County of Brant Trail Master Plan

Final Report

August 2010

Revised October 2017

County of Brant Simply Grand

EDA Collaborative Inc.

1.0 INTRODUCTION

A well-developed trail system can lead to an increase in the quality of life for residents of any community. Recognizing this reality and the need to establish a vision for the trail system, the County of Brant embarked on an initiative to develop a Trail Master Plan. The County engaged EDA Collaborative, in 2009 Inc. to undertake this important task, and from inception EDA has taken a whole-team approach in working collectively with the County Trail Technical Committee. The draft Trails Master Plan was completed and most recently the Parks and Recreation Master Plan included some updated information which will act as a companion document.

1.1 Goal of the Trail Master Plan

The Purpose of this plan is to provide a strategic direction for council, staff and the community in order to set priorities and guidelines for the future regarding trail development and planning. The final master plan identifies trail development priorities, a management process to facilitate development including guidelines, policies, partnerships, and the signage program and selection criteria.

1.2 Objectives

The objectives of this Plan are to:

- Develop a vision for new trails that recognize the merit of different trail standards and trail uses.
- Provide a framework for the development for new trails within the County and links with neighboring communities.
- Build upon the existing Trail Use Report and public consultation process, involving the public in the development of the plan.
- Build upon the findings in the adopted Transportation Master Plan.

1.3 Study Area

The County of Brant is a predominantly rural single-tier municipality in Southern Ontario with a population of approximately 36,700. The County has experienced moderate population growth over the past decade and is expected to continue to grow in the future. The proximity of the County to Highway 401 and 403 provide for trade access to a number of large markets, including the Greater Toronto-Hamilton Area, Southern Ontario as well as the northern Unites States.

The County of Brant borders the City of Hamilton, the Regional Municipality of Waterloo, Haldimand, Norfolk and Oxford County, as well as the Six Nations of the Grand River Reserve. The County fully surrounds the City of Brantford (a separate municipality), is approximately 845 square kilometers in size and is located approximately 100 kilometers southwest of Toronto (*See Figure 1*).

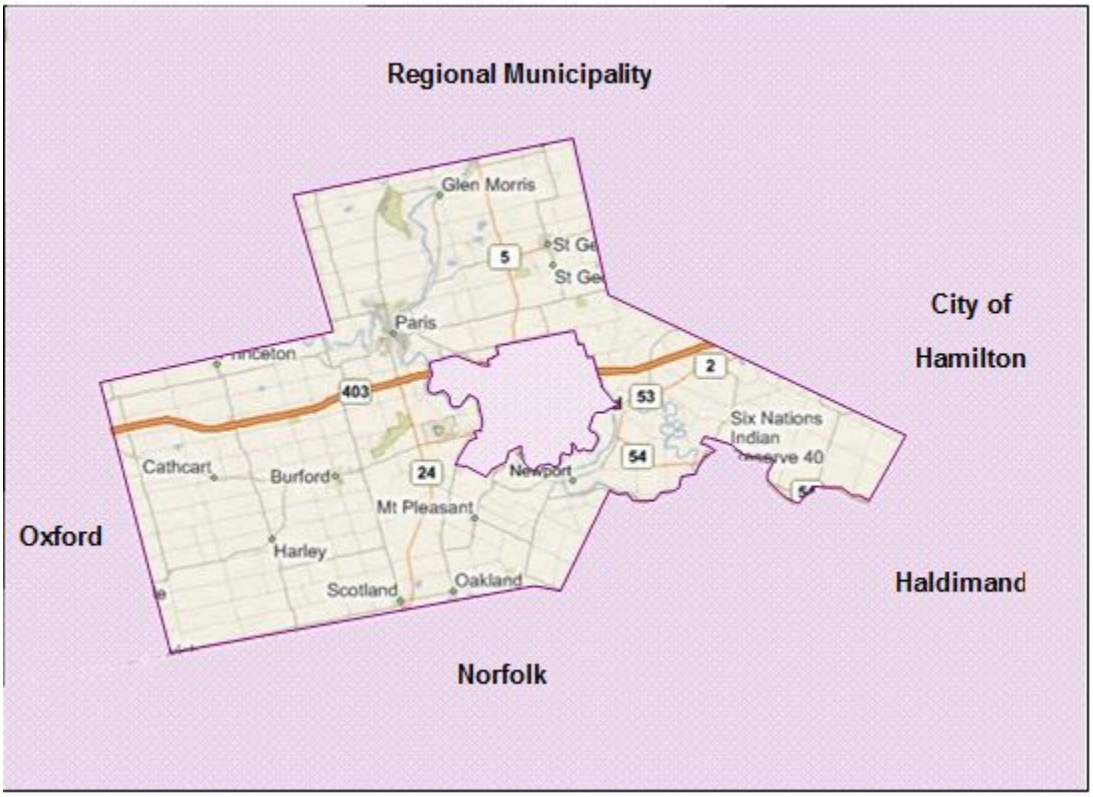


Figure 1: County of Brant Context Map

1.4 Study Process

EDA Collaborative Inc. undertook a four phase approach to development of this Trail Master Plan:

Phase I: Data Collection and Analysis focused on collecting background data relating to all aspects of the trail system and analyzing this data to gain a full understanding of the County of Brant and its existing trail system. This phase also included engaging stakeholders through individual interviews and a workshop/design charrette.

Phase II: The Trail Development Process and Guide-lines was carried out with a focus on the development of trail guideline. Looking at information gathered in Phase 1, further analyzing it, a more detailed understanding of the trail system was established, taking into consideration the natural and social contexts, trail management context and emerging trends in the trail development.

During Phases III and IV the Consulting Team focused on developing an interconnected trail network and management program for the County of Brant as well as an implementation strategy for the trail network.

Stantec Consulting undertook a series of public consultation sessions in 2016-17 and have presented recommendations regarding trail needs, design and routing.

2.0 BACKGROUND INFORMATION

2.1 County History

The County of Brant is named after the Mohawk Chief Joseph Brant (Thayendanegea) who settled the area in the late 1700's. The county was officially established in 1853 and has a rich natural, cultural and human history.

The Grand River, a central part of the County of Brant, was designed as a Canadian Heritage River in 1994 due to its extensive natural and cultural history. Native cultures have been present in the watershed for over 10,000 years, while in the more recent past, settlers navigated the River in search of land for agriculture. Today the River has preserved pieced of this history with 19th Century foundries, mills and factories still present in the banks.

In addition to the strong natural and cultural history, the County of Brant has a rich railway history including Toronto or Buffalo (TH&B) Railway and the Lake Erie and Northern (LE&N) Railway, among others.

The TH&B Railway was based in Hamilton and ran in Southern Ontario from 1894 to 1987, when it was merged into the Canadian Pacific Railway (CPR). This line never reached Toronto or Buffalo, but extended to Dunnville and Port Maitland. A portion of this line is still in use between Hamilton and Welland, but west of Hamilton to Waterford via Brantford the line was abandoned in the 1990s after tracks near the Grand River were washed out.

The LE&N Railway was completed in 1914, operating from Galt to Port Dover on Lake Erie. In 1915 the LE&N purchased the portion of railway from Paris to Galt and the line was later extended to Simcoe and Port Dover in 1916. It was used for many years, until the LE&N Railway rails were lifted during the 1980s (a portion of this former rail right-of-way is now the Cambridge to Paris Rail Trail).

As with the amalgamation of many communities in Ontario, the County of Brant was created January 1, 1999 as a single tier municipality under the name The Corporation of the County Of Brant. The new municipality includes the former Town of Paris, Township of Brantford, Township of Burford, Township of Oakland, Township of Onondaga, and the Township of South Dumfries. It also includes the communities of Paris, St. George, Burford, Mount Pleasant, Scotland, Oakland, Tutela Heights, Oakhill, Onondaga, Cainsville, Harley, Harrisburg, New Durham, Falkland, Middleport, Mount Vernon, Glen Morris, Cathcart, Burtch, Kelvin, Muir, Etonia, Gobles, Creditville, Newport, Maple Grove, Northfield Centre, Hatchley, Langford and Fairfield Plain.

2.2 County of Brant Official Plan

The County of Brant Official Plan was adopted by Council in 2012. As stipulated in the Planning Act, municipalities must undergo an Official Plan Review every five years. The 2012 Official Plan will be used as reference for this Trail Master Plan.

A shift towards active lifestyles and increasing demands for sustainable modes of transportation presents a need for a useful and accessible walking and cycling network in the County. This Plan recognizes that bicycle and pedestrian trails and paths contribute to the quality of life and healthy communities and support sustainable modes of travel, while reducing automobile dependence.

Furthermore, trails may provide for the maintenance of unobstructed corridors for possible servicing needs. The Official Plan identifies a number of important factors that are relevant to the future development and growth of the trails system within the County. As stated the Official Plan objectives are:

- To Provide a full range and equitable distribution of accessible opportunities for recreation (including parks, playgrounds, open space areas, trails, water-based activities, gold courses, campgrounds, sports facilities, amusement parks, and facilities such as restaurants, snack bars, parking areas, and auxiliary buildings).
- To ensure adequate opportunities for public access to the Grand and Nith River shorelines.
- To support passive recreational opportunities where suitable.
- To promote walkability through urban design.
- To enhance the financial sustainability of the County by promoting recreational and related tourism opportunities.

The Plan also maintains that among other things, the extensive kilometers of walking and bicycling trails are an important aspect in relation to the tourism market and will be promoted. The official plan states; The county recognized and supports the development of tourism uses within the Urban Settlement Areas and the Grand River that will encourage visitor stops, provided such uses do not detract from the principal functions and uses of these areas. Such initiatives may include, but not limited to, support for: tourist-recreational activities associated with the Grand River and initiatives to enhance the Primary and Secondary Urban Settlement Areas. Multi-purpose trail systems connecting the Counties Urban Settlement Areas and other population centres, natural amenities, the Grand River, and the other significant natural features; The County shall support the development and promotion if functional, scenic, recreational and educational pathways, trails, and parkways with well signed and interesting attractions along the Grand River and other significant natural features and throughout the County.

The following shall be policies of the County, and shall enhance the Natural Heritage Linkage Strategy policies set out by this Plan:

a) Land deemed by the County to be significant to or contribute to the Linkage Strategy shall be retained in public ownership for the purpose of implementing a linked system.
b) In addition to those options for the acquisition of land outlined in Section 6.11, the County may create linked open spaces through the integration of; natural heritage features, areas and systems, abandoned rail lines in public ownership, existing rights-of-way, established and proposed service and utility corridors, existing parkland and open space, sidewalks and pathways, linkages provided through the draft plan of subdivision approval process, agreements with private land owners, retention or acquisition of access easements and land acquisition.

c) The County shall support the provision of certain pedestrian, cycling and trail linkages through the development approvals process, in accordance with the policies of this plan and associated Area Studies as approved by the County.

When dealing with Planning Act applications, the County shall actively encourage residential, commercial and industrial developers to connect with and provide opportunities to extend the community trail system.

General design policies will; encourage community and development design patterns that promote pedestrian movement through pedestrian friendly design, such as pedestrian-scaled streets, sidewalks, trails and a well-connected street network; encourage cycling through the provision of bicycle lanes and cycling trails, where appropriate; encourage the provision of facilities that promote cycling and walkability, specifically within the County's Urban Settlement Areas.

The County encourages the development and enhancement of pedestrian and shared use of non-motorized trails and bicycle routes. In order to do so, the following shall be the policies of the County:

a) The County Shall support the preparation of a Trails Master Plan for the County's trail system to identify a preferred on-road and off-road trail and cycling network to accommodate a variety of non-motorized activities including cycling, walking, and running. The Trails Master Plan should provide for the delineation of existing and proposed trail systems, linkages to natural heritage features, destinations, the County sidewalk system, specific trail standards and design criteria, among other matters.
b) The County shall encourage community partnerships for acquisition, improvement(s) and maintenance of the trail systems.
c) The County may work towards providing safe bicycle and pedestrian paths, both separated from the roadway, on pre-existing and proposed roads, on abandoned rail corridors, on utility corridors, and within parks and open spaces, as appropriate.
d) The County may consider adapting roads to provide safer travel for bicycles and pedestrians on road pathways, where feasible and appropriate.
e) The County shall undertake to interconnect existing walking trails and bicycle paths, where feasible and appropriate to provide continuous trail system linkages. Routes should provide continuous access between neighbourhoods, parks, schools, recreation facilities, along the Grand River, commercial and employment areas and other public buildings and services.
f) The County shall promote accessible and convenient trail systems within a reasonable distance from neighbourhoods and major intersections.

g) The County shall promote aesthetically pleasing trail systems, particularly for recreational purposes. Attention shall be given to trail systems associated with natural assets such as waterfronts, parks, and natural heritage features. Where it is possible, the planting of native species along these trails shall be promoted.
h) The implementation of trail systems should be feasible given the consideration of the costs and benefits associated with the route selection. This should take into consideration the costs of healthy living, environmental sustainability, and the quality of neighbourhood character.
i) The County shall encourage the integration of bicycle paths and walkway systems into the design of transportation facilities by including facilities such as sufficient and protected bicycle storage areas at places of employment and major community institutional, educational, cultural and shopping locations, where suited.
j) The County shall implement and operate an effective trail system maintenance program.
k) In partnership with surrounding municipalities, the County shall promote opportunities for public access to the Grand River waterfront areas and the development of a river trail system and open space linkages throughout the County.
l) The County may explore opportunities for the reuse of abandoned rail corridors for potential trail systems.
m) The County shall evaluate and promote walking systems in new development proposals and consider the overall connectivity of the system.
n) Any public or private trail crossing a Provincial Highway is subject to approval and the restrictions imposed by the Province.
o) In developing the trail systems, consideration shall be given to impacts on hazardous lands, watercourses and natural heritage features that impacts are eliminated or reduced to the greatest extent possible.

2.3 County of Brant Transportation Master Plan

On December 19, 2008, County Council approved in principle the County of Brant Transportation Master Plan (TMP). The County had initiated preparation of the TMP in conjunction with the mandatory five-year review of the Official Plan to guide development of the County's transportation system over the next twenty-five years. It was also resolved that the TMP be subject to review upon the County's next Official Plan Update process expected in 2013. The 2008 TMP was prepared to:

- Identify existing and future levels of travel demand throughout the County
- Outline the transportation infrastructure needed to ensure the safe and efficient movement of people, goods and services for the economic growth and prosperity of the County
- Develop policies and guidelines for all modes of transportation in the County, including roads, trucking, transit, cycling and walking
- Conduct the TMP preparation in conjunction with the County's Official Plan Update process and implement recommendations of the TMP in the new Official Plan

In February 2014, the County issued a Request for Proposal to update the TMP and also prepare a related Aggregate Resource Guide for processing applications under the Planning Act. Once again the TMP Update would be conducted in conjunction with the County Official Plan Review to provide policies and guidelines for all modes of travel including road, rail, air, commercial vehicles (trucks), automobiles, transit, cycling and walking.

The update is required six (6) main reasons:

1. The Provinces Places To Grown legislation, enacted subsequent to the 2008 TMP approval, provides new growth allocations to the County. The TMP Update would assess the impacts of these allocations on traffic growth.
2. The County saw a number of formant aggregate pit permits reactivated and new pit applications made after 2008, leading to the need by County staff to manage the heavy truck movement associated with these other future pits.
3. When the 2008 TMP was being prepared for the County, the Ministry of Transportation (MTO) had initiated the Brantford to Cambridge Transportation Corridor Environmental Assessment (EA) study to address long-term transportation problems and opportunities between the two areas. It was believed by many that the findings of that study could significantly impact the County's transportation system. Then in 2009, MTO received approval of an EA Terms of Reference to conduct the study as an Individual EA. However, since then the study process was stopped, and MTO is assessing its planning priorities and

schedule for actually conducting the individual EA. The project is listed in the 2013-2017 Southern Highways Program only under “Planning for the Future”.

4. Growth and development has continued in the community since 2008, especially in the Community of Paris. This includes development in SW Paris and in the Brant 403 Business Park to the south, all with an impact on travel patterns and volume.
5. Some important transportation-related projects have been implemented as recommended in the 2008, most notably the Alternate 24 Paris Bypass and the Rest Acres Road Municipal Class EA for widening and urbanization to four lanes from King Edward Street to Highway 403.
6. New TMPs have been prepared in neighbouring municipalities that have an influence on the County’s transportation system, from Brantford, Hamilton and the Region of Waterloo. The TMP Update was also to be completed in accordance with Phase 1 and 2 of the Municipal Class EA Process to provide the need and justification for future transportation infrastructure improvements.

Key issues in the transportation master plan relating to the Trails Master Plan are:

- The provision of multi-modal and age-friendly mobility choices for County residents (roads, transit, cycling, walking).
- The provision of infrastructure and services that support Active Transportation in the County (walking and cycling).

Generally, the Transportation Master Plan identifies existing and forecasted travel demand throughout the County determining the transportation infrastructure required for safe and efficient movements while encouraging economic growth and prosperity.

Section 4.7.2 of the 2008 plan prioritizes Paved Shoulders on Rural Roads. The local cycling community (Brantford and Brant Ride Forum) requested that consideration be given in the TMP Update to paved shoulders on County Roads where possible. In response, the Project Team requested further information from cycling community representatives on their priorities for paved shoulders, resulting in the following list of five (5) priority routes:

- Governors Road from Paris towards Copetown
- Powerline Road from King George Road to Bethel Church Road
- East River Road between Green Lane and Brant Road Highway 24
- Paris Road between Brantford and Paris up to Highway 5
- Old Highway 24 south from Mount Pleasant Road towards Waterford

Where paved shoulders for cycling are provided on County Roads, they should be designed to Ontario Traffic Manual, book 18 standards to provide satisfactory

clearances between the bicycle envelope and motorized vehicles. This 1.0 m – 1.5m envelope is recommended because the posted speed on most Count Roads where paved shoulders may be considered is 80km/hr. this results in a pavement width of 2.0-2.5 metres (6.5-8.2 feet) pm each side of the road for a paved shoulder. The cost to retrofit a two lane County Road with 2.5 metre wide paved shoulder bike lanes is estimated at approximately $25,000/kilometer based on the TAC Geometric Design Guide.

The *County of Brant Transportation Master Plan Update* was approved by Council in 2016 which included the following recommendations:

- To include a pedestrian charter in the Trail Master Plan.
- To ensure Section 6.9 Off-Road cycling Strategy and Trail Planning Guidelines prepared for the 2008 TMP be reviewed and incorporated where appropriate into the Parks and Recreation Master Plan.
- Active Transportation (Cycling & Walking) and the basic non-motorized or active modes of transportation using cycling and walking take place throughout the urban and rural areas of the County of Brant primarily in response to leisure and recreation activities, group activities such as bicycle tours, routes to schools and general short distance transportation for all residents and visitors. There are no formal bikeways in the County except along multi-use off-road trails, and no marked bike lanes on sharing lower volume roads in and around the settlement areas, and along the gravel shoulders of County roads.
- Active Transportation In healthy communities, walking, cycling and other kinds of non-motorized active transportation (e.g. roller blades, scooters, skateboards, etc.) are a normal, routine part of daily life. These active modes contribute to the quality of life and public health, provide options for getting around, and are important elements of an integrated transportation system that is moving Towards Sustainability. Promoting and encouraging walking and cycling through the provision of facilities and programs helps build active communities, and reduces the dependence on automobile transportation and the associated infrastructure costs, air quality, safety and congestion problems. With the increasing focus on the health costs of our sedentary lifestyles, daily walking and cycling are seen as essential components of a healthy lifestyle primarily in urban communities, but also in rural areas. Many communities are attempting to redesign themselves to facilitate active transportation by: Providing walkways and bikeways that accommodate and encourage non-motorized travel, rather than only designing communities around the automobile; Managing traffic with road designs that allow pedestrians, cyclists and other travelers as well as motorists to use the roads. Features that facilitate automobile use such as wide roads and intersections, large parking lots and drive-through businesses can

create an uncomfortable and unsafe environment for non-motorists; and encouraging walking and cycling within and between communities by managing the shape of urban growth and promoting more compact development. Within transportation plans, policies that affect walking and cycling involve the planning, design, implementation, operation and maintenance of linear facilities (sidewalks, crosswalks, trails, bikeways, and bicycles aboard transit) and other amenities (benches, shelters, bicycle parking, etc.), and may also complement policies in other municipal programs that encourage cycling and walking (safety and education programs, bikeway maps, etc.). Examples of these programs already in place in the County of Brant include: The Hamilton-Brantford-Cambridge Trail brochure and map produced by the Brant Waterways Foundation in association with the Grand River Conservation Foundation and the Conservation Foundation of Hamilton Region with donations from a wide cross-section of area stakeholders; Best of Brant Outdoors prepared by the County of Brant Tourism; and The Grand River Exceptional Waters material developed by the Grand River Conservation Authority.

- The following additional trail planning guidelines are provided to assist the County and involved agencies in the further development of a system of active transportation trails within the County.
- As well, the guidelines will aid in establishing feeder/connector trails to provide access to the existing trail system, strategic municipal sidewalks, external municipal trail access points, public lands, waterways, etc. The guidelines also provide a means of cooperation between the County of Brant, the City of Brantford, Grand River Conservation Authority, Ontario Trails Council, Brant Waterways Foundation and other government and non-government agencies, service clubs and individual members of the community in the planning and development of off-road trails. The trail system encourages public use of public lands, abandoned rail rights-of-way (rails-to-trails), streams, rivers, greenbelts and where appropriate and acceptable, private easements/rights-of ways. With an inventory of trails in the County, specific trails could be refined, expanded or developed depending upon desire, funding, volunteerism and need. The County and involved agencies will use these guidelines to plan and prioritize trail development on an annual basis, subject to funding availability.
- Trail planning guidelines recommended for the County to implement coordinated trail planning are:
- County Council should determine overall budgetary priorities and allocations for an annual County of Brant Trail Development and Lifecycle Maintenance Program, including annual allocations for new trail development;

- The County should complete and review a minimum of every five years, and possibly over a shorter time period in the case of new phased trail develop a Trails Master Plan that will provide the following for the County's Trail System; Specific trail standards, design criteria, material applications, etc. A map of all trails in the County delineating priority use, locations, access points, services, lengths, links to natural heritage and natural habitat areas, and proposed/possible future on-road/off-road trails. Marketing and promotion plans and materials.
- Identified linkages with the County's Transportation Master Plan, tourism newsletters and brochures, Parks and Recreation plans and the Official Plan.
- The County should strongly encourage community partnerships for acquisition, improvement(s) and maintenance of the trail system. However, the absence of a third-party agreement for acquisition, improvement or maintenance should not be cause for the County to reject acceptance of a proposed trail which is in compliance with these guidelines. The acceptance of a trail does not guarantee County-funded construction or maintenance.
- Trails proposed for incorporation into the County's Trail System will initially be reviewed by the Community Services Committee, and appropriate action taken by County Council as part of the annual budget process.
- Basic standards for the development and maintenance of off-road trails for walking and cycling in the County of Brant should encourage accessible, logical, safe and comfortable usage, serve a wide variety of recreation and transportation modes and impact the environment as little as possible. A mix of trails suitable for use by hikers, bicyclists, equestrians and wheelchairs should be encouraged. Generally, trail widths should be wide enough to accommodate the intended use. All trails constructed must comply with the AODA, Design of Public Spaces Standards. General specifications are provided in these standards. All trails should be reviewed for support opportunities relative to services for rentals, food services, parking and related enhancement opportunities where feasible.
- The purpose of nature and hiking trails is to provide passive recreational opportunities and connections between points of interest. The trail designs vary depending on the volume of activity. Less travelled walking trails will be narrower and will have fewer amenities. More important trails with heavier use will have greater enhancements and be wider. Walking trails will be located predominately in areas of natural heritage including woodlots, along watercourses, around storm water management areas and as connection linkages between larger parks. The following standards shall apply to walking and hiking trails where the County or other proponent installs trail features as shown on Exhibit 6-7: Clearing Width: 1.2 metres to 3.0 metres varying by volume of activity; Tread Width: 0.75 metres to 1.25 metres; Clearing Height: 2.1 metres with sensitivity to maintain existing vegetation where possible; Surface: compacted limestone fines or woodchips; or other suitable material; The construction practices and type of material used for surface treatment should be sensitive to the surrounding natural vegetation and existing materials; and Water Crossing: Wherever possible the need to cross watercourses will be accommodated through existing bridge systems. Where necessary small bridges will be provided to accommodate

walking traffic only. The bridges will be designed to minimize disruption to the waterway and provide sufficient clearance for continued canoe and kayak use.

- Multi-use recreation trails are intended to provide opportunities for a wide range of passive non-motorized activities. These may include walking, cycling, wheelchair access, rollerblades, strollers and walkers for seniors. These trails are intended to be located in proximity to residential areas and newly developing subdivisions. These trails provide access to open space areas and link schools, and commercial and institutional activities within the community. Where possible these trails will be located adjacent to storm water management ponds, environmental areas and natural areas.
- Tread Width: 2 metres to 2.7 metres; 3 metres to 4.5 metres where the tread width anticipates significant cycling activity; Clearing Height: 2.1 metres to 3.0 metres with some impact on surrounding vegetation.
- Surface: compacted limestone fines, minimum; recommended asphalt where significant user activity is anticipated; and Grades: 0 to 5%. The design shall minimize blind corners, sudden grade changes or steep slopes terminating at a path or road intersections. This is intended to provide high levels of safety for cycling and in-line skating where higher speeds may occur.

