide and Community of Ayr Trails/Cycling Network with Commentary from PIC #2 and Mayor's Dance

B.3 UNDERSTANDING THE TRENDS: A SUMMARY OF ONLINE QUESTIONNAIRE RESULTS

A questionnaire was developed and hosted between March and May 2014 using SurveyMonkey (www.surveymonkey.com). The questionnaire provided the study team with valuable information on existing trail/cycling trends as well as future wants and needs which helped to inform the development of the network and master plan recommendations. The online questionnaire was comprised of 15 questions and received a total of 107 responses. The following figures and tables provide a summary of key questionnaire results and have been organized based on their order in the questionnaire.

Question 1:

How far is it from your home to your place of work or school?

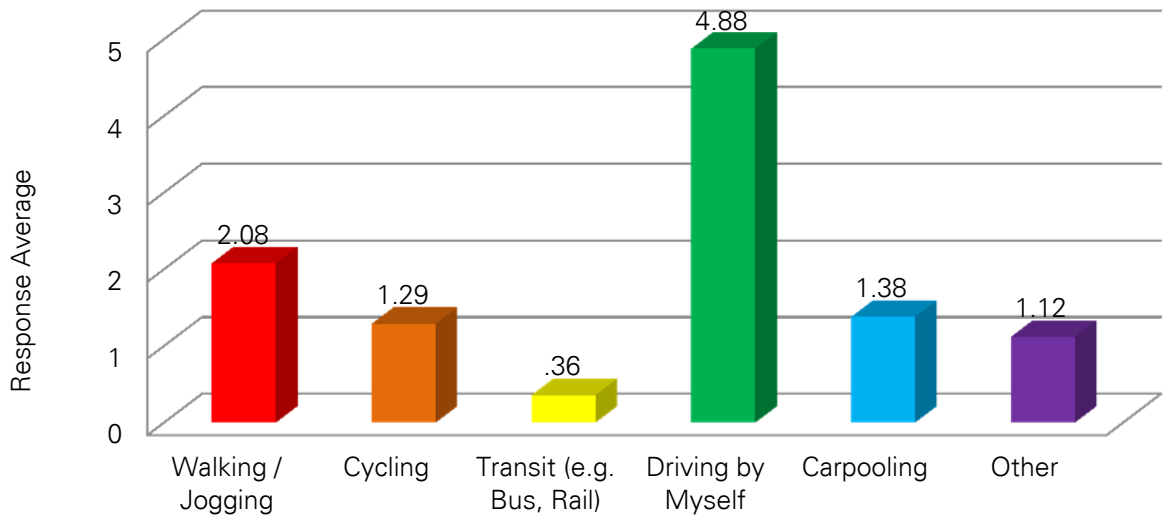


Response Findings: 24.8% of respondents live 10 km or less from their workplace or school and 45.2% respondents live more than 10 km from their workplace or school.

Potential Conclusions: Research shows that individuals who have a commute of 10 km or less are more likely to explore cycling as an alternative mode of transportation to an automobile. As such, there is potential to increase the number of local commuters who integrate trails and cycling into their day to day activities. Though there are respondents who live within 10km or less of their place of work or school there are a greater number of respondents who have a commute greater than 10 km. The greatest number of responses were for distances greater than 20 km (37.1%). As commuting distances are typically greater than 20 km people will be less likely to use trails or cycle to get to and from work or school. The 20% who did not have a commute to report represent a potential population who could be encouraged to engage in more active forms of recreational transportation as opposed to active transportation for commuting purposes.

Question 2:

Thinking about your typical 7-day week, let us know which travel modes you use and the number of days you use them.

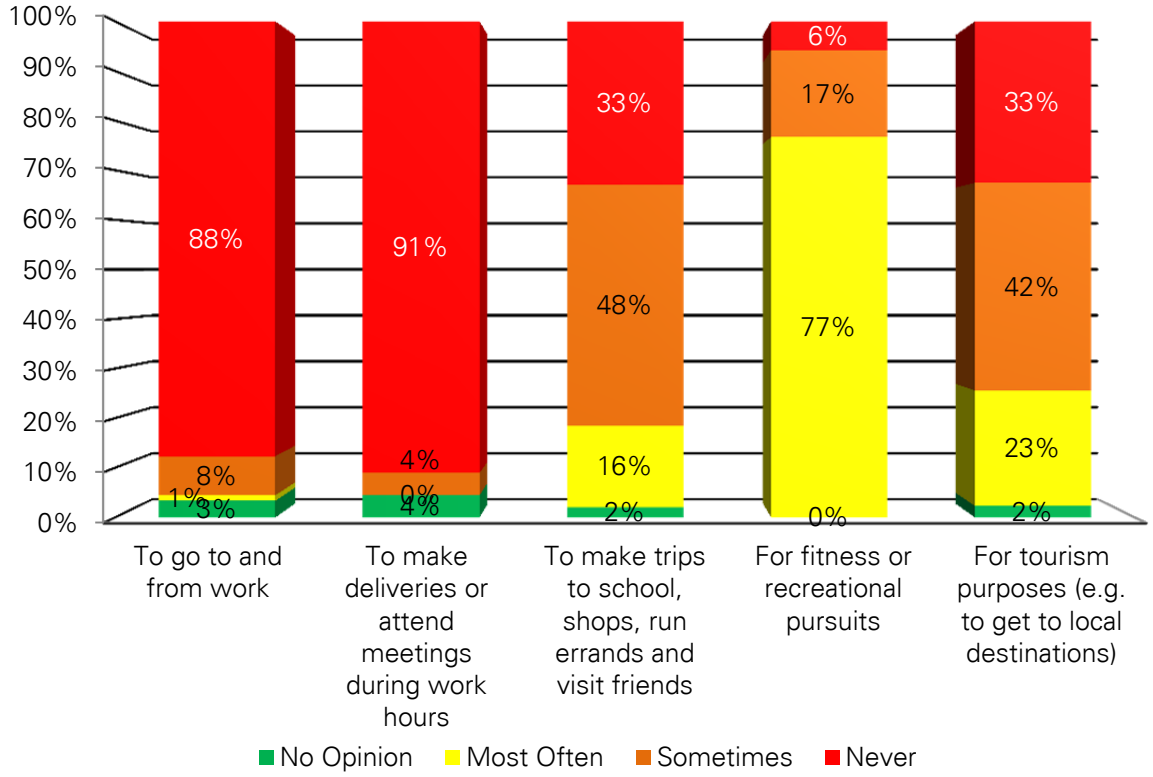


Response Findings: Respondents tend to drive by themselves almost 5 days a week to and from their place of work, school and other destinations. Respondents walk, jog or cycle as a preferred transportation mode 2 or fewer days a week.

Potential Conclusions: The results identify the potential for increased levels of active transportation and recreation should additional infrastructure be developed. Though, it is not realistic to expect people to walk or cycle year-round or for every trip given the climate and the topography of North Dumfries, there is opportunity to increase the frequency of active transportation and recreation by developing a more continuous trails/cycling network and connecting to existing trails such as the Cambridge to Paris Rail Trail, Grand Valley Trail, etc.

Question 3:

Why do you use trails or cycle in the Township?

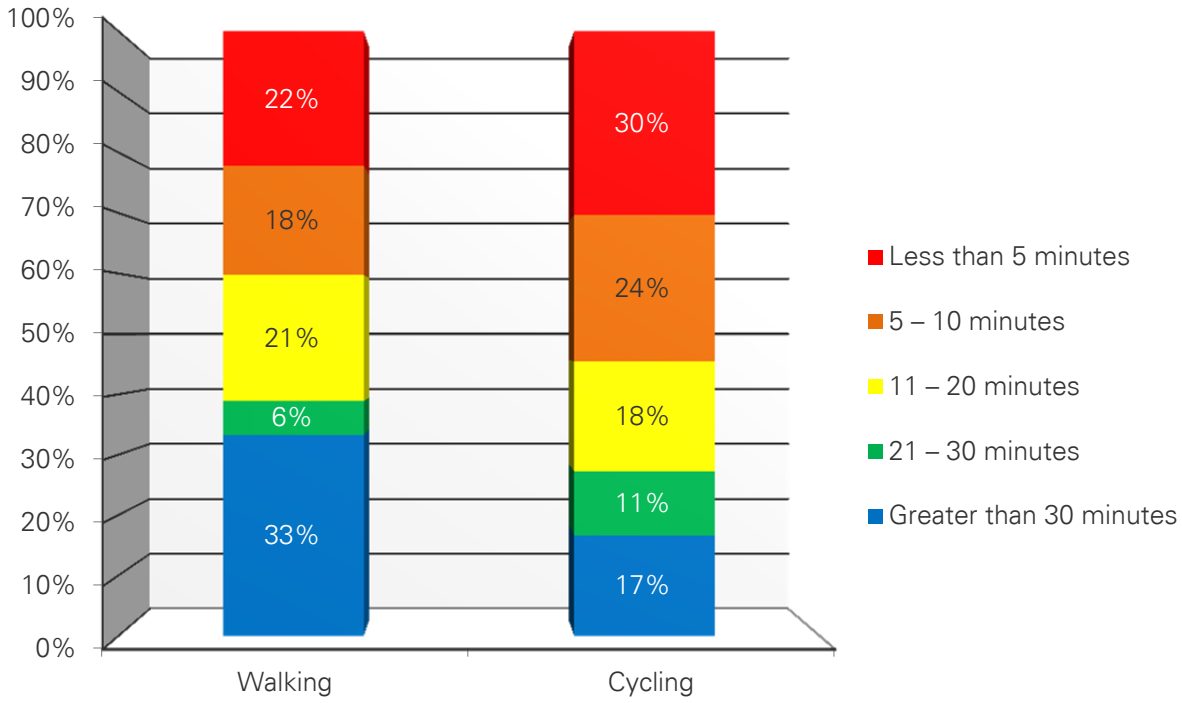


Response Findings: 94% of respondents use trails or cycle for fitness of recreational purposes most often or sometimes, followed by those who use trails or cycle for tourism purposes (65%) and to make trips to school, shops, run errands and visit friends (64%).

Potential Conclusions: The results generated from this question support a common trend in many municipalities comprised of a mix of urban and rural land uses. When communities are further apart and commuting distances increase there is a decrease in trips made by active forms of transportation as shown by the 88% of respondents who never use trails or cycle to get to and from work. Although distance between key destinations in rural areas is an important factor to consider, these results could occur due to the lack of infrastructure or current land use planning trends to encourage residents to engage in modes of active transportation.

Question 4:

When you want to use a trail or go for a bike ride in the Township how long does it usually take you to get to the closest trail or bike facility?



Response Findings: 22% of respondents reported less than 5 minutes travel time to access the nearest trail or bike facility by foot and 30% by bike. 18% of respondents reported it took them 5-10 minutes to access the nearest major trail or bike facility by foot and 24% by bike.

Potential Conclusions: As 40% of respondents are within a 10 minute or less walking trip and 54% are within a 10 minute or less cycling trip, there is a great potential to increase the number of users on these existing trail and bike facilities. This could also indicate a high demand for new / additional facilities.

Question 5:

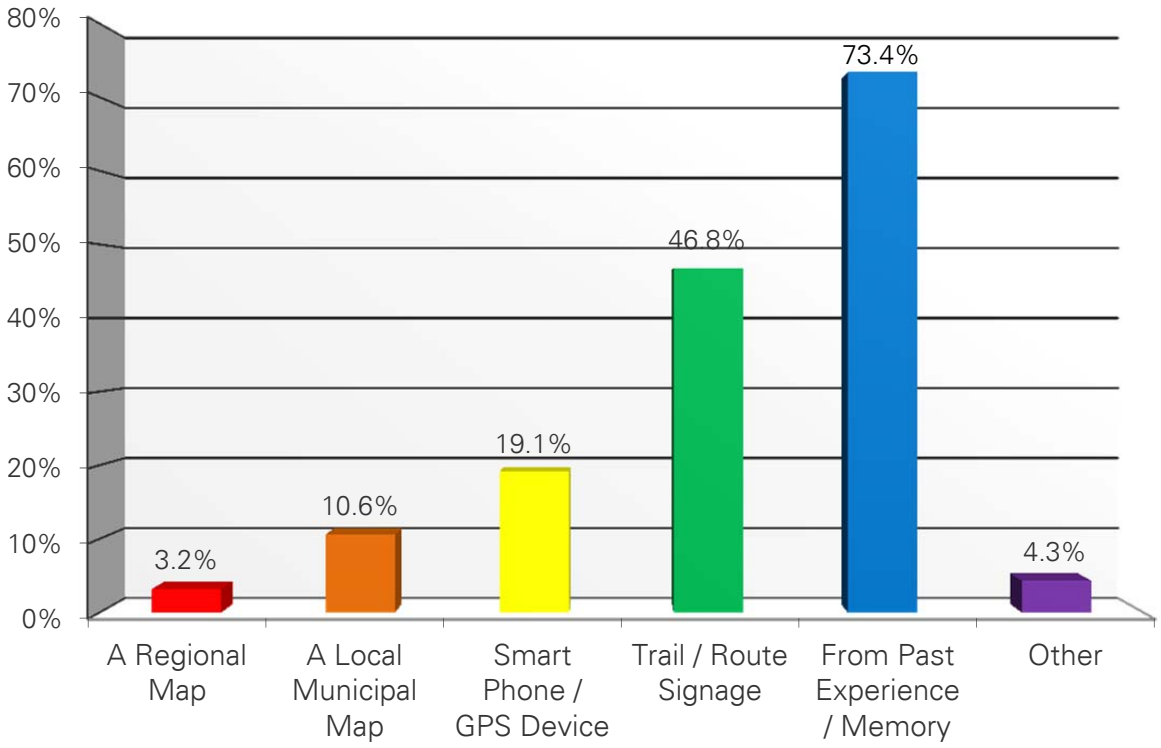
If you provided a response to Question #4 please tell us the name of the trail or where the cycling facility is located that you use / access.

Response Findings: The trail facilities and cycling locations most often used by respondents include Grand River Trail, Dryden Tract, Drynen Tract, Sudden Tract, Piper's Glen Park, RARE trails, Northumberland Street, and Spragues Road.

Potential Conclusions: Responses indicate a strong support for off-road trails in natural areas, such as parks and forest tracts, as well as on-road linkages which provide direct connections key destinations and urban centers.

Question 6:

When you use a trail and / or go for a bike ride what do you use to guide you along the route and / or find your location?

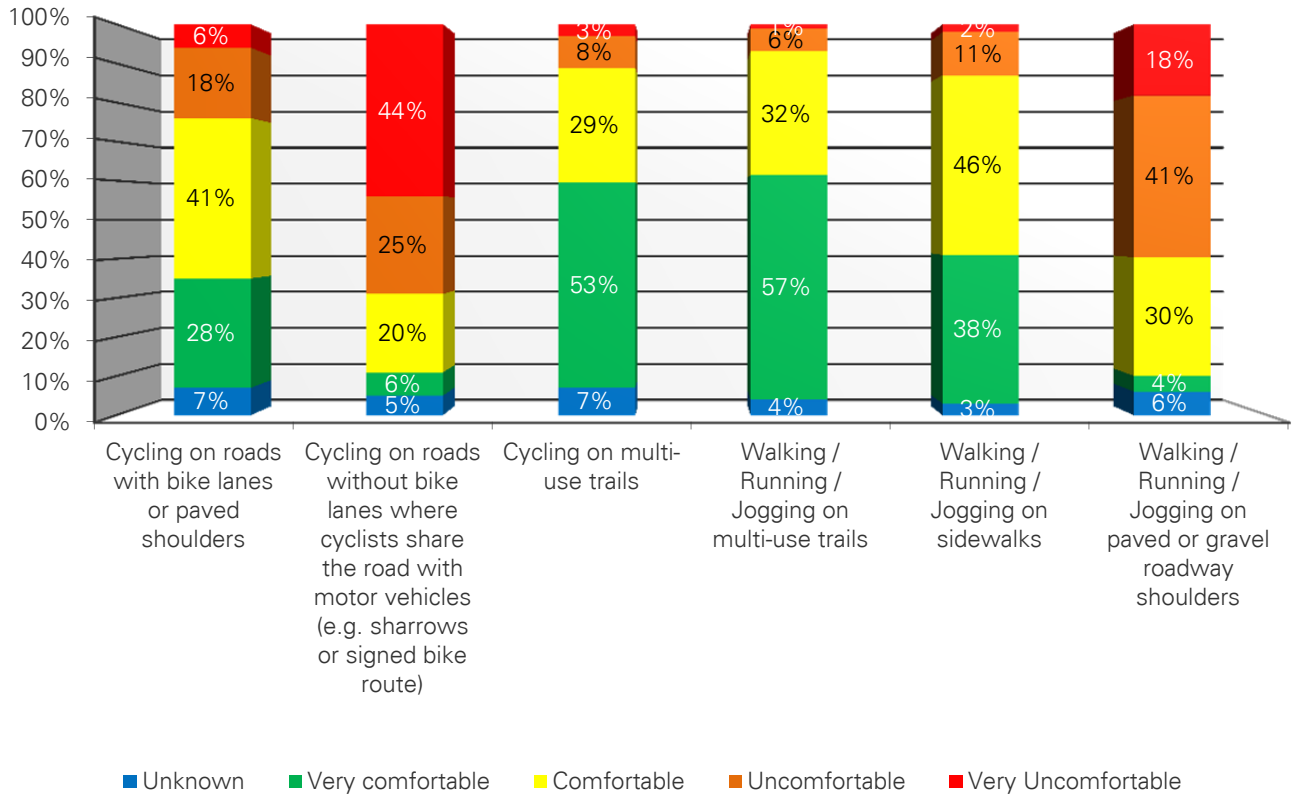


Response Findings: The majority of respondents (73.4%) indicated that they used past experience or memory to guide them along a route and / or find their location when using a trail or going for a bike ride. Trail / route signage was used second most (by 46.8% of respondents) and smart phones / GPS devices were used third most (by 19.1% of respondents).

Potential Conclusions: Given that the majority of respodents use past experience / memory and/or trail / route signage as a means of navigating a trail system or bike route, it is very important that the Township of North Dumfries implements a comprehensive signage strategy as part of the implementation of the trails/cycling network.

Question 7:

For the trails and cycling facilities listed below please indicate how comfortable you are using each.

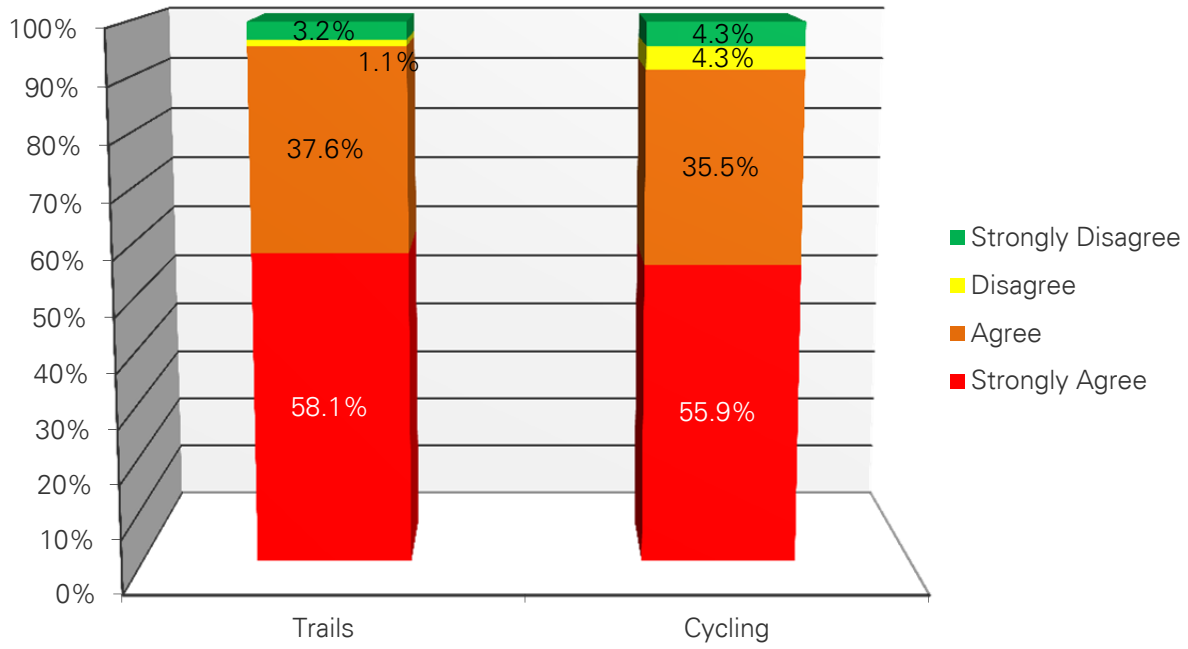


Response Findings: Respondents indicated being most comfortable when walking / running / jogging on multi-use trails (61%) and cycling on multi-use trails (60%). 69% of respondents indicated lower comfort levels when cycling on roads using shared space with motor vehicles, such as sharrows or signed bike routes.

Potential Conclusions: Research shows an increased level of comfort or a perceived sense of safety as separation increases between cyclists, pedestrians and motorists. As such the conclusions from this question are in line with many other trends in the active transportation field of research. Though separation increases levels of comfort for users it does not necessarily increased levels of safety. Research shows that by providing any form of facility and increasing awareness through education campaigns, promotional materials, signage and mapping people's level of comfort will increase as will their perception of safety. As such, it may be the implementation of new facilities combined with a robust educational campaign that will help respondents feel more comfortable with a range of facility types.

Question 8:

Do you think the Township should invest in improving the trails and cycling facilities through North Dumfries to provide additional community connections?

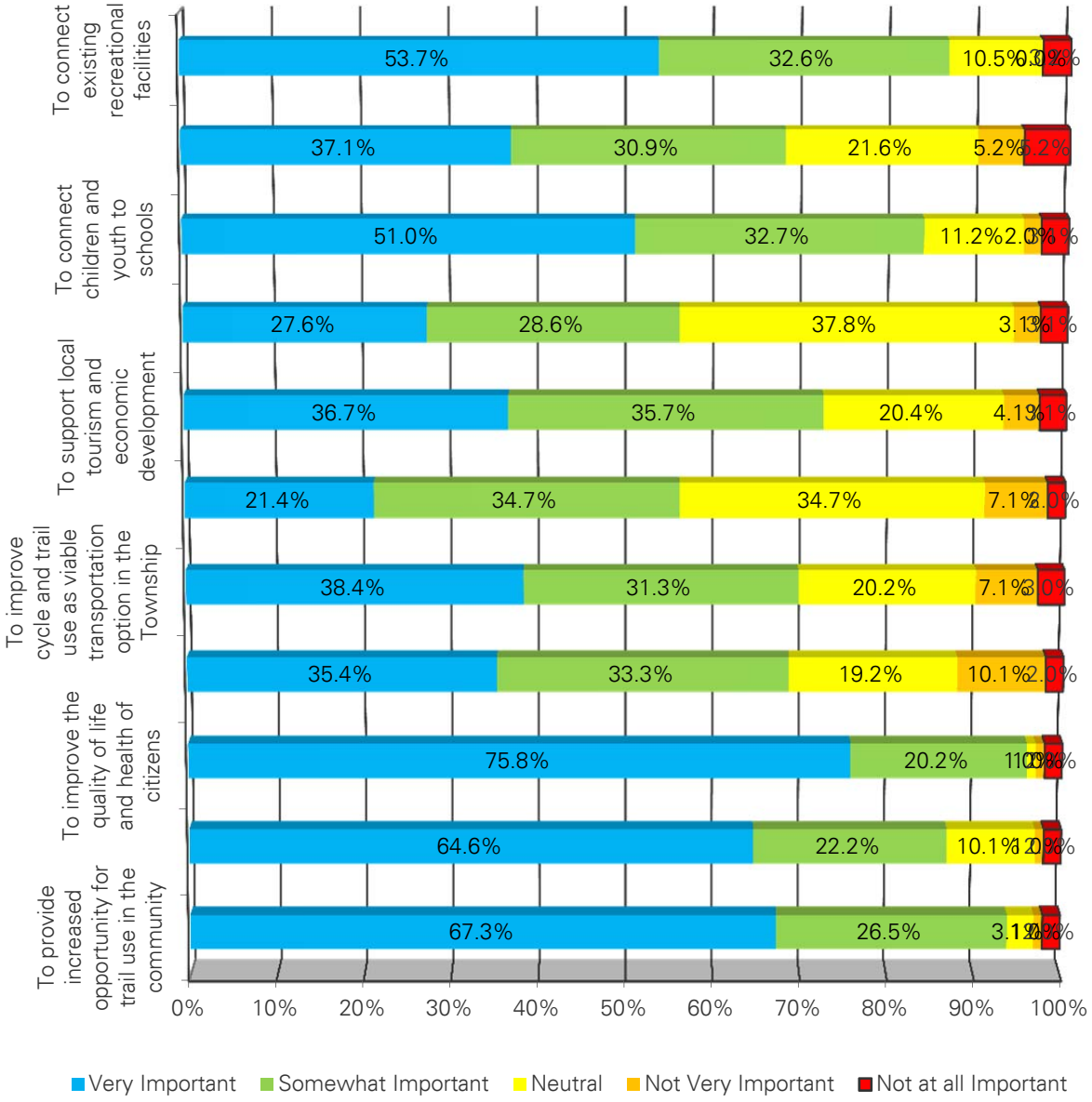


Response Findings: Respondents are supportive of the Township improving trails and cycling facilities through North Dumfries. 85.7% of respondents strongly agree or agree that the Township of North Dumfries should improve trail facilities and 91.4% of respondents strongly agree or agree that the Township should improve cycling facilities.

Potential Conclusions: The results could help show Council and Township staff that their residents are supportive of the Township's commitment to the development and improvement of trails and cycling facilities in North Dumfries.

Question 9:

Why do you think the Township should improve trails and cycling? Please indicate how important each of the following reasons are for developing the master plan for North Dumfries.



Response Findings: Respondents indicated that the Township of North Dumfries should improve trails and cycling to (95%) and to provide increased opportunity for trail use in the community (89%).

Potential Conclusions: As noted in Question 3, one of the primary reasons residents of North Dumfries use trails or cycling in the Township is for fitness or recreational purposes (94%). As such, it is plausible that most people would value the increased quality of life that can result from developing a long term trails/cycling strategy. In addition, as noted in Question #8 there is significant support for the Township to improve trails and cycling facilities. Increased investment leads to increased infrastructure which can increase the number of opportunities for trail and AT use throughout the community.

Question 10:

What are the top 3 locations in the Township or within the surrounding communities where you currently use trail or like to cycle?

Respondents identified the following as key locations to use trails or cycle:

- Cambridge to Paris Rail Trail
- Forest Tracts (Dryden Tract, Sudden Tract, Drynen Tract, etc.)
- Piper's Glen Park
- Grand Valley Trail
- Alps Road
- Wrigley Road
- Northumberland Street
- Ayr
- Roseville


Sudden Tract


Northumberland Street


Piper's Glen Park

Question 11:

Please let us know of 3 locations where you would like to see new or expanded trails or cycling routes.

Respondents identified the following as key locations to expand trail and cycling routes:

- North Dumfries Community Complex
- Along Nith River in Ayr
- Nith River Park
- Spragues Road
- Wrigley Road
- Greenfield Road
- Rail Trail in Branchton
- Rural roads


Rural Roads


Branchton Rail


Spragues Road

APPENDIX C

Trail / Cycling Design Guidelines

APPENDIX C TRAILS/CYCLING DESIGN GUIDELINES

C TRAILS/CYCLING DESIGN GUIDELINES

C.1 USING THE GUIDELINES

These guidelines have been prepared for the Township as a reference when implementing the Trails/Cycling network but are not intended to address every condition encountered. The intent is for Township staff to use these guidelines while also considering context sensitive design solutions on a project-by-project basis. In some cases an interim solution may be required for projects which cannot be completed in the short or medium-term. However, where possible the interim solutions should meet users' needs and safety concerns.

G1 → Adopt the trail/cycling design guidelines presented in Appendix C as the basis for the design of facilities.

G2 → The design guidelines should be distributed to designers and builders to ensure consist design and implementation.

The cycling facility design alternatives identified in these guidelines are reflective of the newly released provincial cycling guidelines found in Ontario Traffic Manual (OTM) Book 18: Cycling Facilities. When designing future on-road facilities OTM Book 18 should be the primary reference for facility selection and design. In addition to the design guidelines set out for the North Dumfries Master Plan the following guidelines and standards should also be referenced:

G3 → Township staff should use Ontario Traffic Manual Book 18 as a primary reference for the design of on-road cycling facilities.

- Ontario Traffic Manual (OTM) Book 15: Pedestrians (2011);
- Transportation Association of Canada Bikeway Traffic Control Guidelines (2008); and
- Accessibility for Ontarians with Disabilities Act 2003 (Accessibility Standards for the Built Environment).

Key Consideration: The Region's Active Transportation Master Plan includes design guidelines and selection criteria for active transportation facilities (see Section 3.7.3). These design guidelines should be used as a reference for the design of facilities along Regional roadways. In some cases there may be slight differences between facility type definitions; however, for the purposes of the Trails/Cycling Master Plan for North Dumfries the primary reference should be OTM Book 18 and 15.

C.2 KEY CONSIDERATIONS

C.2.1 USER GROUPS

Characteristics and preferences of users can be the driver behind facility design. If users experience a sense of comfort and safety when engaging in trail or cycling activities they are more likely to do so again. For the purposes of the Master Plan, pedestrians and cyclists are assumed to be the most common user group. However, additional, less frequent users such as inline-skaters, cross-country skiers and snowshoers may be seasonal users of the system.

G4 → The design of the Trails/Cycling network should be based on design criteria pedestrians and cyclists.

Design considerations and criteria for pedestrians and cyclists have been identified below.

Pedestrians

Considerations:
Typically travel at lower speeds (with the exception of some groups e.g. joggers) and generally require less manoeuvering space.

Groups:
Walkers, hikers and joggers as well as people with mobility devices (similar operating speed).

Interest & Motivator:
Varies for each group but can range from leisure and recreation to fitness and contact with nature.

Types of Trips:
People walking may engage in commuter trips and those hiking and jogging will typically engage in recreational trips – hikers 5 – 30 km trips and joggers 3 to 15 km trips.

Facility Types:
Off-road multi-use trails, sidewalks or multi-use trails in place of a sidewalk.

Cyclists

Considerations:
Typically travel between 15 – 20km/h and 18 – 30 km/h on road and 30 to 50km/h downhill.

Groups:
Short distance and long-distance on-road cyclists, mountain bikers and commuter cyclists.

Interest & Motivator:
Varies for each group but can include fitness, tourism or day to day transportation.

Types of Trips:
Cyclists may engage in commuter trips, long distance cycling (multi-day) or for fitness purposes.

Facility Types:
On-road cycling facilities (signed bicycle route with or without sharrows, bike lanes, etc.) and off-road trails with granular or hard surfaces.

C.2.2 OPERATING SPACE

When designing a multi-use trail careful consideration should be given to the physical, aesthetic and environmental requirement for each trail type. Design criteria related to operation space, design speed, alignment and clear zone are often governed by the needs of the fastest, most common user group on the majority of the trail - the cyclist. This is not to say that all multi-use trails need to be designed to meet cyclist requirements; however, when trails are being designed it is prudent to use design parameters for this user group as well as the provincial build environment standards for trails. Generally an operating width of 1.2m to 1.5m is sufficient to accommodate forward movement by most cyclists. For additional considerations regarding the operating space of cyclists refer to Ontario Traffic Manual Book 18 section 2.2.

G5 → When developing trail design concepts the minimum and preferred operating space widths should be considered.

G6 → Additional consideration for horizontal and vertical clear distances and longitudinal and cross slope should also be considered.

For other user groups the operating space varies and is dependent on the trail design considerations. Table C.1 highlights the minimum and preferred operating space for potential trail users.

Table C.1 Minimum and Preferred Operating Space for Trail Users

Operating Condition	Minimum (m)	Preferred (m)
One-way Travel (one wheelchair user)	1.2	1.5
One-way Travel (two pedestrians)	1.5	2.0
One-way Travel (one cyclist)	1.2	1.5+
One-way Travel (one in-line skater)	2.3	3.0
One-way Travel (one equestrian)	1.7-2.4	4.3-5.5
Two-way Travel (two cyclists)	3.0	3.0+
Two-way Travel (two wheelchair users)	3.0	3.0+

The operating space for trail users also takes into consideration horizontal and vertical clear distance or the clear space abutting the trail. For this area the preferred horizontal clear distance is 1.0m and vertical clear distance is 3.0m. A trail's curve radius should also be considered and is dependent on the anticipated user, design speed, width and trail slope. A minimum radius of 10m is recommended but can increase based on the varying characteristics and users on the trail.

C.2.3 SURFACE TYPES

There are a number of surface type options, each with their own advantages and disadvantages related to cost, availability, ease of installation, lifespan and compatibility with various user groups. There is no one surface material that is appropriate in all locations. During the design stage, trail surface materials should be considered in the context of the trail location and the anticipated users. Possible trail surface types include:

G8 → When designing trails the Township should consider the trail location and users to confirm the preferred surface type.

- Concrete
- Unit Pavers
- Asphalt
- Granular (for bases)
- Granular
- Stone Dust
- Mulch and Wood Chip
- Earth / Natural Surface
- Soil Cement and Soil Binding Agenda
- Wood

C.2.4 LIGHTING

Lighting trails must be carefully considered. There are few municipalities that select to light their entire trail system. However, there may be some locations along the trail where lighting may be appropriate. The decision of whether or not to light segments of the network should be made on a project-by-project basis but could include:

G9 → Lighting of trails should be reviewed on a project-by-project basis based on the recommended locations and confirmed by staff.

- Main connections to important attractions such major parks;
- Heavily used commuter routes (anecdotal information on volume of use supported by user counts);
- Key school routes; and
- Numerous requests for lighting, supported by similar results through public consultation.

Where it has been determined that lighting is appropriate, the quality and intensity of lighting should be consistent with prevailing standards that fit the setting being considered.

C.3 SELECTING & DESIGNING ON & OFF-ROAD FACILITIES

C.3.1 WHAT ARE THE FACILITIES?

The Trails/Cycling facilities proposed for the Township of North Dumfries can be divided into two categories: off-road trails and on-road cycling linkages.

G10 → The guidelines identified in Appendix C are intended to inform the detailed design and construction of on and off-road trails and cycling facilities.

Off-road Trails

Include trails of varying widths, alignments, and surface types which are typically located on publically owned lands (e.g. Township, Region or Grand River Conservation Authority) such as conservation areas, public open spaces, valleys and parklands as well as linear corridors or abandoned railway lines and unopened road allowances.

On-road Cycling Linkages

Refers to facilities specifically designed for cyclists found within the road right-of-way. The facilities are proposed on or along an existing road or may be considered when exploring future roadway improvements.

Key Consideration: For the purposes of this master plan the focus has been placed on identifying off-road trail connections where possible with select on-road linkages that provide direct connections between the trails and key community destinations within North Dumfries. Though on-road cycling linkages have been identified to complement the Township's system of existing and proposed off-road trails and the Region's on-road cycling network, the Township is also encouraged to explore additional pedestrian connections including sidewalk connections or multi-use trails in place of a sidewalk where the space is available. Additional design details are presented in the following section.

Off-road Trails

The preferred design of off-road trails should be confirmed by Township staff based on an

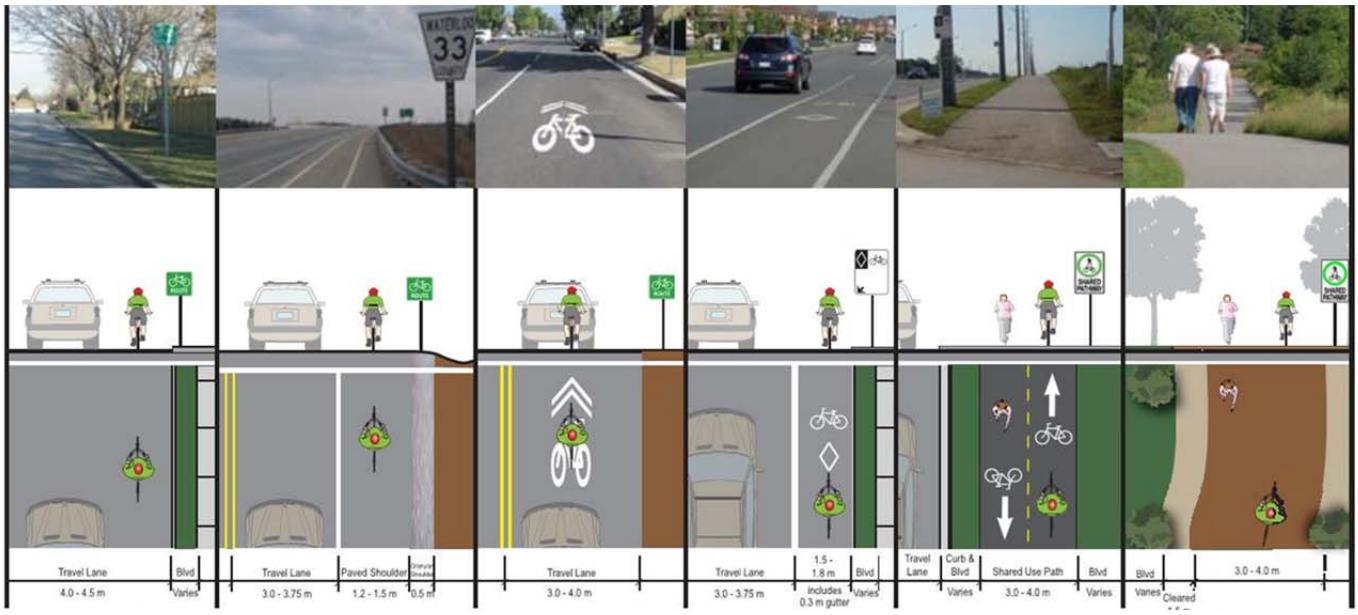
assessment of existing characteristics of the site and its natural surroundings. The design guidelines prepared for the Township are intended to be used by staff and those responsible for the design and implementation of trails in the Township. Design concepts have been prepared and should be considered as the Township proceeds with implementation. A summary of the design details and their application is provided in the table below. The design details are provided at the end of Appendix C.

Trail Types	
Within Road Right of Way	• 3.0m Wide Asphalt Multi-Use Trail • 3.0m Wide Trail – Construction Detail
Outside Road Right of Way	• 3.0m Wide Trail – Construction Detail • 2.0m – 2.4m Wide Limestone Trail
Natural Setting	• Mulch Trail in a Natural Setting
Wetland/Swamp/Bog	• Boardwalk (See section C.4.3 for details)
Rail Corridor	• Active Rail with Trail "Rails with Trails"
On Slope	• Inslope with Drainage Pipe • Outslope • Retaining Walls
Trail Amenities	
Type	• 1.4m High Cyclist Rub Rail • Trail Lookout Structure
Trail Access	
Type	• Typical Major Staging Area (See section C.4.4 for details) • Removable Steel Bollard (See section C.4.3 for details) • Heavy-Duty Swing Gate (see Section C.4.3 for details)
Road Crossings – Refer to C.4.1 Crossings for further information	
Rural	• Rural Road Crossing
Urban	• Urban Intersection Crossings • Signalized and Unsignalized Mid-Block Crossing • Crossrides
Signage	
Layout	• Typical Trail Signage Layout
Type	• Major Trailhead Sign • Minor Trailhead Sign • Interpretive Sign • Directional Sign • Regulatory, Warning and Custom Information Signs

On-road Cycling Linkages

Where possible off-road trail linkages have been identified throughout the Township. However, in cases where an off-road connection is not realistic or feasible to facilitate connectivity in the network on-road connections should be implemented. This is the case in rural areas where long distance connections are required to link existing and proposed off-road trails. This may also be the case in urban and suburban areas where public space is found within park lands or the road right-of-way.

In locations where public land is not available and off-road trails on private lands are not feasible the Township is encouraged to explore on-road connections using the road network. For these linkages, cyclists are expected to use the on-road cycling facilities or multi-use trails within the boulevard and pedestrians are expected to use the sidewalks in urban areas and paved shoulders in rural areas. There are a number of design alternatives which exist for the Township. The graphics below illustrate some of the on-road design treatments which are proposed or could be considered for future implementation throughout the Township.



Signed Bike Route on Local Roadway | Signed Bike Route with Paved Shoulder | Signed Bike Route with Sharrow | Bike Lane | Multi-use Trail within the Road Right-of-Way | Multi-use Trail outside of the Road Right-of-Way

In some locations a context sensitive solution may be required to address site-specific characteristics including the speed and volume of motorized vehicles, surrounding natural areas or proximity to key community destinations e.g. schools. In these situations practitioners are encouraged to work through the facility selection process identified in OTM Book 18 – as described in section C.3.2.

C.3.2 HOW ARE FACILITIES SELECTED?

When selecting the preferred facility type the Township is encouraged to use the Facility Selection Tool identified in OTM Book 18.

The tool is made up of three steps and is intended to be used by practitioners to aid in the selection and implementation of on and off-road cycling facilities. Figure C.6 illustrates the process.

G11 → The three step facility selection tool as identified in OTM Book 18 should be used when selecting the preferred facility type as part of the trails/cycling network.

Step 1	Step 2A	Step 3
Facility pre-Selection (use Nomograph – Figure 3.3 in OTM Book 18	Inventory Site Specific Conditions	Justify Rationale (Prepare Model Worksheet) – Sample in OTM Book 18
	Step 2B	
	Review Design Considerations and Application Heuristics (section 3.2.2.2 OTM Book 18)	
	Step 2C	
	Select Appropriate and Feasible Cycling Facility Type	

Step 1 allows practitioners to pre-select the desired facility type based on the motor vehicle operating speed and the average daily traffic volume. This step is accomplished through the use of the 'Desirable Bicycle Facility Pre-Selection Nomograph' illustrated in Figure 3.3.

Step 2 guides practitioners to take a more detailed look at site specific characteristics in order to determine the appropriateness of the pre-selected facility type. Practitioners use this step to critically evaluate the situation in order to select the most appropriate facility type.

Step 3 guides practitioners in documenting their rationale for their final decision. Sections 3.2.2.1 to 3.2.2.3 provide more detailed information about each step.

C.4 ADDITIONAL DESIGN FEATURES

C.4.1 CROSSINGS

Mid-Block Crossings

Minor Roads

When designing crossings of lower volume, and / or lower speed roadway consideration should be given to the creation and maintenance of an open sight triangle at each crossing point; access barriers to prevent unauthorized motorized users from accessing the pathway; advisory signing along the roadway in advance of the crossing point to alert motorists to the upcoming crossing; signing along the pathway to alert users of the upcoming roadway crossing; the alignment of the crossing point to achieve as close as possible a perpendicular crossing of the roadway, to minimize the time that users are in the traveled portion of the roadway and a concrete ramp in boulevard between the sidewalk and roadway; and curb ramps on both sides of the road.

G12 → Crossings of local minor roads at mid-block locations should include advance advisory pedestrian crossing signs on the roadway approach and a yield or stop sign on the trail approach.

Mid-block Crossing on Minor Road
Source: City of Toronto

Pavement markings, to delineate a crossing, should not be considered at "uncontrolled" intersections with roads. At uncontrolled intersections users are required to wait for a gap in traffic before crossing. Pavement markings designed to look like a pedestrian cross over may give users the false sense of right-of-way over motor vehicles, contrary to the Highway Traffic Act.

In some locations signing may not be enough to get users to stop before crossing the road. Under these circumstances or in situations where the sight lines for motorists are reduced, the addition of other elements may be necessary. Changing the alignment may help to get users to slow and stop prior to crossing. Changes to the streetscape may also provide a cue and traffic calming effect for vehicles.

Median Refuge Islands

Refuge islands are medians placed in the centre of the roadway separating opposing lanes of traffic. They are intended for mid-block crossings of multi-lane roads and allow users to cross one direction of traffic at a time, using the refuge island as a resting area. Refuge islands are particularly suited for roadways with multiple lanes.

Typical refuge islands are designed with a minimum length of 6m and a width of at least 1.8 m (2.4 m is preferred to accommodate wheelchairs in a level landing 1.2 m wide). Curb ramps should be provided to allow access to the roadway and island for wheelchair users and detectable warning devices should be placed at the bottom of the curb ramps. The pathway should be constructed of concrete as users with low vision or complete visual impairment can better detect the change in texture and contrast in colour supplemented by the detectable warning devices to locate the refuge island. Appropriate tapers are required to diverge traffic around the island based on the design speed of the roadway.

Sample Median Refuge Island
Source: www.catsip.berkley.edu

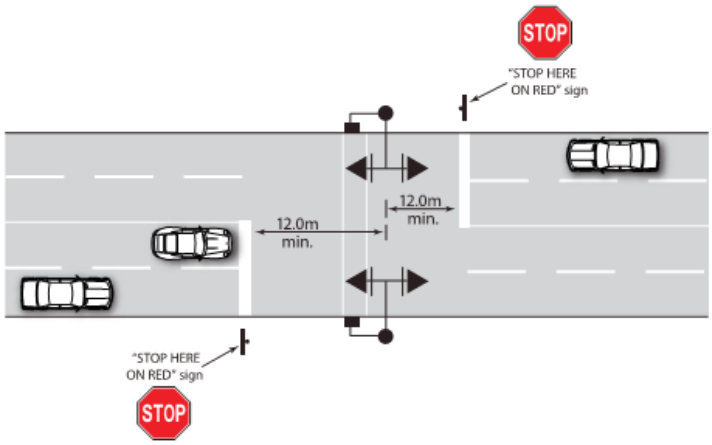
Signage can include "Keep Right" and "Object Marker" warning signs installed on the island facing traffic, and "Pedestrian Crossing Ahead" warning signs installed on the roadway approaching the crossing. "Wait for Gap" warning signs can be installed on the far side of the crossing and on the refuge island if pedestrians are failing to cross in a safe manner.

Pavement markings are not provided unless the crossing is at an intersection controlled by signals, stop or yield signs, or controlled by a school crossing guard. When designing the space, railings are not recommended as they are a hazard in potential collisions and some pedestrians will walk in front of or behind the island to avoid the railings, which is not as safe as waiting on the refuge island.

Pedestrian Signals

Midblock pedestrian signals may be considered when crossing a high volume and / or multi-lane road, a grade separation is not practical or if the nearest signalized crossing is far enough away from the trail crossing that it is inconvenient for trail users to travel to.

The pedestrian signal is intended to assist pedestrians and is a more positive and effective crossing device than a pedestrian crossover (PXO).



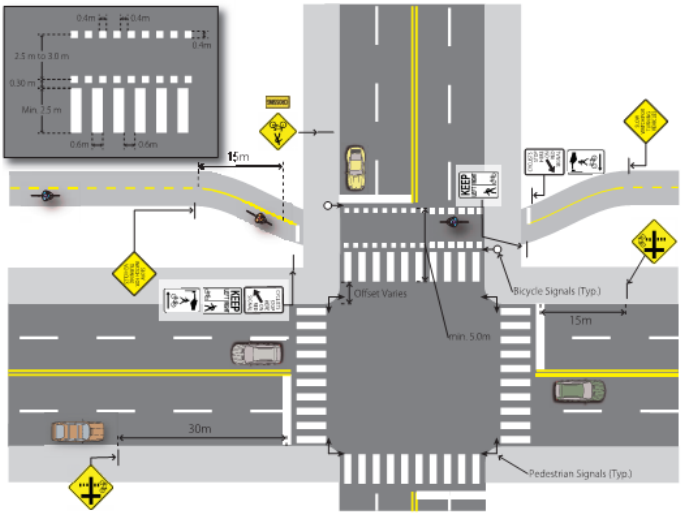
Midblock Pedestrian Signal
Source: OTM Book 15

A midblock pedestrian signal includes standard traffic signal indications to control traffic on the major street and the application of standard pedestrian "Walk" and "Don't Walk" signals, activated by push buttons, for pedestrians wishing to cross the major street at the designated crossing point. For additional details regarding the application of pedestrian signals please refer to Section 3.2.2 in Ontario Traffic Manual Book 15.

G12 → At-grade mid-block trail crossing of a collector or arterial roadway should be controlled by pedestrian signals where possible.

Crossings at Controlled Intersections

There are a number of design alternatives which could be used to help pedestrians and cyclists to safely cross at controlled intersections. The crossing design can vary based on the type of controlled intersection – signalized or stop controlled. A design alternative that has recently emerged is the cross-ride. A cross-ride can be used by both pedestrians and cyclists. It provides a designated space for both users and helps to prevent possible conflicts at the crossing. Recently implemented in communities such as the City of Mississauga, the design feature is included in OTM Book 18 specifically in Section 4.4.1.4.



Separated Pedestrian and Cyclist Crossride (Signalized)
Source: OTM Book 18

Crossings at Active Railways

In order to establish a pathway crossing of an active rail line, proponents must submit their request directly to the railway company. Submissions need to identify the crossing location and its basic design. Designs should be consistent with Draft RTD-10, Road/Railway Grade Crossings: Technical Standards and Inspection, Testing and Maintenance Requirements (2002) available from Transport Canada. In the event that an agreement cannot be reached on some aspect of the crossing, then an application may be submitted to the Canadian Transportation Agency, who may mediate a resolution between the parties.

C.4.2 BRIDGES, UNDERPASSES & TUNNELS

Bridges

Where possible, the trail network should make use of existing bridges (e.g. pedestrian bridges, vehicular bridges and abandoned road/railway bridges). In cases where this is not possible, a new structure is needed. The type and design of a structure needs to be assessed on a project-by-project basis. Some considerations include:

- Prefabricated steel truss bridge as a practical, cost effective solution;
- A wooden structure constructed on site in locations where crossing distances are short;
- Railings (at a minimum height of 1.37m), if the height of the bridge deck exceeds 60cm above the surrounding grade. Should also consider designing with a cyclist "rub rail" to prevent bicycle pedals and handlebars from becoming entangled in the pickets;
- Accessibility and ability to maintain the structure; and
- Decking running perpendicular to the path as opposed to over decking running parallel, as the latter is more difficult for use by wheelchairs, strollers, in-line skates and narrow tired bicycles.

To meet accessibility needs a hard surface should be used at trail approaches and bridge decking should be spaced sufficiently close to allow safe passage by a person using a mobility-assisted device.

Underpasses & Tunnels

Often an underpass or tunnel is the only way to cross significant barriers such as elevated railways and multi-lane highways. Designing trails through underpasses and tunnels can be challenging because of the confined space. Underpasses should be wide enough to accommodate all trail users whether they are traveling by foot, bicycle, in-line skates, wheelchair or other forms of active transportation. Where feasible, it is suggested that trail widths through underpasses be equal to or greater than that of the approaching trail. For additional details regarding the design of trail underpasses and tunnels please refer to Section 4.0 – Physically Separated Facilities in Ontario Traffic Manual Book 15.

Crossing of Active Rail Line


Brampton Trail Bridge Crossing

C.4.3 TRAIL STRUCTURES

Gates & Barriers

Access barriers are intended to allow free flowing passage by permitted users, and prohibit access by others (i.e. motor vehicles). Barriers typically require some mechanism to allow access by service and emergency vehicles. Depending on site conditions, it may also be necessary to provide additional treatments between the ends of the access barrier and limit of the trail to prevent bypassing of the barrier altogether. Each access point should be evaluated to determine if additional treatments including plantings, boulders, fencing or extension of the barrier treatment are necessary. Gates and barriers should be designed to encourage cyclists to dismount. They can generally be grouped into three categories.

Bollards

The bollard is the most simple and least costly barrier, and can range from permanent, direct buried wood or metal posts, to more intricately designed removable cast metal units. A bollard is placed in the trail bed to create two "lanes" for users to follow as they pass through. Although the removable bollard system provides flexibility to allow service vehicle access, they can be difficult to maintain as the metal sleeves placed below grade can be damaged by equipment and can become jammed with gravel and debris from the trail bed. Bollards should have reflective materials so they are easily seen at night.

Swing Gates

The single swing gate combines the ease of opening for service vehicle access, with the ease of passage of the bollard. Gates also provide a surface/support for mounting signage. The swing gate should provide a permanent opening to allow permitted users to flow freely through the barrier.

Bollards & Swing Gate Application
Source: Cities of Toronto & Burlington

The width of the permanent opening must also consider the passage by wheelchairs, wide jogging and double strollers and bicycle trailers and electric scooters, while restricting passage by unauthorized vehicles such as snowmobiles and all-terrain vehicles. An offset gate is similar to a single swing gate, except that barriers are paired and offset from one another.

Although they can be effective in limiting access by unauthorized users and can be easily opened by operations staff, some groups including cyclists, especially cyclists pulling trailers and wheelchair users, can have difficulty negotiating the offset swing gate if the spacing between the gates is not adequate.

In urban areas the single swing gate or bollard is quite effective for most applications. For large parks, park service access/pathway routes, more rural settings and locations where unauthorized access is an ongoing problem, a more robust single swing gate should be considered.

Boardwalks

Where trails pass through sensitive environments an elevated trail bed or boardwalk is usually required to minimize impacts on the natural feature. If these areas are left untreated, users tend to walk around obstacles such as wet spots, gradually creating a wider, often braided trail through the surrounding vegetation. Low profile boardwalks have been successfully employed. Where the trail is in a high profile or high use location, or where the trail surface must be greater than 60cm above the surrounding grade, a more sophisticated design and installation is necessary. This is likely to include engineered footings or abutments, structural elements and railings. A professional who is trained in structural design and approval requirements should be retained for these types of applications.

Sample Boardwalk Application , Hamilton
Source: MMM Group

Switchbacks & Stairs

Pedestrian and some self-propelled users are capable of ascending grades of 30% or more whereas some users are limited to grades of less than 10%. Once trail slopes exceed the 5% accessible threshold and are long (i.e. more than 30m) alternative methods of ascending slopes including switchbacks should be considered. Where construction is feasible, switchbacks are generally preferred because they allow wheeled users to maintain their momentum, and there is less temptation to create shortcuts. Switchbacks are constructed with turns of about 180 degrees and are used to decrease the grade of the trail.