TRAIL SELECTION, MAPPING AND FUNDING

- Trail Selection Procedure - The following criteria are recommended to determine the suitability of a proposed trail to be included in the County of Brant trail system. Trails will be considered for inclusion upon submission of an official request to the County of Brant; any person or group may submit a request. Documented concurrence of the involved landowner(s) and/or managing agency(s) must be provided with each request. All requests will be reviewed by the County for general public safety, completeness and appropriateness. Based upon the recommendation of County staff, final approval of the requested trail for inclusion in the County's trail system will be by the County of Brant Council.
- Trails that connect with one of the following will be given strong consideration: Existing or proposed trails as already delineated on the County's trail maps. The terrain and/or topography for a trail should be suitable for trail purposes, either multi-use or specific. They may be of various degrees of difficulty. Trails that provide an alternate means of transportation should be given strong consideration, as should trails located in floodplains, old railroad rights of way, and utility easements and on watercourses.
- The Trail Maps adopted by County Council should be the official documents outlining the County's Trail System. These maps should be maintained by the County and revised as directed by the County Council. These official Trail Maps should also be reflected on the Transportation Schedule of the County's Official Plan, and maps and brochures produced by the County of Brant Operations Department, economic development and tourism agencies and private organizations (i.e. GRCA, Brant Waterways Foundation).
- The decision to amend the trail system and Trails maps should be based on one or more of the following criteria:
- Whether the subject trail or trail access serves as a link to a major nature

preserve or waterway;

- Whether the subject trail or trail access is selected so as to minimize the impact on the environment; and/or whether the subject trail access is positioned in a way to minimize impacts upon adjacent structures and property owners;
- Whether the subject trail or trail access crosses roadways at grade separations or away from blind curves or stretches of road where visibility is obscured;
- Whether the subject trail or trail access is a significant scenic or historical route which serves as a link in the overall trail system;
- Whether the subject trail or trail access will require significant alteration or removal of existing vegetation; and/or,
- Whether the subject trail or trail access will pose significant design or safety problems or has experienced water level or related constraints.
- County Council may set up a separate account to accept donations, grants or any funds to be used exclusively for the acquisition, development, preservation and maintenance of the County's trail system. County Council may also consider the use of Ecological Land Donations, Job Creation Programs and other funding sources. Trails that serve new development may also be funded by development charges. As new subdivisions are developed, additional charges/revenues may apply.
- 2008 TMP Recommendations:
- Access management and intersection operations should be applied and designed not only for auto traffic, but also for commercial vehicles, transit vehicles, cyclists, pedestrian and persons with special mobility needs. This multi-modal approach to access management ensures that the person carrying capacity of arterial roads is optimized, as well as the vehicle capacity;
- The *Transportation Master Plan* also identifies a number of trail planning strategies and design guidelines to enable the further development of an active transportation system. These strategies and guidelines were considered when creating the trail design guidelines for the trail network in the County of Brant.

2.4 Trails Use Report for the County of Brant

The Trails Use Report, submitted by the Trails Steering Committee in 2007 preceding this Trail Master Plan, outlines a number of recommendations that will have an impact on the trail development within the County of Brant. The Trails Steering Committee consisted of a number of individuals including Paula Neice, Delia O'Byrne, Bill Leask, Don Holmes, Nikki Lefler and Jen Book. These recommendations have provided a solid starting point for the Consulting Team to develop this Trail Master Plan and are as follows:

1. *Vision* – The County should encourage the development of a year-round multi-use trail network connecting to other trails for the use of residents and visitors. This can be done by working with local trail clubs, adjacent municipalities, conservation authorities and other groups in a collaborative manner.

2. *Trail Activities* – The County encourages multiple use trails, meaning two or more uses on one or more pathways. Potential trail uses include walking, hiking, jogging, cycling, horseback riding, snowmobiling, cross country skiing and ATVs.
3. *Planning Principles* – The County will designate a staff person to act as the point of contact for trail policy and all issues related to the trail system.
4. *The TH&B Abandoned Rail Corridor* – The County shall develop a planning process for the TH&B; this will inform the development of the corridor as a multi-use recreational trail.
5. *Trail Use* – Within the TH&B Corridor: two sections should be zoned for different uses and the development of the trail bed will reflect the approved trail uses. Within the LE&N Trail Corridor: use should continue as a hiking and cycling trail. Equestrian use on a designated stretch should be discussed.
6. *Signage* – The County should develop a signage program that includes orientation/ direction, safety, approved uses and trail etiquette and education.
7. *Trail Amenities* – Including amenities for trail users is a priority. These include distinct access points/ trail heads, picnic tables, benches, plantings, maps. Etc.

3.0 TRAILS IN ONTARIO

3.1 Active Canada 20/20: **A Physical Activity Strategy and Change Agenda for Canada,** is the response of a broad cross-section of the physical activity community from across Canada who are concerned about health and quality of life, and who are committed to addressing the urgent national need to increase physical activity and reduce sedentary living. Eighty-five percent of Canadian adults and Ninety-three percent of Canadian children and youth do not achieve the minimum level of physical activity necessary to ensure long-term good health and well-being.

Active Canada 20/20 provides a clear vision and a change agenda to describe successful steps that, if implemented, will increase physical activity and reduce sedentary behaviour, thereby reducing health risks and achieving the many benefits of a society that is active and healthy. It demonstrates the actions that, if undertaken at multiple levels, will strengthen Canada by making physical activity an important cultural trademark.

ACTIONS FOR COMMUNITY DESIGN
BUILT AND NATURAL ENVIRONMENTS:
Every municipality should develop or review and revise municipal/local government master plans to ensure that opportunities for physical activity are explicitly included in all facets of the plan that barriers to an active lifestyle are eliminated, and that environments promoting sedentary behaviours are limited.
Within the municipal/local government master plan for physical activity, a strategic plan for transportation that explicitly places priority on safe and active transportation, as well as public transportation, should be developed.
Municipalities/local governments should plan and establish active transportation routes designed to meet the needs of everybody with safe and accessible routes to nearby neighbourhood and community-wide destinations.
Governments should address the recreation infrastructure deficit in order to ensure everyone has access to indoor and outdoor facilities and public spaces where they can learn, experience, play and practice physically active pursuits.
Municipal/local governments should identify existing facilities and spaces (public, private and others) and develop plans to maximize community-wide shared use in order to increase access by community members for physical activity.

3.2 # Cycle ON – Ontario's Cycling Strategy

This 20 year strategy (2013-2033) is designed to encourage the growth of cycling while improving the safety of people who cycle in the province. The strategy's vision requires commitment from partners for integrated action to:

- Design healthy, active, prosperous communities
- Improve cycling infrastructure
- Make highways and streets safer
- Promote cycling awareness and behavioral shifts
- Increasing cycling tourism in Ontario

Guiding principles for planning and design are:

- Incorporating Complete Streets design principles. Complete streets are roads and adjacent public spaces that are designed for people of all ages, abilities and modes of travel. Within Complete Streets, safe, comfortable access for pedestrians, cyclists and transit users is not an afterthought, but an integral planning feature.
- Implementation of guidelines from the Ministry of Municipal Affairs, Provincial Planning Strategy on cycling infrastructure.
- Implementation of guidelines from the Ministry of Transportation, Book 18 and/or Bikeways Design Manual Awareness.
- Partner with local agencies to deliver awareness campaigns that educate and promote a culture of cycling.
- Implement a "Share the Road" program.

Tourism

- Continue growth in cycling by creating more route supporting infrastructure
- Link to neighbouring community cycling infrastructure and partner to close haps between existing cycling routes

3.3 The Need for Good Trails

A well-connected and integrated trail system is important for human well-being and quality of life. Many benefits of trails have been identified:

Better Health

Trails are part of the overall parks, recreation and open space system, supporting an active lifestyle and improving health. Healthy communities can lower the burden put on the health care system. Trails are readily accessible, low cost and provide the type of activities that many people enjoy regularly (walking, cycling and jogging). Trails are available for a wide variety of people including people with disabilities, children and youth, seniors and others.

Strong People, Strong Economy

Trails attract a wide range of users to communities where they are present. This type of tourism creates jobs and injects money into the local economy. The Ontario Trails Council estimates that all types of trails and activities contribute at least $5 billion per year to Ontario's economy. Studies related to the economic impacts of trails on communities consistently prove that trails have a positive effect on property values. Properties located near trails generally sell for more than those located further away.

Strong Communities

Ontario's trail system has been built mainly by volunteers; this type of pride and appreciation is socially valuable and meaningful, creating stronger communities. Trails continue to provide numerous opportunities for volunteering in communities. The notion of strong communities also relies on the generosity of private property owners. Many trails cross or encroach onto private lands with access granted by owners willing to share with trails users. Further, the construction and maintenance that is completed through partnerships among community and user groups; businesses, local owners and residents will build and solidify a strong community.

Conserving and Appreciating the Environment

Trails lead people through a wide variety of natural and urban landscapes. The opportunity for interpretive signage to enhance the trail system is important and enhances our appreciation of the natural and cultural heritage. Trails provide outdoor experiences that are meaningful to users, reaffirming a sense of connection with the natural environment and an appreciation for Ontario's heritage. This appreciation leads to environmental education and a commitment to environmental conservation. The degree of protection of natural resources should be considered in the development of the detailed routes for trails relative to the ANSI's and ESA's in the county.

Strategies may involve routing to avoid the sensitive areas, boardwalks, railings, interpretive signage and other forms of control.

3.4 Market Trends Affecting Trails

A number of opportunities, challenges and issues have been identified that are currently facing Ontario's trail community:

- Sustainable transportation systems, through the implementation of Transportation Demand Management (TDM), are becoming more common for municipalities throughout Ontario to strive towards. TDM strategies reduce congestion and reduce reliance on the single-occupant vehicle through utilizing the current infrastructure by supporting cycling, walking transit and carpooling.
- The health benefits of a walkable community are becoming increasingly important to Ontarians. Communities are seeing the importance of well- designed communities that supports walking as a primary mode of transportation where people can walk to school, work, parks, stores and restaurants, reducing the need to use the automobile.
- In Ontario, ownership of all-terrain vehicles has increased, while the development of ATV trails has not kept up with the growth in demand for these trails. With relatively few trails for ATVs, these users have been frequenting trails unsuitable for their vehicles.
- The economic impacts generated by trails, in particular as a result of trail for motorized users (snowmobilers and ATV's) can be significant. Economic impacts are generally greater in regions where trails bring in visitors from outside the immediate area.
- Involving the tourism sector in marketing of trail products is important if the trails are to become tourism experiences, and help attract visitors to the area. In Quebec and Wisconsin, trails are seen as a major tourism product and there is considerable emphasis on developing and marketing them as such.
- For motorized and multi-use/shared use trails, establishing clear rules and safety standards and enforcing them is extremely important.
- Offering different types of trail experiences is also important, for several different user groups. For motorized users, trails with different degrees of difficulty and through different types of terrain are appealing, as are open "scramble" areas. Hikers and cyclists appreciate trails of varying types (e.g. rural roads, bike paths, road shoulders for cyclists) and through varying terrain.
- There is a definite movement in the United States towards "user pay", a payment system for trail use to provide funds toward trail maintenance and upkeep. This is particularly the case for motorized trail users.

- Developing packages around trail experiences can help create products to appeal to tourism markets and also increase economic impacts. Examples include guided tours, self-guided inn-to-inn or campground to campground hiking and biking tours, family ATV tour packages, etc.
- Signage is important - to direct users to trail heads to direct trail users to services close to the trail and to provide information and guidelines to users.
- For hikers, having loop trails is very important, as are trails through scenic, natural areas. Loop trails of varying difficulty and length are important to maximize the base of potential users.
- More difficult hiking trails that offer outstanding trail and natural experiences can become significant demand generators for areas and draw visitors from both national and international markets.
- Cycling offers some real potential in both resident and tourist markets, as evidenced by the experience in Quebec and Maine. However, it is important to offer a quality cycling experience in order to capitalize on this market. This means designating cycling routes on cycle paths, rural roads and along shoulders of roads in cycling lanes, routes through scenic areas and access to appropriate infrastructure and services.
- The approach to motorize vs. non-motorized uses appears to be to develop separate trails. Hikers, walkers, cyclists and cross-country skiers prefer trails that are not shared by motorized users.
- Trail organizations must work together to use resources most effectively, and:
- Increasing pressures on the natural and cultural features of trails due to growing population densities and the increasing number of off-road vehicles, many of which are used off-trail also.

4.0 COMMUNITY ENGAGEMENT PROCESS

4.1 Individual Interviews

At the very onset of the community engagement process, members of the Consulting Team met with the County staff and were provided a list of key community informants who had and continue to play a vital role regarding trails within the County. The Consulting Team has interviewed a number of these informants as well as tourism players and representatives of municipalities. A complete list of those interviewed is provided in Appendix 3: List of Interviewees. The individual comments have not been included for reasons of confidentiality; however a summary of the key themes, issues and challenges regarding trail development and operation/ maintenance that were identified from the interviews is included:

- Concerns of safety, particularly when people are alone on rural trails;
- A need for distance markers on the rail trails to measure distances;
- Creating an interconnected trail network linking with existing trails within the County and beyond is important in providing people many trail options;
- Dedicated maintenance and trail inspections is important for safety and liability concerns – need to establish who will be responsible for this;
- Developers need to invest in trail system development to help create an integral network;
- Trails linking with urban centres can be economically beneficial to the County;
- Concern about the current lack of directional signage and the connection of trails to the smaller communities within the County;
- Trails are an excellent, inexpensive recreational feature that many people can physically and mentally benefit from;
- Trail education and etiquette is necessary to make multi-use trails successful.

4.2 Stakeholder Workshop

A stakeholder workshop and design charrette was held in the evening on May 14th, 2009 to gain insight into future trail development, use and management and to discuss any other related issues. The evening was organized into two parts: the first part consisted of presentation by the Consultant Team providing a background and purpose of the workshop and the second part was organized as a "hands on" design charrette that allowed participants to create their own ideal network of trails within the County of Brant. These were developed in small groups, and then shared with the entire group at the end of the evening. There were a number of commonly shared views and ideas that emerged from this workshop session. This stakeholder workshop drew 30 people, all with an interest in the future of trails within the County of Brant. The key points of discussion at the workshop are summarized in Appendix 4: Stakeholder Workshop Comments.

4.3 Community Open House

A community open house was held in the evening on June 24th, 2009. This open house consisted of a brief presentation by the Consulting Team, but was mainly a listening session for the community to respond to the concepts being presented and voiced their opinions, concerns and ideas. A summary of comments heard at this open house are included below:

- The master plan should consider both the county-wide scale and the local community scale in planning the trails system;
- Link existing community core areas and new growth areas to the trail system -
- i.e. Paris core area and surrounding new/planned communities;

- Ensure an adequate number of trail access points are planned in close proximity to residential communities - i.e. without having to drive to trail heads;
- Provide suitable and appropriate amenities at trail heads - such as adequate parking areas, interpretive signage, maps, picnic tables, trash receptacles, etc.;
- Ensure that there is adequate and regular communication among trail user groups and stakeholders during the planning process and beyond;
- On-road bicycle trails are considered legal on Provincial Highways (except 400 series) provided that cyclists obey the rules of the road;
- There was strong consensus that a system of trails as well as potential areas for motorized users should be considered as part of the Master Plan;
- The Ontario Off-Road Group provides an enforcement mechanism that requires trail permits (for snowmobiles and potentially other types in the future);
- An ATV trail system is being developed in Norfolk County - i.e. motorized trails are running parallel to the non-motorized trail system. There is an opportunity to potentially connect with this system along the County of Brant boundary;
- Provide easily accessible walking loops within existing and new communities;
- Ensure that demographics are considered in the study - such as youth, aging population, new Canadians, health benefits, etc.;
- There are areas where multi-use trails may not be appropriate - i.e. nature interpretive trails through sensitive ecological areas, etc.;
- LE&N trail is a provincially owned route that may connect with Lynn Valley Trail in Norfolk County - concern that it may be used in future as a pipeline right-of-way;
- Concern relative to agricultural use crossings over the trail in the rural areas that may cause damage to trails;
- Opportunity to support employment area with well-connected trails between employment lands and residential land use areas;
- Strong opportunity to promote active lifestyles through education and related programs including the "Pathways for Health" and the "Walkability" program sponsored by the County Health Unit.

4.4 Data Collection Surveys

This section summarizes two surveys that have been conducted by the County of Brant. The first, prepared in collaboration with the Consulting Team, is a questionnaire specifically related to current trail users and uses; a copy of this questionnaire is provided in Appendix 5: Trail User Questionnaire. The second, a Parks and Recreation Needs Assessment Survey, is more general in nature yet still relevant to the development of this Trail Master Plan.

4.4.1 County of Brant/ EDA Trail Users Questionnaire

The consulting Team worked with the County of Brant Trail Technical Committee to develop a trail questionnaire in order to gain insight into user needs, a copy of which is attached in Appendix 5. This survey, conducted during June and July 2009, was made available to the public through a link on the County website and in hard copy format at the County of Brant Customer Service Centres. In total, 64 questionnaires were returned, the results of which helped to identify and establish the need for facilities and amenities required to support a comprehensive trail system.

4.4.1.1 Main Themes

Initial analysis of the survey data indicated that a majority of respondents use trails on a weekly basis (45 percent) and that they mostly use trails located within the City of Brantford (outside of the County of Brant), The LE & N Rail Trail and the Cambridge to Paris Rail Trail. Most respondents indicated that they use the trails mostly for walking/ hiking/ jogging, and cycling, while horseback riding was also noted as a use of the trails.

A number of themes emerged from the survey results, including trail connectivity, points of interest / destinations, social and health benefits, types of amenities, maintenance issues and location of trails.

Many respondents indicated a lack of trail linkages and loops to neighborhoods and / or work destinations. All survey respondents indicated that they did not use the trails to get to work. However, with greater trail connectivity a unique opportunity exists to incorporate everyday destinations into the trail network.

The top destinations / points of interest among survey respondents included natural features, rivers and restaurants. The nature and wildlife experience was important along the trails, yet the inclusion of restaurants indicates that points of interest at the end of trails, for resting, would help to enhance the trail experience. Further observation presents an opportunity to reinforce the local connection between Brantford and Paris through the use of interest points to create more linkages through the County of Brant.

Among several survey respondents, the social interaction of the trails was an important factor to consider. Greater use of the trails as a means of everyday travel could promote social interaction, physical and mental health benefits as well as provide a greater amenity value of the trails to the County of Brant.

Parking was ranked as the most important amenity, while general signage and trail maps were viewed as important amenities to highlight rest stops, food areas and trailheads. These rest stops and trailheads should also provide washrooms and parking, as this was indicated as important by a majority of survey respondents. Several survey

comments mentioned maintenance, clean up, and horse and dog droppings as being of concern. Further indications that maintenance and care of trails was an issue include respondents identifying garbage cans as important amenities for the trails. As a result of this evidence, more intensive trail management may be warranted.

4.4.2 2009 Parks and Recreation Needs Assessment Survey

In June 2009 the County of Brant conducted a Parks and Recreation Needs Assessment Survey. This survey was distributed to 1500 randomly selected households within the County of Brant in order to study the current level of use and future needs of indoor and outdoor parks and recreation facilities and services. Upon receiving the results of the survey, the Consulting Team determined that information relevant to multi-use trails was considered useful to supplement the information gathered from the Trail User Survey. Themes that emerged from the analysis of this survey data are described below.

The survey results indicated that among the several parks and recreational areas / amenities, it was found that multi-use trails were often the most common response regarding usage, in comparison to the other categories, proving their popularity among local residents. The survey results also show that of any type of outdoor space for the community to build, trails were the most frequently cited, followed by playgrounds.

Among the County of Brant population, multi-use trails are largely enjoyed and supported, particularly in the Paris area (50 percent of respondents indicated Paris as their place of residence). Since the most likely users of the trails are currently the sizeable long-term resident population (nearly half of residents indicated they have resided in the area for more than 10 years), there may be a need for greater marketing of the trails to newer residents.

Trail activity seemed to be prevalent among couples and couples with dependent children suggesting a focus on social interaction and family-oriented activities. Overall, there is generally a satisfaction with the current trail system and minor investment with little cost to taxpayers is supported. A stakeholder meeting with cycling enthusiasts was held in Decembers 2016 as facilitated by GSP Group. The feedback received from that session is included:

- Brant-Oxford Road – potential signed route or paved shoulder.
- German School Road – potential connection east-west with St. George / Lynden Loop.
- Governors Road from Paris to Copetown – as Arterial Road should have bike lanes or paved shoulders (needs engineering review).

- Paris Road between Brantford and Paris up to Highway 5 has a full paved shoulder for partial distance – this is a good route, consider potential extension of paved shoulder.
- East River Road between Green Lane and Brant Road Highway 24 – good route – there was reference to tar and chip surface along this route.
- Old Highway 24 south from Mount Pleasant Road towards Waterford – good route.
- Transportation Master Plan recommends for Rural Arterial, Rural Collector and Rural Local Roads that bike lanes may be considered if speed limit is less than 80km/hr – should consider paved shoulders where speed limit is 80km/hr +.

4.4.3 Overall Survey Conclusions

Overall, trails within the County of Brant remain a valuable and appreciated amenity, but need to be developed further. It became apparent that creating a cohesive network of trails and developing related amenities is supported and encouraged by a majority of survey respondents. What remained constant in both surveys was support of the investment and development of the trail system at a minimal cost to the local taxpayers. The results of the surveys determined that trails offer the local population a community focal point and area for social interaction and betterment of health.

Both surveys showed frequent usage and overall satisfaction with trails and their current condition. Although trails in the County of Brant were found to be generally well used, there appeared to be a lack of younger users and single parent families in comparison to couples with and without children.

From the survey conclusions, a number of considerations have been identified:

- Trails should take advantage of natural and wildlife destinations as desired points of interest;
- Trails should link employment areas with residential and neighboring destinations providing an active mode of transportation for everyday use;
- The addition of trail signage, washrooms and parking should be implemented and located along trails, where appropriate, and/ or at existing and future trailheads;
- Marketing to new residents and young families should be pursued in order to diversify the user base of the trail system;
- It is recommended that a maintenance plan be implemented in order to keep trails from falling into disrepair and ensure user satisfaction and safety.
- Additional funding should be sought from other levels of government for the future development of trails.

- It is recommended that all new development in the County of Brant are required, or at least encouraged, to include trail development as part of their open space system, linking with existing or planned trails in the community.
- Attention should be paid to linking the County of Brant trail system to hose in the County of Norfolk and other surrounding communities/municipalities.
- It is recommended that a trail survey be conducted at regular intervals (i.e. every five years) to ensure that the trails needs of the community are taken into account.
- It is recommended that several cycling routes be approved, signed and marketed based on Ministry of Transportation, Book 18 Standards.

5.0 TRAIL USERS

The current trail system within the County of Brant is utilized by a variety of users, however from the background research and stakeholder workshop it is clear that pedestrians (including walking, hiking and jogging) and cyclists seem to be predominant users of the trails. A broader range of users may be anticipated if the appropriate trail network is provided in the County of Brant. The following table summarizes users that may be anticipated on future trails within the County of Brant.

Trail User Category	Trail User Sub-Category
Non-Motorized Users	
Pedestrians	Walkers, Hikers, Joggers
In-Line Skaters	
Bicyclists	On-road, Off-road, BMX
Special Needs	Wheelchair users, people with visual impairments, people with strollers
Equestrians	
Cross Country Skiers	
Motorized Users	
Off Highway Vehicles (OHVs)	ATVs, Motorcycles, 4x4s
Snowmobiles	

Table 1: Anticipated Trail Users

The following is an overview of each trail user:

Walkers, hikers, joggers

These types of users may use sections of a trail system for passive recreation, exercise activities and / or trips of purpose. However, due to long distances between urban areas and / or lack of many attractions/ destinations close to the trails currently in the County, may make walking less popular than other types of trail use, unless within an urban area.

In-Line Skaters

These users are able to travel a farther distance than pedestrians trail users because they can travel at a faster rate. These users also have a larger sweeping distance compared to bicyclists and therefore may require a wider trail than pedestrian or cyclists. In-line skates are generally designed for use on relatively flat terrain with smooth surfaces therefore paved areas and trails would be ideal.

Bicyclists

Off-road bicyclists may be well suited to County conditions because they are able to travel long distances between destinations and urban areas. Trails that are separated from roadways and traverse the natural landscape are likely to appeal to recreational users because they are away from vehicles making it safer and a more attractive trip.