G13 → When slopes exceed 15% or where there is inadequate room to develop a switchback or another accessible solution, a stairway system should be considered based on careful consideration regarding the potential design.

A properly constructed switchback also provides outlets for runoff at regular intervals, thus reducing the potential for erosion. Switchbacks typically require extensive grading and are more suited in open locations where construction activity will not cause major disruption to the surrounding environment. They can be difficult to implement in wooded areas.

C.4.4 TRIP END FACILITIES

Bicycle Parking

The provision of bicycle parking is a vital part of a connected and continuous trails and cycling network. A lack of adequate parking can deter many cyclists from considering the use of their bicycle as a mode of transportation. When designing and implementing bicycle parking two types can generally be considered: bicycle racks and lockers. Additional design considerations and guidelines for bicycle parking can be found in the TAC Manual and OTM Book 18.

Bicycle Racks

Rack Element	Rack	Rack Area
The portion of a bicycle rack that supports the bicycle.	A grouping of rack elements.	The area where more than one bicycle rack is installed - separated by aisles.
• Joined on any common base or arranged in a regular array and fastened to a common mounting surface. • Various types of designs e.g. "Ribbon" rack, the "Ring" rack, the "Ring and Post" rack and the "Swerve" rack. • Should support the bicycle by its frame in two places and prevent the wheel from tipping over. • Should allow front-in parking and back-in parking with a U-lock able to lock the front and the rear wheel.	• Should be securely fastened to a mounting surface to prevent the theft of a bicycle attached to a rack. • Be easily and independently accessed by the user. • Should be arranged to allow enough room for two bicycles to be secured to each rack element. • Should be arranged in a way that is quick, easy and convenient for a cyclist to lock and unlock their bicycle to and from the rack.	• Recommended minimum width between aisles should be 1.2 m. Aisle widths of 1.8 m are recommended in high traffic areas. • A 1.8 m depth should be provided for each row of parked bicycles. • Large bicycle rack areas with a high turnover rate should have more than one entrance. • Rack area should be sheltered to protect bicycles from the elements. • Bicycle racks should be placed no more than 15m from an entrance.

Bicycle Lockers

Bicycle lockers are individual storage units; they are weather-protected, enclosed and operated by a controlled access system. Some lockers are set up for multiple users (i.e. coin operated or secured with personal locks). On average, two standard car parking spaces (of 5.6m x 2.6m each) can accommodate 10 individual bicycle locker spaces - this may differ depending on the locker model.

Bike Lockers require a level surface, clearance for locker doors and should be located close to building entrances or on the first level of a parking garage and within range of security surveillance. Bicycle Lockers are best placed away from sidewalks and areas with high pedestrian traffic. High quality, durable models should be able to withstand regular use, intense weather conditions and potential vandalism. The installation of lockers and showers at workplaces and educational institutions helps to promote the use of cycling for utilitarian purposes. Businesses or institutions with more than 20 employees commuting by bicycle should be encouraged to offer these facilities.

Rest & Staging Areas

Network continuity, connectivity and feasibility are further enhanced through the implementation of staging areas. In some cases, amenities can be the factor which makes an individual decide whether or not to make a trip using an active mode of transportation. Staging areas can be appropriately designed to reinforce the Township's commitment to promoting trails and may include lighting, rest areas, car and bicycle parking, signage, loading / unloading areas, garbage receptacles, washroom and amenity buildings and gates / access barriers.

G14 → Rest and staging areas should be provided at strategic locations such as gathering points, attractions and destinations as well as other locations where users are expected to stop.

In the built up areas of the Township, staging areas could be integrated into many of the existing park spaces and tourist destinations. In the rural areas, staging areas may play a key role in the marketing package for trail use and tourism. If properly implemented and promoted, it may help to reduce the tendency for trail users to park on rural roadsides to access trails. In the master plan report suggested staging area design options and a hierarchy of staging area types in section 3.0. The Township should consider implementing this approach to the design and implementation of trail/cycling amenities.

C.4.5 MAINTAINING THE FACILITIES

Maintenance costs associated with developing a trails/cycling network must be acknowledged. Poor quality roadways and other infrastructure can present risks to users. Effective route and system design can decrease maintenance costs and deter liability risks. The following are maintenance considerations and best practices which should be considered by the Township.

Painting Bike Lanes
Source: greenactioncentre.ca

Trash and Litter Removal and Grass Cutting

Perhaps one of the most difficult tasks in maintenance is collecting the increasing amount of litter in open spaces and along road sides. While the task of litter collection is primarily a municipal responsibility, in recent years it has become common practice to encourage citizens' groups to assist in litter control and vegetation management. This maintenance can occur in conjunction with grass cutting. The grass should typically be cut down to approximately 75mm on either side of a trail or in boulevard spaces adjacent to sidewalks.

Maintaining Off-road Cycling Trails
Source: cmbcyukon.ca

Vegetation

Vegetation should be routinely cut back since overgrown shrubs and low-hanging branches can obscure signs and pose a hazard to users. Adequate clearance and sight distances should be maintained at driveways and intersections so that users are visible to motorists. Installing root barriers during trail and sidewalk construction may assist in preventing premature break-up of the surfaces. Maintenance of vegetation originating on private property should be required through Township or Regional by-laws.

Surface Maintenance

Asphalt trails are most suitable for intense high traffic multi-use areas and have a life span of approximately 8 to 15 years and requires a base of properly compacted granular 'A'. Inspection of asphalt trails should be undertaken at least once a year, especially for potholes and cracks in the spring. This is particularly true given the regular freeze-thaw cycles which are experienced throughout Canada.

Leaf Removal

Piles of wet leaves can present a serious hazard to cyclists when encountered on trails or in roadway gutters. It is difficult for cyclists to stop on leaves and falls can occur. Leaves can also hide potholes, debris and drainage inlets. It is recommended that excessive fallen leaves be removed from the travelled portion of the pedestrian and cycling facility as soon as possible to prevent accidents. Leaf removal is especially important in older sections of the Township due to the full tree canopies that are prevalent on many streets.

Winter

Some cyclists are active year round, though their numbers are typically reduced during winter months. Nevertheless, measures should be taken to ensure that cycling in the winter can remain a realistic transportation alternative, especially as the network is expanded. The Township should endeavour to clear roads of snow as soon as possible after a snowfall. As the network is expanded, roads with designated on-road cycling facilities or signed-only cycling routes that are part of the network should be considered for maintenance once the Township's existing roadway maintenance responsibilities have been met.

Once these requirements have been met, priority should be given to roads that have been designated as the "spine" tier of the network. This means that paved shoulders or bike lanes on these roads would be cleared of snow to accommodate cyclists following the roads that the Township is legally required to maintain. During the winter months, snow and ice should be regularly removed, when possible, from the network with a priority placed on the primary routes of the network. Liability is limited when ice is eliminated due to good drainage design and efficient snow removal schedules.

Following the end of winter, the use of cycling facilities can be delayed due to accumulated snow and or debris that may still be present in locations where the sun does not reach until later in the season. Should a small section of the network be blocked by snow and debris accumulation, it could affect an entire area. Several weeks of system use could be added to the year with several well-timed snow and debris cleaning per year. Although it may not be feasible or necessary to clear all multi-use trails in the winter, consideration should be given to clearing trails that provide key connections or links to "spine" segments of the network.

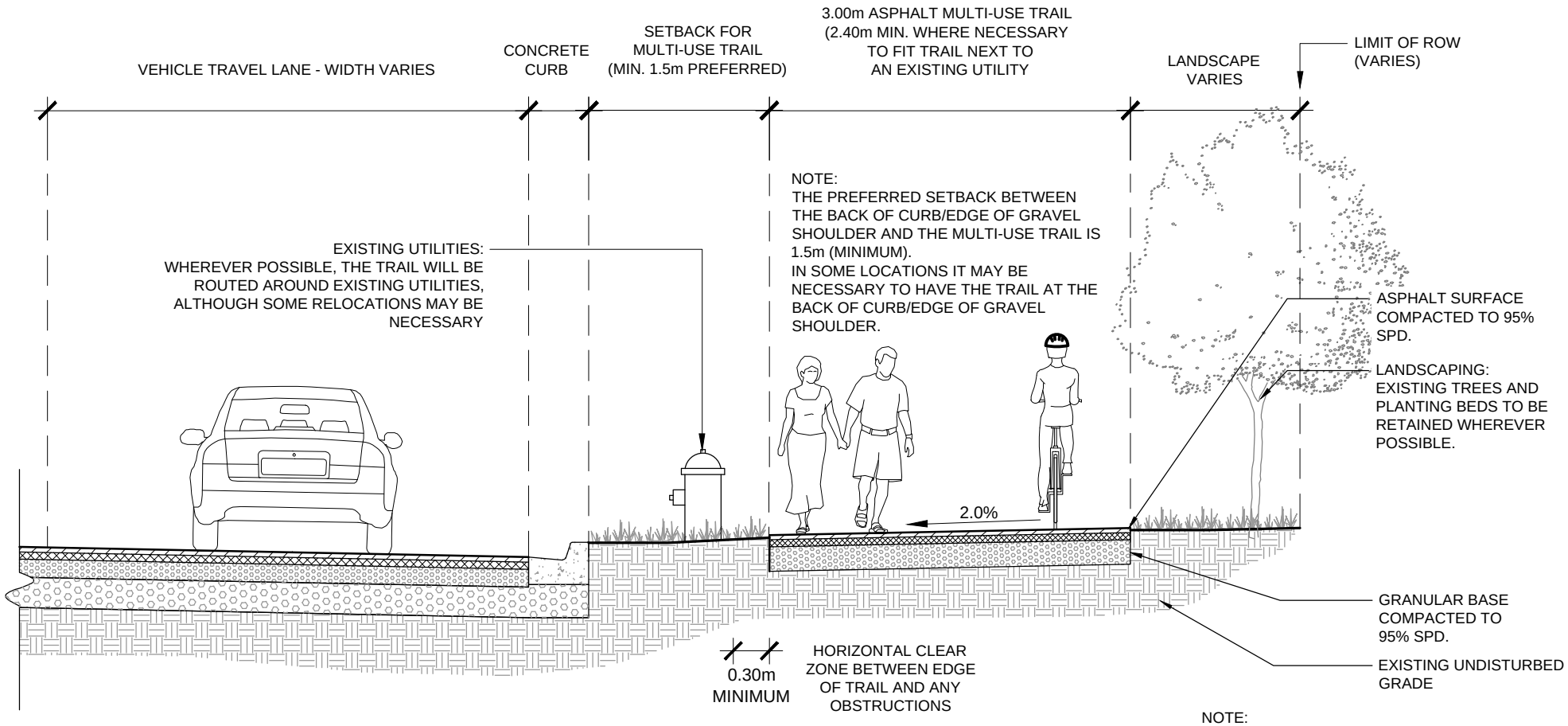
C.4.6 LIABILITY

Through the implementation of an asset replacement program, the risk of liability can be significantly reduced if the Township provides adequate resources and coordinated programs for good network design, construction, monitoring, maintenance and repairs. A well-constructed network that is free of potholes, ruts and obstructions allows the user to travel safely. Regular inspection and repair will keep the surface in a smooth and level condition.

Signing, as a warning mechanism, could also reduce liability concerns. Signing throughout the network should be designed to warn the off-road users of road crossings, steep grades and low clearance underpasses. The ultimate goal for limiting liability is to provide a safe system through effective design, construction, monitoring and maintenance techniques.

For off-road trails that comprise part of the trails/cycling network, an annual review and inspection should be undertaken. This should be complemented by standard weekly-monthly patrols as required by the Province's minimum maintenance standards. Staff representing the jurisdiction or property owner through which a route or system passes should be cognizant of potential hazards such as broken tree limbs and damaged signs. Trail erosion is a result of high water and the undermining of off-road trail structures. Extra care should be taken with respect to ensuring sight lines are not compromised. Acts of vandalism should be addressed as soon as possible. Ensuring the system is safe and litter free will help promote its use to residents and visitors.

Asphalt off-road trails should be swept once a year, following winter and prior to special events. Trails that are not maintained in the winter should be signed accordingly and spring sweeping should be a major priority for these facilities. Trails that are intended to be challenging and that would be compromised by sweeping should be exempt from this policy.



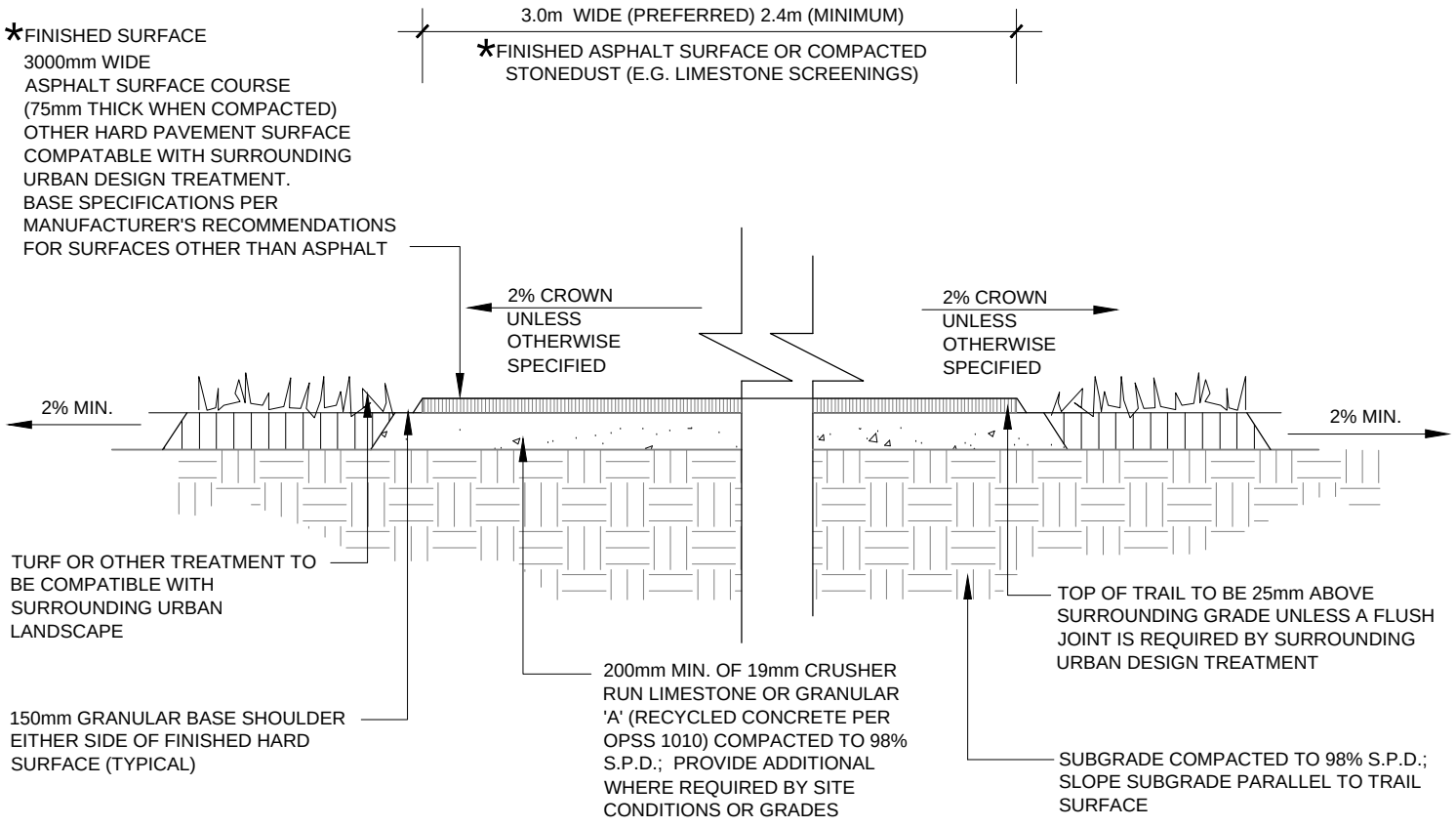
NOTE:
EXISTING VEGETATION IS TO BE MAINTAINED TO PROVIDE A VERTICAL CLEAR ZONE OF AT LEAST 2.5m FROM THE MULTI-USE TRAIL SURFACE TO THE LOWEST BRANCHES / LEAVES AND A HORIZONTAL CLEAR ZONE OF AT LEAST 0.3m FROM THE EDGE OF THE MULTI-USE TRAIL.

TRAIL TYPES - WITHIN ACTIVE ROAD RIGHT-OF-WAY

SCALE = 1:50

The TOWNSHIP of NORTH DUMFRIES

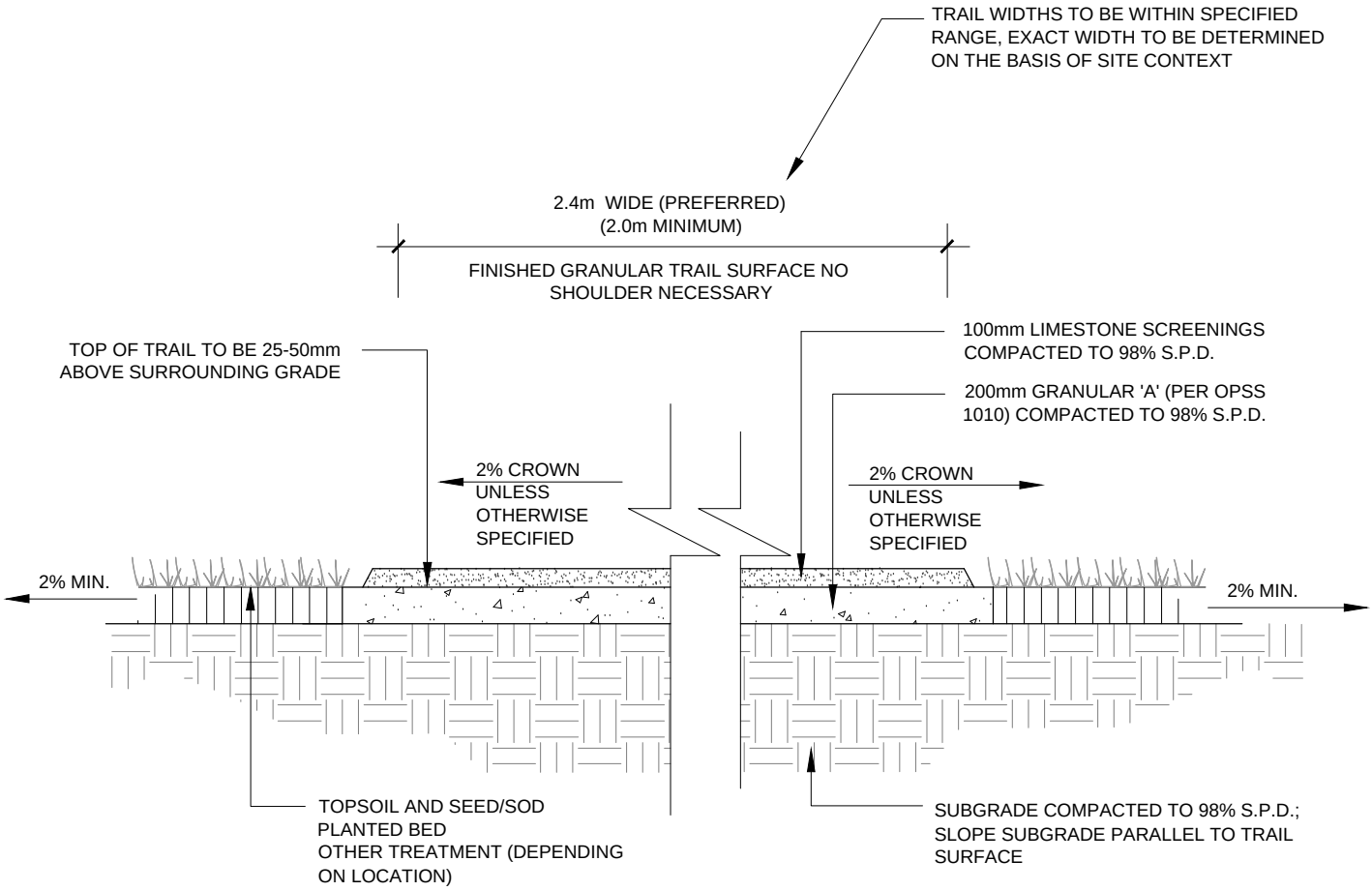
3.0m WIDE ASPHALT MULTI-USE TRAIL



NOTE:
THIS TRAIL CAN BE APPLIED IN A PUBLIC PARK OR OPEN SPACE, UTILITY CORRIDOR, IN OPEN ROAD ALLOWANCE OR ABANDONED RAILWAY LINE.

TRAIL TYPES - OUTSIDE OF AN ACTIVE ROAD RIGHT-OF-WAY	SCALE = 1:40	The TOWNSHIP of NORTH DUMFRIES

3.0m WIDE TRAIL

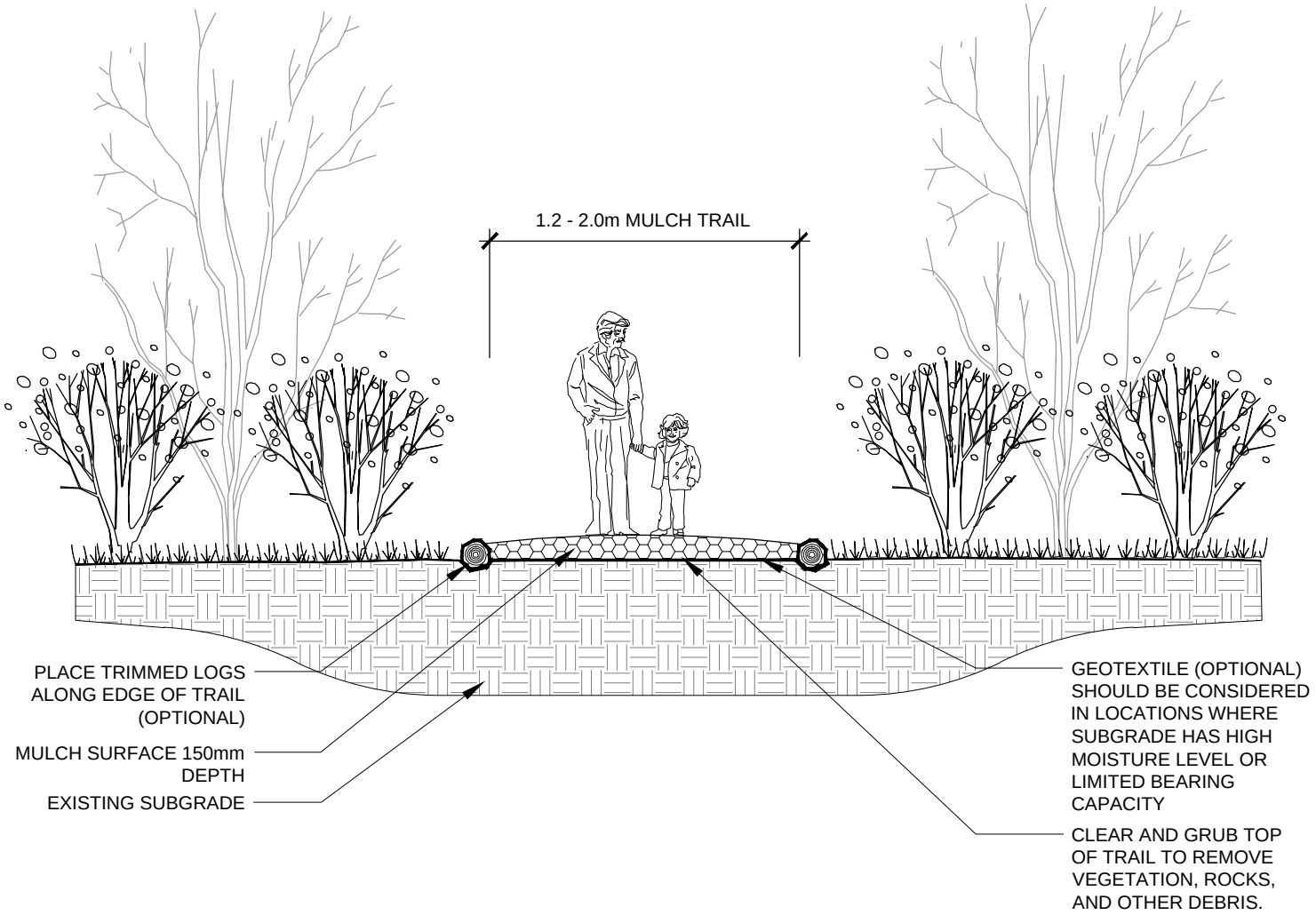


NOTE:

- THIS TRAIL CAN BE APPLIED IN A PUBLIC PARK OR OPEN SPACE, UTILITY CORRIDOR, IN OPEN ROAD ALLOWANCE OR ABANDONED RAILWAY LINE.
- WHERE CYCLING IS AN INTENDED USE, TRAIL SHOULD BE 2.4m TO ACCOMMODATE 2-WAY TRAVEL.

TRAIL TYPES - OUTSIDE OF AN ACTIVE ROAD RIGHT-OF-WAY	SCALE = 1:40	The TOWNSHIP of NORTH DUMFRIES

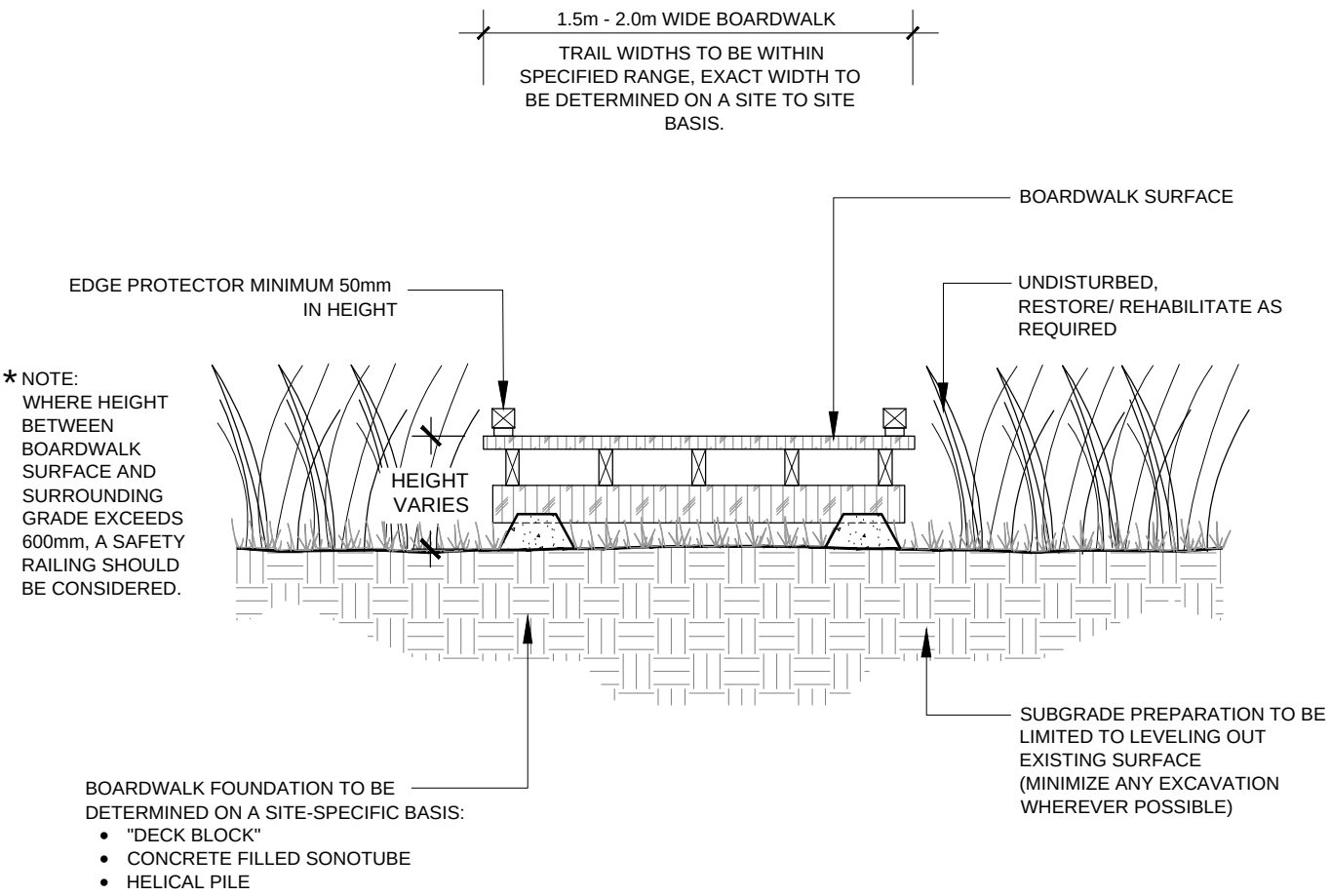
2.0m - 2.4m WIDE LIMESTONE TRAIL



NOTE:
MULCH TRAILS SHOULD NOT BE INSTALLED WITHIN TERMITE ZONES.