On-road bicyclists may be commuting from point A to point B. These types of users would likely use on-road routes because they provide the most convenient and direct route. Roadways provide a relatively unbroken and extensive network for cyclists to access their destination. County wide, there may be potential to include some paved roads as part of a cohesive trail network, ensuring that safe crossings are in place. Locally, roads can link residential areas with areas of interest or the Grand River.

BMX bicyclists may prefer to be on a designated trail, away from traffic. This user type may favour gravel or dirt trails rather than paved trails.

Special Needs

Designing trails for this user type is important in the County of Brant as the population statistics indicate that both the number and age of seniors within the County are increasing. This may result in a greater percentage of the community having some form of impairment or special need.

Although it may not be possible to make all trails completely accessible, due to terrain or other constraints, it is imperative to accommodate as wide a cross-section of the

community as possible. General considerations for those with special needs are as follows:

People who use Wheelchairs / Scooters vary greatly in their ability and strength. There are some users that may need assistance while others that will be capable to navigate trails on their own. Because of this wide range of users within this category, trails should be designed to accommodate people in need of assistance. Wheelchairs and scooters are generally designed for use on smooth, relatively flat surfaces. Therefore steps, steep grade changes or soft and muddy surfaces are undesirable.

For people with visual impairments trail surface needs to be distinguishable from adjacent surfaces and should generally be no more than two meters wide to avoid disorientation. Textural surface changes can guide people around areas of hazard.

Equestrians

Horse riding could be a popular use due to potential trail lengths and rural character of the County. This use could potentially be conflicted by motorized uses and/or cyclists.

Cross Country Skiers

Cross Country Skiing could also be a popular use with the County's natural landforms and potential trail distances, yet could be impacted by motorized uses due to disturbance of set trails.

Off Highway Vehicles (OHVs)

The size of the County and potential for long trails is an advantage for OHV riders. However, conflict with other users is a concern. There are two types of OHV users – those using trails for touring and those interested in site-oriented events.

Snowmobilers

Snowmobiling is a popular winter sport in Ontario, particularly in rural areas. With the wide variety of users that may potentially use the trails within the County of Brant there is a great need for mutual respect, education and communication among different users to minimize and control conflicts.

6.0 SITE INVENTORY AND ANALYSIS

The purpose of this section of the report is to establish an inventory of existing trails and features that will influence future trail development. Existing trails have been documented, and various features that will have an Existing trails have been documented, and various features that will have an effect on the development of trails in the County of Brant are discussed below.

6.1 Existing Trails

There are a number of trails that currently exist within the County of Brant. One of the key tasks of this study was to inventory and map all existing trails in the County. The existing trails have informed the Trail Master Plan for the County of Brant. Trails that are used, recognized and managed by municipalities, stakeholder groups and others have been mapped and described below (see Table 2: Existing Trails). Map MP -1: Multi-use Trail System illustrates the current trail system at a County-wide scale.

Trail Name	Location	Length	Surface Material	Use / Activity	Signage / Identification	Operating Organization
Grand Valley Trail	Alton (near Orangeville) to Lake Erie (Rock Point Prov. Park)	275 km	Mainly Compacted Soil	Walkers and hikers		Grand Valley Trail Association
Cambridge to Paris Rail Trail	City of Cambridge to the Community of Paris	18 km	Fine Crushed Gravel	Walkers, hikers, cyclists	Km marks; kiosks at Cambridge, Paris, Glen Morris - map / history	Grand River Conservation Authority (GRCA)
S.C. Johnson Rail Trail	Willow Street Paris to the City of Brantford (Powerline)	5.5 km	Stone Dust; some sections follow municipal roadways	Walkers, hikers, cyclists	Information kiosk - trail maps / history at parking area	County of Brant/ (GRCA)
Brantford to Hamilton Rail Trail	City of Brantford to the City of Hamilton	32 km	Stone Dust	Walkers, hikers, cyclists, minimal equestrian users	Km markers from Hamilton; trail kiosks at parking lots - trail maps, information / railway history	City of Brantford, GRCA & Hamilton Conservation Authority own & maintain
Lake Erie & Northern (LE&N) Rail Trail	City of Brantford to Village of Mount Pleasant	4 km	Stone Dust/Wood Chip	Walkers, hikers, cyclists; equestrians	Posts mark each km; kiosks at Brantford, Mt. Pleasant	Trail leased by County from Infrastructure Ontario County of Brant maintain trail

Trail Name	Location	Length	Surface Material	Use / Activity	Signage / Identification	Operating Organization
Toronto, Hamilton & Buffalo (TH&B) Rail Trail	Runs through the County of Brant / City of Brantford	12 km	Paved	Walkers, hikers, cyclists, roller blading	Trail kiosks at parking lots - trail maps / interpretive signs / railway history	Owned/Maintained by the County of Brant
	Shellards Lane to Jenkins		Paved			
Nith River Trail	Paris (West River St. to Mechanic St, through Lions Park	1.5 km	Paved/Stone Dust	Runners, Walkers, hikers, cyclists	Trail kiosks	Owned/Maintained by County of Brant;
Green Lane Trail	Green Lane Sports Complex	1.0 km	Stone Dust	Walkers, hikers, cyclists		Owned/Maintained by County of Brant; Brant
Barkers Bush	Paris (Nith Peninsula) Barker St.)		Compacted Soil	Walkers, hikers, cyclists		Privately Owned
Jacob's Wood	St. George		Compacted Soil	Walkers, hikers, cyclists		Owned by County of Brant
Lions Way	Maple Ave. N, Burford / Lions Centennial Park	2 km	Paved	Walkers, hikers, cyclists	Interpretive sign	Owned by County of Brant

Table 2: Existing Trails

It should also be noted that currently there are a number of unmarked, on-road bicycle routes throughout the County. The "bicycling through Brant" brochure and Outdoor Adventure Map outline 18 routes. These bicycle routes range in length from 25km to 167km which tours the entire County. These routes are mostly located on paved roads, with the exception of locations where the route follows a pre-existing trail with a compacted stone dust surface. Of the 18 unofficial routes, 6 are proposed for approval as with minor modifications they will comply with Book 18 standards.

6.2 Natural Features

The natural resources of the County are illustrated on Map MP-2: Natural Features. These resources identify the general characteristics of the natural resource base of the area that will influence trail planning, routing, development costs and maintenance/ operations. The terrain in the County is mostly gently rolling landscape reminiscent of the previous and current agricultural activities with some steeper areas surround the Grand River.

It is clear that the River is an important feature of the County; running directly through the County and having a considerable number of tributaries surrounding it. The Grand River was declared a Canadian Heritage River in 1994 in order to promote, protect and enhance its heritage and ensure that it is managed in a sustainable manner. With the numerous rivers and streams, there are substantial areas prone to flooding, steep slope areas, and wetlands that are considered Provincially Significant. The Province of Ontario, under the 2005 Provincial Policy Statement (PPS), protects wetlands ranked as Provincially Significant. The PPS states that "Development and site alteration shall not be permitted in significant wetlands."

Along the northern portion of the Grand River, within the County of Brant, there are areas of Provincially Significant Life Science Area of Natural and Scientific Interest (ANSI). This designation denotes that the Ontario Ministry of Natural Resources has identified the area as having ''provincially significant representative ecological features related to natural heritage protection, scientific study or education''. In the case that these lands are on public land, the Ministry will ensure that activities and land uses in this area are providing for the protection of the identified value.

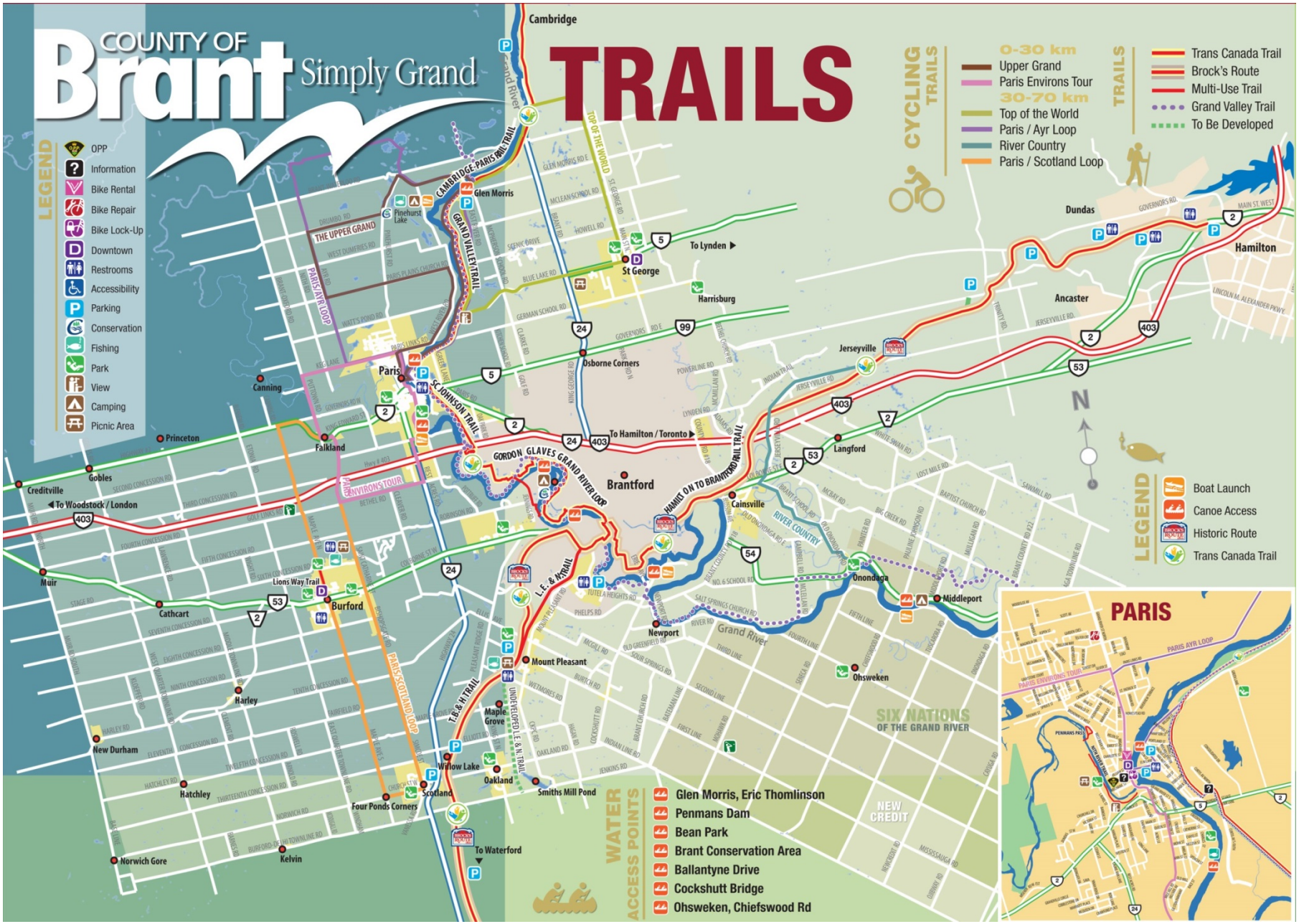
These rich natural resources are conducive to interpretation; trail development could provide linkages to these unique and valuable features, with an opportunity for education and themed elements for the trails. However, as site alterations are not permitted to significant wetlands, trail development should maintain the integrity of the landscape and protect these important natural environments.

6.3 Land Use and Designations

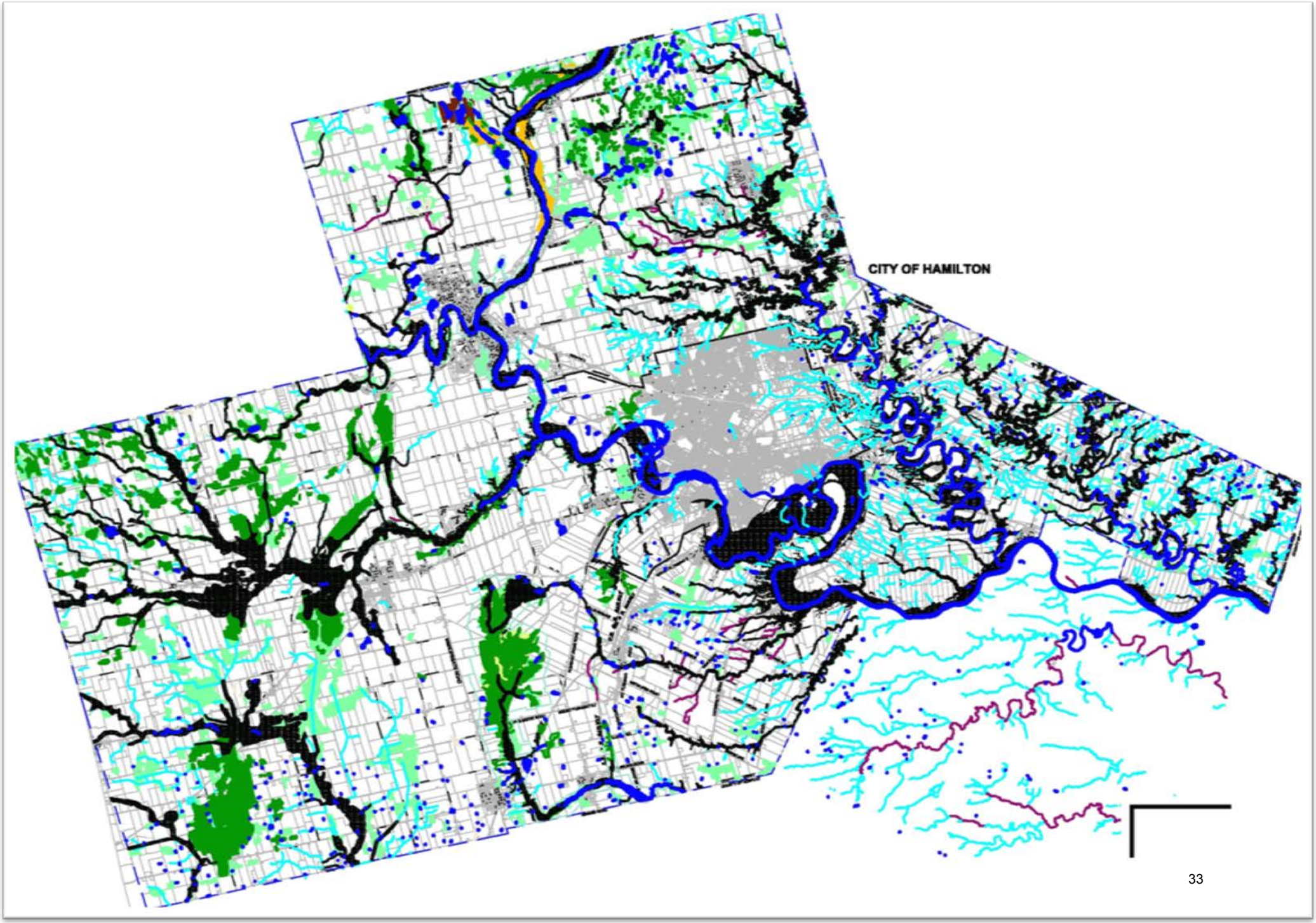
Key land uses, ownerships and jurisdictions are the Official Plan Land Use Designations. These designations will have an important influence on trail planning, routing and management aspects. The designations mapped include: conservation areas, natural areas, recreational areas, industrial areas, Municipal boundaries and well head protection areas.

The land uses within the County of Brant vary greatly from agricultural uses to more urban designations as well as recreational and industrial areas. This variation in land

MP-1 Multi-use Trail System



MP 2 - Natural Features



use provides for a number of opportunities for the development of trails linking some of these features. The potential of lands presently devoted to extractive industries which are planning or currently undergoing restoration should be investigated for future consideration for recreational and trail uses such as motorized and I or non-motorized uses including ATV, motorcycle, BMX, etc. It is important to note that only after the land is remediated and the operating license repealed, would the County be able to use these lands in conjunction with the applicable zoning of the property.

In addition, development proposals for new community residential expansion should be planned to include trail linkages relative to open space systems and links with the county-wide trail system.

6.4 Parks and Recreational Facilities

Within the County of Brant there are a number of parks and recreational facilities. Included are facilities such as community centres, parks with baseball diamonds and parks with swimming pools. These features provide important areas for residents and visitors to relax, participate in recreational activities, and interact with the community.

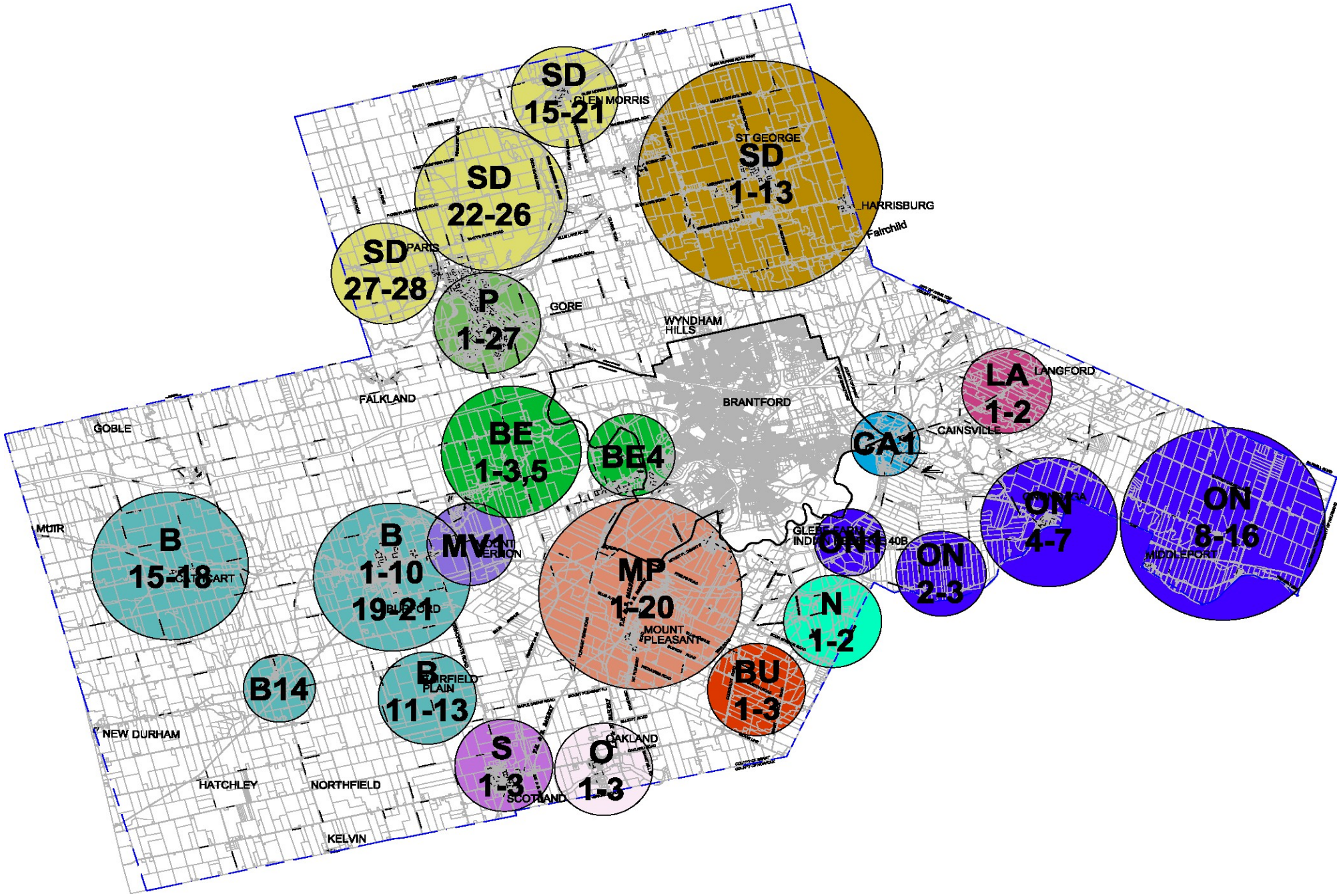
The opportunity exists to connect these facilities with residential or urban areas through the development of trails. This can provide an active transportation route to the facilities and can become a tertiary or local link within the overall County of Brant trail system.

6.5 Cultural Features

The key attractions, features and points of interest documented in this study are illustrated on the accompanying map MP-3: Cultural Features. These resources include a wide variety of historical sites and attractions as identified by the Brant County Heritage Committee in the County of Brant Heritage Driving Tour (2006). Features include historic homes, churches, cemeteries, rail bridges and junctions, mills, schools, look-outs, museums, etc. A complete inventory is broken down into several sub-areas and provided in Appendix 6: Cultural Features Listing.

The extensive list of cultural heritage features within the County of Brant provides a background and history of the area for residents and visitors alike. This, combined with the natural features, current land use and parks and recreational facilities within the County, creates an interpretive opportunity and lends itself to trail development in order to link these features both locally and on a County-wide level.

MP 3- Cultural Features



7.0 CONCEPTUAL TRAIL SYSTEM

7.1 Hierarchy

Much like a road system has a hierarchy of road types, trail systems need a hierarchy of trail types related to frequency of use, type of users, etc. Trail hierarchies also relate to establishing an easily navigable system. It is important to establish a hierarchy of trails in order to organize the many kilometers of trails into a plan that is easy to interpret, and to define the trail system in a way that is logical, useful and understandable to those using it.

Generally, a trail hierarchy consists of the following:

Primary trails most often are those with regional significance or connecting the County with adjacent jurisdictions. In general Primary trails are anticipated to have the highest volume of and most diverse users.

Secondary trails feed into the larger trail network and provide connections between the Primary trails and the local trails. These trails will generally have a lower level of use than Primary trails and therefore are often built and maintained to a different standard.

Tertiary trails are the next step down in the trail hierarchy. They are meant to connect with the Secondary trails, which lead to the Primary trails, provide a more local system for County residents and integrate with settlement areas.

The existing trails are an important part of this Trail Master Plan and through discussion with the County of Brant staff, the stakeholder workshop and design charrette a number of possible future trails were discussed and many of these have been incorporated into the trail network for the final Trail Master Plan.

7.2 Routes

As a result of the individual interviews and stakeholder workshop, County staff and the Consulting Team identified a number of candidate routes. These routes were evaluated and refined during the third phase of the master planning process.

The diverse range of existing and future trails in the County is evident on the mapping. The County of Brant is well endowed with a large number of trail route possibilities that served as a basis for further evaluation. This is an unusual circumstance since many jurisdictions are very limited in their available potential routings and it bodes well for the eventual extent and success of the system.

7.3 Trail Management

The range of existing trails within and immediately adjacent to the County are currently owned and managed by a consortium of organizations including the Grand River Conservation Authority (GRCA), the Grand Valley Trails Association, City of Brantford, Hamilton Region Conservation Authority, Infrastructure Ontario and The County of Brant. As the trail system in the County expands, there will be a greater burden on the municipal budgets for not only capital works but on-going maintenance and operations as well. The range of costs will generally include additional maintenance and operational staff salaries, supplies and materials, monitoring and repairs, upgrades as well as security patrols. There may be opportunities for partnerships to undertake these tasks among existing organizations as well as volunteer groups and Stakeholders. These discussions should be initiated early in the planning process to establish the connections that are anticipated.

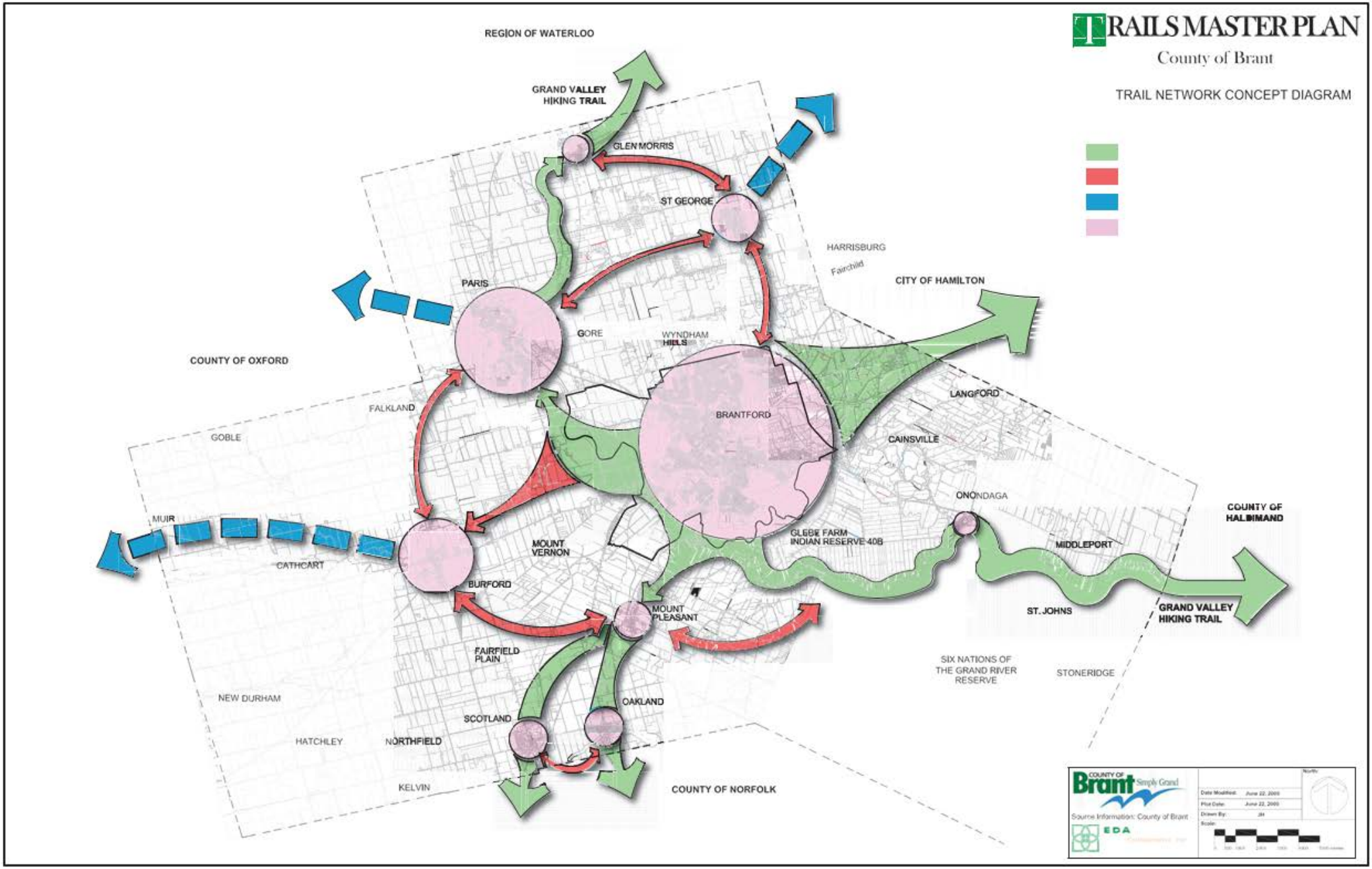
7.4 Concept Diagram

The development of the Trail Master Plan for the County of Brant identifies an incremental approach – that is, building upon the existing structure of the community and trail systems to create a plan that can be implemented over time.

County of Brant is a rural municipality that surrounds the City of Brantford and includes several smaller communities - as previously described. The County is reasonably well served by an existing regional system of trails including the Grand Valley Hiking Trail, a hiking trail along the Grand River; the S.C. Johnson Trail, a rail trail linking to Brantford; the Paris to Cambridge Trail, a rail trail along the Grand River; and the Hamilton to Brantford Trail, a rail trail linking Hamilton to Brantford via Dundas Valley. The City of Brantford has a comprehensive trail system plan that has developed over several years with additional future links planned. The City's trail system forms a core with opportunities for connections with the County trail system. The combination of the existing regional trails together with the City of Brantford trail system forms an important armature upon which to base the conceptual plan for the future county-wide trail system.

Centered on these two important existing systems, an overall trail system for the County is envisioned to reinforce the regional connections as well as interconnect Brantford and the communities within County of Brant. The accompanying Trail Network Concept Diagram (Map MP4) illustrates conceptual corridor links that connect Brantford with Paris and Glen Williams and Brantford with Mount Pleasant, Scotland and Oakland. Another layer of potential trail links are also illustrated that interconnect the communities within the County - that is Paris to Burford and St. George, Burford to Mount Pleasant and the Grand River Valley, Brantford to St. George, St. George to Glen Williams and

MP 4 - Conceptual Trail Network



back to Paris. These conceptual corridors illustrate a potential trail system diagram that forms a "constellation" of interconnected communities, conservation areas and heritage sites within the County. In addition, the plan illustrates the need to make the important inter-regional connections with adjacent jurisdictions to ensure connectivity with the Trans Canada Trail including Norfolk County to the south, City of Hamilton to the north east, Haldimand County to the east, Region of Waterloo to the north and possibly with Oxford County to the west.

Another important layer to the plan is the local community trail systems that are envisioned for each community. Just as the City of Brantford has developed its local community system, so should each of the communities within County of Brant. This will require a combination of making connections through existing areas as well as ensuring that new development incorporates trail connections as well. Paris, for example, has already built several initial links that connect the core area across the Nith River valley to existing parks and open space areas. This system should be expanded using existing parks and open spaces as well as on-road sections for cycling as the community expands particularly to the south and west. Burford has now has a trail from the core area to Whiteman’s Creek and a bridge connects to Lions Park. Similar opportunities exist in each of the other communities.

8.0 THE TRAIL NETWORK

The proposed trail network includes existing trails as well as new trails that offer connections between established trails, various destinations and places of interest throughout the County of Brant. As described in Section 7 of this report, a hierarchy of trails has been developed. The categories of trails can be described as follows:

Primary Trails - These are multi-use inter-regional trails which connect adjacent jurisdictions to the County of Brant. These trails provide destinations for recreation as well as scenic municipal linkages to other areas within the county. In the County of Brant, all of the Primary Trails are established on the east side of the Grand River, with the exception of the T.H. & B Rail Trail which connects with Norfolk County to the south.

Secondary Trails - Within the County of Brant, these trails provide connections between the Primary Trails and the more local Tertiary Trails. Many of these trails are located adjacent to roadways throughout the County and connect Primary Trails with urban areas and/or points of interest.

Tertiary Trails - These trails are more localized and connect with the Secondary Trails. They provide opportunities for nature viewing and hiking as well as a route for pedestrians to travel where there is less potential for conflict with motorized vehicles.

With the implementation of this Trail Master Plan the communities within the County of Brant will be more interconnected and more easily accessible by alternative modes of transportation. Individual community maps have also been provided to offer a more detailed look at four of the centres within the County.

8.1 Existing Trails

Route 1: Cambridge to Paris Rail Trail

This existing trail is situated along the eastern bank of the Grand River and makes use of an abandoned rail corridor. It connects the County of Brant with the Region of Waterloo following the Grand River from Paris to the City of Cambridge. This trail is part of the Trans Canada Trail and also the Grand Valley Trail system.

Route 1a: Extension of Trail from Trailhead to Portage Area

This proposed trail extension is a connection between the Paris - Jean Rich Foundation Trailhead and parking area to the Canoe Portage Area located to the south.

Length: **Route 1**: 13 km in length between Paris and the County of Brant boundary at Lockie Road.

Route 1a: 0.25 km

Route 1: Compacted stone dust surface Route 1a: Asphalt paving

Width: **Route 1**: 3 metre tread area, 4 metre cleared area (see Section 9.2.2 for cross-section and details).

Paris – Jean Rich Foundation Trailhead and parking area

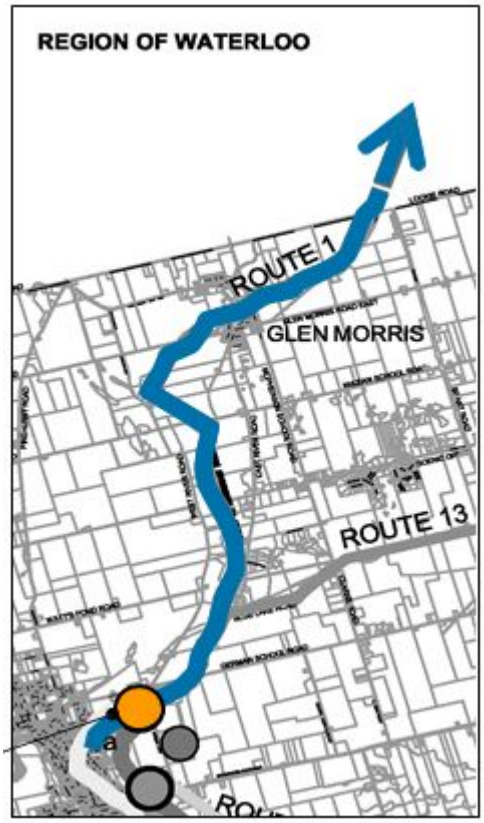


Figure 2: Route 1 – Cambridge to Paris Rail Trail

Route 1a: Paved shoulder dimension of 1.5 meters (see Section 9.2.3 Bicycling – On Road for cross section details).

Users: Walkers, hikers, joggers and bicyclists; accessible for wheelchairs

Amenities:

- Jean Rich Foundation Trailhead and parking area, access to SC Johnson Trail.
- Kilometer distance markers along trail.
- Historic and interpretive signage and plaques.
- Benches and rest areas.

Themes:

- Railway History
- Natural Environment

Route 2: SC Johnson Trail

The SC Johnson Trail runs between Brantford and Paris connecting the Cambridge to Paris Rail Trail with the Gordon Glaves Memorial Trail and the Hamilton to Brantford Rail Trail. This existing trail forms an important part of the Trans Canada Trail within the County of Brant.

Length: 13.9 km total length; 5.5 km in the County of Brant

Surface: Compacted stone dust surface

Width: 3 m tread area, 4 m cleared area (see Section 9.2.2 for cross section and details)

Users: Walkers, hikers and bicyclists; accessible for wheelchairs (except in areas of steep slope – near Hardy Road at Masters Lane Trailhead)

Amenities:

Trail access points/ trailheads are located at the following points along trail:

- Jean Rich Foundation Trailhead – access to the Paris to Cambridge Rail trail, parking area.
- Governors Road East.
- SC Johnson parking area at Powerline Road.
- Hardy Road/ Golf Road – parking, trail kiosk, natural wetland area.
- Wilkes Dam – limited parking, views.
- Kilometer markers along length of trail.
- Green Lane Site for Mountain Biking (close to trail) – open recreational space particularly suited for mountain biking.

Themes:

- Natural Environment and Heritage

Jean Rich Foundation Trailhead and parking area

Green Lane Site for Mountain Biking

Trailhead at Governors Road East

SC Johnson parking area at Powerline Road

Hardy Road at Golf Road

Hardy Road at Masters Lane

Wilkes Dam

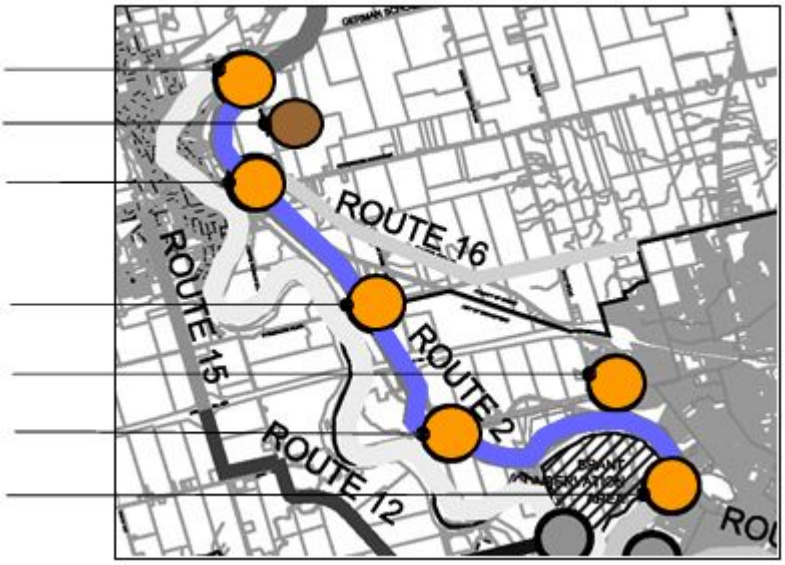


Figure 3: Route 2 – SC Johnson Trail

Route 3: Gordon Glaves Memorial Pathway

It is recognized that this existing trail is entirely within the City of Brantford not in the County of Brant however, due to the fact that it provides an important linkage between the SC Johnson Trail and the Hamilton to Brantford Rail Trail on the Trans Canada Trail system it is included in this Master Plan.

Length: 11.1 km in length (within City of Brantford)

Surface: Compacted stone dust surface

Width: 3 metre tread, 4 metre cleared area (see Section 9.2.2 for cross section and details)

Users: Walkers, hikers and bicyclists; accessible for wheelchairs

Amenities:

Trail access points or trailheads are described below (numbers correspond with those on the map below):

1) Wilkes Dam – parking for 8 cars, trail kiosk, interpretive areas, viewing points.
2) Waterworks Park – parking for 50 cars, trail kiosk, interpretive loops, picnic tables and shelter, natural areas.

3) D'Aubigny Creek Park West – parking for 50 cars, trail kiosk, soccer fields, picnic tables, natural areas.
4) D'Aubigny Creek Park East – parking for 25 cars, trail kiosk, soccer fields, canoe launch, natural areas.
5) Earl Haig Family Fun Park – parking for 50 cars, kiosk, washrooms, swimming; A Trans Canada Trail pavilion is located just north of this park.
6) Lions Park (Brantford) – parking for 50 cars, kiosk, interpretive loops, picnic tables with shelter, natural areas, washrooms and phone at arena.
7) Greenwich Street – parking for 40 cars, access to Hamilton Rail Trail.

Themes:

- Natural History

Route 4: Hamilton to Brantford Rail Trail

This trail connects the two major urban centres of Brantford and Hamilton by means of an abandoned rail corridor. This trail is part of the Trans Canada Trail system and was completed in 1996.

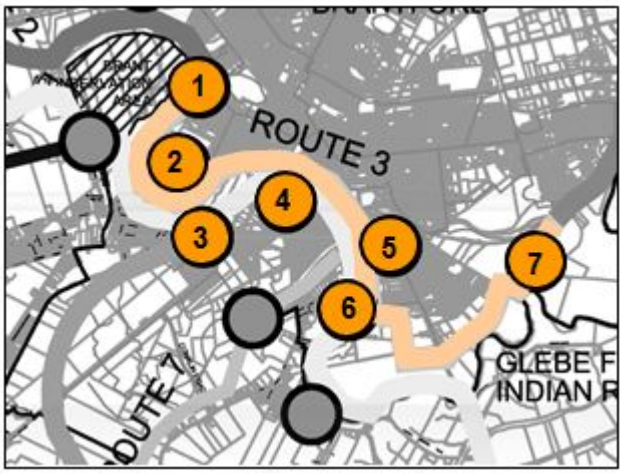


Figure 4: Route 3 – Gordon Glaves Memorial Pathway

Length: 12 km within the County of Brant / 32 km total length

Surface: Compacted stone dust surface

Width: 3 metre tread, 4 metre cleared area (see Section 9.2.2 for cross section and details)

Users: Walkers, hikers and bicyclists, equestrian; accessible for wheelchairs

Amenities:

- Trailhead at Greenwich Street - parking for 40 cars, access to the Gordon Glaves Memorial Pathway.

Themes:

- Railway History
- Cultural Heritage

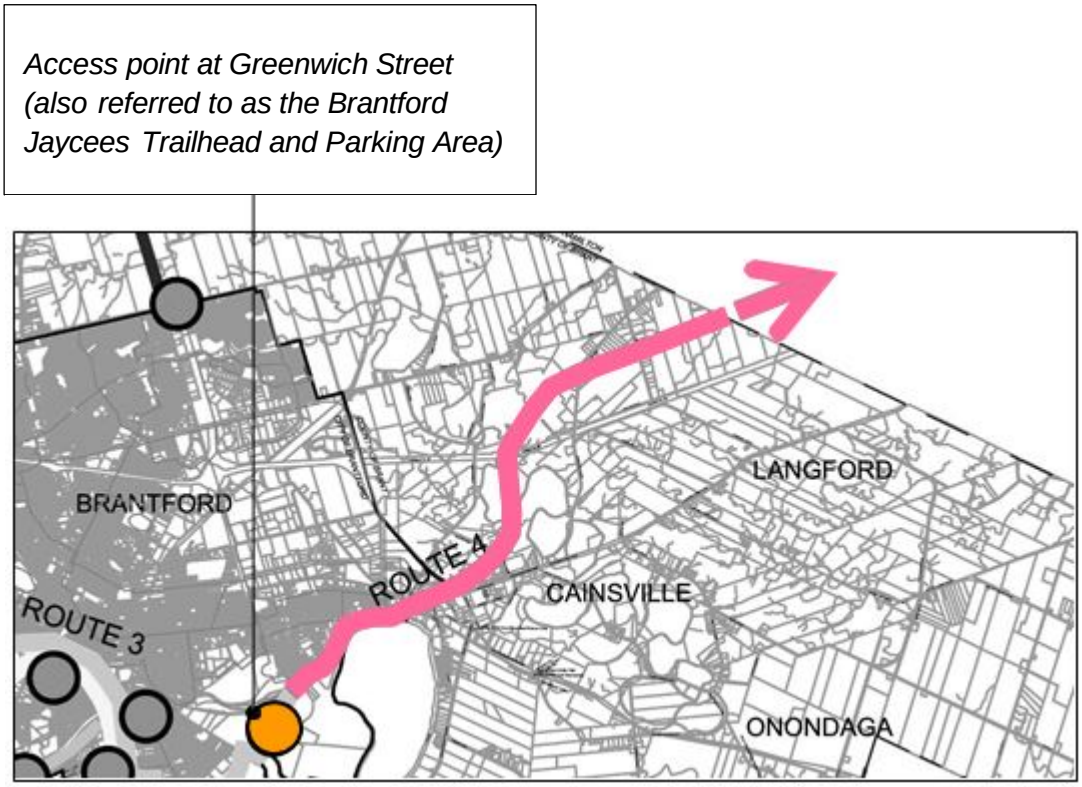


Figure 5: Route 4 – Hamilton to Brantford Rail Trail

Route 5: Grand Valley Trail

The Grand Valley Trail runs from Alton, which is near Orangeville, to Rock Point Provincial Park on Lake Erie. Within the County of Brant it runs continuously, joining parts of the Trans Canada Trail within the County of Brant and the City of Brantford. For a majority of the trail length it follows the Grand River, however in some areas where the trail has not yet been developed, it follows roadways.

Length: Section of trail within the County of Brant is 46 kilometers; 22.9 km in the City of Brantford joins the two County sections.

Surface: Compacted earth – in areas not part of Trans Canada Trail (TCT) Compacted stone dust or gravel – sections that are part of the TCT

Width: Most of trail is a narrow natural footpath; however where it is part of the Trans Canada Trail system, it is 3 m wide tread with a 4 m cleared area.

Users: Walkers and hikers; not suitable for wheelchair access in all sections

Amenities: Trail access points / trailheads can be found at:

1) Jean Rich Foundation Trailhead – access to Paris to Cambridge trail and parking.
2) Brant Conservation Area – Trail kiosk, telephone, picnic area, washrooms, camping, boat launch and swimming.
3) D'Aubigny Creek Park West – parking - 50 cars, kiosk, soccer fields, picnic area, natural area.

4) D'Aubingy Creek Park East – parking for 25 cars, trail kiosk, soccer fields, canoe launch, natural area.
5) Lions Park (Brantford) – parking for over 50 cars, kiosk, interpretive loops, picnic tables, natural area, washrooms and phone.
6) Bell Homestead – parking for 10 cars, washrooms, picnic area, and restaurant.
7) Trailhead at Route 9 – trail kiosk, interpretive panels.

Themes:

- Natural Environment
- Aboriginal Heritage

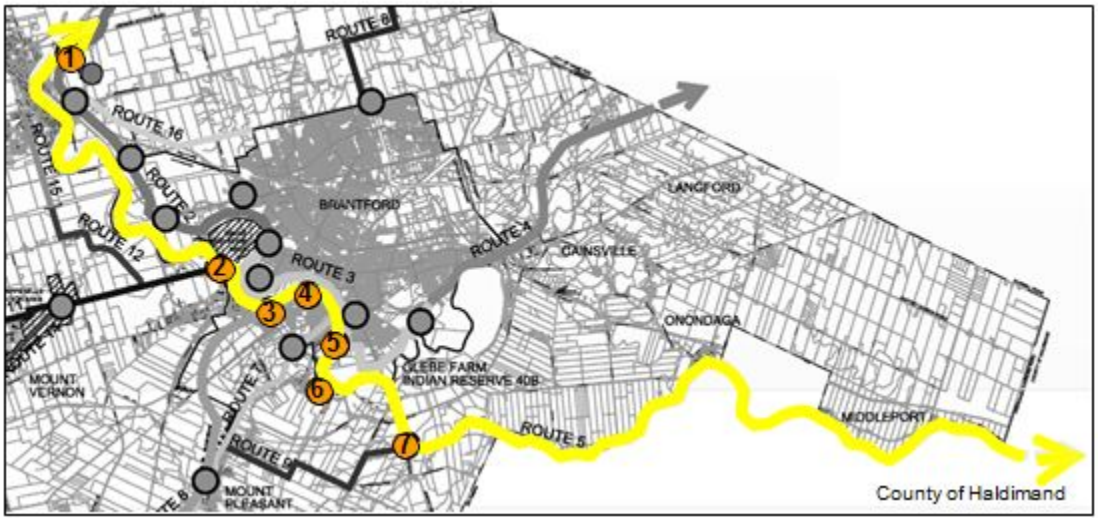


Figure 6: Route 5 – Grand Valley Trail

Route 6: TH & B Rail Trail

This trail makes use of an abandoned railway corridor beginning in the County of Brant and ending in Port Dover on Lake Erie. The TH & B Rail Trail is part of the Trans Canada Trail system.

Length: 12 km of trail within the County of Brant

Surface: Paved surface (completed) from the City of Brantford boundary to Burtch Road; Stone dust surface from Burtch Road to the County of Brant boundary.

Width: 3 metre tread, 4 metre cleared area (see Section 9.2.2 for cross sections and details)

Users: Walkers, hikers and bicyclists

Amenities: Trailheads include:

1) D'Aubigny Creek Park West – parking for 50 cars, trail kiosk, soccer fields, picnic tables, natural area.
2) Shellard Lane, Brantford- Kiosk.
3) Mount Pleasant Park– parking, trail kiosk with information and map, interpretive signage.
4) Oakland Road – parking, trail kiosk.
5) Jenkins Road, Kiosk.

Themes:

- Railway History / Heritage
- Natural Environment
- Recreation

Route 7: LE & N Rail Trail

This trail is constructed from Brantford to the Mt. Pleasant Nature Park. The remainder of the abandoned rail line travels from Mt. Pleasant through Oakland to Lake Erie. The corridor has been designated for utilities by the Province and is managed as such. The County of Brant has a maintenance agreement for the entire 8 km.

Length: 4 km of developed trail within the County of Brant

Surface: Stonedust surface (completed) from the City of Brantford boundary to Burtch Road; Wood chip surface from Burtch Road to the Mt. Pleasant Nature Park

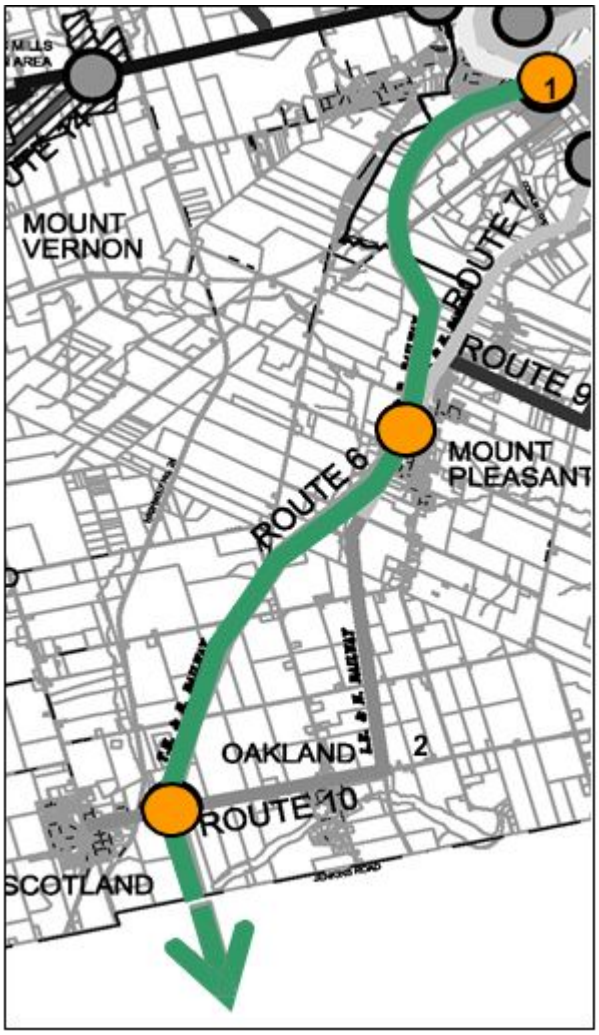


Figure 7: Route 6- TH&B Rail Trail

Width: 3 metre tread, 4 metre cleared area for walking, hiking and bicycling (see Section 9.2.2 for cross sections and details); 2.5 metres tread for equestrian (see Section 9.2.4 for cross section and details).

Users: Walkers, hikers and bicyclists, equestrian users permitted between Conklin Road and the Mt. Pleasant Nature Park.

Route 7a: TH & B – LE & N Linkage

This route links the Route 6 (TH & B Trail) with Route 7 (LE & N Trail) just outside of the community of Mount Pleasant.