TRAIL TYPES	SCALE = 1:50	The TOWNSHIP of NORTH DUMFRIES

MULCH TRAIL IN A NATURAL SETTING

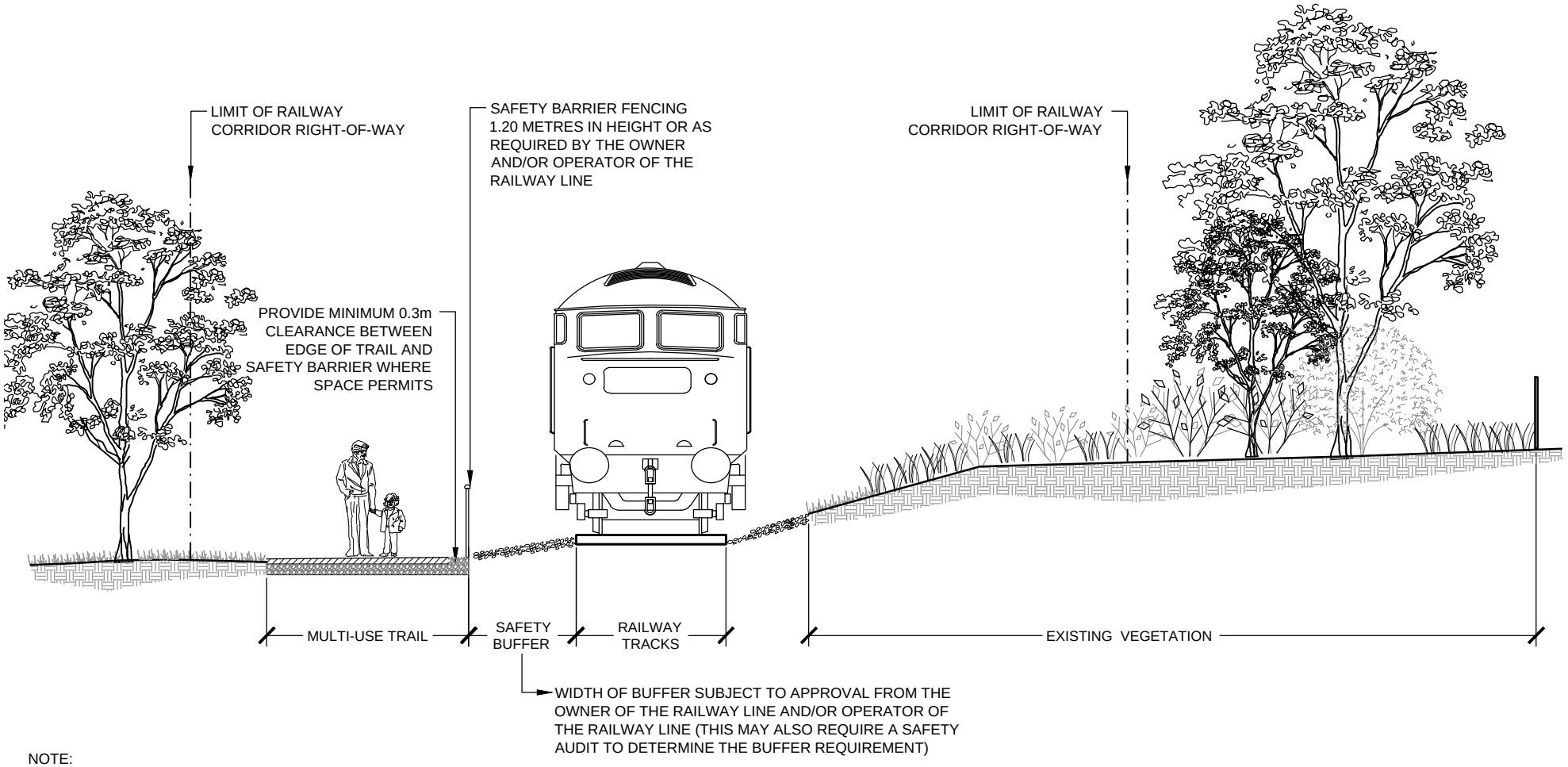


NOTE:

- BOARDWALK HEIGHT SHOULD BE CONSIDERED WHEN DESIGNING SHOULD A RAILING NOT BE DESIRED.
- DEPENDING ON THE LOCATION, A SEDIMENT CONTROL BARRIER MAY BE REQUIRED TO DEFINE LIMITS OF WORK AND PREVENT MIGRATION OF MATERIALS INTO SURROUNDING AREA.

TRAIL TYPES - OUTSIDE OF AN ACTIVE ROAD RIGHT-OF-WAY	SCALE = 1:40	The TOWNSHIP of NORTH DUMFRIES

BOARDWALK



WIDTH OF BUFFER SUBJECT TO APPROVAL FROM THE OWNER OF THE RAILWAY LINE AND/OR OPERATOR OF THE RAILWAY LINE (THIS MAY ALSO REQUIRE A SAFETY AUDIT TO DETERMINE THE BUFFER REQUIREMENT)

NOTE:

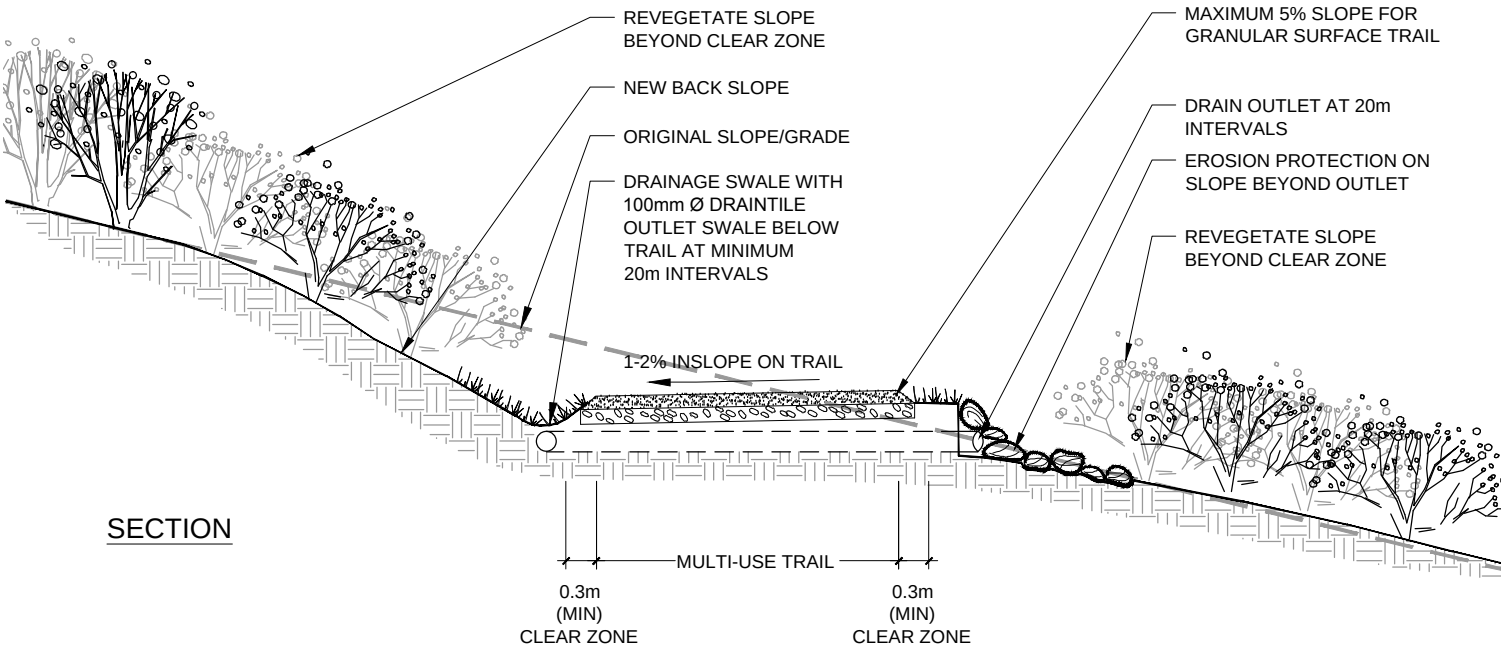
- RAIL WITH TRAIL PROJECTS REQUIRE APPROVAL FROM THE OWNER AND/OR OPERATOR OF THE RAILWAY LINE.
- CROSSINGS OF ACTIVE RAILWAY LINES ARE ALSO SUBJECT TO APPROVAL FROM TRANSPORT CANADA.

TRAIL TYPES

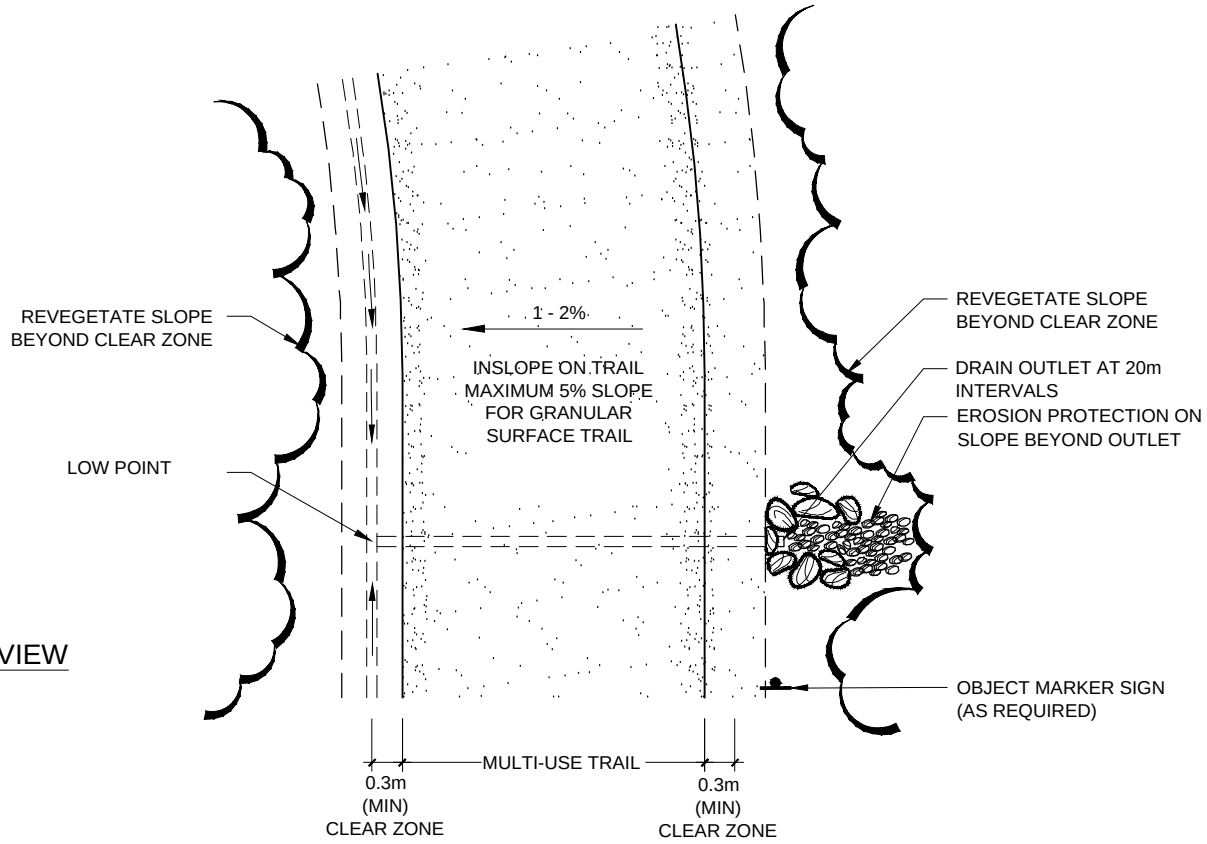
SCALE = 1:40

The TOWNSHIP of NORTH DUMFRIES

ACTIVE RAIL WITH TRAIL "RAILS WITH TRAILS"



SECTION



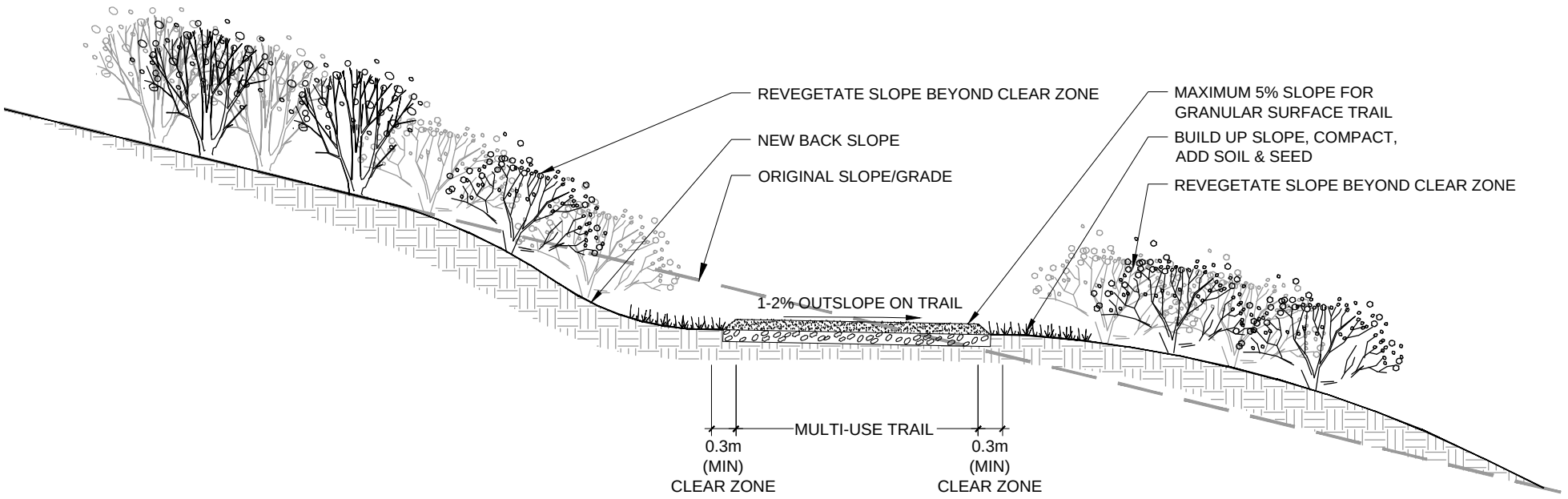
PLAN VIEW

TRAIL TYPES

SCALE = 1:75

The TOWNSHIP of NORTH DUMFRIES

TRAIL ON SLOPE - INSLOPE WITH DRAINAGE PIPE

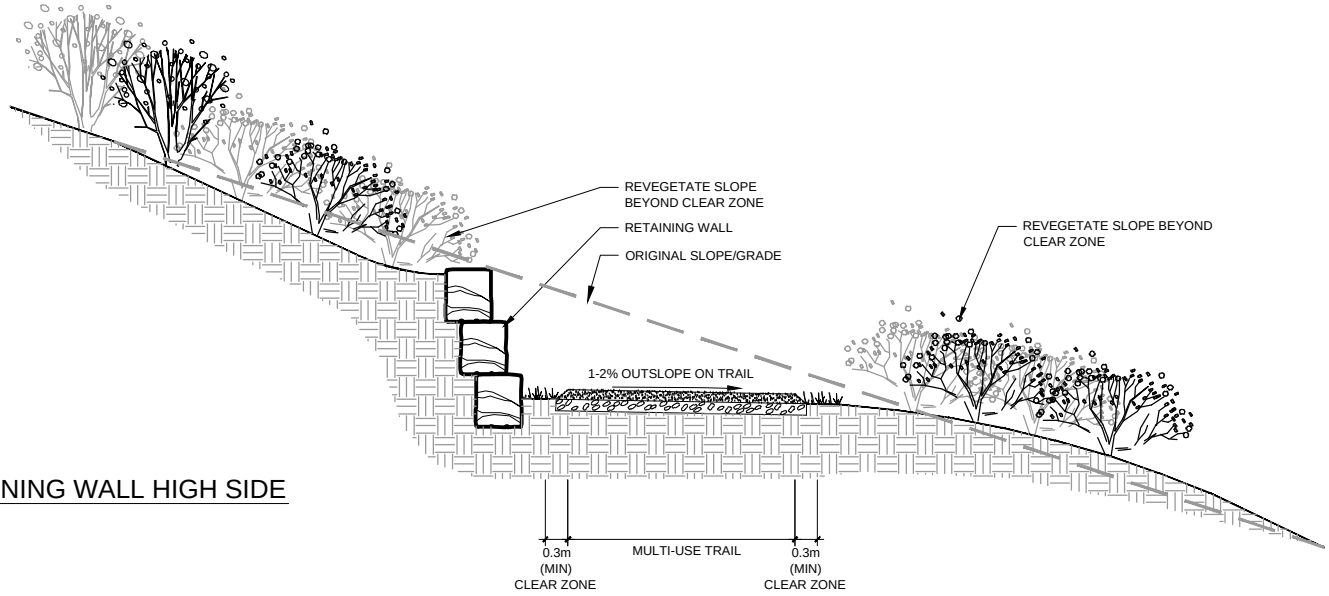


TRAIL TYPES

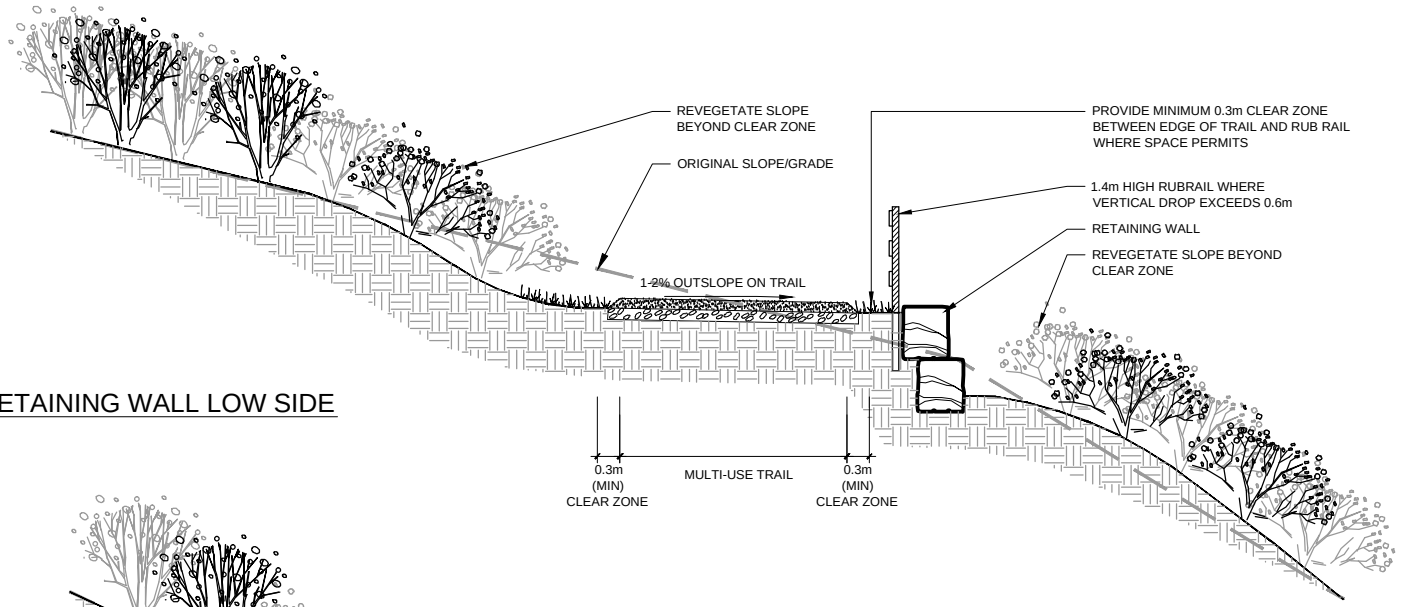
SCALE = 1:75

The TOWNSHIP of NORTH DUMFRIES

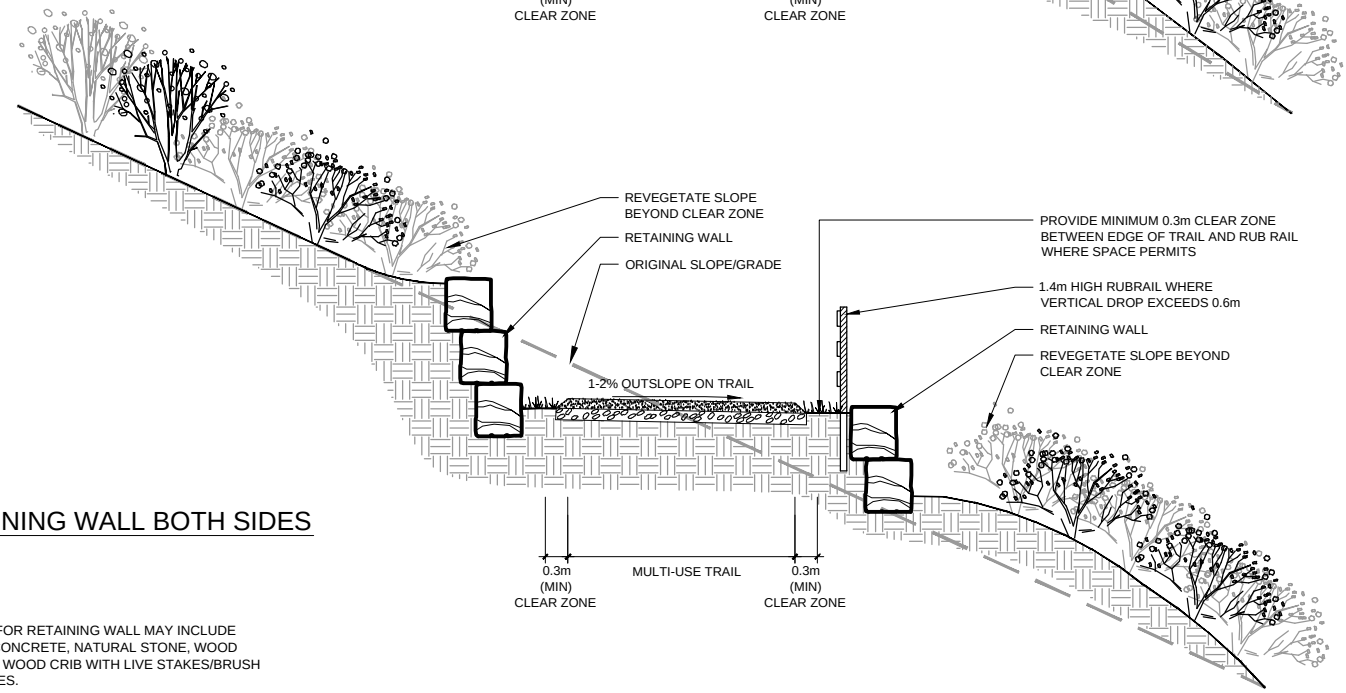
TRAIL ON SLOPE - OUTSLOPE



RETAINING WALL HIGH SIDE



RETAINING WALL LOW SIDE



RETAINING WALL BOTH SIDES

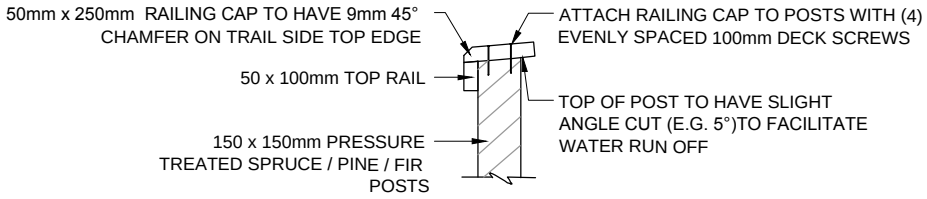
NOTE:
MATERIAL FOR RETAINING WALL MAY INCLUDE PRECAST CONCRETE, NATURAL STONE, WOOD TIMBER OR WOOD CRIB WITH LIVE STAKES/BRUSH MATTRESSES.