Length: 0.04 km

Surface: Asphalt paving

Width: Route 7a: Paved shoulder

Users: Walkers, hikers, bicyclists;

Amenities:

- Trail kiosk with information and map.
- Mount Pleasant Park – parking, Burtch Rd. trail kiosk with information and map, interpretive signage.
- Mount Pleasant Na
  extends from Burtc

Themes:

- Equestrian
- Recreation

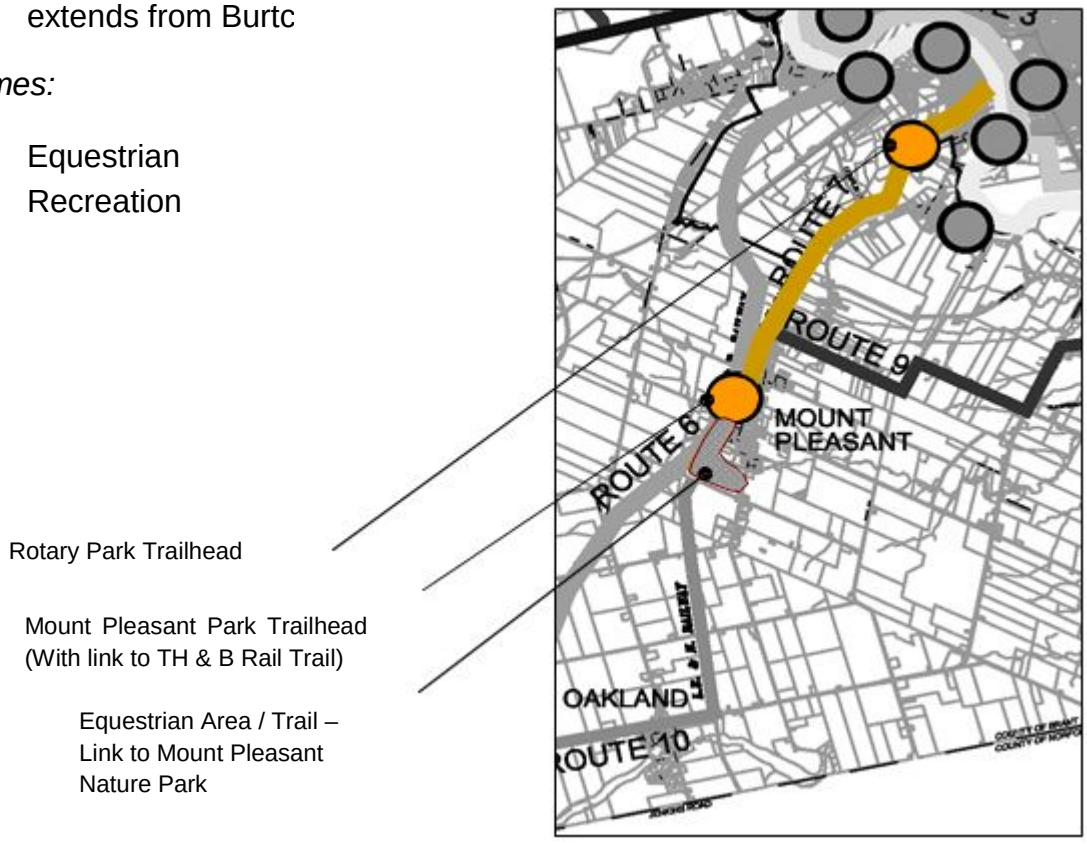


Figure 8: Route 7 – LE & N Rail Trail

8.2 Cycling Routes

Through the efforts of volunteers, cycling enthusiasts and staff, several maps such as Bicycling through Brant and the Outdoor Adventure Map were developed in the last 3 - 20 years that highlighted 18 cycling routes that either originated in the County of Brant or have portions that pass through the County.

In December of 2013, the Ministry of Transportation released the Ontario Traffic Manual, Book 18, and Cycling Facilities. "The purpose of the Ontario Traffic Manual (OTM) is to provide information and guidance for transportation practitioners, and to promote uniformity of treatment in the design, application and operation of traffic control devices and systems across Ontario. The objective is safe driving behaviour, achieved by a predictable roadway environment through the consistent, appropriate application of traffic control devices. Additional purposes of the OTM are to provide a set of guidelines consistent with the intent of the Highway Traffic Act, and to provide a basis for road authorities to generate or update their own guidelines and standards."

Staffs have reviewed the formerly mapped routes and have determined that 6 of the 18 routes can be modified, integrated, signed or constructed meet or exceed the Book 18 guidelines.

The routes recommended for inclusion in the Trail Master Plan are identified as:

River Country – 48 km (Bicycling Through Brant)

The Upper Grand – 39 km (Bicycling Through Brant)

Top of the World – 30 km (Bicycling Through Brant)

Paris- Ayr - 35 km (Outdoor Adventure Map)

Paris Environs Tour – 20 km (Outdoor Adventure Map)

Paris-Scotland Tour – 48 km (Outdoor Adventure Map)

Several other connecting links and/or routes are proposed to be developed when practical in coordination with road work improvements and in cooperation with neighbouring municipalities where applicable.

Route 8: Brantford to St. George (Phase I)

This proposed route provides a link between the City of Brantford and the Region of Waterloo through the County of Brant, the community of St. George in particular. This trail connects with the City of Brantford trail Route 8 – Wayne Gretzky Parkway Trail to Powerline Rd. to Park Rd. to Governor's Rd. to St. George Rd.

Route 9: Mount Pleasant to Newport / Dike Trail

This proposed route links two primary trails with secondary trails, providing many options and route variations for frequent trail users. It begins in Mount Pleasant, bisecting the LE & N and TH & B trails, travels in a general east direction and links with the Grand Valley Trail at Newport Road. This trail route also provides linkages to the Bell Homestead and the Dike Trail.

Length: 7.2 km *Surface*: Asphalt paving *Users*: Bicyclists

Width: Paved shoulder dimension: 1.5 meters (see Section 9.2.3 Bicycling – On Road for cross section and details).

Amenities:

- Access points / trailheads.
- Grand Valley Trail - trail kiosk, interpretive panels.
- Mount Pleasant – parking, trail kiosk with information and map, interpretive signage, access to the TH & B and LE & N Rail Trails.
- Brantford – Bell Homestead.
- Link to Dike Trail.

Themes:

- Cultural Heritage
- Aboriginal History
- Recreation
- Active Transportation

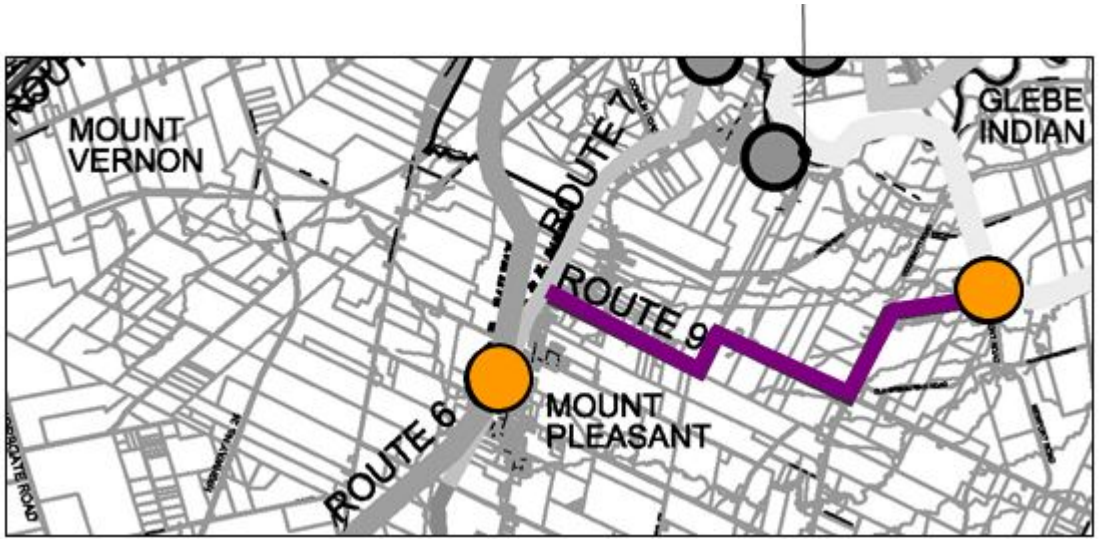


Figure 9: Route 9 – Mount Pleasant to Newport / Dike Trail

Route 10: Hamilton to Brantford Rail Trail to Six Nations and Haldimand County

This on-road route connects the Hamilton to Brantford Trail to Onondaga and Six Nations. The proposed route follows Jerseyville Road to Colborne St. W. to Brant School Rd., and then connects to Old Onondaga Rd., bringing you to the village of Onondaga. This route provides good connection to Six Nations and beyond to Haldimand County.

Length: 10 km in length

Surface: Asphalt paving

Width: Shared Lane

Users: Bicyclists

Amenities:

- Trailhead and Parking at Jerseyville Rd.
- Restaurants in Cainsville and Ohsweken.
- National Historical Site – Chiefswood.

Themes:

- Culture – Six Nations of the Grand River
- Recreation – Grand River
- Natural History

Route 13: St. George to the Cambridge to Paris Rail Trail

Route 13 connects Route 8 (St. George Road) with Route 1 (Cambridge to Paris Rail Trail). This proposed route travels along Highway No. 5/Blue Lake Road and terminates at the Cambridge to Paris Rail Trail next to the Grand River. This route may be appropriate for the County of Brant to implement as St. George develops further.

Length: 8.6 km *Surface*: Asphalt paving

Width: Paved shoulder dimension: 1.5 meters (see Section 9.2.3 Bicycling – On Road for cross section details)

Users: Bicyclists

Amenities:

- Route and kilometer markers.

Themes:

- Cultural Heritage
- Recreation
- Active Transportation
- Scenic Views
- Adelaide Hunter Hoodless Site

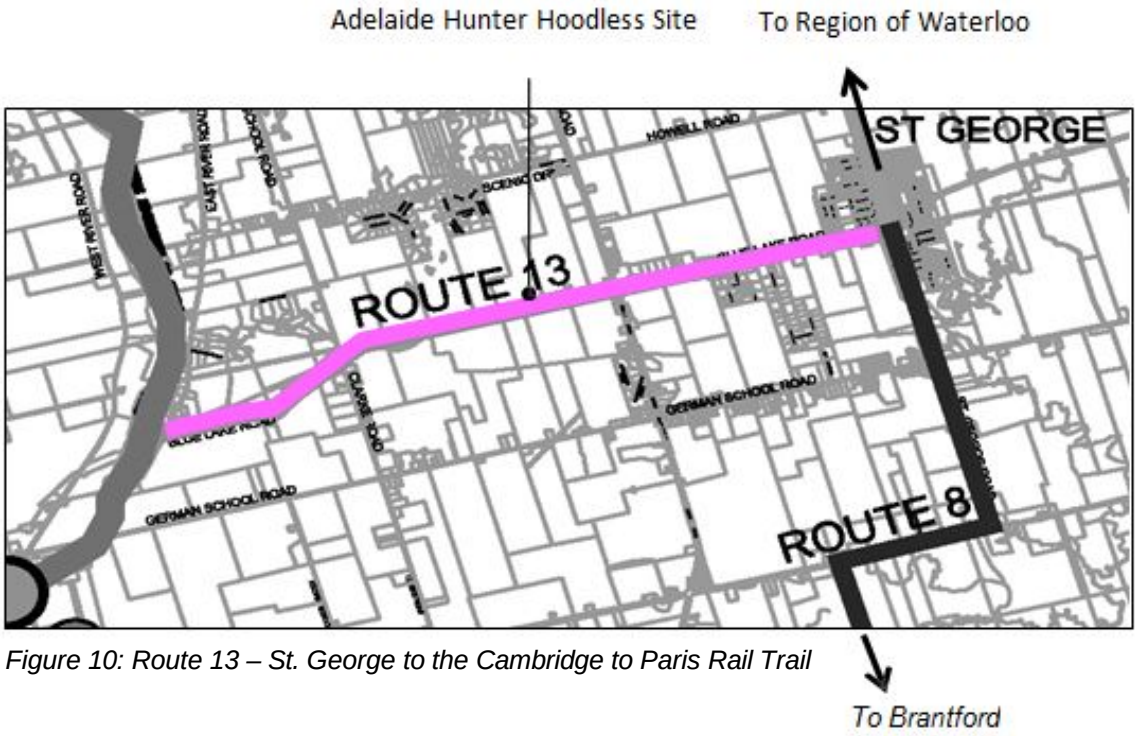


Figure 10: Route 13 – St. George to the Cambridge to Paris Rail Trail

Route 16: Paris to Brantford Route

Route 16 connects Paris with the City of Brantford. This proposed route travels along Paris Road from Dundas St. to Powerline Road, terminating at the City of Brantford boundary, connecting with a north-south neighbourhood / route link.

Length: 6 km *Surface*: Asphalt paving

Width: Paved shoulder dimension: 1.5 meters (see Section 9.2.3 Bicycling – On Road for cross section details)

Users: Bicyclists

Amenities:

- Trailhead / access point at Dundas St.
- Route and kilometer markers.

Themes:

- Cultural Heritage
- Recreation
- Active Transportation

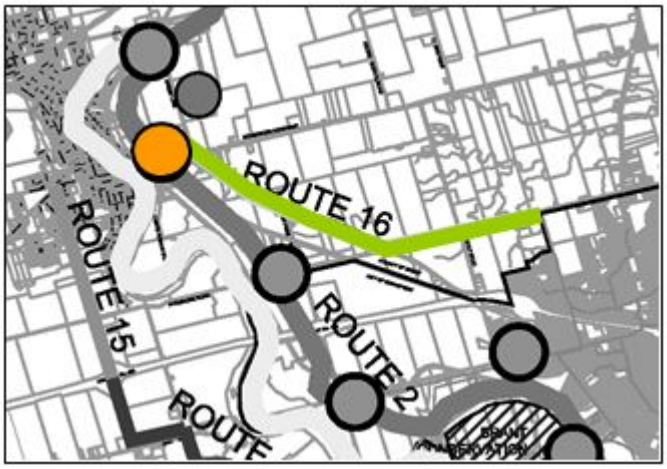


Figure 11: Route 16 Paris to Brantford Trail

8.3 Multi-Use Trails

Route 14: Lions Way Trail Extension

This proposed trail is a tertiary trail within the County of Brant, following the banks of Whitemans Creek. The trail travels from Lions Park in Burford to Bishopsgate Rd. /Brant Rod and Gun Club. A portion of the trail is located on privately owned lands. Trail development will require negotiation and agreement with landowners prior to implementation.

Length: 5.8 km *Surface*: Stonedust and/or Compacted earth

Width: 1.5 metre tread and 2.5 metre wide cleared area (see Section 9.2.1 for cross sections and details)

Users: Walkers and hikers,

Amenities:

- Brant Rod and Gun Club – Trail kiosk, parking, washrooms.
- Burford Trailhead – Trail kiosk, information and maps, parking.
- Interpretive signage and benches along length of trail at points of interest and nature viewing areas.

Themes:

- Natural History
- Cultural Heritage

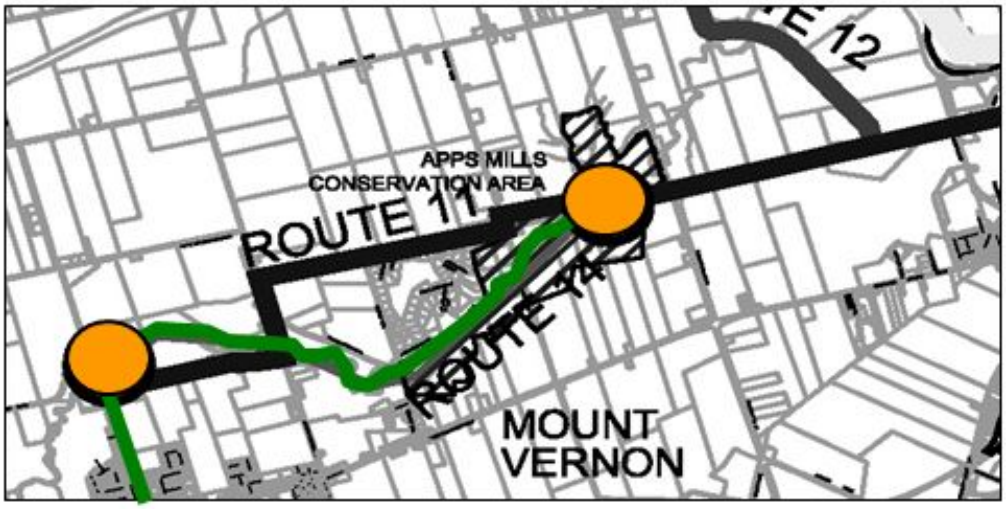


Figure 12: Lions Way Trail Extension

Route 15: Rest Acres Road Multi-use Trail

This proposed path is a secondary trail within the County of Brant, following Rest Acres Road from Dundas Street to Highway 403. This multi-use trail is proposed to be built adjacent to road upgrades along the easement on either the east or west side of the road.

Length: 3 km

Surface: Asphalt paving

Width: 3.0 metre tread and 4.0 metre wide cleared area (see Section 9.2.2 for cross sections and details)

Users: Walkers, hikers and bicyclists

Amenities:

- Route and kilometer markings.

Themes:

- Cultural Heritage
- Recreation
- Active Transportation

Figure 13: Route 15 – Rest Acres Road Trail

8.4 Individual Community: Paris Area

A number of enhancements are proposed to the trail network within the community of Paris. Creating a more integrated network of trails, both on-road and off-road is important in this settlement area. Proposed enhancements include:

- Improved intersection crossing at Dundas Street East and Curtis Avenue, including directional signage and pedestrian crosswalk markings; and
- Various on-road trails throughout the community to improve connectivity, accessibility and promote active transportation.

A conceptual future trail link is also shown on Figure 16 as follows. This link would connect the proposed paved on-road cycling lane on Keg Lane with the proposed local on-road trail to the south of King Edward Street, following the Nith River for a portion of the trail.

Recommendations:

1) Develop a 3.0 metre wide trail adjacent to Rest Acres Road as upgrades take place. This will be located along the easement on either the west or east side of the road from Dundas Street to Highway 403. (Route15)
2) Develop a 3.0 metre trail along Dundas Street from Green Lane to Curtis Avenue. - 650 m distance.
3) Create a bicycle lane along Paris Road and Powerline Road during road reconstruction. (Route16)
4) Develop a 3.0 metre trail along Green Lane from Dundas Street to East River Road. 1.6 km distance.
5) Create access between the Nith Peninsula subdivision and the Lion's Park trails and provide connectivity to Dundas St. /Rest Acres Rd.

6) Fully connect remaining 350 m of asphalt trail within Lion's Park between the Mechanic Street Bridge and Penman's Pass along the top of the dyke; and connect to the Nith Peninsula.
7) Develop the former railway lands between Capron Street and Grand River Street into a trail. - 750 m distance.
8) Develop a bike lane from Rest Acres Road to Misener Rd. on Brant Hwy 2.
9) Connect Cleaver Rd. to Powerline Rd. through a combination of on-road bike lanes and off-road multi-use trails. Connections to be developed through the Grandville subdivision to link all areas back to Rest Acres Road and the Brant Sports Complex.
10) Maintain and enhance the nature trails in Barker's Bush.
11) Develop 3.0 – 5.0 m multi-use trails in the Watt's pond area in coordination with area subdivision developments.
12) Investigate use of an unopened road allowance to be developed as a multi-use trail that runs north from Watt's Pond Road to Drumbo Road that can connect to Pinehurst Conservation Area. - 4.8 km distance.
13) Provide improved pedestrian and cycling infrastructure on Grand River St. N.
14) Develop trails on the west side of the Grand River on the Golf North (Paris Grand Golf Course) property.
15) Investigate developing a connection from the SC Johnson trail along Willow Street to Penman's Dam.

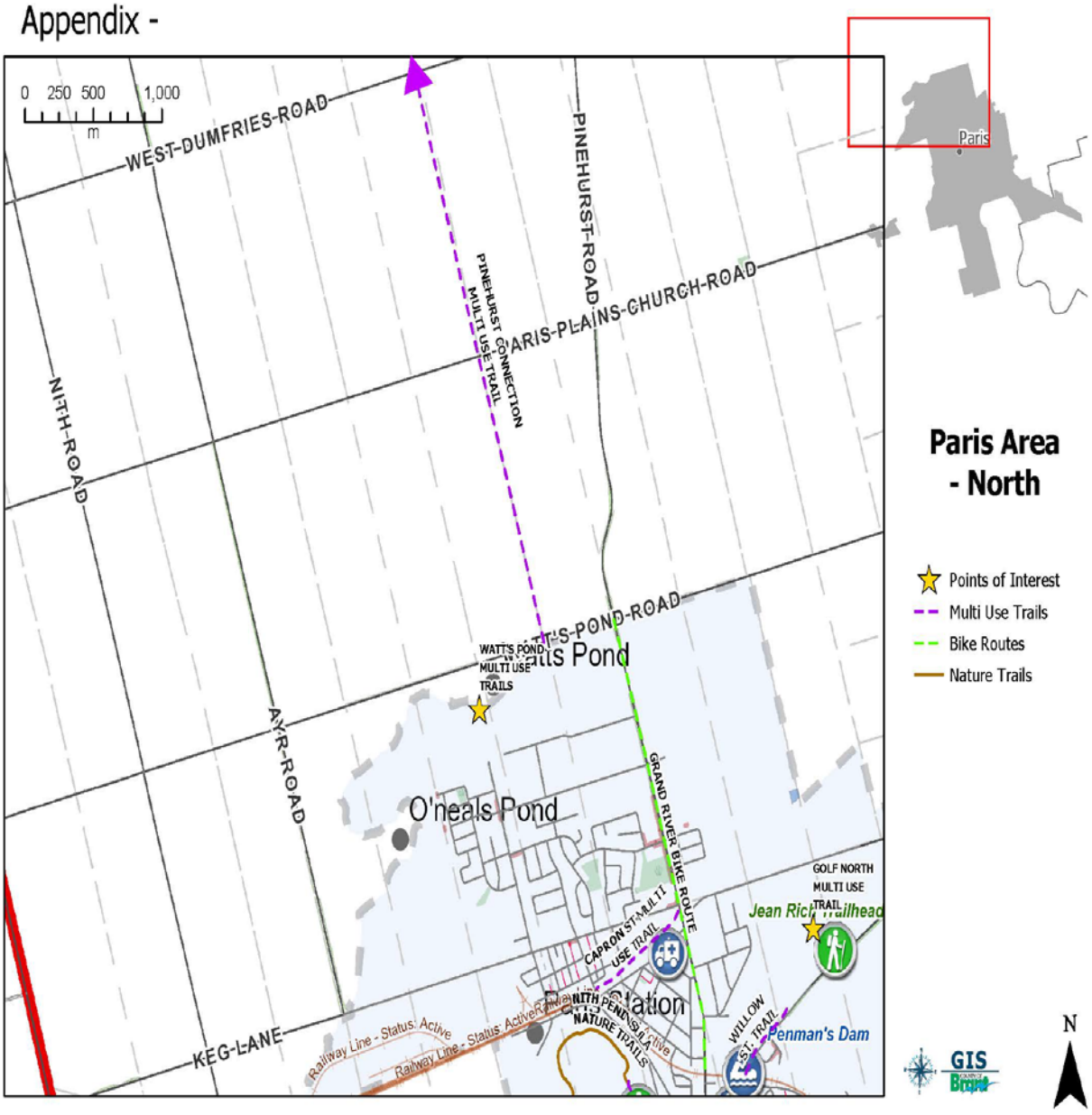


Figure 14a: North Individual Community Map – Paris North

Appendix -

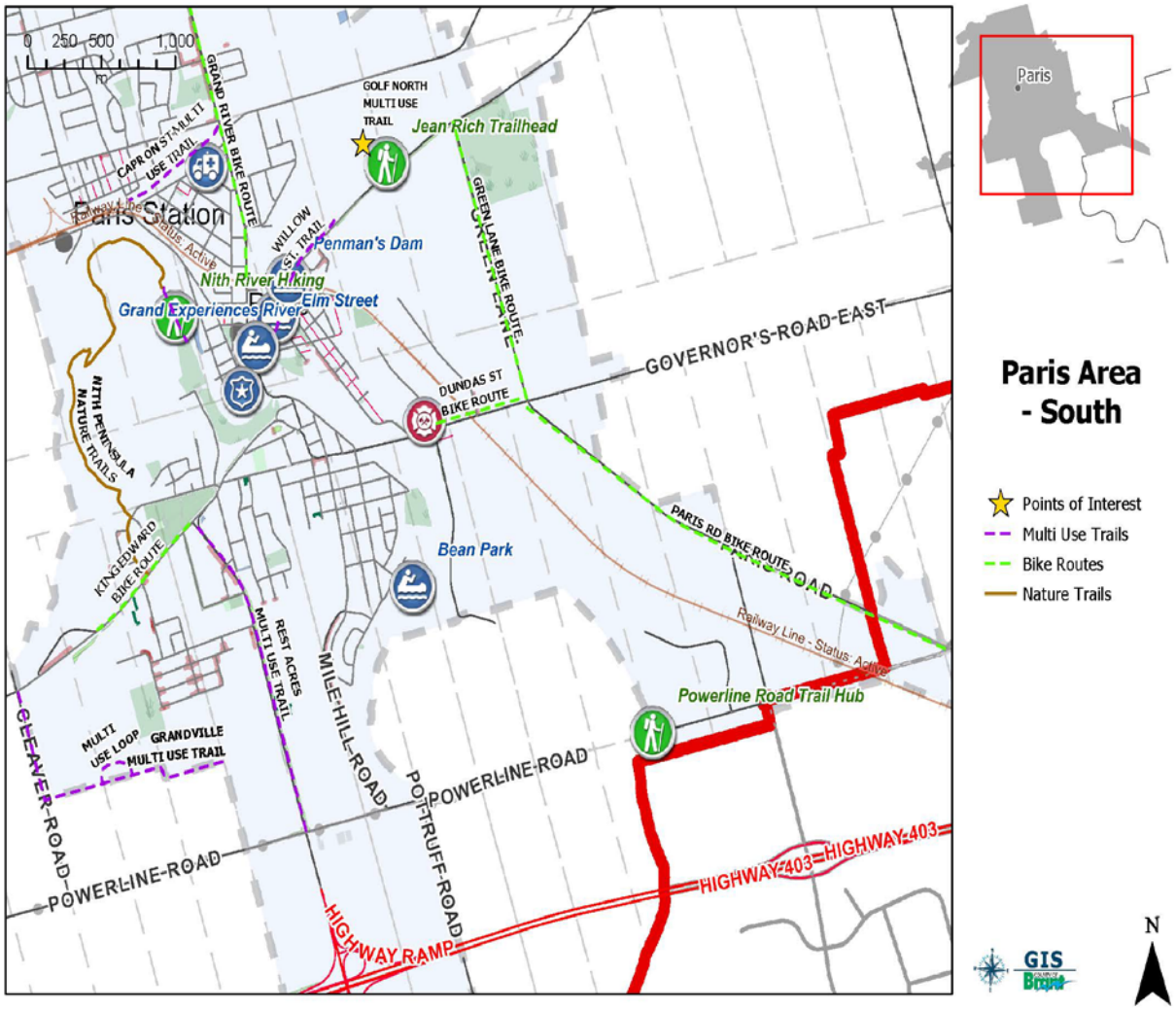


Figure 14b: South Individual Community Map – South Paris

8.5 Individual Community: **Brant West Area**

Within the community of Burford, located in the western portion of the County of Brant, proposed additions to the current trail network include:

- Trailhead to be located at Lions Park, providing a sending off point for Trail Route 14 – Apps Mill Nature Park which terminates at Bishopgates Rd./ Brant Rod and Gun Club.