TRAIL TYPES

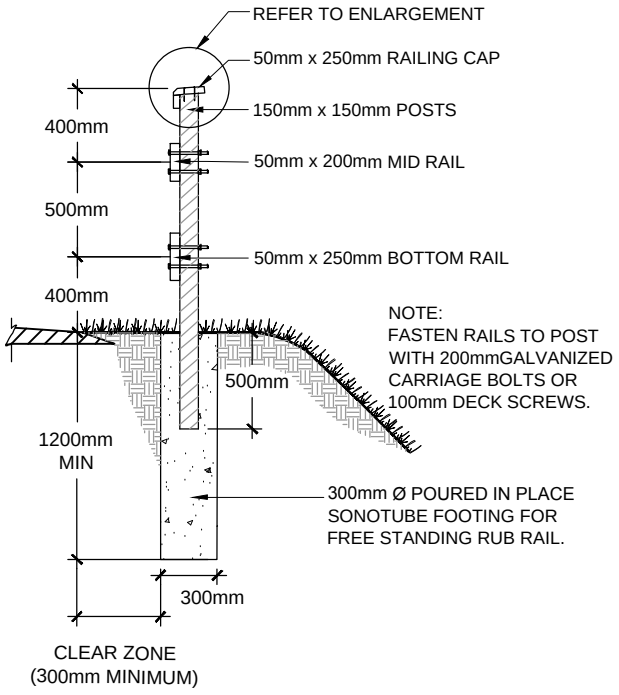
SCALE = 1:100

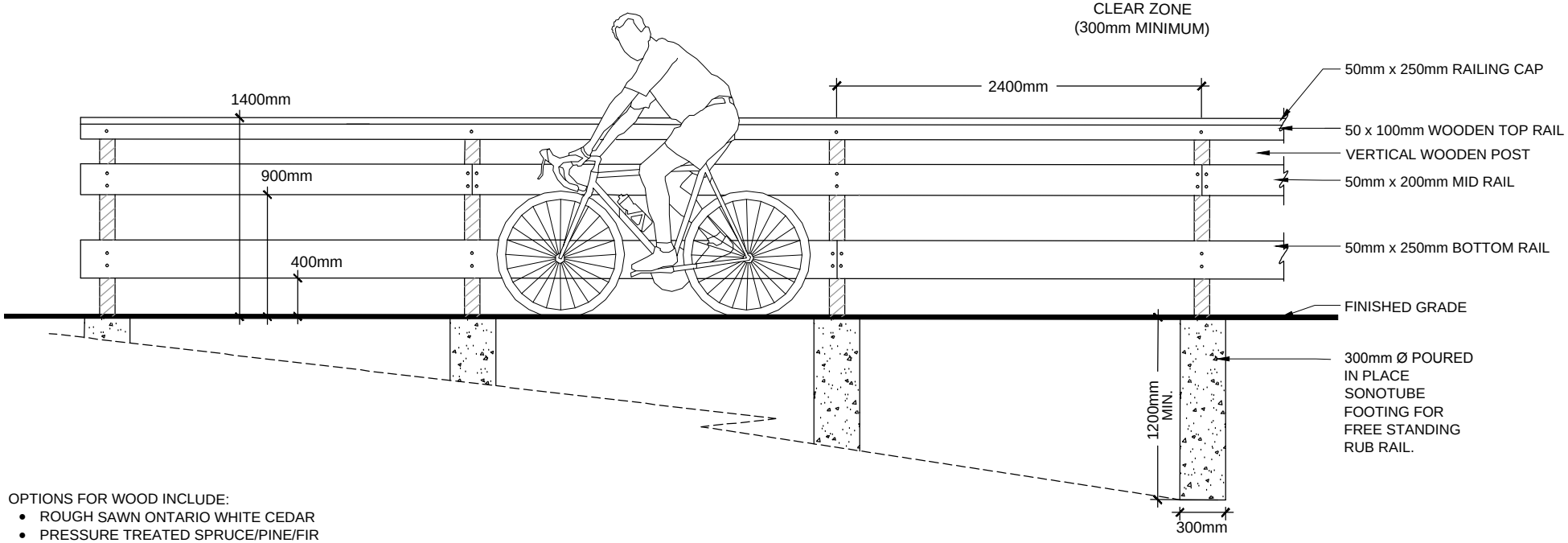
The TOWNSHIP of NORTH DUMFRIES

TRAIL ON SLOPE - RETAINING WALLS



ENLARGEMENT





OPTIONS FOR WOOD INCLUDE:

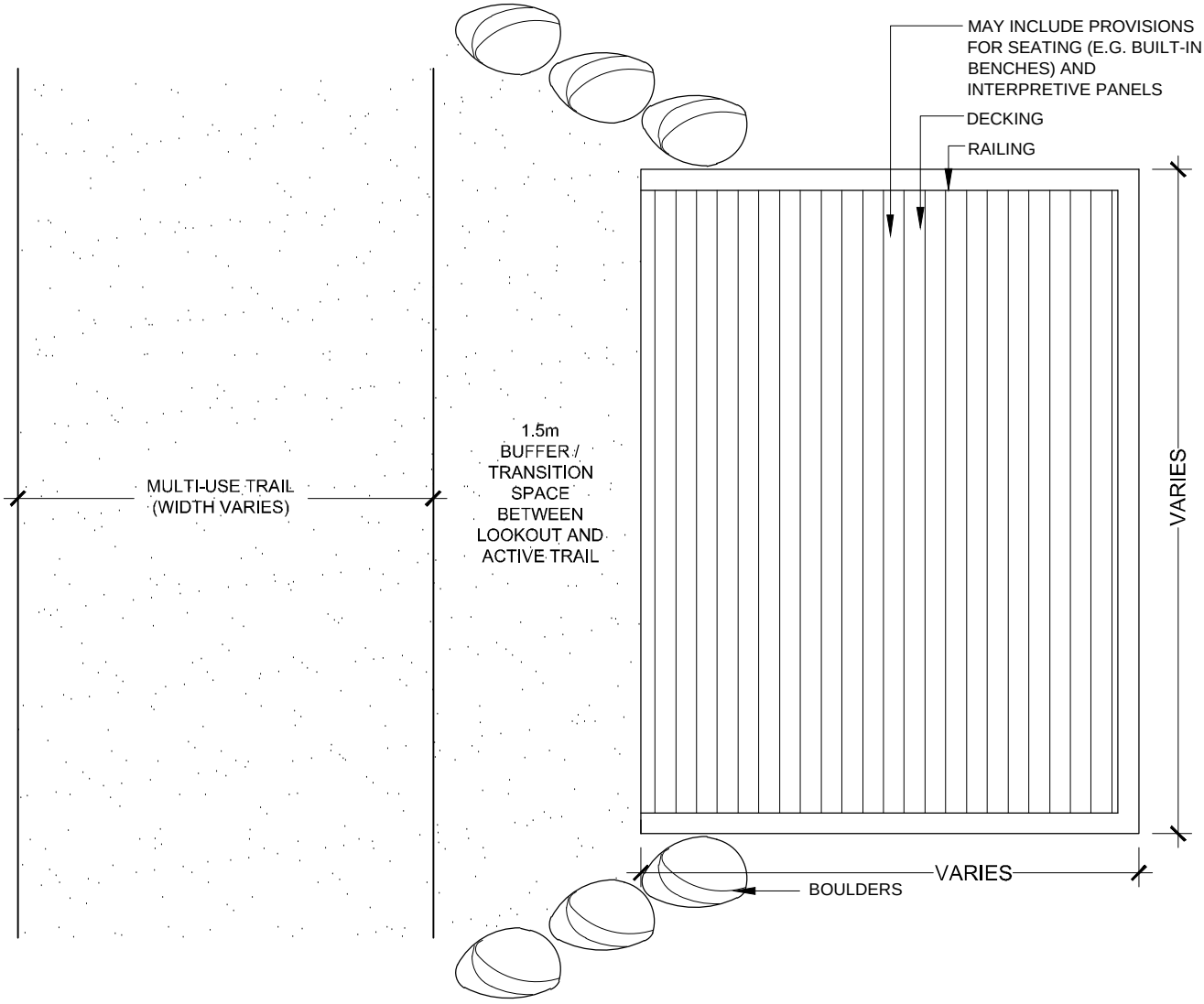
- ROUGH SAWN ONTARIO WHITE CEDAR
- PRESSURE TREATED SPRUCE/PINE/FIR

TRAIL TYPES

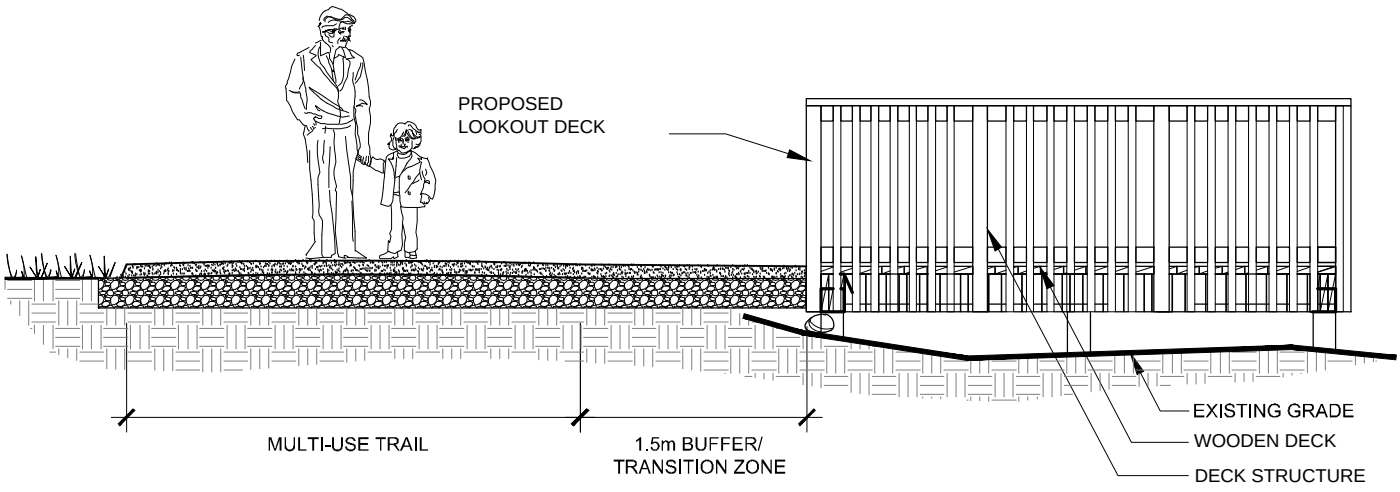
SCALE = 1:40

The TOWNSHIP of NORTH DUMFRIES

1.4m HIGH CYCLIST RUB RAIL



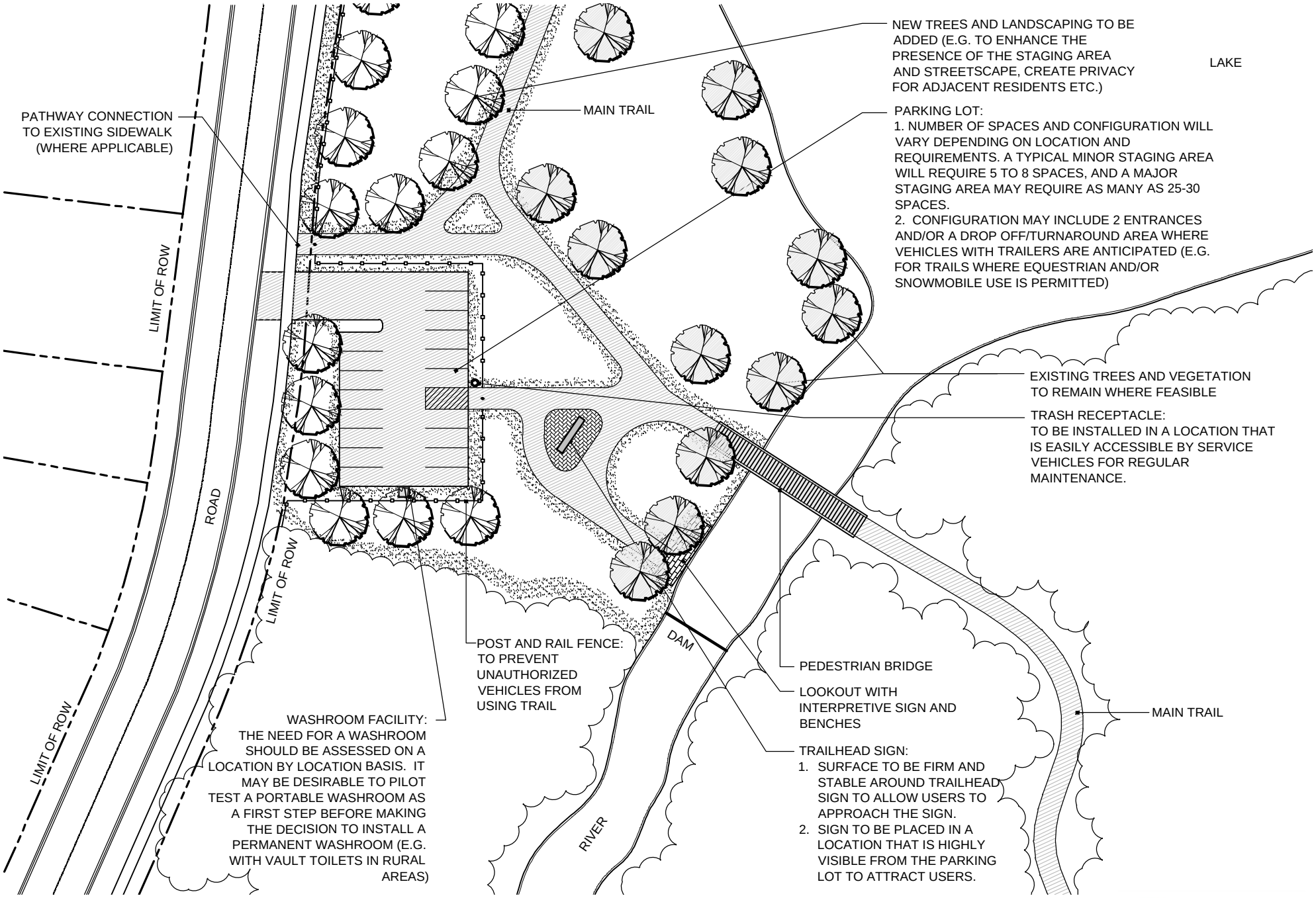
PLAN VIEW



SECTION

TRAIL TYPES	SCALE = 1:50	The TOWNSHIP of NORTH DUMFRIES

TRAIL LOOKOUT STRUCTURE

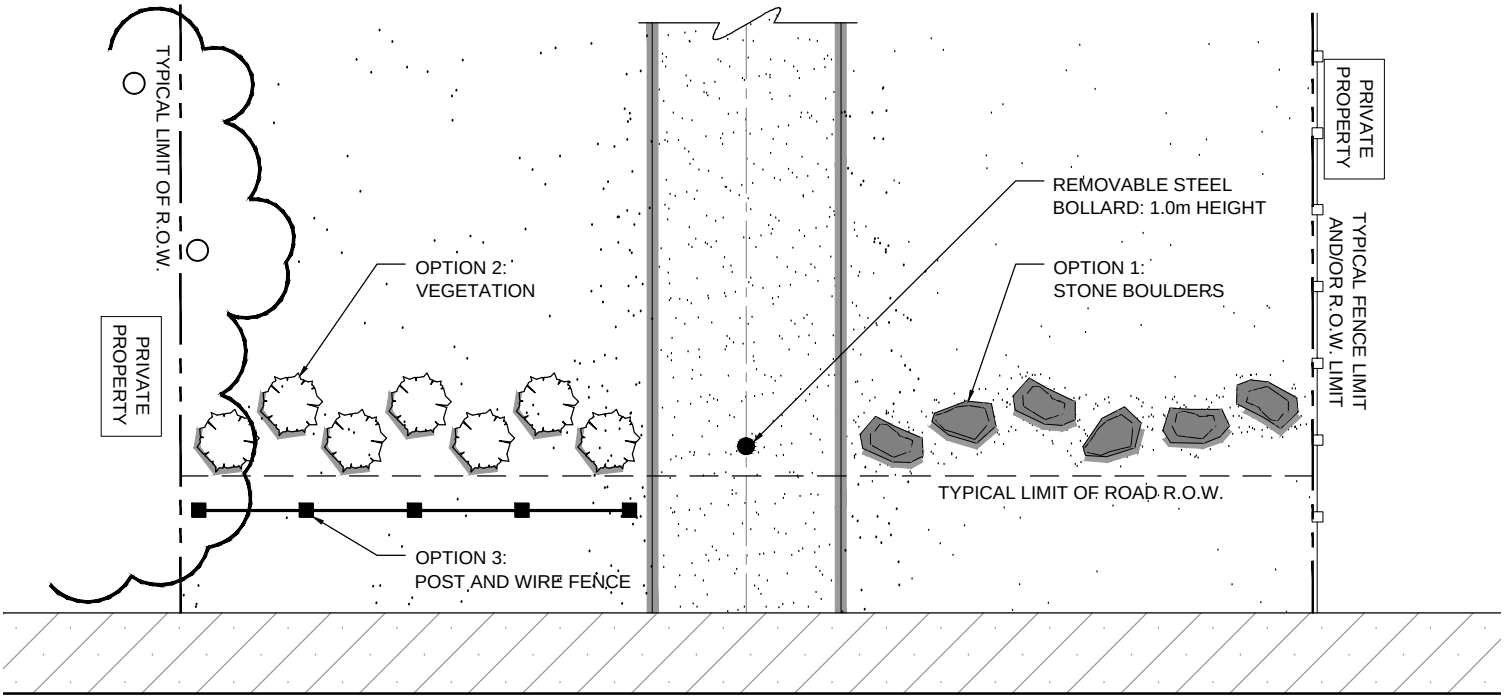


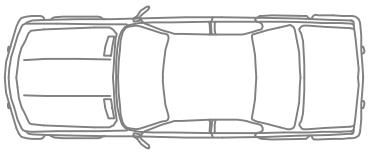
TRAIL ACCESS

SCALE = NTS

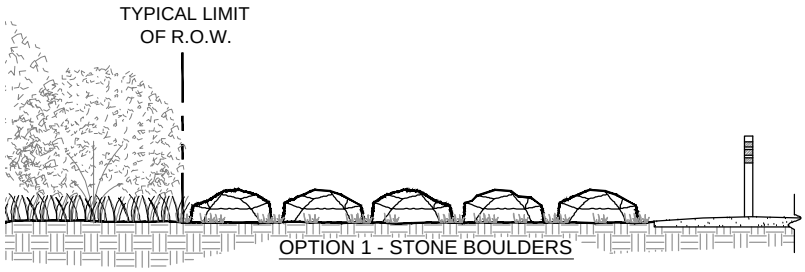
The TOWNSHIP of NORTH DUMFRIES

TYPICAL MAJOR STAGING AREA

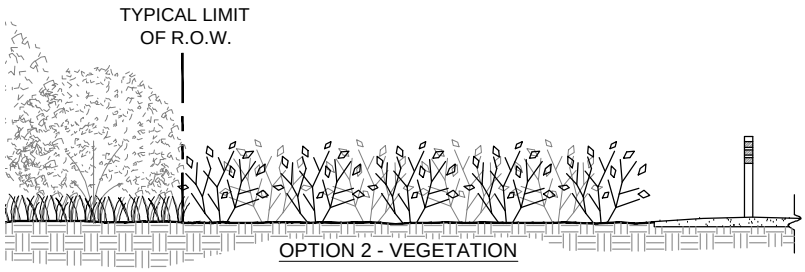




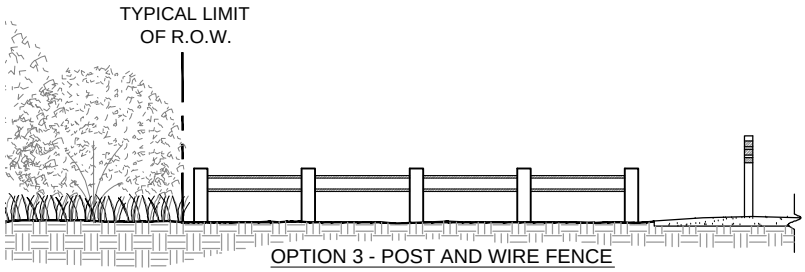
TYPICAL TRAIL ACCESS WITH REMOVABLE BOLLARD - PLAN VIEW



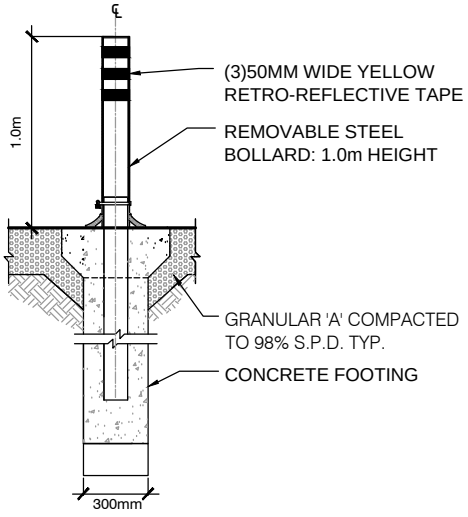
OPTION 1 - STONE BOULDERS



OPTION 2 - VEGETATION



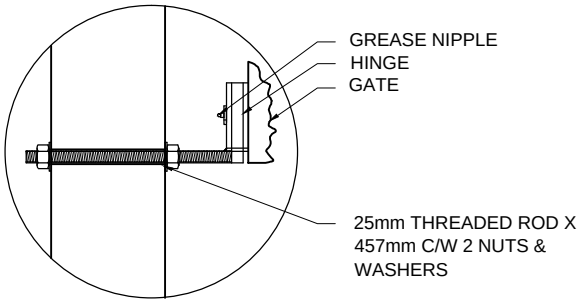
OPTION 3 - POST AND WIRE FENCE



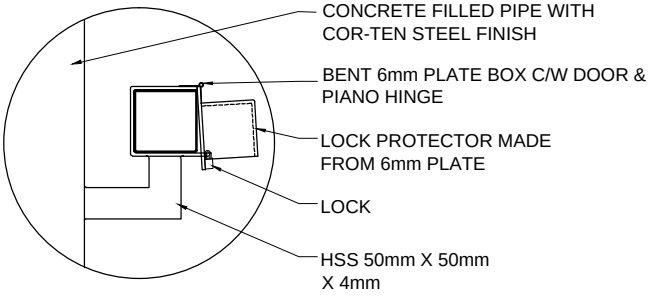
ENLARGEMENT

TRAIL ACCESS	SCALE = NTS	The TOWNSHIP of NORTH DUMFRIES

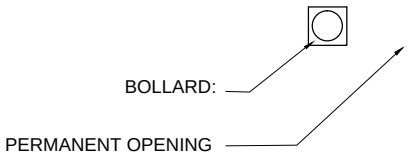
REMOVABLE STEEL BOLLARD

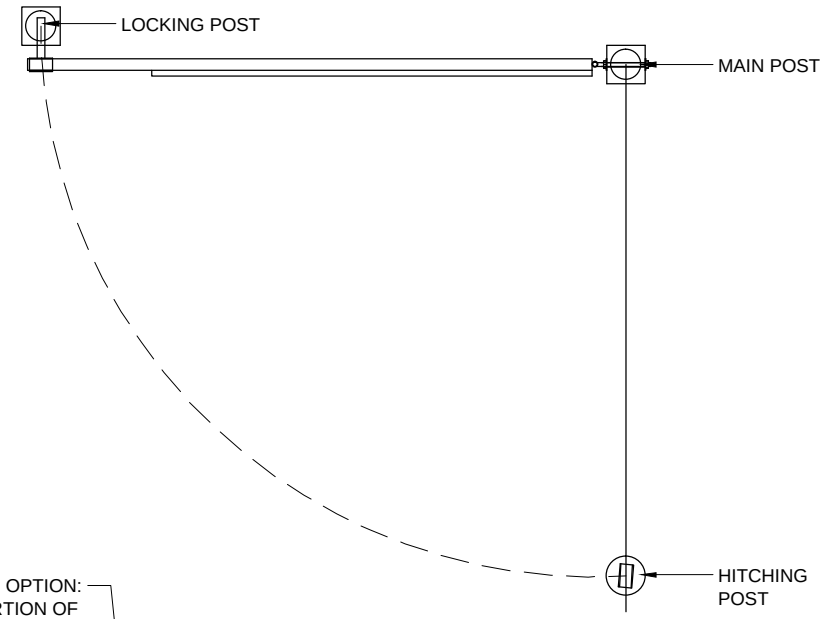


HINGE DETAIL

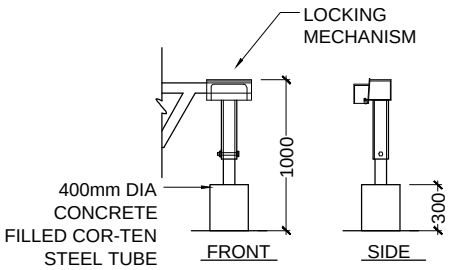


LOCK MECHANISM DETAIL

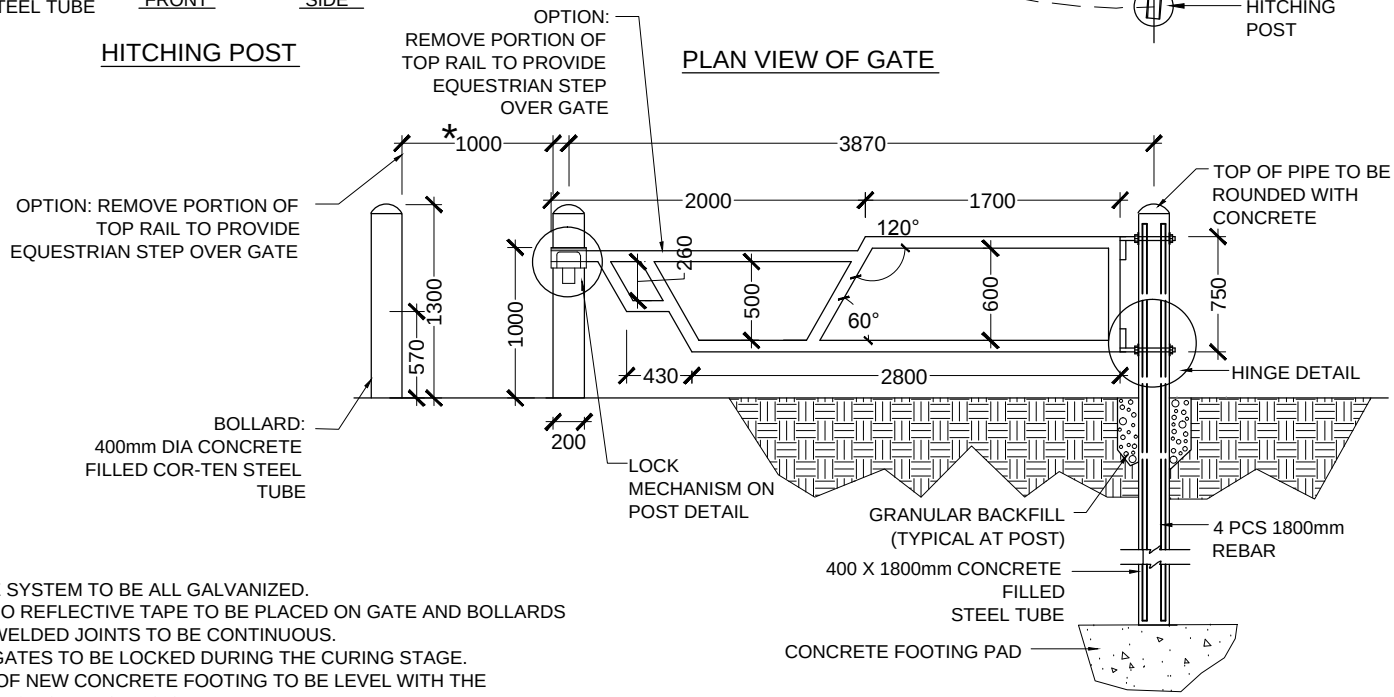




PLAN VIEW OF GATE



HITCHING POST



ELEVATION OF GATE

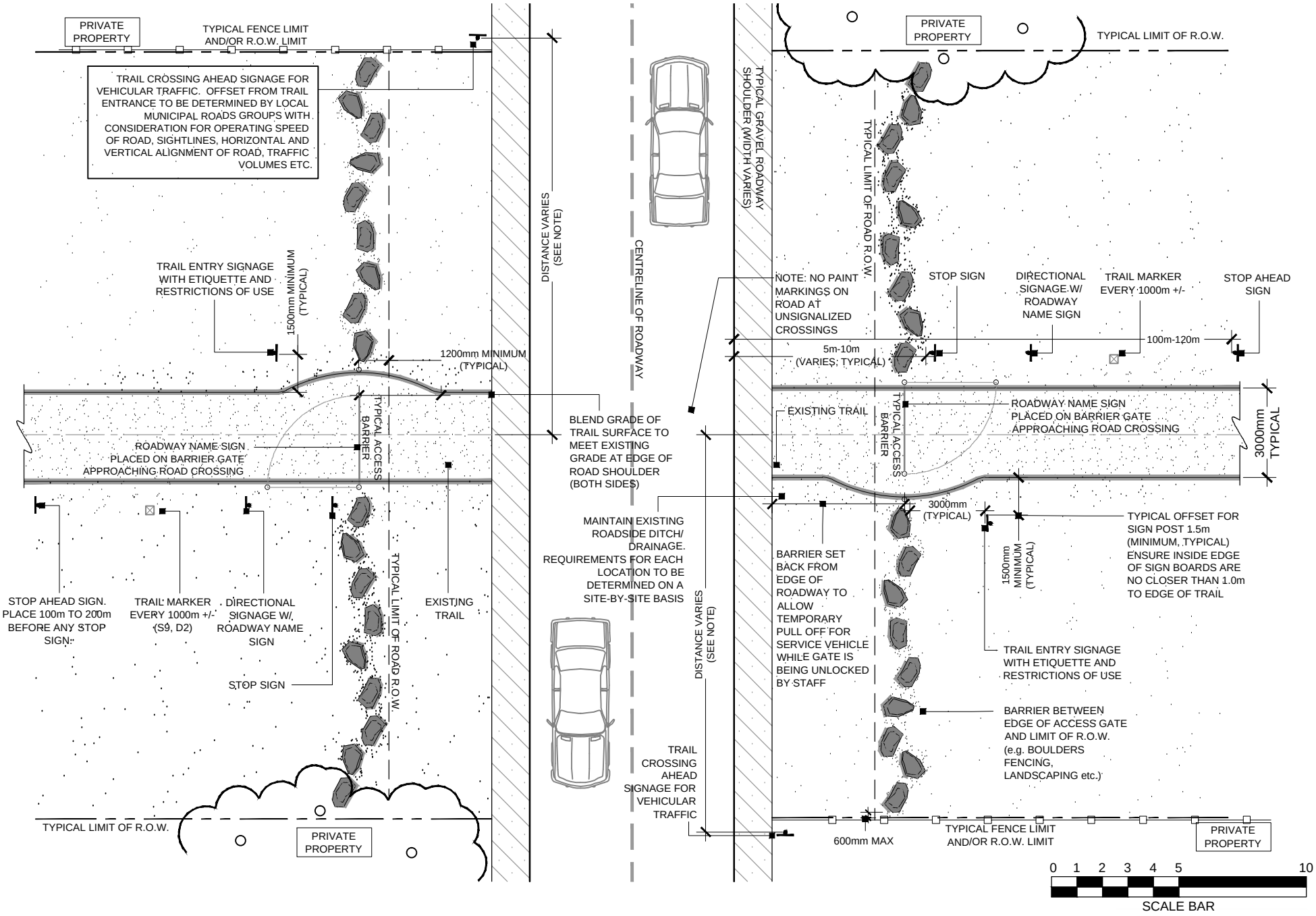
NOTES:

- GATE SYSTEM TO BE ALL GALVANIZED.
- RETRO REFLECTIVE TAPE TO BE PLACED ON GATE AND BOLLARDS
- ALL WELDED JOINTS TO BE CONTINUOUS.
- ALL GATES TO BE LOCKED DURING THE CURING STAGE.
- TOP OF NEW CONCRETE FOOTING TO BE LEVEL WITH THE SURFACE OF EXISTING GRADE.
- ALL HARDWARE TO BE GALVANIZED.
- ALL DIMENSIONS IN mm (MILLIMETERS).
- ALL METAL COMPONENTS SHALL CONFIRM TO RELEVANT OPSS.

★ PERMANENT OPENING TO BE A MINIMUM OF 1000mm FOR ACCESSIBLE TRAILS

TRAIL ACCESS	SCALE = 1:50	The TOWNSHIP of NORTH DUMFRIES

HEAVY-DUTY SWING GATE FOR RURAL LOCATIONS

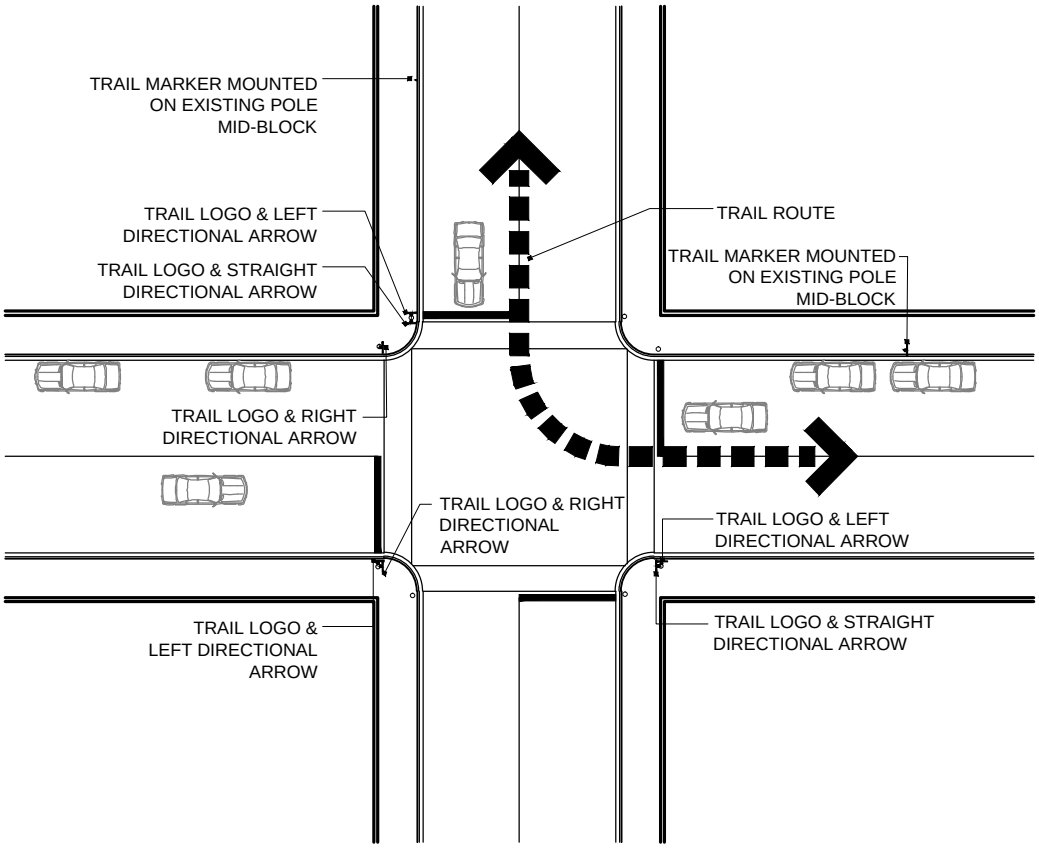


ROAD CROSSINGS

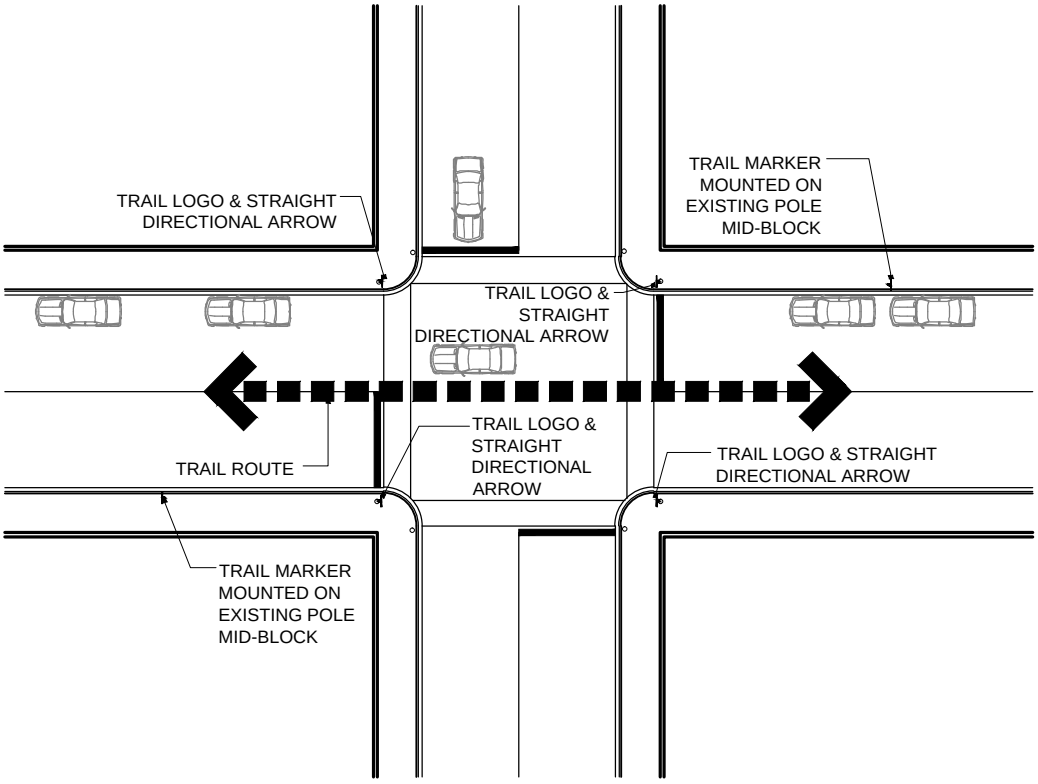
SCALE = 1:200

The TOWNSHIP of NORTH DUMFRIES

RURAL ROAD CROSSING



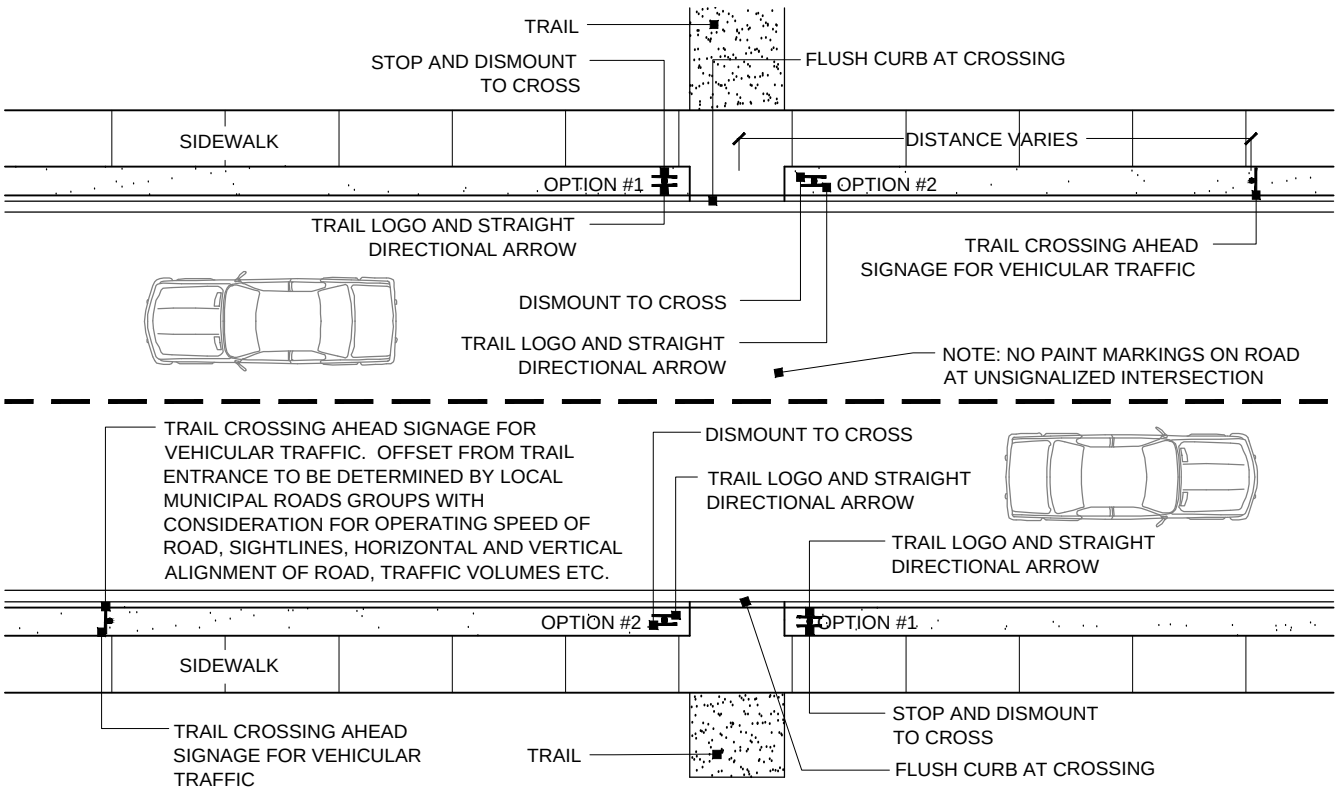
TRAIL ROUTE TURNS AT INTERSECTION



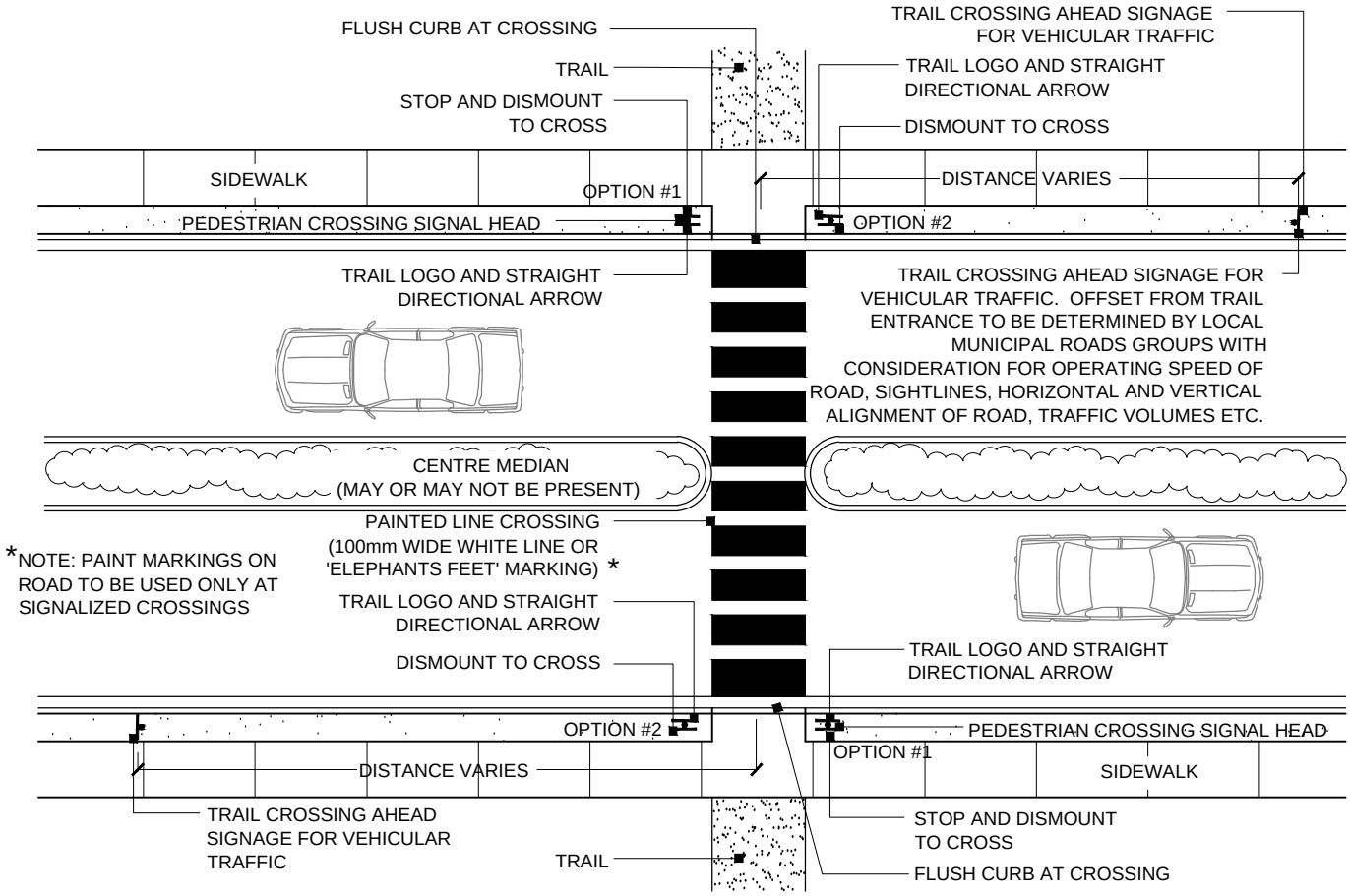
TRAIL ROUTE RUNS STRAIGHT THROUGH INTERSECTION

ROAD CROSSINGS	SCALE = NTS	The TOWNSHIP of NORTH DUMFRIES

URBAN INTERSECTION CROSSINGS



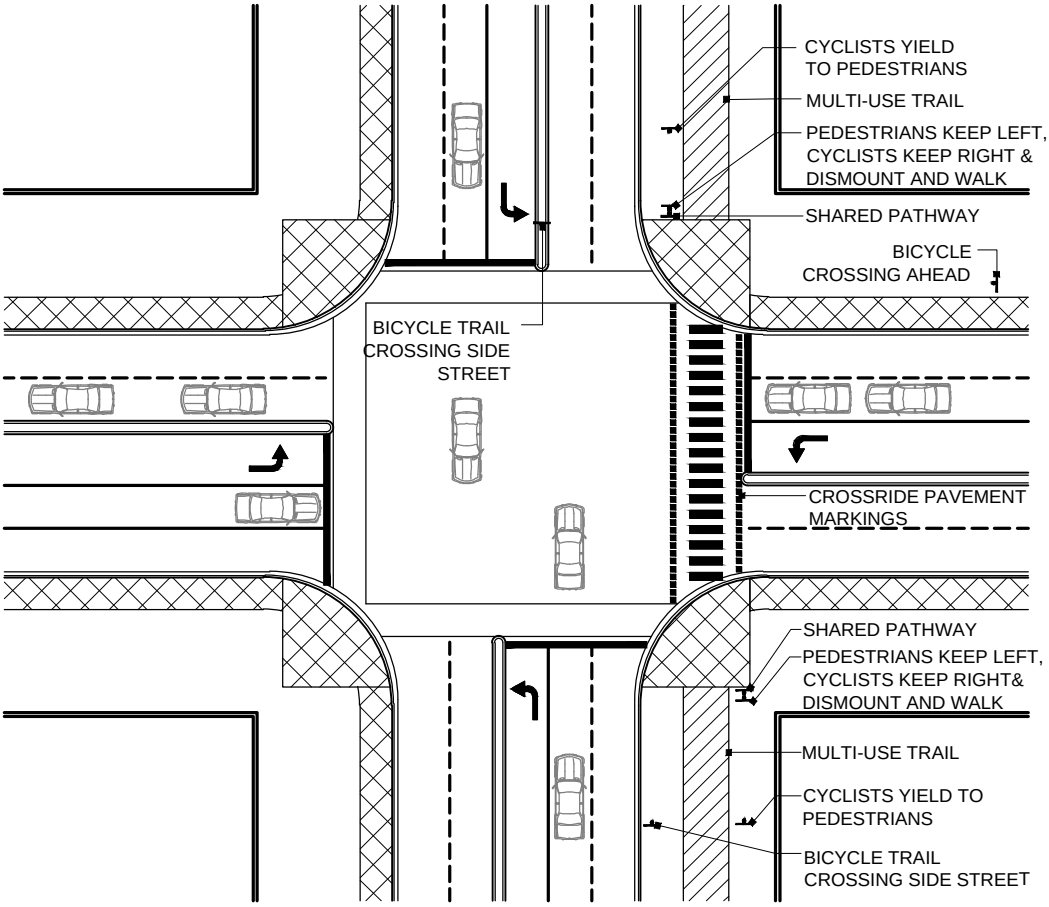
UNSIGNALIZED MID-BLOCK CROSSING



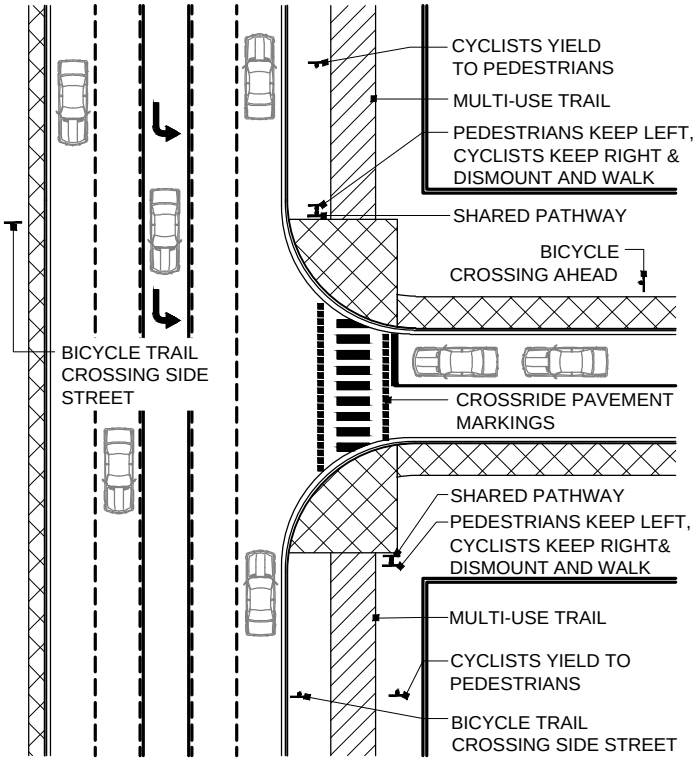
SIGNALIZED MID-BLOCK CROSSING

ROAD CROSSINGS	SCALE = NTS	The TOWNSHIP of NORTH DUMFRIES

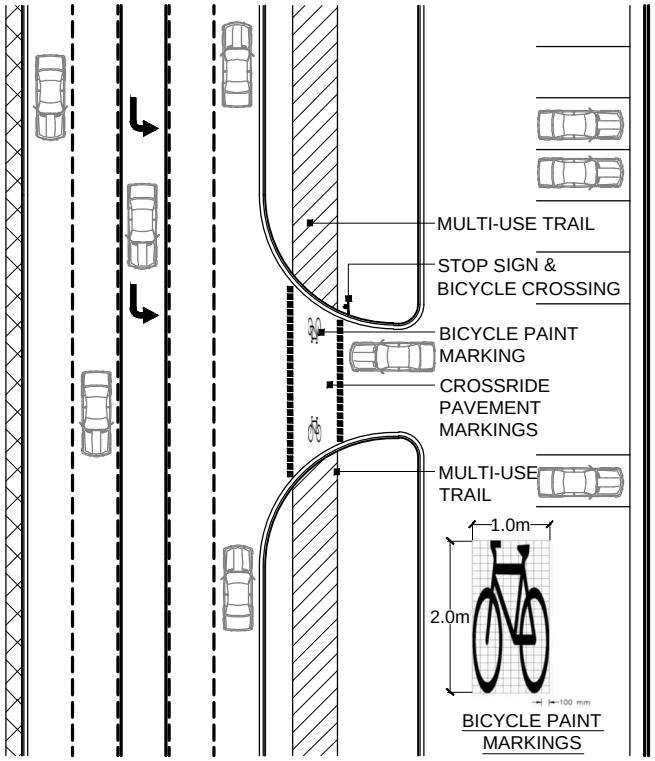
SIGNALIZED AND UNSIGNALIZED MID-BLOCK CROSSING



SIGNALIZED INTERSECTION WITH CROSSRIDE



UNSIGNALIZED INTERSECTION WITH CROSSRIDE



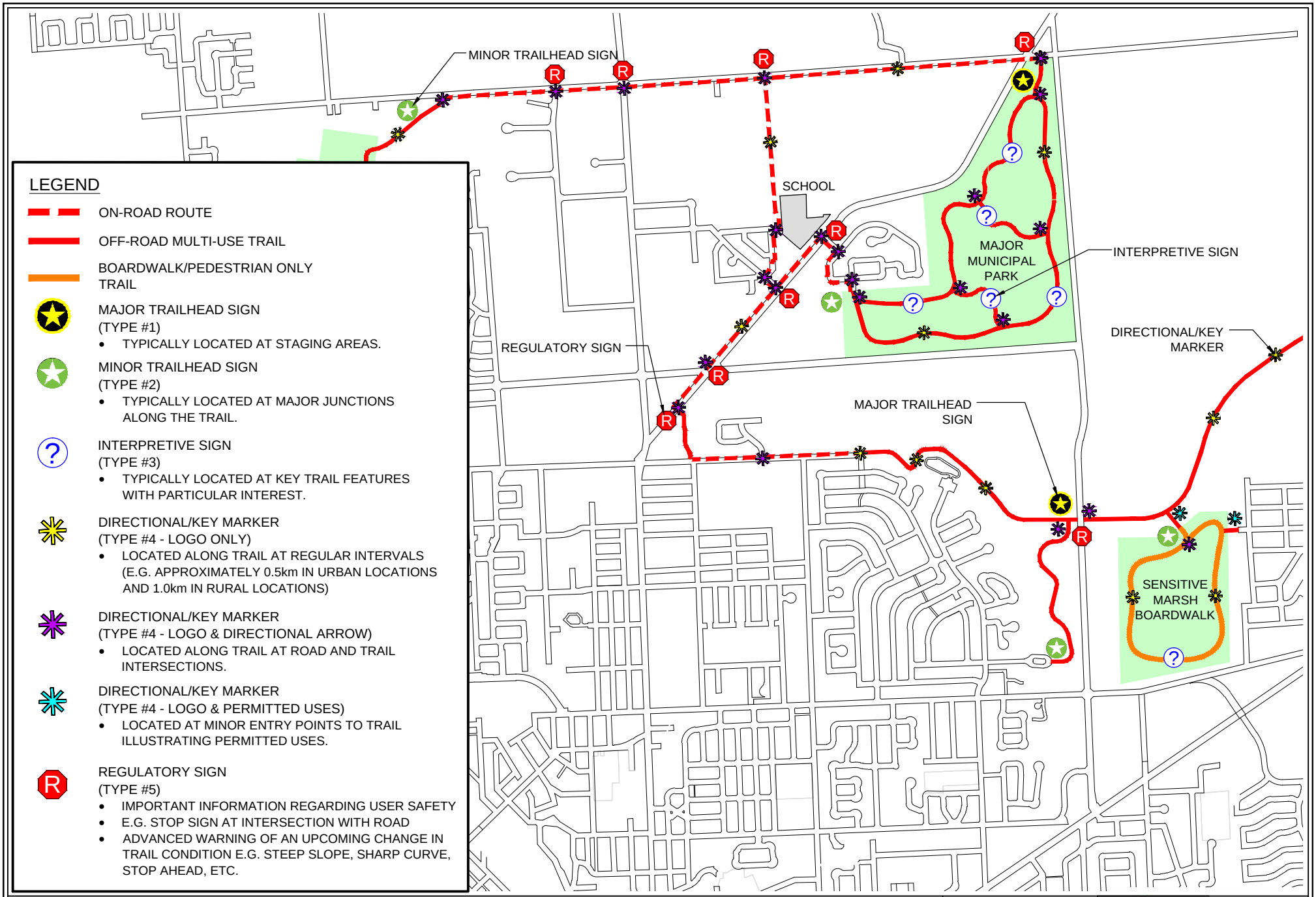
COMMERCIAL DRIVEWAY CROSSING WITH CROSSRIDE