Recommendations:

1) Provide a multi-use trail and/ or bike lane on Hwy 53 from Bishopgates Rd. to Minshall St – 1.2 km distance.
2) Construct an internal paved 2.0m walking loop at the Burford Community Centre property - 800m distance.
3) Lions Way extension from Lions Park (Maple Ave) to Bishopsgate Rd. / Brant Rod and Gun Club.
4) Scotland connection on or off-road to the TH&B trail.

Appendix -

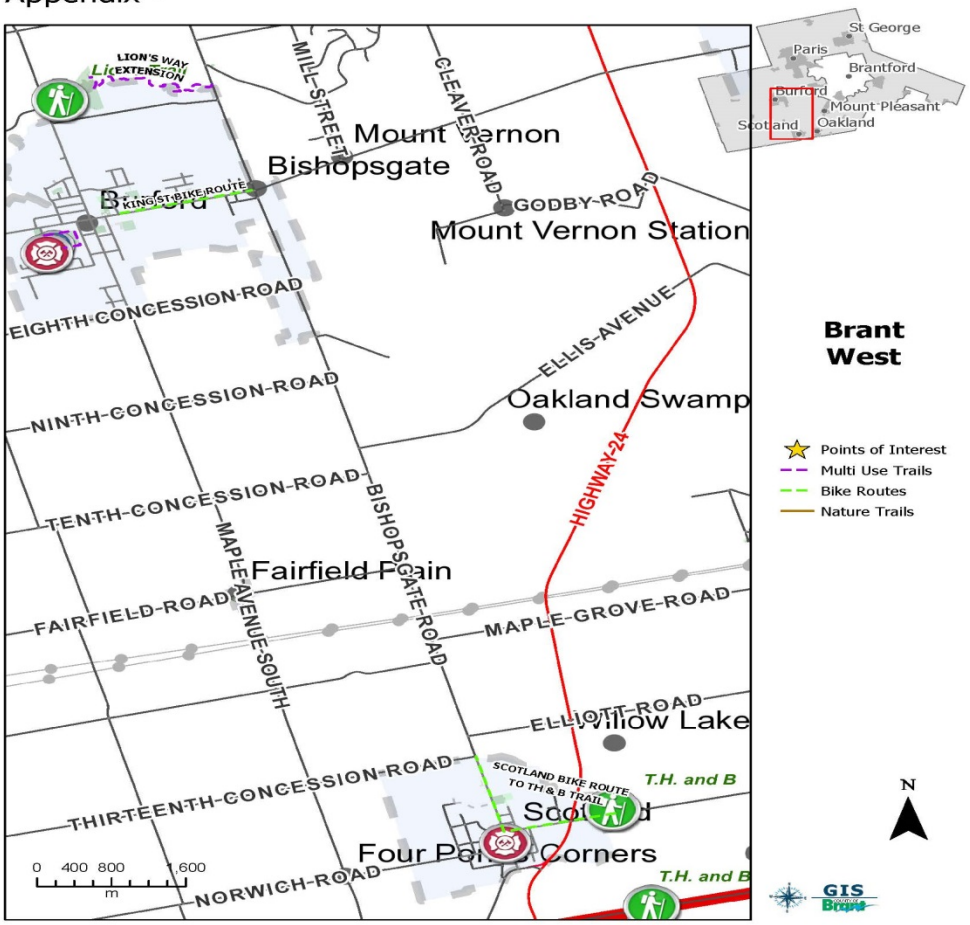


Figure 15a: Individual Community Map – Brant West

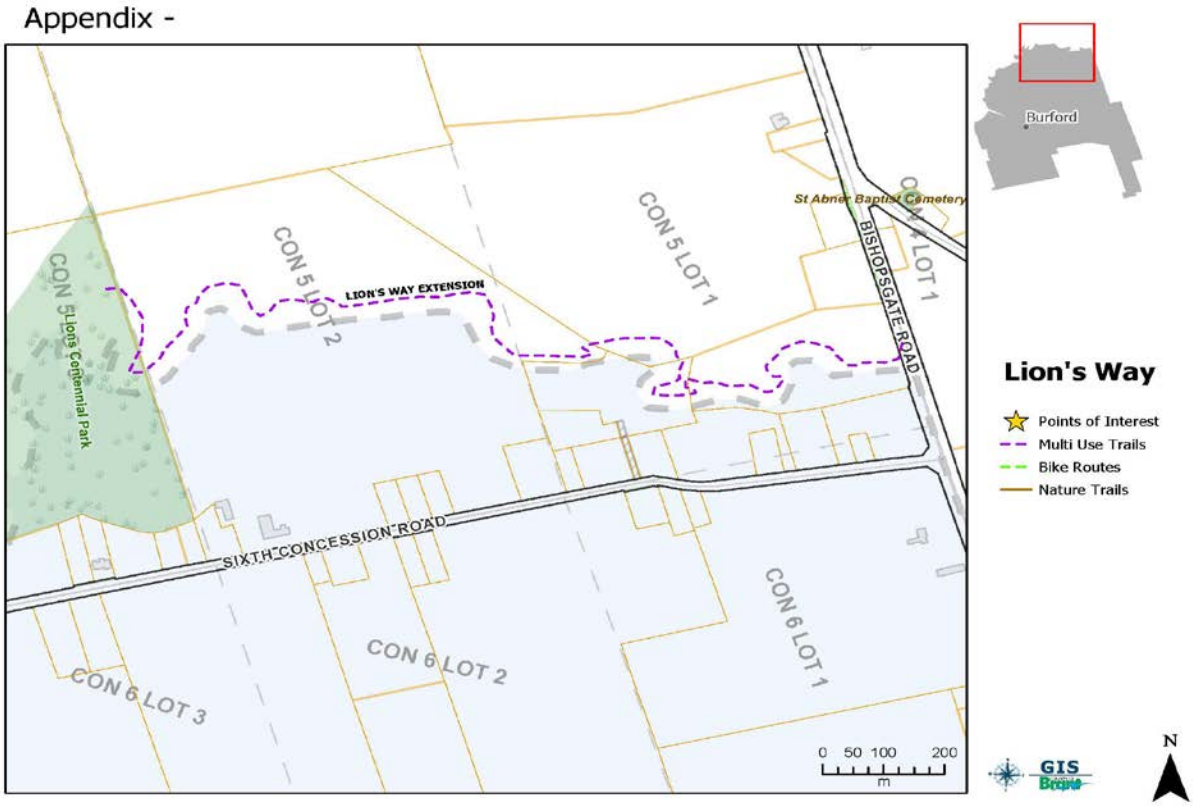


Figure 15b: Individual Community Map – Lion's Way

8.6 Individual Community: South Dumfries

St. George, located in the north eastern portion of the County, has a number of proposed routes contained within and travelling through the community. Route 13, which follows Blue Lake Road, connects St. George with the Cambridge to Paris Rail Trail and the Grand River. Route 8, located along St. George Road, connects the City of Brantford with the Region of Waterloo. This route passes Sunny Hill Park, a major recreation hub within the County. Also proposed in St. George is an on-road trail connecting Sunny Hill Park with Elliot Field Park on HWY 5 and continuing to Blue Lake Rd. and the Cambridge to Paris Rail Trail. An off- road multi-use trail is proposed to run north-south from German School Road through new subdivision, northerly to Jacob's Wood.

Recommendations:

1) Construct a paved on-road bicycle lane along Park Road between Powerline Road and Governor's Road East to St. George continuing through to the County of Brant border at Lockie Rd. - 13.2 km distance.

2) Develop a north-south multi-use trail linking neighbourhoods between German School Road and Jacob's Wood in concert with subdivision development – 3km approximately.
3) Construct either a multi-use in boulevard trail or 1.5m paved shoulder bicycle lane on Hwy 5 to Hwy 24 – 2.4 km distance. Continue the bicycle lane on Blue Lake Rd. to East River Rd. (Route 13) Bike Lane (2.4 km).

Figure 16: Individual Community Map – South Dumfries

8.7 Individual Community: Brant, Oakland Onondaga Area

Mount Pleasant, located in the southern portion of the County, has a number of proposed enhancements to the current trail network. These include:

- An equestrian trailhead and staging area is proposed to be located at the Mount Pleasant Nature Park for easy access to the southern portion of the LE & N Trail proposed to be an equestrian area along the current trail right-of- way.

Recommendations:

1) Install hitching posts and signage for equestrian users.
2) Develop a BMX biking facility.
3) Investigate development for the LE & N trail from Oakland Rd. to Jenkins Rd.

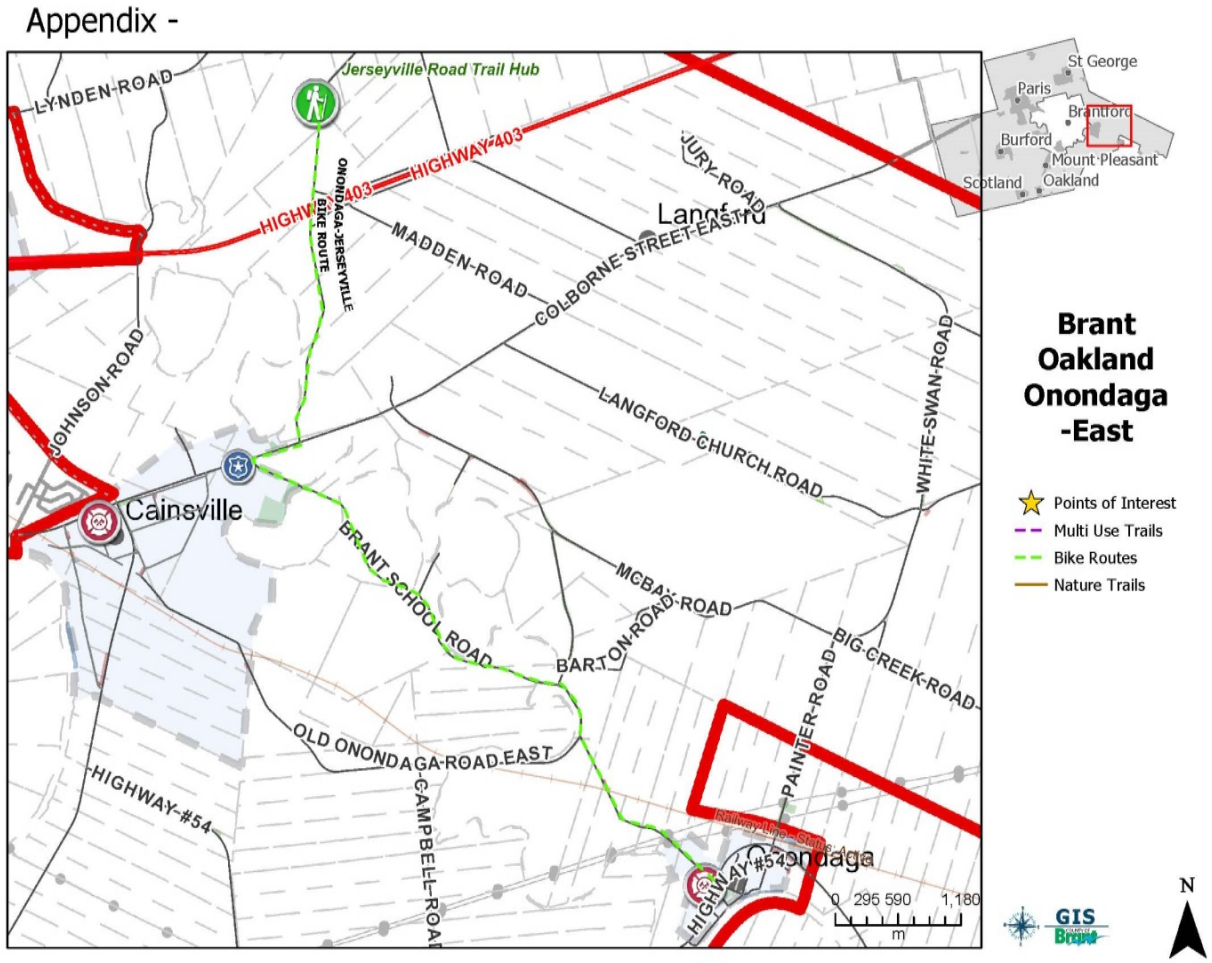


Figure 17a: Individual Community Map – Brant, Oakland, Onondaga – East

Appendix -

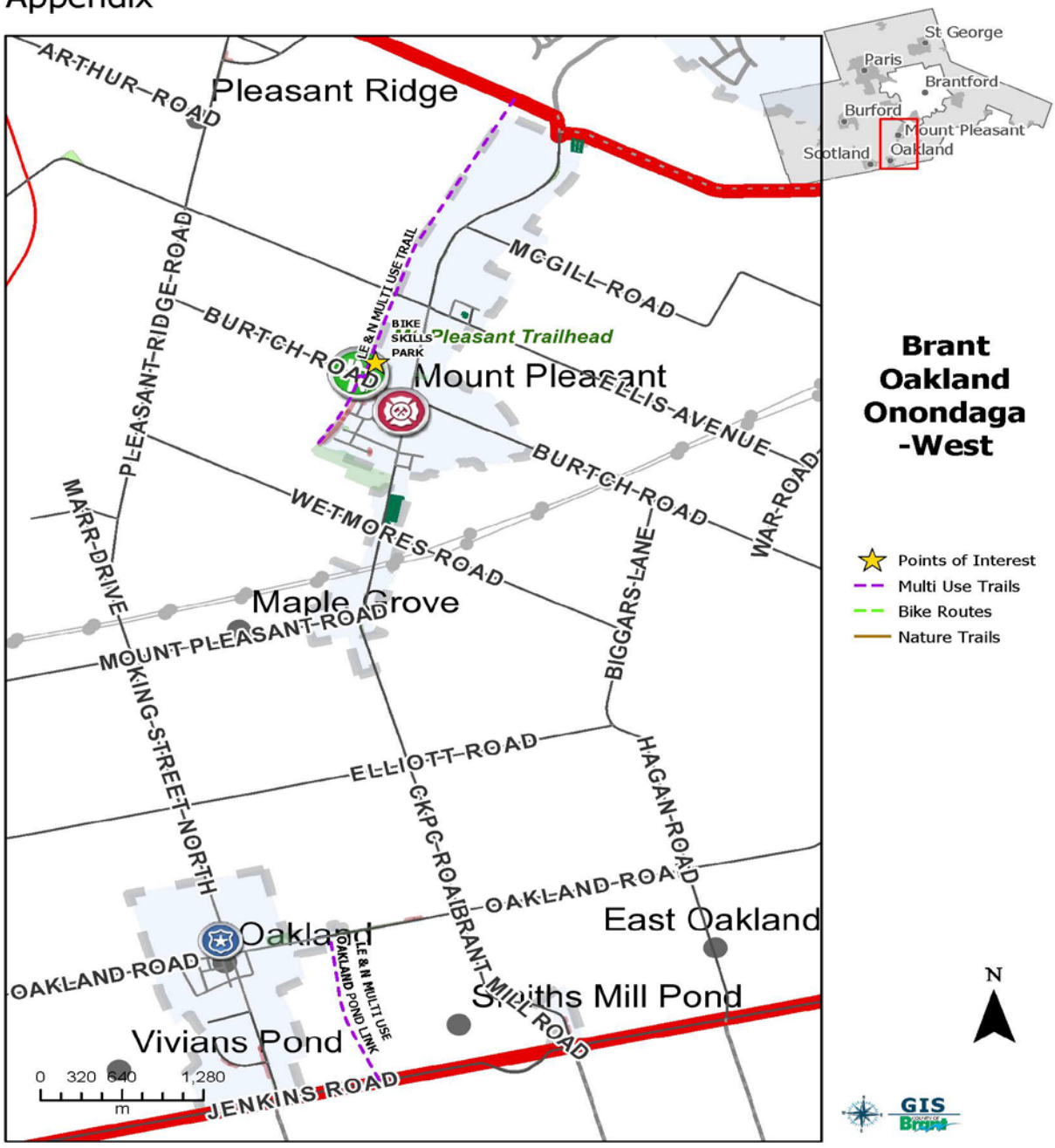


Figure 17b: Individual Community Map – Brant, Oakland, Onondaga – West

9.0 TRAIL GUIDELINES

9.1 General Trail Design Principles

The following principles should be considered as part of the planning design of any trail:

1. Alignment (horizontal curvature) and Sensitivity to Natural and Cultural Resources
2. Water edge treatments
3. Clear Trail width
4. Clear zones (horizontal clearance)
5. Vertical clearance
6. Trail surface
7. Drainage and Soils
8. Profile (vertical curvature) and Gradient
9. Edge protection (railings etc.)
10. Sight distance
11. Hillside Trails

9.1.1 Trail Alignment and Sensitivity to Nature & Cultural Resources

Alignment refers to the horizontal curvature of the trail. A major desire of trail users is to be offered a scenic trail experience. Therefore, it is important that trails do not negatively impact the surrounding environment which they showcase. The following guidelines describe how a trails impact on natural and cultural resources could be reduced.

- Reduce grading on native grasslands and lakeshores.
- Avoid locating trails through wetlands. In cases where wetland crossings are necessary, a boardwalk or other structure may be used.
- Consider a buffer zone, between a trail and wetland, where possible.
- In forested areas, meander trail to avoid removal of significant trees, where possible.

9.1.2 Water Edge Treatments

Lakes, rivers, streams, and wetlands need protection from potential erosion problems. Avoid trail routes that directly adjoin the water’s edge. Natural benches or terraces should be located above the ordinary high water mark. Maintain vegetative filter strips between the trail and water. The width of a filter will vary depending on the slope of the land between the water and the trail. Occasional spur trails may be used to access the water’s edge. Physical barriers or vegetative screening may be necessary to discourage short-cutting to the water.

9.1.3 Clear Trail Width

Clear Trail Width refers to the width of the travelled part of the trail that is free of protruding objects, such as trees and overgrown vegetation.

9.1.4 Clear Zones (horizontal clearance)

Clear Zones refer to the area on each side of the trail which is free from protruding objects and overhead obstructions, such as tree branches or bridges.

9.1.5 Vertical Clearance

Vertical clearance refers to the height above the trail which is free from protruding objects and overhead obstructions, such as tree branches or bridges.

9.1.6 Trail Surface

Trail surface refers to the type of surface on the travelled part of the trail, such as asphalt, concrete, granular, or alternative. Surface quality is affected by tread obstacles, such as roots or rocks, and by any openings such as gaps and grates located within the trail surface.

9.1.7 Drainage and Soils

Examine the trail area for excessive surface water during the spring thaw or after a heavy rain. Avoid these areas, especially if the depth to the water table, bedrock, or hard clay is less than 500mm shallow soils not only have drainage problems, but also tend to erode easily and may slide when walked on. Favour locations where soil depth exceeds 900mm.

Soil texture has a major influence on soil drainage and erodibility. Texture refers to the sizes of individual soil particles. Clay and silt are the smallest particle sizes, and soils containing high amounts of these particles tend to be muddy when wet or cracked and dusty when dry. They are susceptible to compaction and are highly erodible, especially on steep slopes. Likewise, soils composed mostly of sand, which has the largest particle size, are extremely unstable and should be avoided. Single-texture soils may be suitable for trail use if gravel-sized particles are embedded in the soil. The best soils for trail use are loam soils that contain a mixture of sand, silt and clay. Boardwalks may be required on trails built on sand or clay soils.

Soil Texture	Identification
Sand	Loose and gritty. Will not form a ball.
Loam	Smooth (flour-like), but slightly gritty. Forms a ball, but ribbon usually breaks easily.
Silt	Smooth (flour), no grittiness. Forms ribbon that break under own weight.
Clay	Smooth and sticky when wet. Forms ribbon that is long and pliable.
Organic (peat, muck)	High amount of decomposed material and water. Black to brown colour. Wetlands, low areas.

Table 3: Soil Textural Classes

9.1.8 Profile (vertical curvature) and Gradient

Profile refers to vertical curvature of the trail while gradient refers to the angle or slope of the longitudinal trail surface.

Gradient	Description
0 to 2%	Nearly level
3 to 6%	Gently sloping
7 to 12%	Moderately sloping
13 to 18%	Moderately steep
19 to 25%	Steep
26% and greater	Very steep

Table 4: Description of Different Trail Grades

If trails must traverse steep slopes to access important places, switchbacks or steps may be required. Both have considerable drawbacks and alternative routes should be carefully evaluated.

Switchbacks are designed to reduce trail grades by lengthening the trail. Trail grades should rarely exceed 10 to 15 percent. Switchback turns (or landings) must be located on stable soils to reduce erosion. Favour flat benches or areas with the least slope. Timber steps may be used to level the landing and reduce erosion.

Shortcut trails often develop prior to switchbacks. Construct log, rock, or shrub barriers at trail turns to ensure that users remain on the trail. Alternatively, attractive features such as benches and vistas may be located at the turn.

Steps may be needed on steep terrain with highly erodible soil, but have several drawbacks. They may be costly to construct, restrict trails to summer use, and prohibit access for some disabled persons. Steps should rise at least 125mm, but not more than 225mm. Stairways may be required on slopes exceeding 100 percent (45 degrees).

9.1.9 Edge Protection (railings, etc.)

Edge protection refers to any protective barrier designed to separate the trail from its surrounding environment, and may take the form of a fence, railing or curb. As a general rule, curbs should not be less than 10mm in height.

9.1.10 Sight Distance

The sight distance and minimum turning radius must increase with the speed of the trail user. Generally, try to maintain a forward sight distance of 30m on snowmobile and bicycle trail curves. Avoid placing curves on downhill slopes or at the bases of hills. End downhill runs with a straight section on level terrain that is at least as long as the slope or with a short rise in grade before entering a curve. If a downhill curve is necessary, install warning signs at least 30m prior to entering the curve and provide a run-out or widen the trail or increase the turn radius Provide wider curves with longer sight distances on heavily used trails with traffic flowing in both directions.

9.1.11 Hillside Trails

Retaining of hillside cuts may be required when a trail crosses a steep slope. Back-slope cut ratios vary depending on the soil (Table 3). Take precautions to ensure that water does not flow down the trail and cause erosion. Cross-trail drainage can be encouraged by maintaining a 2 to 3 percent out-slope on the tread-way. Avoid unnecessary disruptions to the natural vegetation beside the trail and always attempt to protect large trees. Establish native vegetation, grasses, or legumes on exposed soils.

Soil Type	Back slope Cut Ratio (horizontal : vertical)
Sand	3 or 4 : 1
Moist clay	2 or 3 : 1
Loose, gravelly soil or organic	1.5 or 2 : 1
Loose rock	0.5 : 1
Stable rock	0.25 : 1

Table 5: Back-slope Cut Ratios by Soil Type

A retaining wall may be required to protect the trail base when the side-slope grade exceeds 50 percent. Stones or rough-sawn, rot-resistant timbers may be used to construct the wall. Water must be allowed to drain around, beneath, or through the wall and must not be allowed to accumulate behind it.

9.2 Trail Guidelines for Non-Motorized Uses

One of the most basic and fundamental requirements for trail construction includes the dimensions of the trail. Trails are constructed similar to roads, in that, there is a cleared right-of-way which has all rocks and trees removed with a track put down for travel. The width of the right-of-way and track are determined by trail use. The right-of- way width (clearing width) is important to ensure that unobstructed passage can be attained along the trail. The track width, or tread width, is critical to provide adequate space for comfortable and safe movement.

Each of the identified, non-motorized trails is described in detail as follows:

9.2.1 Hiking/ Walking Trails

As the population base in North America ages, participation in pleasure walking in natural environmental settings (hiking) is expected to be one of the fastest growing segments of outdoor recreation over the next 20 years.

Guidelines – Nature Trails

Nature viewing trails are generally designed to accommodate a low number of users. Trail patterns should focus attention on the food, water, and cover that the environment provides for wildlife. Habitat improvement measures may be necessary to attract desired species.

Selecting trail routes that pass through a diversity of wildlife habitats is important. Areas between adjoining habitat types tend to offer the greatest species diversity. Uplands between wetlands or waterways are excellent trail locations. Constructed trails often will be used by wildlife. Carefully select vantage points near openings or waterways. Water, especially if it is running or splashing, attracts birds and other species. Woodland edges should be favored. An occasional cut into the open area may be used to observe the forest canopy. Avoid routes that traverse sensitive nesting and rearing areas (e.g., blue heron rookery). Design the trail to approach prime viewing areas with the sun at the trail user's back. This helps illuminate birds and other wildlife for easy viewing.

Incorporate gradual curves into the trail design. Keep the trail surface as natural as possible, with woodchips, corduroy, or gravel added only in wet areas. Clear trail corridors to a suitable width as narrow trails are quickly closed by surrounding vegetation. If safety permits, dead standing trees (commonly known as snags) should be retained as they offer homes and feeding locations for many bird and mammal species. Consider erecting nest boxes or creating artificial snags in woodlands near the trail route.

Accessible Trails

Hiking trails often can be made accessible to persons with disabilities. Recognizing the needs of persons with disabilities before designing the trail. Their outdoor expectations differ little from other trail users. When designing the trail, work closely with potential future users and the County of Brant Accessibility Advisory Committee representing persons with disabilities.

Loop trails with cut-offs are desirable. Although trail lengths of less than 1.2 km are often provided, a variety of trail lengths are needed to accommodate different abilities and expectations. Identify routes with a variety of different sights, sounds, odors, and objects. Trails should follow a logical sequence to prevent the user's loss of direction. Place a trail information sign at the entrance. Mount it within easy reach of the trail at a height of 750-1000mm. Signs should use san serif characters that have high tonal contrast with the background letters to inform users about the length of the trail, the type of surface that the trail is constructed of, the average and minimum width of the trail, the average and maximum cross and running slopes, the location of amenities.

Trails should be free of debris and cleared to a minimum width of 1000mm and height of 2.1m. On trails with one-way traffic, most tread-ways should be at least 1000mm wide; 1.5m on two-way traffic trails. For wheelchairs, asphalt is almost a necessity for the trail tread, but flagstones, bricks (gaps less than 20mm), or crushed stone that has been rolled and compacted also may be used. Provide boardwalks in wet areas. Persons who are visually impaired can use natural trail treads with guide ropes or definite edges such as logs or railroad ties. Although trails usually are located on level terrain with grades rarely exceeding 5 percent, acceptable grades will vary depending on the abilities and expectations of trail users. Provide regular rest stops on steep slopes.

Design rest rooms, parking lots, and ramps carefully to ensure access. At least 900mm of level, cleared space should be provided to the side of benches for wheelchairs. Provide plenty of space at scenic overlooks for persons to watch and listen. Safety rails must be carefully located to ensure that the sight line of persons who use wheelchairs are not blocked. This is best done by working closely with County of Brant Accessibility Advisory Committee and other potential users when designing trails for persons with disabilities.

Illustrations

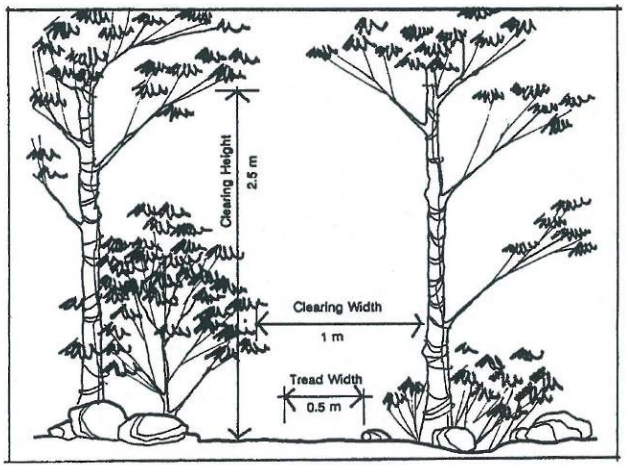


Figure 18: Clearing width and height for hiking / walking trail

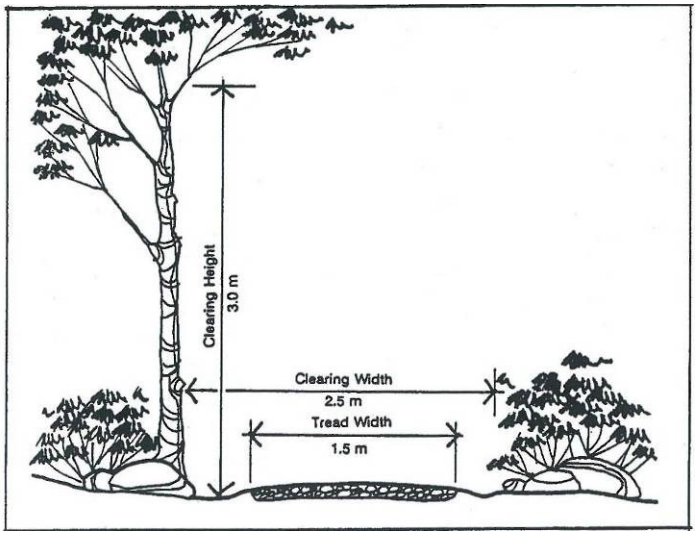


Figure 19: Gradients for accessible pathway ramp

Criteria	***Description***
Range	• Depending on terrain and ability, hikers average 1.5 to 5 km / hour • Internal connector trails / cut-offs used to offer different trail lengths • Day Use: 0.5 to 8 km (1/2 day); 8 to 25 km (full day) • Backpacking: 35 km or more
Clearing Width	• Vary clearing widths to avoid tunnel effect and promote a variety of environments (woodland flowers, meadow openings, woodland edges) • Trails generally should narrow on steep slopes to a minimum width of 900mm to reduce the potential for erosion • Light use: 1.0-1.2m (one-way traffic) • Heavy use: 2.1-3.0m (two-way traffic)
Clearing Height	• Minimum: 2.1 m • Additional clearance may be needed to compensate for branches drooping with heavy rain or snow
Tread Width	• Light use: 500-1000mm • Heavy use: 1.2-1.8m (two-way traffic)
Trail Surface	• Light use: Natural with gravel or corduroy used in wet areas • Heavy use: Natural if possible, woodchips or gravel

Criteria	Description
Turning Radius	• Turning radius: not critical; however, shortcut trails often will develop prior to sharp-angled turns and gentle curves are aesthetically pleasing and easier to maintain. • Straight sections generally should not exceed 30m.
Gradient	• Grades exceeding 10 percent are difficult for hikers to sustain and, without additional protection, erosion problems often develop • Steps, switchbacks, or water-bars may be needed on slopes over 25%. Occasional grade changes or dips should be incorporated into the trail layout to promote user interest and facilitate natural drainage. • Desired: 0 – 5% • Maximum: 15% (sustained); 40% (shorter than 50 yards) • Outslope: 4% (maximum)
Sight Distance	• Sight distances are not especially critical on hiking trails, except at motorized road crossings. These must be carefully located and designed to ensure trail users and vehicle drivers have good sight distances in all directions.
Water Crossings	• Structures for crossing water depend on the flow and length of the crossing and expectations of the hiker - almost all methods will accommodate foot traffic. • Bridges: Must be located above ordinary high water mark or cabled at one end to prevent washout. Width: 0.6 – 1.2m (light use), 1.5 – 1.8m (heavy use), 2.4m or more (maintenance vehicles). Weight capacity: Variable depending on maintenance equipment, bridge length and alternative trail uses. • Fords: Slow moving water less than 600mm in depth may be forded. Rocks and stepping stones may be used to assist hikers.
Compatible Uses	*(with suitable trail design standards)* • Winter: Snowshoeing, ski touring or snowmobiling • Summer: Cycling (low use), accessibility trails for those with disabilities
Incompatible Uses	• Summer: Horseback riding, OHV's, motorcycles, cycling (heavy use)
Facilities	• Parking area at trailhead, picnic areas, resting areas, lookouts and water should be considered. Information boards and signs should be provided at regular intervals. Facilities for resting should be provided at the top of long climbs.

Table 6: Details for hiking / walking trails

9.2.2 Bicycling- Off Road

Off road bicycling can be broadly separated into two major categories. The first category, urban cyclists, includes recreational and commuting cyclists in an urban or semi-urban setting who require a reasonably high standard of off-road trail. The bikes of urban cyclists may not be suitable for rugged terrain. The trails of off road cyclists may also commonly be used by walkers, hikers and joggers; therefore, becoming multi-use trails.

The second category includes mountain bikers in a non-urban setting who are recreational only. Mountain bike trails are typically rugged, off-road facilities. They have

far less stringent guidelines than non-motorized multi-use trails, but can accommodate only one type of bicycle. The hallmark of mountain bike trails is the "single track," which is a narrow pathway with many hills and sharp turns. Such facilities can vary greatly in difficulty.

Due to the potential dangers involved in bicycle passing, single direction mountain bike trails should be favored. Loop or linear destination trails often are used. Many mountain bicyclists are willing to shuttle vehicles in order to use high quality linear trails. Mountain bicycle (and BMX bicycle) trails are less expensive to construct, but must be carefully located and their use monitored to protect the environment.

Without proper drainage, mountain bike trails may become severely eroded. Mountain bike trails should be cross-sloped at 3 to 5 percent. Flexible water-bars or swales should be used to remove water from trails.

The objectives for bikeways networks are to:

- Provide accessible and continuous pathways.
- Provide accessibility to all users, including physically impaired or challenged persons.
- Reduce safety conflicts between pedestrians, bicyclists and automobiles at road crossings.
- Provide amenities for the bicyclists.
- Provide design consistency throughout the pedestrian and bicycle networks.

Illustrations

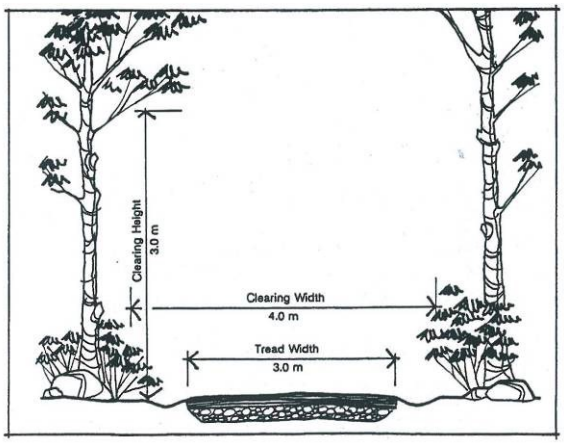


Figure 20: Clearing width and height for Bicycle trail

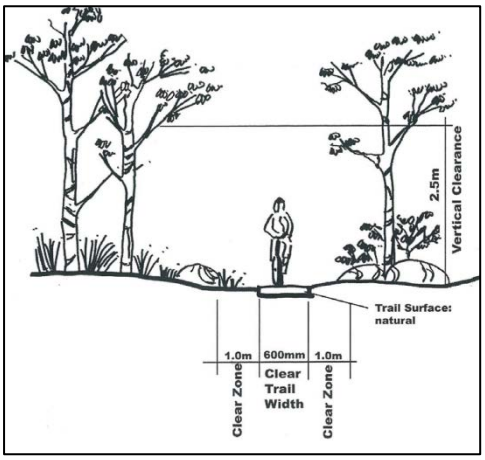


Figure 21: Dimensions for mountain bike trails

Criteria	Description
Range	• Average speed: 13 - 32 km per hour, but vary by abilities and gradients • Most bicyclists can cover 16 to 32 km per day; experienced riders can travel 80 km or more. Minimum length for bicycle trail: 1.5 km • 400 m loop trails with obstacles and challenges may be desired by BMX bicycle riders
Clearing Width	• The average width of a bicycle is 600mm, additional pavement width and clearances must be provided to accommodate a moving bicycle • Shrubby vegetation should be removed to a distance of 1.0 m on each side of tread. • Established trees and grasses may remain • Mountain bicycle: 1.8 - 2.6 m, with additional width on downhill sections and curves
Clearing Height	• 2.5 - 3.0 m
Tread Width	• Mountain bicycle: 600 - 900 mm • Urban bicycle: 3.0 m shared pathway
Trail Surface	• Mountain bicycle: Natural surface, preferably compacted earth • Urban bicycle: Bikeway pavement surface should have a smooth but not slick finish, which can be dangerous to bicyclists during wet conditions (concrete and asphalt are recommended). A 50 mm thick asphalt surface with a 75-100 mm base of compacted gravel is recommended. Limestone fines and other crushed granular stone (10 mm or less) surfaces are also acceptable.
Turning Radius	• Wide, gentle curves with good forward sight distances are ideal for bicycle travel. Never locate turns on downhill sections or at the base of a hill. Tight turns require installation of run-outs and warning signs. • Mountain bicycle: 1.2 m (minimum), 2.4 m or more (desired). • Urban bicycle: 4.5 m (minimum), 5.4 m (desired). If the bikeway shares the right-of-way with a walkway, banks should be limited to 6% slope for pedestrian comfort.
Gradient	• Trail grades less than 5% are generally acceptable for bicycle travel. • Avoid steep downhill grades that endanger trail users and pose erosion problems from continual braking and skidding. • Switchbacks with barriers and run-outs may be used on steep slopes. • Motorized roadway approaches should be located on level grades or gentle uphill climbs (less than 3%). Because of the trail surfaces used, both types of bicycle trails have similar grade specifications. • Desired: 0-3%; Maximum: 5-10% (sustained), 15% (fewer than 45m); Outslope: 2-4% (maximum)
Sight Distance	• Forward sight distances of at least 30 m are critical at motorized road and water crossings and on trails with traffic flowing in both directions. • Curves should be designed to maintain good sight distances, turns and bends tend to help reduce travel speeds. • Desired: 30 m; Minimum: 15 m
Water Crossings	• Culverts, bridges, or boardwalks should be used to cross waterways; always cover with smooth planking oriented at a 45-90° angle to the direction of travel. Bridge approaches should be straight, level, and at least 30 m long. • Bridges: Must be located above the high water mark with railings on both sides. Width: 1.2–2.4 m (one-way traffic), 3.0 m (two-way). Weight capacity: variable, 5 tons or more for maintenance equipment.
Compatible Uses	*(with suitable trail design standards)* • Winter: Snowmobiling or cross-country skiing and snowshoeing. • Summer: Hiking and accessibility trails for persons with limited basis.
Incompatible Uses	• Horseback riding, OHV's, motorcycles.
Facilities	• Parking areas at trailheads, washrooms, water, bike racks, information board and signs.

Table 7: Details for off road bicycle trails

9.2.3 Bicycling – On Road

In the County of Brant, there is substantial potential for bicycle touring on existing roads between towns and villages. These roads may be of an adequate standard already to accommodate this use or may require some upgrading to meet desirable standards. There are essentially three types of on-road bicycle facilities: paved shoulders, shared roadways (including wide curb lanes), and bicycle lanes. All on-road bicycle facilities should be designed so bicyclists travel in the same direction as motorists.

Safety is of great concern in the design of on-road bicycle facilities. Conflicts with pedestrians, automobiles, or other bicyclists can lead to serious injury. Poorly maintained pavement, snow build-up and debris can also lead to safety problems. The guidelines listed below are minimum recommendations only, and site-specific conditions may dictate variations for safety purposes.

The bicycle network would follow existing paved roads which provide access to destination points including urban or rural centres and major attractions. Selection of suitable roads based on safety criteria would be an important component of route selection. The routes would generally provide a scenic experience and be reasonably direct. Share the Road signage should be installed for all on-road cycling routes where applicable and in compliance with Ontario Traffic Manual Book 18 standards.

Illustrations

Figure 22: Paved shoulder dimensions

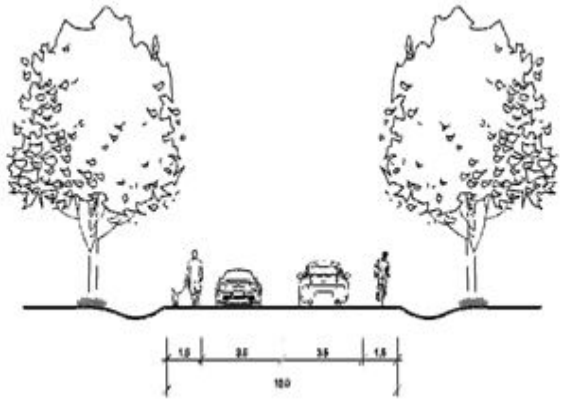


Figure 23: Shared lane dimensions

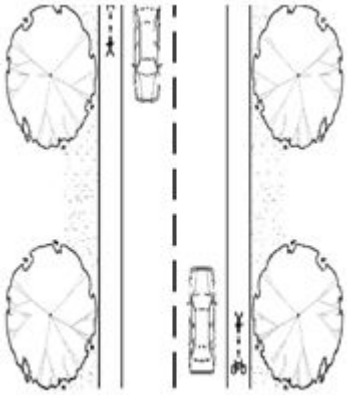


Figure 24: Dual On-Road Plan

Figure 25: Dual On-Road Dimensions

Criteria	Description
Range	• Trail lengths vary depending on the skills and expectations of the bicyclists. Bicyclists tend to travel at speeds of 13 to 42 km per hour. • Speeds can be dramatically influenced by user abilities, curves, and gradients. Experienced riders can travel 80 km or more in a day. • Day use: 10 – 20 km (1/2 day), 20 – 40 km (full day)
Clearing Width	• Paved shoulders: minimum 1200 mm, to accommodate bicycle use; those adjacent to guardrails or other roadside barriers: 1.5 m. • Widened curb lanes shared with vehicles: 4.2 m (minimum) lane width. • Widened curb lanes shared with vehicles on steep uphill segments: 4.5 m (continuous wide lanes greater than 4.5 m are not recommended, as motor vehicles may use them as two lanes). • Minimum width of bicycle lanes: 1200 mm as measured from edge of roadway travel lane, or 1.5 m as measured from the face of the curb or a guardrail to the bicycle lane stripe. Desired width of bicycle lanes: 1.5 m, measured from edge of roadway travel lane. • Minimum width of bicycle lanes adjacent to parking: 1.5 m • Provide additional width on downhill sections and curves.
Clearing Height	• 2.5 - 3.0 metres
Trail Surface	• Touring bicycle: A 50 mm thick asphalt surface with 75 -100 mm base of compacted gravel is recommended. Limestone fines and other crushed granular stone (10 mm or less) surfaces also are acceptable.
Turning Radius	• The radius of curvature required for cyclists is generally satisfied by the design characteristics of the roadway.
Gradient	• On-road bicyclists can generally negotiate the grades at which roadways are built. On-road bicycle facilities should only be designated on hard-surfaced roadways. • Desired: 0 – 3% • Maximum: 5 – 10% (sustained), 15% (fewer than 45 m) • Outslope: 2 – 4% (maximum)
Sight Distance	• Forward sight distances of at least 30 m are critical at motorized road and water crossings and on trails with traffic flowing in both directions. Although curves should be carefully designed to maintain good sight distances, turns and bends tend to help reduce travel speeds. • Desired: 30 m • Minimum: 15 m
Water Crossings	• Provide adequate width for cyclists on bridges shared with vehicles, or provide separated pedestrian / cyclist facility on side of bridge. • If cyclists are to share with pedestrians, provide clear signage explaining the shared use. Also provide generous ramps from roadway onto shared pathway. In either case, provide signage well in advance of bridge to warn cyclists of change of conditions ahead. • Always cover bridges and boardwalks with smooth planking oriented at a 45 to 90 degree angle to the direction of travel. Bridge approaches should be straight, level, and at least 30 m in length.
Compatible Uses	• Vehicles, pedestrians *(with suitable trail design standards)*
Incompatible Uses	• Horseback riding
Facilities	• Trail head parking area (for cars and bikes), washrooms, rest areas, information boards, signs, water supply.
Maintenance/ Management	• Debris and gravel should be regularly cleared from bicycle lanes. • Snow may also need to be cleared depending on seasonal use.

Table 8: Details for on road bicycle trails

9.2.4 Equestrian

Trail surface wear is the most evident problem on an equestrian trail. A firm tread surface and avoiding areas with poor drainage and surface water are very important. Limiting the size and number of horse parties so that they do not exceed the trails carrying capacity will help to minimize wear. Trail use should be restricted during times of heavy rain and spring run-off.

A certain amount of wear is inevitable and therefore environmentally sensitive areas should be avoided. Where access to sensitive areas is desirable, riders should be encouraged to dismount, tie their horses, and walk to lookouts, lakeshores or scenic viewpoint within areas of extreme sensitivity.

Trail Layout

Single direction loops or multiple loops are suitable for horse trails. Provide routes with a variety of scenery and terrain. Wet areas and steep slopes pose extreme difficulties to trail maintenance and should be avoided. Keep water and motorized road crossings to a minimum. Open parade areas may be offered for riders to practice their skills.

Trail Signage

Provide directional signs at intersections and points of potential confusion. Use standard equestrian / trail riders symbols for marking trails. Trails should be marked in accordance with the Ontario Trail Riders Association guidelines.

Illustrations

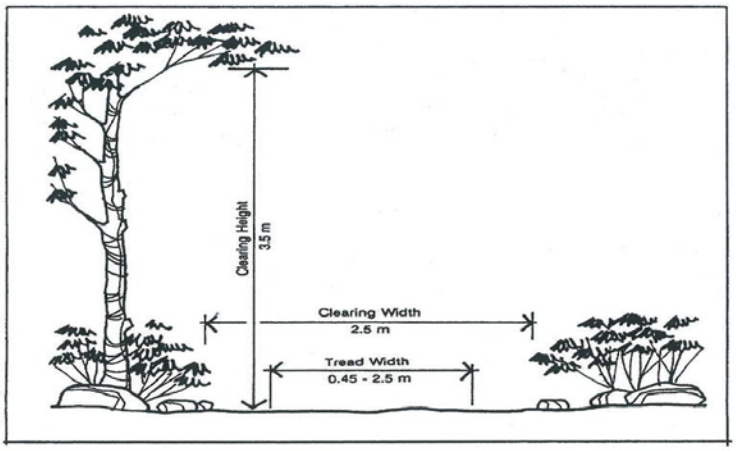


Figure 26: Clearing width and height for Equestrian trails

Criteria	Description
Range	• Horseback riders travel at average speeds ranging from 6.5 to 13 km per hour. Many day-use trails are designed to cover 8 to 40 km.
Clearing Width	• Light use: 2.5 m (one-way traffic) • Heavy use:3.5 m (two-way traffic)
Clearing Height	• 3.5m
Trail Width	• Light use: 600-1200 mm (one way traffic) • Heavy use: 1.5 -1.8 m (two-way traffic)
Trail Surface	• Well drained natural trail surfaces should be favoured. A corduroy base covered with soil or woodchips is recommended for areas with erodible or poorly drained soils. Avoid using asphalt or concrete as either may injure horses' hooves.
Turning Radius	• Turning radius is not critical on horseback riding trails; however, avoid sharp - angled turns or turns on steep slopes.
Gradient	• Erosion problems will often develop on grades exceeding 10%. • Switchbacks and water-bars may be needed to traverse steep slopes. • Offer resting grades (4% or less) of 150m in length at regular intervals. • Desired: 0 – 10% • Maximum: 10% (sustained), 20% (shorter than 45 m) • Outslope: 4% (maximum)
Sight Distance	• Sight distances are not critical on horse trails unless horse traffic flows in both directions or the trail is shared with hikers. In these cases, forward sight distances of 15 - 30 m should be provided. • Warn riders at least 30 - 60 m in advance of motorized road crossings.
Water Crossings	• Keep water crossing to a minimum on horseback riding trails. Natural crossings and culverts should be favoured over bridges. • Bridges must be carefully designed to meet the needs and weight of horse travel. High, narrow bridges may scare some animals. • Bridges must be located above high water mark. Width: 2.4 m (minimum), weight capacity: 5 tons, variable depending on maintenance equipment and length of bridge. • Fords: Horses can easily cross slow moving water less than 600 mm in depth. Favour stable streambeds with sand and gravel rocks downstream of the water crossing.
Compatible Uses	*(with suitable trail design standards)* • Winter: Snowshoeing, cross -country skiing, snowmobiles • Summer: Walking, hiking
Incompatible Uses	• Motorized vehicles in summer
Facilities	• Parking area at trailhead with space for trailers, hitching post or tether line and designated water holes for the horses. • Equestrian staging areas usually provide loading/unloading ramps and some provide corrals, vault toilets, animal-proof garbage containers, picnic tables, dropping disposal, water wells and fire rings.