ROAD CROSSINGS

SCALE = NTS

The TOWNSHIP of NORTH DUMFRIES

CROSSRIDES

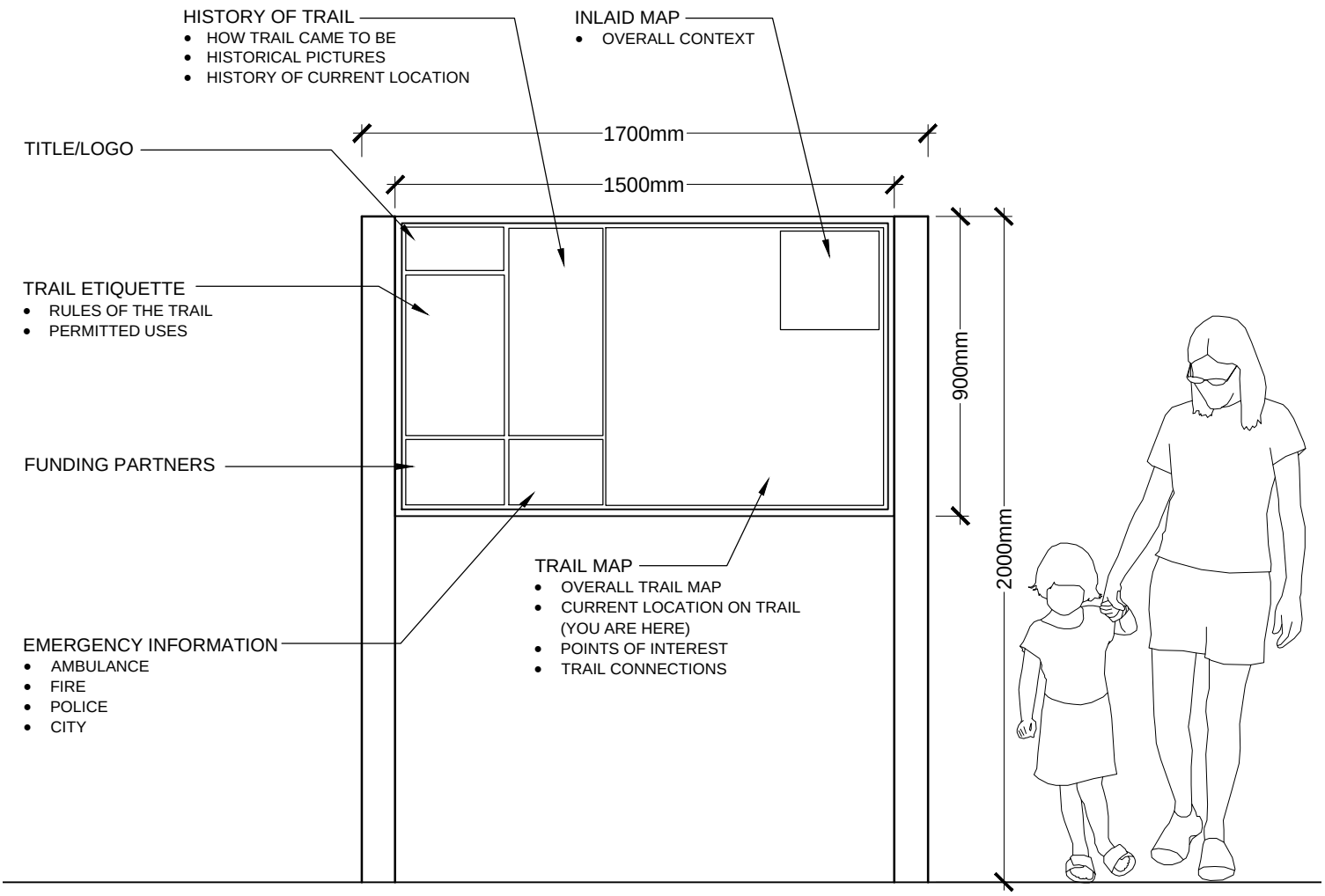


TRAIL SIGNAGE

SCALE = NTS

The TOWNSHIP of NORTH DUMFRIES

TYPICAL TRAIL SIGNAGE LAYOUT



FUNCTION:

- PROVIDES ORIENTATION TO OVERALL TRAIL SYSTEM BY WAY OF MAPPING AND INTERPRETIVE INFORMATION.
- CAN ALSO PROVIDE THE HISTORY BEHIND THE TRAIL OR REGION.
- LISTS THE PERMITTED USES OF THE TRAIL AND EMERGENCY CONTACT INFORMATION.
- THE MAJOR TRAILHEAD SIGN IS LARGER IN SIZE AND CAN ALSO ACT AS AN IDENTIFIER TO PASSING PEDESTRIANS AND VEHICLES.

TYPICAL LOCATION:

- TYPICALLY LOCATED AT STAGING AREAS.
- IN CASES WHERE IT IS ASSOCIATED WITH A PARKING AREA THE TRAILHEAD SIGN IS USUALLY IN THE TRANSITION AREA BETWEEN THE PARKING LOT AND TRAIL.

TYPICAL SIGN ELEMENTS:

- TRAIL ETIQUETTE DENOTING GUIDELINES FOR TRAIL USERS
- EMERGENCY CONTACT INFORMATION (IE. 911 OR MAINTENANCE ISSUES)
- IMAGERY OF DESTINATION POINTS ALONG TRAIL
- LOGOS FROM TOWN/MUNICIPALITY, COUNTY AND SPONSORSHIPS
- TRAIL MAP INDICATING LENGTH, DESTINATION POINTS AND OVERALL TRAIL LAYOUT
- PERMITTED USES (I.E. BICYCLES, EQUESTRIANS, ETC.)

QR CODES:

- QUICK RESPONSE CODES CAN BE SCANNED BY MOBILE PHONE DEVICES THAT WILL PROVIDE INSTANT ACCESS TO A DESIGNATED WEBSITE. WEBSITES CAN BE EASILY MODIFIED SO THAT INFORMATION (MAPPING, EVENTS, PROGRAMS, ETC.) ARE CURRENT.

OTHER NOTES:

- MAY OR MAY NOT HAVE A ROOF STRUCTURE.
- OFTEN A CUSTOM DESIGNED STRUCTURE, ALTHOUGH THERE ARE SOME PRE-MANUFACTURED STRUCTURES ON THE MARKET.
- WITHIN URBAN AREAS, STRUCTURE CAN BE MADE OF COLOURED METAL FOR A MORE FORMAL LOOK.
- WITHIN RURAL AREAS, STRUCTURE CAN BE MADE OF WOOD FOR A MORE NATURAL LOOK.
- WHEN SELECTING TEXT FOR SIGNAGE, IT IS SUGGESTED TO CHOOSE A SANS SERIF FONT. SERIF FONTS CAN MAKE IT DIFFICULT FOR THOSE WITH VISUAL IMPAIRMENTS TO READ THE LETTERING AS THE TEXT TENDS TO BLEND TOGETHER.
- HIGH CONTRAST BETWEEN BACKGROUND AND TEXT FOR EASY READABILITY. A MINIMUM LIGHT REFLECTIVE VALUE OF 70% IS RECOMMENDED TO MEET AODA REQUIREMENTS.

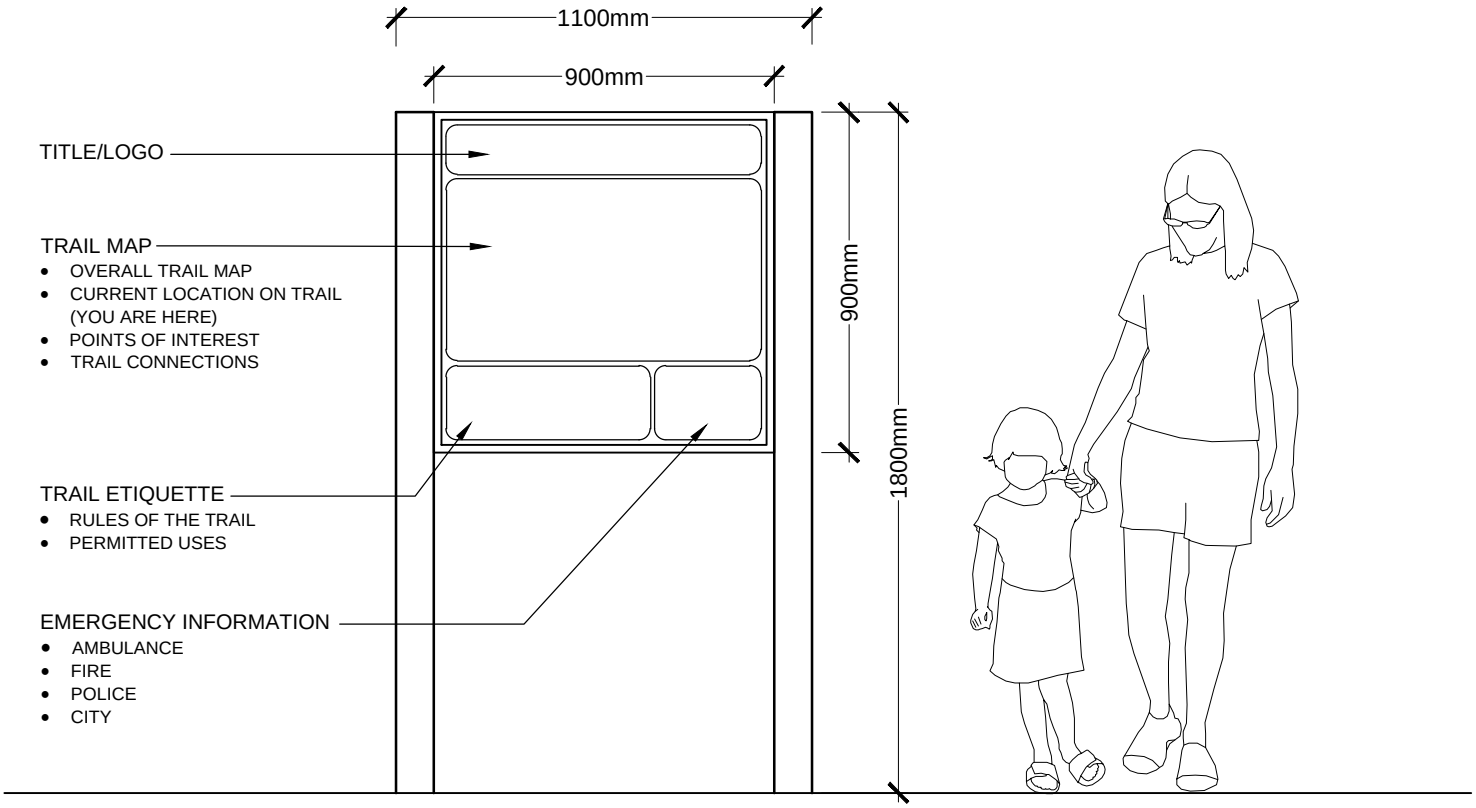
SCALE BAR

SIGNAGE

SCALE = 1:20

The TOWNSHIP of NORTH DUMFRIES

MAJOR TRAILHEAD SIGN



FUNCTION:

- SMALLER THAN A MAJOR TRAILHEAD SIGN.
- THIS SIGN PROVIDES USERS WITH THEIR CURRENT LOCATION, INTERPRETIVE INFORMATION.
- LISTS THE PERMITTED USES OF THE TRAIL AND EMERGENCY CONTACT INFORMATION.

TYPICAL LOCATION:

- TYPICALLY LOCATED AT MAJOR JUNCTIONS ALONG THE TRAIL AND MINOR STAGING AREAS.

TYPICAL SIGN ELEMENTS:

- TRAIL ETIQUETTE DENOTING GUIDELINES FOR TRAIL USERS
- EMERGENCY CONTACT INFORMATION (IE. 911 OR MAINTENANCE ISSUES)
- IMAGERY OF DESTINATION POINTS ALONG TRAIL
- LOGOS FROM TOWN/MUNICIPALITY, COUNTY AND SPONSORSHIPS
- TRAIL MAP INDICATING LENGTH, DESTINATION POINTS AND OVERALL TRAIL LAYOUT
- PERMITTED USES (I.E. BICYCLES, EQUESTRIANS, ETC.)

QR CODES:

- QUICK RESPONSE CODES CAN BE SCANNED BY MOBILE PHONE DEVICES THAT WILL PROVIDE INSTANT ACCESS TO A DESIGNATED WEBSITE. WEBSITES CAN BE EASILY MODIFIED SO THAT INFORMATION (MAPPING, EVENTS, PROGRAMS, ETC.) ARE CURRENT.

OTHER NOTES:

- FRAMES CAN BE CUSTOM DESIGNED OR PRE-MANUFACTURED.
- WITHIN URBAN AREAS, STRUCTURE CAN BE MADE OF COLOURED METAL FOR A MORE FORMAL LOOK.
- WITHIN RURAL AREAS, STRUCTURE CAN BE MADE OF WOOD FOR A MORE NATURAL LOOK.
- WHEN SELECTING TEXT FOR SIGNAGE, IT IS SUGGESTED TO CHOOSE A SANS SERIF FONT. SERIF FONTS CAN MAKE IT DIFFICULT FOR THOSE WITH VISUAL IMPAIRMENTS TO READ THE LETTERING AS THE TEXT TENDS TO BLEND TOGETHER.
- HIGH CONTRAST BETWEEN BACKGROUND AND TEXT FOR EASY READABILITY. A MINIMUM LIGHT REFLECTIVE VALUE OF 70% IS RECOMMENDED TO MEET AODA REQUIREMENTS.

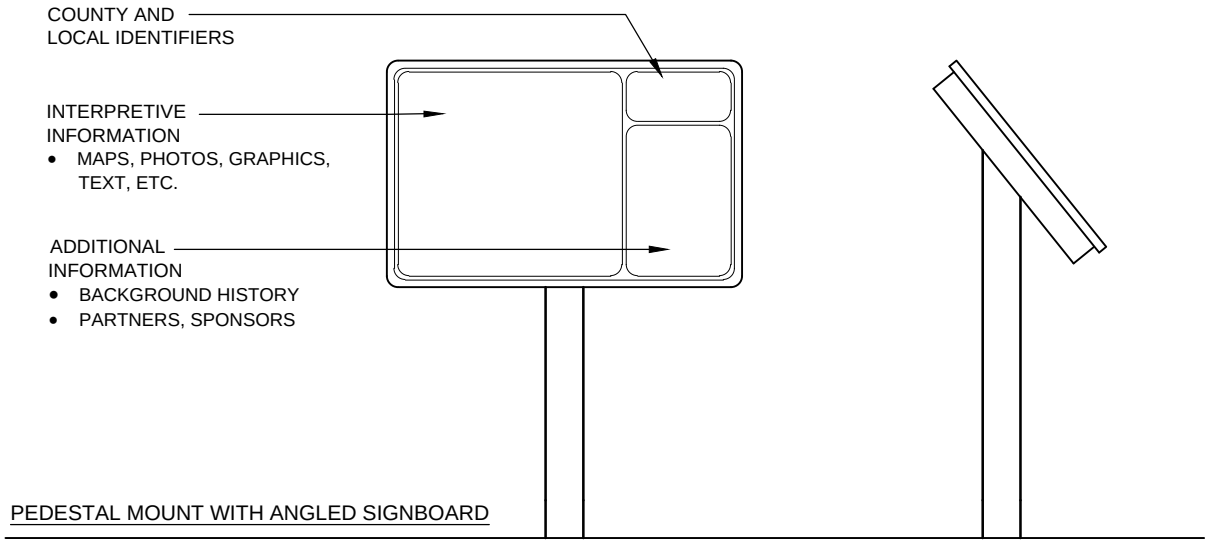
SCALE BAR

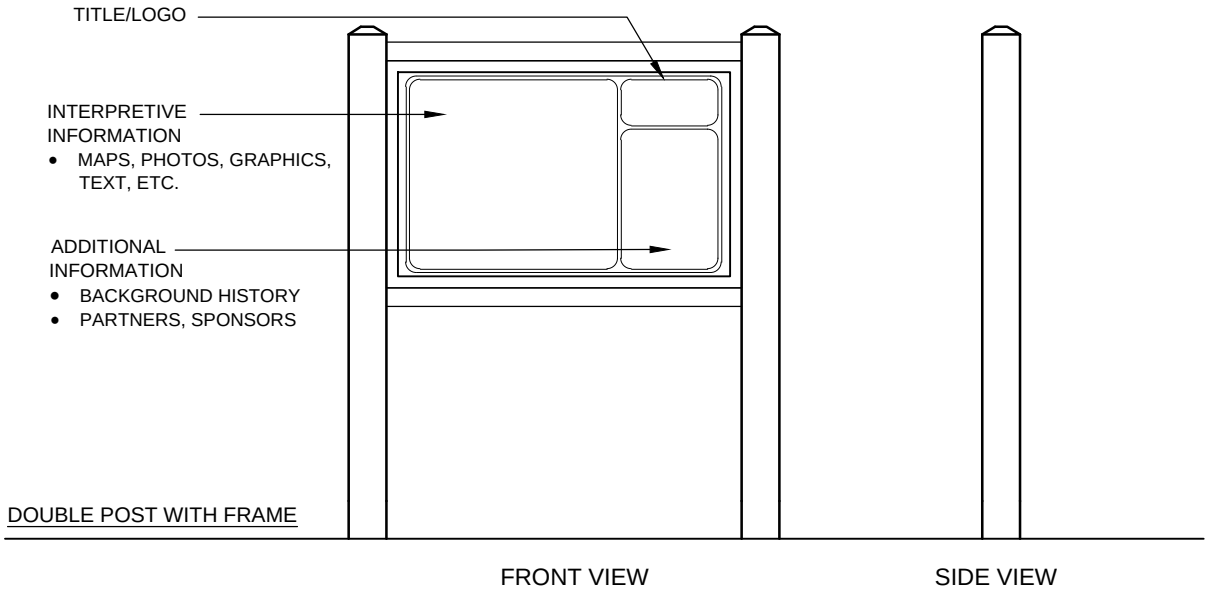
SIGNAGE

SCALE = 1:20

The TOWNSHIP of NORTH DUMFRIES

MINOR TRAILHEAD SIGN





FUNCTION:

- PROVIDES TRAIL USERS WITH INFORMATION ABOUT A KEY TRAIL FEATURE WHICH MAY BE CULTURAL, HISTORICAL OR NATURAL.
- INTERPRETIVE SIGNS SHOULD BE HIGHLY GRAPHIC AND EASY TO READ.
- SIGNS CAN INCLUDE A SIGNIFICANT AMOUNT OF INFORMATION AND DETAIL WHERE APPROPRIATE.
- OFFER THE POTENTIAL TO PARTNER WITH LOCAL GROUPS FOR THE DEVELOPMENT OF TEXT AND GRAPHICS.

TYPICAL LOCATION:

- TYPICALLY LOCATED AT KEY TRAIL FEATURES WHICH HAVE PARTICULAR INTEREST.
- SHOULD BE PLACED IN A HIGHLY VISIBLE OR HIGH TRAFFIC LOCATION TO DISCOURAGE VANDALISM.
- WHERE THE SIGN IS INTERPRETING A SENSITIVE ENVIRONMENT OR RARE SPECIES, LOCATE THE SIGN AWAY FROM THE ACTUAL LOCATION TO AVOID POTENTIAL DAMAGE TO THE FEATURE.

SIGN STRUCTURE:

- WITHIN URBAN AREAS, STRUCTURE CAN BE MADE OF COLOURED METAL FOR A MORE FORMAL LOOK.
- WITHIN RURAL AREAS, STRUCTURE CAN BE MADE OF WOOD FOR A MORE NATURAL LOOK.

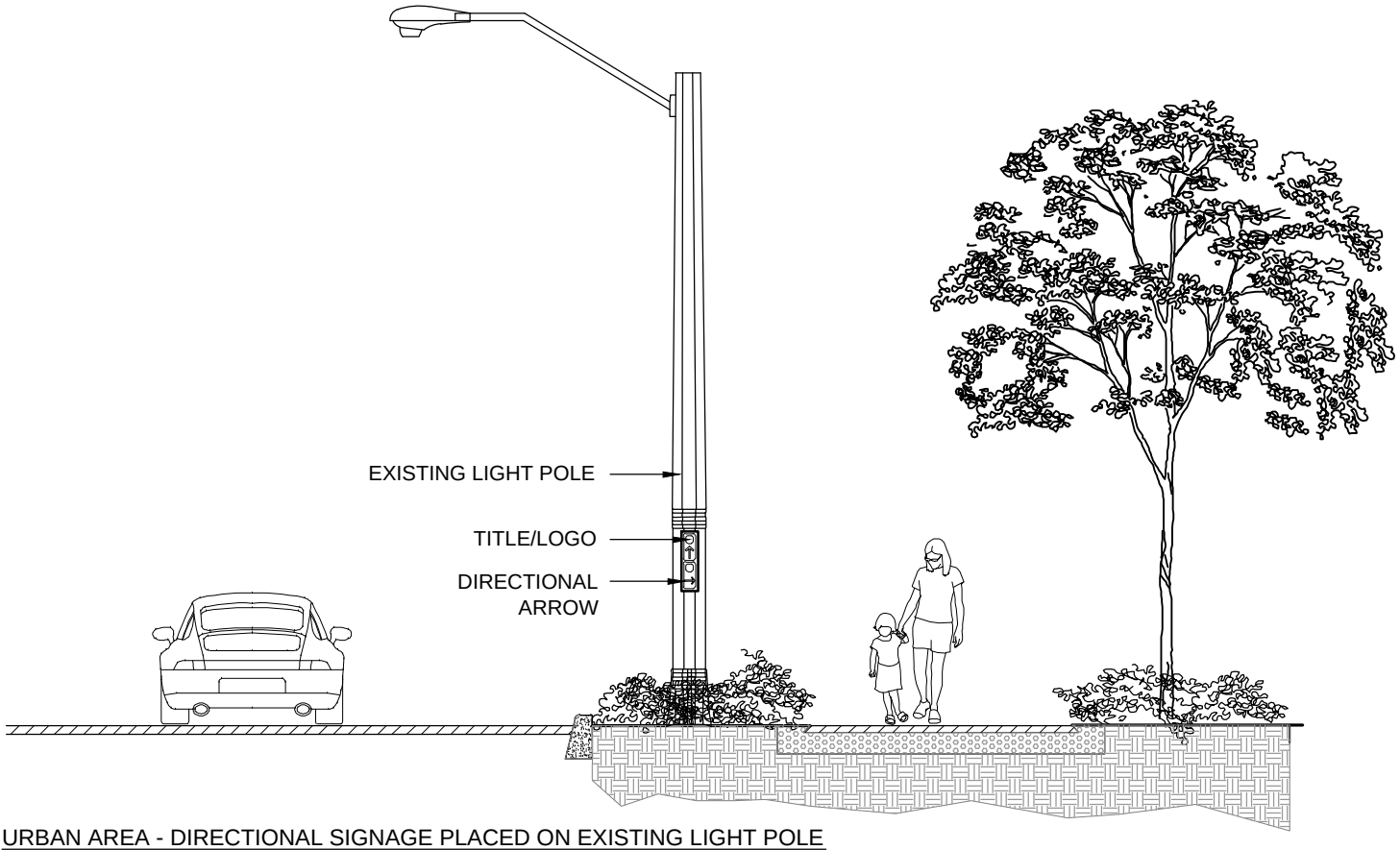
SCALE BAR

SIGNAGE

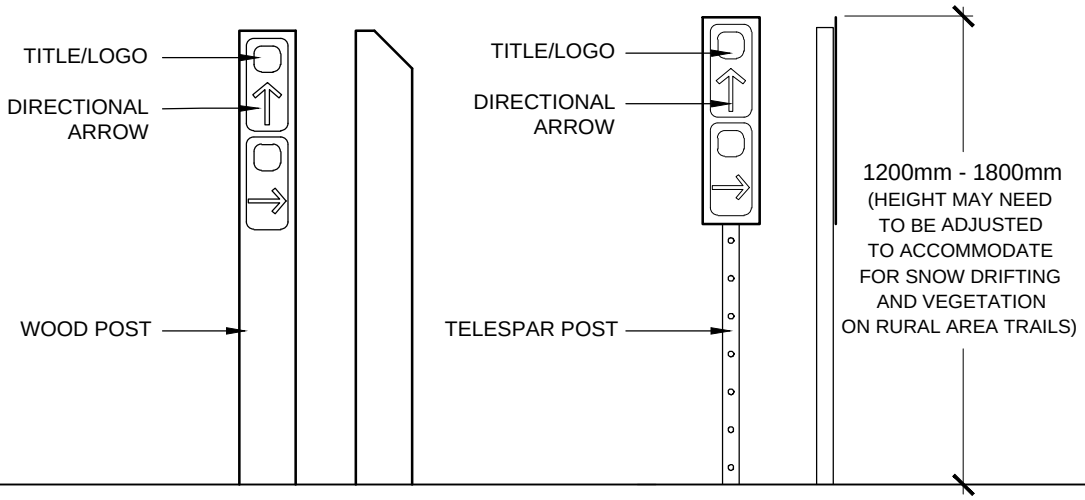
SCALE = 1:20

The TOWNSHIP of NORTH DUMFRIES

INTERPRETIVE SIGN



URBAN AREA - DIRECTIONAL SIGNAGE PLACED ON EXISTING LIGHT POLE



FUNCTION:

- ROUTE MARKER: PROVIDES A SIMPLE VISUAL MESSAGE TO TRAIL USERS THAT THEY ARE ON THE DESIGNATED ROUTE.
- DIRECTIONAL SIGN: USED TO CUE TRAIL USERS FOR GIVEN DESTINATIONS ALONG THE TRAIL AND DISTANCES TO GIVEN DESTINATIONS.

TYPICAL LOCATION:

- TYPICALLY LOCATED AT TRAIL INTERSECTIONS.
- ALSO PLACED AT REGULAR INTERVALS ALONG LONG, UNINTERRUPTED SECTIONS OF TRAIL, PARTICULARLY IN RURAL AREAS.

SIGN STRUCTURE:

- WITHIN URBAN AREAS, STRUCTURE CAN BE MADE OF COLOURED METAL FOR A MORE FORMAL LOOK.
- WITHIN RURAL AREAS, STRUCTURE CAN BE MADE OF WOOD FOR A MORE NATURAL LOOK.

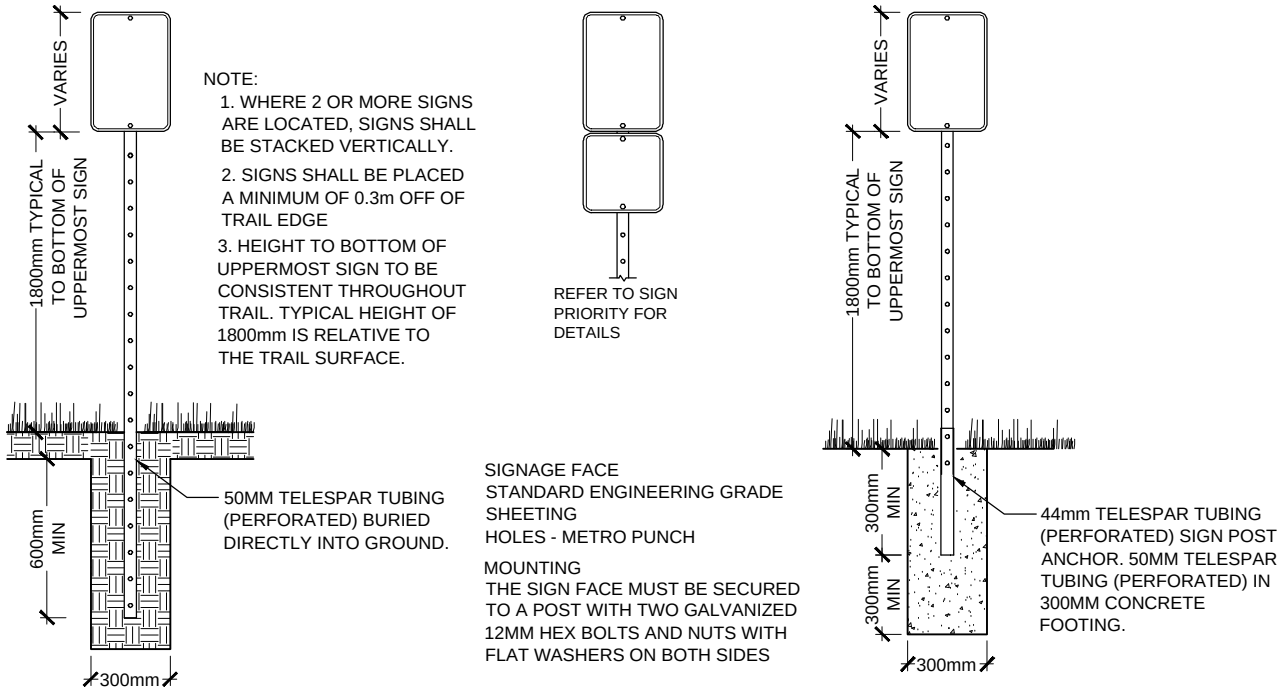
OTHER NOTES:

- CONSIDER A COUPLE OF DIFFERENT SIGN STYLES THAT RELATE TO THE LOCATION. (I.E. HIGHER END STYLE FOR URBAN AREAS AND A SIMPLER STYLE FOR RURAL AREAS).
- DIFFERENT SIGN STYLES HELP TO KEEP COSTS DOWN.

SCALE BAR

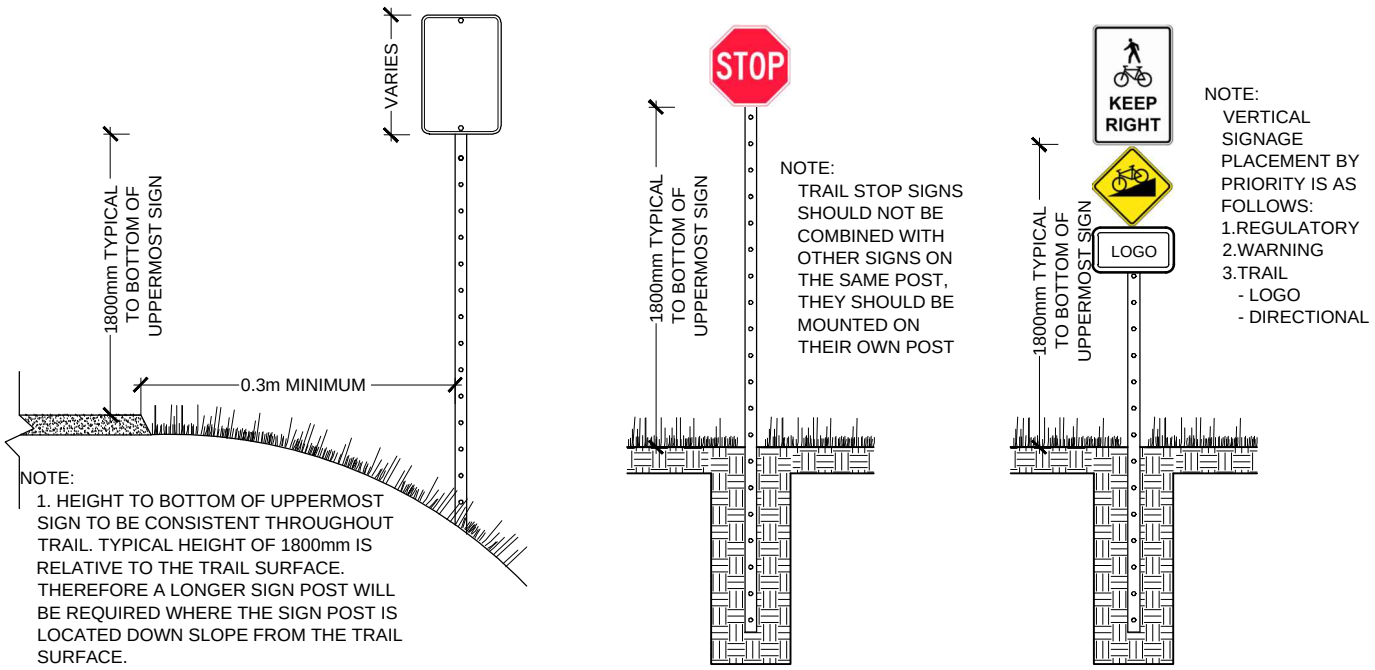
SIGNAGE	SCALE = 1:20	The TOWNSHIP of NORTH DUMFRIES

DIRECTIONAL SIGN



SIGN MOUNTING DIRECTLY INTO GROUND

SIGN MOUNT WITH CONCRETE FOOTING



SIGN MOUNT DOWN SLOPE OF TRAIL

SIGN PRIORITY

FUNCTION:

- USED TO ALERT TRAIL USERS ABOUT UPCOMING OBSTACLES OR CHANGES ALONG THE TRAIL.
- REGULATORY AND WARNING SIGNS FOLLOW THE SAME CONVENTIONS AS ROADWAY SIGNS RECOMMENDED BY THE TRANSPORTATION ASSOCIATION OF CANADA (TAC).

TYPICAL LOCATION:

- PLACED IN ADVANCE OF AN UPCOMING HAZARD.
- USED TO MARK THE ACTUAL LOCATION OF THE HAZARD.
- CONSULT WITH LOCAL ENGINEERING/TRAFFIC DEPARTMENTS FOR THE PLACEMENT OF ANY SIGNS ALONG ROADWAYS. (E.G. ADVANCED WARNING FOR MOTORISTS APPROACHING TRAIL CROSSING AHEAD)

OTHER NOTES:

- MOUNT ON EXISTING POLES. ALSO CONSIDER SIMPLE MOUNTING SYSTEMS (E.G. TELESPAR POST)
- SIMPLER MOUNTING SYSTEMS CAN HELP WITH KEEPING COSTS DOWN.
- ANY LETTERING ON REGULATORY SIGNAGE SHOULD BE A MINIMUM HEIGHT OF 100mm.
  (LETTERING CAN BE SMALLER ON CUSTOM INFORMATION SIGNS)

SIGNAGE	SCALE = NTS	The TOWNSHIP of NORTH DUMFRIES

REGULATORY, WARNING AND CUSTOM INFORMATION SIGNS

APPENDIX D

Unit Cost Summary

Appendix D - Unit Price Schedule
Township of North Dumfries Trails/Cycling Master Plan
DRAFT June 2014

ITEM	DESCRIPTION	UNIT	VALUE	COMMENTS/ASSUMPTIONS
1.0 GENERAL ACTIVE TRANSPORTATION FACILITIES				
Shared Lanes / Paved Shoulders				
1.1	Signed Bike Route in Urban Area	linear KM	$1,500.00	Price for both sides of the road, assumes one sign a minimum of every 330m / direction of travel (e.g. 6 signs / km).
1.2	Signed Bike Route in Rural Area	linear KM	$1,000.00	Price for both sides of the road, assumes one sign a minimum of every 600m / direction of travel (e.g. 4 signs / km)
1.3	Signed Bike Route with Sharrow Lane Markings	linear KM	$3,500.00	Price for both sides of the road, includes route signs every 330m ($1,500/km both sides), and sharrow stencil every 75m as per Ministry Guidelines (Painted $75 each x 26/km = $1,950 in table) If thermoplastic type product is used assume $250 / each x 26 = $6,500 source Flint Trading Inc.
1.4	Signed Bike Route with Wide Curb Lane with Construction of a New Road	linear KM	$60,000.00	Price for both sides of the road, assumes 0.5m to 1.0m widening on both sides of the road (3.5m to 4.0m)
1.5	Signed Bike Route with Wide Curb Lane with Road Reconstruction Project	linear KM	$240,000.00	Price for both sides of the road, includes curb replacement, catch basin adjustments, lead extensions and driveway ramps
1.6	Signed Bike Route with Paved Shoulder in conjunction with existing road reconstruction / resurfacing	linear KM	$55,000.00	Price for both sides of the road, 1.5m paved shoulder, assumes cycling project pays for additional granular base, asphalt and edge line (assume $110,000 per kilometre if additional widening of granular base required)
1.7	Signed Bike Route with Buffered Paved Shoulder in conjunction with existing road reconstruction / resurfacing project	linear KM	$150,000.00	Price for both sides of the road, 1.5m paved shoulder + 0.5 to 1.0m paved buffer, assumes cycling project pays for additional granular base, asphalt, edge lines and signs (buffer zone framed by white edge lines)
1.8	Addition of Rumble Strip to Existing Buffered Paved Shoulder (rural)	linear KM	$3,000.00	Price for both sides
1.9	Granular Shoulder Sealing	linear KM	$3,000.00	Both sides spray emulsion applied to harden the granular shoulder. This will reduce gravel on the paved portion of the shoulder and significantly reduce shoulder maintenance.
Conventional and Separated Bike Lanes				
1.10	Conventional 1.5m-1.8m Bicycle Lanes by Adding Bike Lane Markings and Signs	linear KM	$7,500.00	Price for both sides of the road, includes signs, stencils and edge line. Price is for conventional paint, (assumes painted lane line at $1 / m + $75 / symbol x 26 + $2000 for signs)increase budget to $20,000 /km for Thermoplastic) e.g. lane line in thermo is $5.50/m compared to $1.00/m for paint
1.11	Conventional 1.5m-1.8m Bicycle Lanes through Lane Conversion from 4 lanes to 3 lanes	linear KM	$35,000.00	Price for both sides. Includes grinding of existing pavement, markings, signs, line painting and symbols
1.12	Conventional 1.5m-1.8m Bicycle Lanes in Conjunction with a New Road or Road Reconstruction Project	linear KM	$300,000.00	Price for both sides of the road, assumes 1.5m bike lanes on both sides of the roadway (1.5m x 2 sides = 3.0m). Includes catch basin leads, asphalt, signs, pavement markings sub-base only. Road project funds all other improvements
1.13	Conventional 1.5m-1.8m Bicycle Lanes by Retrofitting / Widening Existing Road	linear KM	$700,000.00	Price for both sides of the road, includes the cost for excavation, adjust catch basins, lead extensions, new curbs/driveway ramps, asphalt and sub-base, pavement markings and signs.
1.14	Wide Bicycle Lane (2.0m - 2.5m BL) in Conjunction with New Road or Road Widening Project	linear KM	$250,000.00	Price for both sides of the road, assumes 2.0m to 2.5m bike lanes on both sides of the roadway . Includes catch basin leads, asphalt, signs, pavement markings sub-base only
1.15	Buffered Bicycle Lane with Hatched Pavement Markings - Assumes New Road or Road Reconstruction/Widening already Planned	linear KM	$350,000.00	Price for both sides of the road, assumes 1.5m bike lanes + 0.5m - 1.0m buffer zone with hatched pavement markings on both sides of the roadway. Includes catch basin leads, asphalt, signs, pavement markings sub-base only. Road project funds all other components
1.16	Buffered Bicycle Lane with Flex Bollards - Assumes New Road or Road Reconstruction/Widening Already Planned	linear KM	$365,000.00	Price for both sides of the road, assumes 1.5m bike lanes + flex bollards centred in hatched buffer zone at 10m intervals. Includes catch basin leads, asphalt, signs, edge line pavement markings (both sides of buffer zone) sub-base only
1.17	Buffered Bicycle Lane with Pre-Cast Barrier - Assumes New road or Road Reconstruction/Widening Already Planned	linear KM	$400,000.00	Price for both sides of the road, assumes 1.5m bike lanes + pre-cast and anchored curb delineators . Includes catch basin leads, asphalt, signs, edge line pavement markings (both sides of buffer zone) sub-base only

Appendix D - Unit Price Schedule
Township of North Dumfries Trails/Cycling Master Plan
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Cycle Tracks				
1.18	Uni-directional Cycle Tracks: Raised and Curb Separated - Retrofit Existing Roadway	linear KM	$500,000 - $1,200,000	Both sides. Includes construction but excludes design and signal modifications. Form of cycle track and materials as well as related components such as bike signals, upgrade/modification of signal controllers, utility/lighting pole relocations, bike boxes etc. are project specific and will impact unit price
1.19	Two Way Cycle Track - Retrofit Existing Roadway	linear KM	$500,000 - $800,000	One side. Includes construction but excludes design and signal modifications. Form of cycle track and materials as well as related components such as bike signals, upgrade/modification of signal controllers, utility/lighting pole relocations, bike boxes etc. are project specific and will impact unit price
Active Transportation Paths and Multi-Use Trails				
1.20	Two Way Active Transportation Multi-use path within road right-of-way	linear KM	$250,000.00	3.0m wide hard surface pathway (asphalt) within road right of way (no utility relocations)
1.21	Two Way Active Transportation Multi-use path within road right-of-way on one side with removal of existing sidewalk	linear KM	$275,000.00	3.0m wide hard surface pathway (asphalt) within road right of way on one side of road in place of 1.5m concrete sidewalk (includes crushing of existing sidewalk and compacting for trail base)
1.22	Concrete Splash Strip placed within road right-of-way between Active Transportation Multi-Use Path and Roadway	m^2	$150.00	Colour Stamped Concrete
1.23	Hard Surfaced Off-Road Multi-Use Trail Outside of Road Right-of-Way in an Urban Setting (New)	linear KM	$250,000.00	3.0m wide hard surface pathway (asphalt) within park setting (normal conditions) 90mm asphalt depth
1.24	Hard Surfaced Off-Road Multi-Use Trail Outside of Road Right-of-Way in an Urban Setting (Upgrade existing granular surface)	linear KM	$100,000.00	Includes some new base work (25% approx.), half of the material excavated is removed from site. Add trail marker signs
1.25	Granular Surfaced Off-Road Multi-Use Trail Outside of Road Right-of-Way in an Urban Setting	linear KM	$140,000.00	3.0m wide, compacted stone dust surface normal site conditions
1.26	Granular Surfaced Off-Road Multi-Use Trail Outside of Road Right-of-Way in an Rural Setting (New)	linear KM	$200,000.00	3.0m wide, compacted stone dust surface in complex site conditions (includes cost of clearing and grubbing)
1.27	Upgrade existing granular surface trail to meet 3.0m wide compacted granular trail standard	linear KM	$50,000.00	Includes some new base work (25% approx.) and an average of 20 regulatory signs per kilometre
1.28	Off-Road Multi-Use Trail Outside of Road Right-of-Way on Abandoned Rail Bed in a Rural Setting	linear KM	$130,000.00	3.0m wide, compacted stone dust surface, includes signage along trail and gates at road crossings
1.29	Granular Surfaced Multi-use Trail in a Woodland Setting	linear KM	$120,000.00	2.4m wide, compacted stone dust surface
1.30	Woodchip Surfaced Off-Road Multi-Use Trail with logs beside the trail and geotextile fabric below the mulch (suitable for trails in areas with moist soils)	linear KM	$45,000.00	2.0m wide multi-use trail ($45 / linear metre). Mulch is available from local sources and is supplied free of charge to the municipality (e.g. from park and hydro tree pruning), logs along the side of the trail are available locally and free of charge to the municipality. For instance logs may come from trees that have to be removed to accommodate the trail. Minor grading only is required to level out the trail bed prior to adding the fabric and mulch.
1.31	Woodchip Surfaced Off-Road Multi-Use Trail with no logs and no fabric (suitable for trails in areas with dry soils)	linear KM	$35,000.00	2.0m wide multi-use trail ($35 / linear metre). Mulch is available from local sources and is supplied free of charge to the municipality (e.g. from park and hydro tree pruning). Minor grading only is required to level out the trail bed prior to adding the fabric and mulch.
2.0 STRUCTURES AND CROSSINGS				
2.1	Pedestrian Boardwalk (Light-Duty)	linear KM	$1,500,000.00	Structure on footings, 3.0m wide with railings
2.2	Self weathering steel truss bridge	m^2	$2000 - $2500	Footings/ abutments additional, assume $30,000 per side for spread footings; $50,000 - $90,000 per side for piles
2.3	Retrofit / Widen Existing Pedestrian / Trail Bridge (29m long, 3m clear width)	m^2	$2,500.00	Price assumes modifications to existing abutments

2.4	Grade separated cycling/overpass of major arterial/highway	each	$1,000,000- $8,000,000	Requirements and design vary widely, use price as general guideline only
2.5	Metal stairs with hand railing and gutter to roll bicycle	vertical M	$3,000.00	1.8m wide, galvanized steel
2.6	Pathway Crossing of Private Entrance	each	$1500 - $2000	Adjustment of existing curb cuts to accommodate 3.0m multi-use pathway
2.7	Pathway / Road transition at unsignalized intersection(crossride)	each	$5,000.00	Typically includes warning signs, curb cuts and minimal restoration (3.0m pathway)
2.8	Pathway / Road transition at existing signalized intersection (crossride)	each	$25,000.00	Typically includes installation of 4 signal heads, 2 poles, 2 foundations, 2 controller connector and 2 arms.
2.9	At grade mid-block crossing	each	$5,000.00	Typically includes pavement markings on pathway, warning signs, curb cuts and minimal restoration. Does not include median refuge island.
2.1	Median Refuge	each	$20,000.00	Average price for basic refuge with curbs, no pedestrian signals
2.11	Mid-block Pedestrian Signal	each	$75,000-$100,000	Varies depending on number of signal heads required
2.12	At grade railway crossing	each	$120,000.00	Flashing lights, motion sensing switch (C.N. estimate)
2.13	At grade railway crossing with gate	each	$300,000.00	Flashing lights, motion sensing switch and automatic gate (C.N. estimate)
2.14	Below grade railway crossing	each	$500,000-$750,000	3.0m wide, unlit culvert style approx. 10 m long for single elevated railway track
2.15	Multi use subway under 4 lane road	each	$1,000,000-$1,200,000	Guideline price only for basic 3.3 m wide, lit.
2.16	Retaining Wall	m^2	$600.00	Face metre squared
3.0 BARRIERS AND ACCESS CONTROL FOR MULTI-USE TRAILS OUTSIDE OF THE ROAD RIGHT-OF-WAY				
3.1	Lockable gate (2 per road crossing)	each	$5,000.00	Heavy duty gates, price for one side of road (2 required per road crossing). Typically only required in rural settings or city boundary areas
3.2	Metal offset gates	each	$1,200.00	"P"-style park gate
3.3	Removable Bollard	each	$500-$750	Basic style (e.g. 75mm diameter galvanized), with footing. Increase budget for decorative style bollards
3.4	Berming/boulders at road crossing	each	$600.00	Price for one side of road (2 required per road crossing)
3.5	Granular parking lot at staging area (15 car capacity-gravel)	each	$35,000.00	Basic granular surfaced parking area (i.e. 300mm granular B sub-base with 150mm granular A surface), with precast bumper curbs. Includes minor landscaping and site furnashings, such as garbage receptacles and bike racks.

3.6	Page wire fencing	linear M	$20.00	1.5m height with peeled wood posts
3.7	Chain link fencing	linear M	$100.00	Galvanized, 1.5m height
4.0 SIGNAGE				
4.1	Regulatory and caution Signage (off-road pathway) on new metal post	each	$150-$250	300mm x 300mm metal signboard c/w metal "u" channel post
4.2	Signboards for interpretive sign	each	$500-$800	Does not include graphic design. Based on a 600mm x 900mm typical size and embedded polymer material, up to 40% less for aluminum or aluminum composite panel
4.3	Staging area kiosk	each	$2,000-$10,000	Wide range provided. Price depends on design and materials selected. Does not include design and supply of signboards
4.4	Signboards for staging area kiosk sign	each	$1,500-$2,000	Typical production cost, does not include graphic design (based on a 900mm x 1500mm typical size and embedded polymer material). Up to 40% less for aluminum or aluminum composite panel
4.5	Pathway directional sign	each	$500-$750	Bollard / post (100mm x100mm marker), with graphics on all 4 sides
4.6	Pathway marker sign	each	$250.00	Bollard / post (100mm x100mm marker), graphics on one side only
4.7	Pathway marker sign	linear KM	$1,500.00	Price for both sides of the path, assumes one sign on average, per direction of travel every 0.5 km
5.0 OTHER				
5.1	Major rough grading (for multi-use pathway)	m^3	$10-$25	Varies depending on a number of factors including site access, disposal location etc.
5.2	Clearing and Grubbing	m^2	$2.00	
5.3	Bicycle rack (Post and Ring style)	each	$150-$250	Holds 2 bicycles , price varies depending on manufacturer (includes installation)
5.4	Bicycle rack	each	$1,000-$1,200	Holds 6 bicycles, price varies depending on manufacturer (includes installation)
5.5	Bicycle Locker	each	$3,000.00	Price varies depending on style and size. Does not include concrete mounting pad
5.6	Bench	each	$1000-$2,000	Price varies depending on style and size. Does not include footing/concrete mounting pad
5.7	Safety Railings/Rubrail	linear M	$100-$120	1.4m height basic post and rail style
5.8	Small diameter culvert	linear M	$150-$250	Price range applies to 400mm to 600mm diameter PVC or CSP culverts for drainage below trail
5.9	Pathway Lighting	linear M	$130-$160	Includes cabling, connection to power supply, transformers and fixtures

5.10	Relocation of Light / Support Pole	each	$4,000.00	Adjustment of pole offset (distance between pole and roadway)
5.11	Relocation of Signal Pole / Utility Box	each	$8,000.00	Adjustment of pole offset (distance between pole and roadway)
5.12	Flexible Bollards	each	$100.00	Should be placed at 10m intervals where required
5.13	Pavement Markings	linear M	$1.00	

NOTES:

1. Unit Prices are for functional design purposes only, include installation but exclude contingency, design and approvals costs (unless noted) and reflect 2014 dollars, based on projects in southern Ontario.
2. Estimates do not include the cost of property acquisitions, signal modifications, utility relocations, major roadside drainage works or costs associated with site-specific projects such as bridges, railway crossings, retaining walls, and stairways, unless otherwise noted.
3. Assumes typical environmental conditions and topography.
4. Applicable taxes and permit fees are additional.

APPENDIX E

Summary of Network Costing

Appendix E - Costing Summary
Township of North Dumfries Trails/Cycling Master Plan
DRAFT June 2014

Facility Type	FULL BUILD OUT							
				Proposed Cost by Jurisdiction				
	Total Distance (KM)	Unit Price (per KM)	Total Estimated Cost	Township of North Dumfries		Region of Waterloo[1]	GRCA / Other	
				Distance (KM)	Estimated Cost	Distance (KM)	Distance (KM)	Total Cost
Off-Road Multi-Use Trail[2]								
Upgrade existing granular surface trail to meet 3.0m wide compacted granular trail standard	0.0	$50,000	$85,000	0.0	$0	0	1.7	$85,000
Granular Surfaced Multi-use Trail in a Woodland Setting	1.5	$120,000	$180,000	1.5	$180,000	0	0	$0
Hard Surfaced Off-Road Multi-Use Trail Outside of Road Right-of-Way in an Urban Setting (New)	0.2	$250,000	$57,500	0.0	$0	0	0.2	$57,500
Bike Lane	60.6	$7,500	$0	0	$0	60.6	0	$0
Paved Shoulder	4.6	$55,000	$119,350	2.2	$119,350	2.4	0	$0
Proposed Signed Bike Route	74.0	$1,500	$109,110	72.7	$109,110	1.2	0	$0
Proposed Signed Bike Route with Sharrow	2.9	$3,500	$6,125	1.8	$6,125	1	0	$0
Desired Connection[3]								
Woodchip Surfaced Off-Road Multi-Use Trail with logs beside the trail and geotextile fabric below the mulch (suitable for trails in areas with moist soils)	1.3	$45,000	$59,400	1.3	$59,400	0	0	$0
Two Way Active Transportation Multi-use path within road right-of-way on one side with removal of existing sidewalk	0.5	$275,000	$137,500	0.0	$0	0	0.5	$137,500
Off-Road Multi-Use Trail Outside of Road Right-of-Way on Abandoned Rail Bed in a Rural Setting	5.5	$130,000	$715,000	0.0	$0	0	5.5	$715,000
Granular Surfaced Off-Road Multi-Use Trail Outside of Road Right-of-Way in an Urban Setting	13.3	$140,000	$1,856,400	0.0	$0	0	13.3	$1,856,400
				Total Distance (KM)	Total Estimated	Total Distance (KM)	Total Distance (KM)	Total Estimated Cost
				79.5	$473,985	65.4	21.2	$2,851,400

Total Estimated Distance (KM) of Full Build-out for all Jurisdictions: 166.1 KM

Total Estimated Cost of Full Build-out for proposed routes under the jurisdiction of the Township of North Dumfries and GRCA / Other (excludes the Region of Waterloo): $3,325,385

Notes:

1. Refer to the Region of Waterloo Active Transportation Master Plan (February 2014) for information regarding the network cost for proposed routes on roads / lands under the jurisdiction of Region of Waterloo.
2. Proposed distance and cost for off-road multi-use trails does not include Wilma's Walk (approximately 100 metres) which has already been budgeted for.
3. Desired connections are conceptual routes identified for the Township of North Dumfries' consideration. These desired connections are located on lands under GRCA or private ownership. The Township should investigate funding and partnership options to implement desired connections should the opportunity arise in the future. The assumed facility type for desired connections in the Township of North Dumfries Trails/Cycling Master Plan is an off-road multi-use trail. Refer to Appendix D for additional information regarding unit price costs for multi-use trails.