Table 9: Details for Equestrian trails

9.3 Trail Guidelines for Motorized uses

NOTE: Trails in the County of Brant are currently not designed for motorized vehicle use. However, the following guidelines, dimensions and details may be used this type of trail is developed in the future.

- The use of motorized vehicles in off road situations is controlled by legislation in Ontario. The following summarizes some of the Acts which may be applicable.
- Operation of motorized vehicles must comply with the provisions of the Highway Traffic Act, the Motor Vehicle Safety Act and the Off Road Vehicle Act.
- Motorized vehicles must be registered with the Ministry of Transportation and display license plates as issued by a motor vehicle license office.
- Motorized vehicles must be covered by liability insurance. The driver of the vehicle must carry proof of insurance.
- The Off-Road Vehicle Act states that off-road vehicles may access highways 500 to 899, 7000 series and highways with low traffic volumes.
- Off-road vehicle operators require consent of land owners to ride on private land trails.
- Motorized off-road vehicles must not exceed 50 km per hour.
- Motorized off-road vehicles (any two or more wheeled vehicle designed primarily for recreational use) must comply with noise limits and standards as set by the Canadian Motorcycle Association.

9.3.1 Off Highway Vehicles (OHV)

The category, off-road vehicles, covers a wide range of motorized vehicles in a number of settings. The major sub-groups in this category include:

- Standard 4 x 4's - multiple passenger 4-wheel drive vehicles which generally utilize existing routes such as logging roads, forestry trails, etc.
- ATV's - smaller 4-wheel drive vehicles which carry only one or two passengers. (The US Forest Service defines an ATV as being less than 1270 mm in width).
- Motorized off-road bikes (motocross, dirt bikes) - lightweight motorcycles designed for use on rough surfaces such as dirt roads or trails.
- Electric bikes (E-bikes) – Electric bikes with pedals. E-bikes must not weigh more than 120 kg (includes the weight of bike and battery). Maximum speed is 32km/hr. Permitted to be used on roads by anyone 16 years of age or older.

Facilities specifically for OHV use are typically designed with a system of loops, beginning at a trailhead and offering several loops of different ability levels. OHV parks are usually shared by motorcyclists so loops should be planned for these users as well.

Illustrations

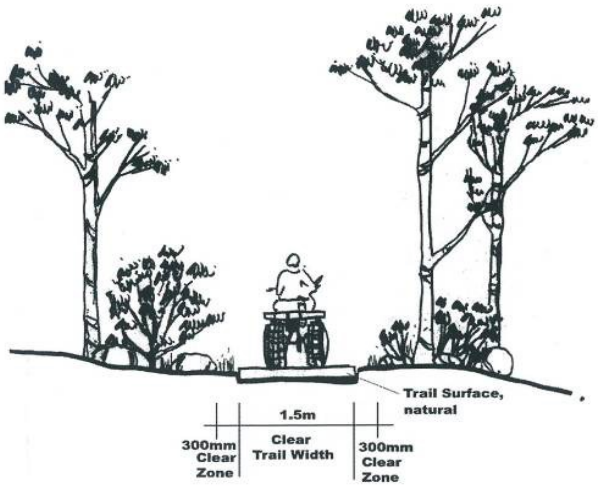


Figure 27: Trail dimensions for one-way OHV trails in wooded areas

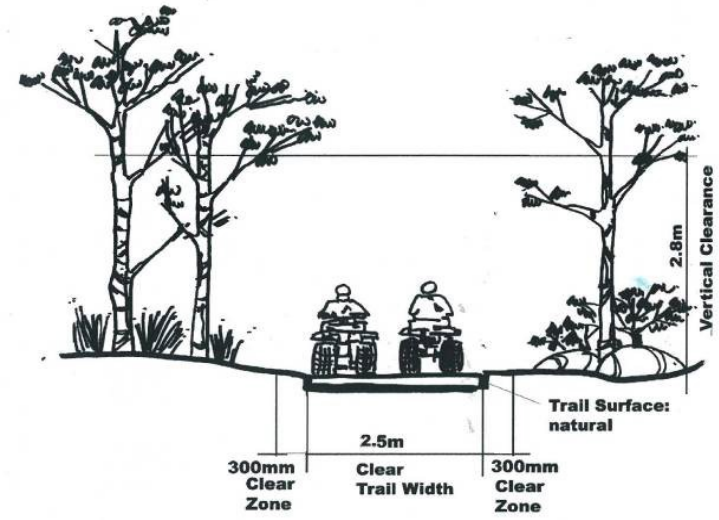


Figure 28: Trail dimensions for two-way OHV trails in open areas

Criteria	Description
Range	• 100 km / day for destination OHVs
Clearing Width	• 300 mm minimum clear zone on each side of trail
Clearing Height	• At least 2.8 m
Trail Width	• Recommended width for one-way OHV trail in a wooded area: 1.5 m • Recommended width for two-way OHV trail in a wooded area: 2.5 m • Recommended width for one-way OHV trail in open/grassy area: 1.2 m
Trail Surface	• OHV trails should have a natural surface, resistant to erosion; sandy soils should be avoided. • OHV trails should be free of logs, large rocks, stumps, brush, and other obstructions, unless a more challenging experience is desired.
Turning Radius	• Minimum radius for curves on trails is 3 m • Trails should be widened slightly at curves for safety reasons
Gradient	• Variety in grades for OHV trails is recommended, as it increases the challenges of the trail and facilitates drainage. • Min. slope for OHV trails 2% to ensure adequate drainage. • Maximum continuous slope for OHV trails 8% • Maximum grade for shorter slopes (30 m) is 15%
Compatible Uses	*(with suitable trail design standards)* • Winter: Snowshoeing, cross-country skiing or snowmobiling • Summer: Motorcycling
Incompatible Uses	• Walking, hiking, off-road cycling, equestrian
Facilities	• Major needs include OHV Parks, connections between these parks and exploration of multi-use corridors with separated trails.
Maintenance/ Management	• Keep trail surfaced with materials suited to OHV activities (e.g. limestone screenings) • Keep surface smooth enough for the permitted activities • Ensure trail is drained sufficiently to prevent erosion, puddles or mud • Keep clear (on both sides and above) of obstructions (trees, rocks) • Close trail, and post closed, if dangerous (e.g. if bridge unsafe) • Sign trail, as indicated above, and any missing or vandalized signs replaced as soon as possible • Regular inspections, at least once per month, involving a trail condition and use form for submission to those responsible for maintaining trail. • Regular education about, and enforcement (by police or volunteers authorized to undertake selected enforcement) of regulations pertaining to the trail, (e.g. permitted uses, speed limits, no littering) • Regular contact (e.g. annual meeting, or letter) with owners of land adjacent to the trail to identify any problems arising from use of the trail to resolve them quickly

Table 10: Details for motorized vehicle trails

10.0 SIGNAGE PROGRAM HIERARCHY

Trail signage is an important element that enhances the trail experience and provides guidance to the user. Signs provide four major functions - information, direction, interpretation and regulations, as described below.

10.1 Informational

Informational signage provides detailed information about the use and identity of the trail and adjacent features. This is usually conveyed through the use of maps as components of the sign board. This type of signage also indicates trail conditions, such as steep slopes and trail amenities such as safety features, washrooms and parking areas. Large informational sign boards are commonly located at trail entry locations and provide trail name and possibly logo, trail route map, trail regulations and information as well as the County of Brant name and logo.

10.2 Directional

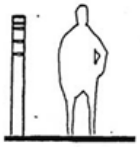
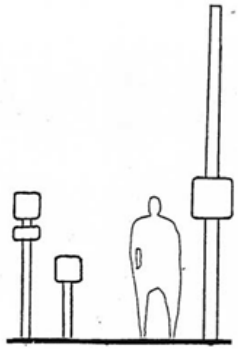
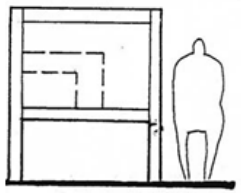
Directional signage should be used to indicate the trail route, including changes in direction and / or straight portions of the trail, at determined intervals. This type of signage can also be used off trail, such as in parks and open space indicating the route to nearby trail access points; at trail intersections or any point where a decision must be made by the user. At these points, information as to trail length, average duration and destinations or points of interest are important to note to allow users to make decisions as to the route to follow.

Directional signage may also be used to indicate any transitions that occur along any given route; this includes from roadside trails to nature trails and roadside bicycle trails to on-road bicycle trails.

10.3 Interpretive

Interpretive signage provides information regarding natural, geo-logical, cultural and historical significance along the trails. These signs should be site specific and located at major interpretive nodes or at particularly exceptional viewpoints, with a surfaced viewing area between trail edge and sign. The information included on these signs should be concise, easy to understand for all age groups, and should ultimately improve user awareness and promote enjoyment of the trail and immediate area. Interpretive signs should be spaced out to enable to trail user to absorb the ideas and information provided.

Table 11: Signage Application Chart

SIGN TYPE	INFORMATIONAL	DIRECTIONAL	INTERPRETIVE	REGULATORY
 POST MARKERS (minimum signage for recreational open space)	• Recommended only for trails in open space • Post every 500 m on relatively straight sections or trails with no or few access points or intersections • Due to the low profile of the post markers, these should be located on both sides of a trail to communicate effectively with both directions of traffic • Post markers are best suited to optimum route segments of the trail where their installation will be permanent • Maximum 3 flashings per side of post	• Directional arrow to be used at trail intersections and at changes in trail direction or trails in open space only • Due to low profile of post markers, these should be located on both sides of a trail to communicate effectively with both directions of traffic • Post markers should be used on optimum route segments of the trail where their installation will be permanent • Maximum 3 flashings per side of post		
 STANDARD SIGN BLANKS (minimum signage within road right-of-ways)	• All standard sign blanks identifying trail route should show a directional arrow indicating left, right or straight ahead • There should be no more than 2 signs per side of post • Trail information and warning signs are to be posted on 30 x 30 cm or 45 x 45 cm sign blanks – depending on speed of trail users • Also use 30 x 45 cm and 45 x 60 cm sizes when showing trail activity symbols and some warning signs	• Use to indicate transitions from roadway to green space trail and offroad to on road bicycle trails • Maximum 2 signs per side of post • 30 x 30 cm sign blank: recommended as the minimum standard for trail identification and directional signage • 45 x 45 cm sign blank: can be used in urban situations to compete with existing volume of signage or communicate with fast cyclists • 30 x 15 cm or 60 x 30 cm sign blank: use as a tab sign to existing parks, trails or roadway signage • Open space trail segments: maximum height to bottom of sign is 1.5 m, use existing uprights where possible, post at changes in trail direction, intersections and every 500 m, post signs 1.0 – 2.0 m from trail edge • Urban trail segments: maximum height to bottom of sign in road R.O.W. 2.5 m, post at changes in trail direction and every 500 m on city streets / 750 m on rural roads		• P.t. 100 x 100 mm post is preferred on open space segments of trails • Steel channel post acceptable in urban or residential sections of trails • Use existing uprights where possible • Max. height from grade of trail: 1.5 m • Post 1.0 – 2.0 m from edge of trail • Black text and graphics on white background • Where posted in combination with directional sign, the directional sign should be above the regulatory
 LARGE SIGN BOARDS	• 1.8 x 1.2 m sign board: locate at major trail entry points, primarily at entrance to trail from a parking area • 1.2 x 0.8 m sign board: locate at major trail entry points of secondary importance, primarily at entrance to trail from park or neighbourhood • Provide trail name, trail route map, trail regulations, and information as well as County of Brant name and logo		• Used for major interpretive nodes and locations, highlighting natural, cultural and historical features • Can vary in size depending on use • Should be site specific • Locate parallel to trail edge with a minimum 2.0 m paved viewing area between trail and sign	

10.4 Regulatory

Regulatory signage provides trail users with the rules and regulations regarding trail use and advises users of local municipal by-laws. This includes stop, yield and do not enter signs, among others.

11.0 TRAIL MAINTENACE AND MANAGEMENT

In order to ensure that the trails within the County of Brant are safe, functional and attractive into the future, a regular maintenance program is necessary. This section outlines an approach to the development of a maintenance program that has been adopted by the City of Guelph and other municipalities in an effort to develop a consistent and comparable maintenance program for their trail networks. The directions outlined in this section should be considered in the light of existing practices in the County of Brant and adapted as the program evolves.

The suggested list of specific maintenance tasks outlined in Section 11.2 is suggested to be carried out on a routine basis to prevent the trails from declining into disrepair. This section also discusses the necessity to coordinate maintenance within a regular operations program.

11.1 Maintenance Program Development: The maintenance program outlined in this section is taken from the Guelph Trail Master Plan – Final Report Fall 2005 prepared by the Stantec Consulting and MMM group and adapted for application in the County of Brant.

The Maintenance Program: The objectives of the Trail Maintenance Program are to:

- Provide safe, dependable and affordable service levels.
- Preserve infrastructure assets.
- Protect the natural environment.
- Enhance the appearance and health of the community.
- Provide a reference framework against which to measure performance.
- Provide the basis of a peer review that is comparable with other jurisdictions.
- Provide citizens and Council with a reference of expectations.

Approach

Maintenance tasks are written from the perspective of the end user. The perspective of the end user helps to define the expected outcome of the service action, how often it will be performed and what an acceptable response time is following notification of a problem (i.e. vandalism of trail sign) or event (i.e. significant rain event). Task descriptions are not intended to be prescriptive and will evolve with time. They are not meant to tell maintenance crews how to perform the task(s); rather the focus is on the outcome or result that is to be achieved when the task is complete.

Format

Outcome: defines the main outcome - what is to be achieved (from the users' perspective).

Description: describes the intent and scope of the standard, and defines the outcome of the standard.

Service Level: defines the frequency or response time to achieve the desired standard.

Trail Maintenance Classification (Priority):

Maintenance priorities are based on the relative importance of the facility within the scope of the entire network. Relative level of importance considers factors such as level of use by trail users (both utilitarian and recreational), access and mobility requirements, and availability/proximity of alternate facilities that receive an equal or higher priority ranking.

Priority rankings are divided into Classes A, B and C depending on factors noted above, where A is given the highest priority and C is the lowest. Where site-specific conditions are known to cause maintenance concerns (i.e. more frequent maintenance required due to trouble spots), a Class B or C priority can be "bumped up" to a B or A.

The table below provides a summary of maintenance class priority ranking according to off-road route type and hierarchy within the network.

	Off-Road Trail and On-Road Route Type (by Hierarchical Category)		
Maintenance Priority Class	*Primary*	*Secondary*	*Tertiary*
Class A Highest priority for maintenance, most regular maintenance and shortest response time.	Off-road trails and on-road routes in special tourist or business areas. Off-road and on-road routes and trails that serve as major or community wide links to major destinations or direct access to key transit services (major recreation facilities, community centres, employment areas). Specific segments or locations (on or off-road) as determined, on site-specific cases where specific conditions or circumstances have historically resulted in the need for more frequent maintenance.	Off-road trails and on-road routes in special tourist or business areas. Off-road and on-road routes and trails that serve as major or community wide links to major destinations or direct access to key transit services (major recreation facilities, employment areas, community centres). Specific segments or locations (on or off-road) as determined on site-specific cases where specific conditions or circumstances have historically resulted in the need for more frequent maintenance.	Not given Class A designation.
Class B Moderate priority for maintenance, Moderate period of time between regularly scheduled maintenance operations.	Off-road trails that serve as neighborhood wide links to local destinations such as schools. Other paved trails not included as part of Class A.	Off-road trails that serve as neighborhood wide links to local destinations such as schools. Other paved trails not included as part of Class A.	Off-road trails that serve as community wide links to major destinations. Specific segments or locations as determined on a Site-specific case basis where specific conditions or circumstances have historically resulted in the need for more frequent maintenance.
Class C Lowest priority for maintenance, longest period Of time between regularly scheduled maintenance operations.	Other off-road trails. Other granular surfaced trails not included as part of Class A or B.	Other off-road trails. Other granular surfaced trails not included as part of Class A or B.	Includes most tertiary trails.

Table 12: Organization of Maintenance Priorities.
The maintenance program is organized in a hierarchical manner. Class A priority is the highest, Class C is the lowest with respect to maintenance factors such as frequency of regularly scheduled maintenance, response time to non- emergency maintenance requests / situations, and tolerance of maintenance outcome or performance standard. *(Source: Guelph Trail Master Plan, 2005)*

Trail Maintenance Tasks

Based on the system outlined in Table 12, a number of specific maintenance tasks are further described according to Outcome, Description, Standard, and Service Level.

A. Routine Trail Patrols

Outcome: To have safe and passable trails by monitoring and reporting on conditions that could pose a hazard to trail users.

Description: Routine trail patrols include the visual monitoring and reporting of conditions.

Standard: Travel all trails in one direction to visually observe and report hazards. Patrols are to be carried out during daylight hours.

Service Level: As a minimum, all trails are to be inspected at least once per year, though more frequent inspections are recommended as follows:

Primary with A maintenance level: once per week. (April 1 – Oct. 31) Primary with B maintenance level: once per month. Primary with C maintenance level: once year.

Secondary with A maintenance level: once per month. Secondary with B maintenance level: once per season. Secondary with C maintenance level: once per year.

Tertiary with B maintenance level: once per year. Tertiary with C maintenance level: once per year.

B. Snow Removal, Snow and Ice Control

Very few municipalities maintain their trails during winter months. Those that do so tend to clear only certain trails that are primary commuter routes. Multi-use trails in the County are intended to be used for year-round recreational uses; therefore regular trail maintenance shall not be performed in the winter months (Nov. 1 – March 31).

Outcome: To create safe, passable trails by reducing the hazard(s) caused by winter storms to allow for recreational activities such as cross-country skiing and snow shoeing.

Description: The standard applies to County-owned trails that are a part of the network.

Standard: Perform monthly inspections and remove hazards such as trees from the travel path.

Service Level: To be undertaken as soon as practicable after becoming aware of the issue.

Primary with A maintenance level: within a week.

Primary with B maintenance level: not maintained in winter. Primary with C maintenance level: not maintained in winter. Secondary with A maintenance level: within a week.

Secondary with B maintenance level: not maintained in winter.

Secondary with C maintenance level: not maintained in winter.

Tertiary with B maintenance level: not maintained in winter.

Tertiary with C maintenance level: not maintained in winter.

C. Hard Surfaces (including cycling facilities on-road)

Outcome: The outcome of maintaining hard surfaces is to provide safe hard surfaced trails and on-road cycling facilities by removing surface hazards and extending the service life of the component.

Description: The standard applied to distortions on paved surfaces such as paved trails and road surfaces (cycling lanes and signed routes that could create a risk to off-road trail and on-road connecting link users). Some operations cannot be carried out between November 1st and April 30th due to temperature limitations. Where these cases occur, temporary measures will be required if it is determined that the conditions create a safety hazard for the users.

Some maintenance aspects are unique to on-road cycling facilities that are included as part of the trail network. These include:

- Street Sweeping and Debris Removal: Sand left over from winter road maintenance and leaves allowed to accumulate in bike lanes can be hazardous to cyclists. Sweeping crews should be instructed to pay particular attention to the right edge of the road along designated bikeways. Another useful strategy is to organize the spring sweep so that roads with bike lanes and routes are swept first, recognizing the potential hazard to cyclists of not doing so.
- Snow Plowing: On-road routes should be cleared as part of the regular removal and de-icing of roadways. A priority-shift to include roads with bike lanes and routes that serve major origins / designations (e.g. Colleges) should be considered.
- Pothole and Surface Irregularities: Catch basin covers, service covers and roadway edges are the first places that cracking, heaving and breakup of asphalt

occur. A 2 cm vertical ridge and a 1 cm groove paralleling the direction of travel can be hazardous to cyclists. The condition of road surfaces particularly near the curb and at corners / intersections is one of the most common complaints about on-road cycling facilities. Patching and pavement overlay procedures may have to be increased to meet these tolerances within the traveled portion of the bikeway.

- Signing and Pavement Marking: Maintain on-road route and regulatory signs in the same manner that other roadway signs are maintained. Renew lane markings and symbols at the same time that other roadway lane markings are renewed.

Standards: The following criteria are used as maximums for allowable distortions in the surface:

- Bumps or depressions causing the ponding of water on at least one third of the width of the trail surface, or cycling surface where on-road links form the network connection.
- Drop-offs at the edges of pavement greater than 5cm in height over a horizontal distance of 20 m. Vertical discontinuities greater than 2.5 cm.
- Cracks (especially parallel cracks) greater than 5 cm wide by 2.5 cm deep by 2.5 cm long.
- Potholes greater than 10 cm in diameter and 2.5 cm in depth.

Service Level: Distortions that pose an immediate hazard to the users are to be clearly marked as soon as practicable, but not greater than 4 hours from the time of becoming aware of the situation or condition.

Surface conditions are to be repaired within the following time periods of time identified and marked:

Primary with A maintenance level: 30 days. Primary with B maintenance level: 30 days. Primary with C maintenance level: 60 days. Secondary with A maintenance level: 30 days. Secondary with B maintenance level: 60 days.

Secondary with C maintenance level: 60 days (hard surfacing applies only in special circumstances/conditions).

Tertiary with B maintenance level: 60 days.

Tertiary with C maintenance level: 120 days (hard surfacing applies only in special circumstances/conditions).

D. Granular Trails (Primary, Secondary and Tertiary)

Outcome: The main outcome of maintaining granular surfaced trails is safe and passable trails for all users by removing surface hazards and extending the facility's lifespan.

Description: The standard applies to distortions on granular surfaced trails. Some operations cannot be carried out between November 1st and April 30th due to temperature limitations. Where these cases occur, temporary measures will be required if it is determined that the conditions create a safety hazard for the users.

Distortions include: bumps, ruts, protruding large rocks and boulders, or potholes that result in water ponding, and other vertical discontinuities.

Standards: The following criteria are used as maximums for allowable distortions in the surface:

- Bumps, depressions or ruts causing the ponding of water on at least one third of the width of the trail surface.
- Drop offs or ruts at the edges of the trail bed greater than 5 cm in height over a horizontal distance of 20 m. Vertical discontinuities including protruding boulders greater than 5 cm.
- Potholes greater than 10 cm in diameter and greater than 5 cm in depth.

Service Level: Distortions that pose an immediate hazard to the users are to be clearly marked as soon as practicable, but not greater than 4 hours from the time of becoming aware of the situation or condition.

Surface conditions identified as hazards should be repaired within the following time period of being identified and marked:

Primary with A maintenance level: 30 days. Primary with B maintenance level: 30 days.

Primary with C maintenance level: 60 days. Secondary with A maintenance level: 30 days. Secondary with B maintenance level: 30 days. Secondary with C maintenance level: 60 days. Tertiary with B maintenance level: 60 days.

Tertiary with C maintenance level: 120 days.

Scheduled Grading for Granular Trails:

Granular trails will receive surface grading on a scheduled basis according to the Facility and Maintenance Class. Grading will include "topping up" of the surface materials where appropriate.

Minimum Frequency for Trail Grading:

Primary with A maintenance level: once per calendar year.

Primary with B maintenance level: once per calendar year.

Primary with C maintenance level: once per calendar year. Secondary with A maintenance level: once per calendar year. Secondary with B maintenance level: once per calendar year. Secondary with C maintenance level: once per calendar year.

Tertiary with A, B or C maintenance level- no regular grading, spot improvements only to remove distortions (based on observations by trail patrols).

E. Trail Drainage Systems

Outcome: The main outcome of maintenance to trail drainage systems is to permit their ongoing function as intended in order to reduce the potential for flooding and associated conditions that could present a safety hazard or that could degrade the quality of the infrastructure.

Description: This standard applies to all drainage structures associated with trails, including but not limited to culverts, drainage ditches, swales, dry wells and French drains.

For on-road routes, standards and service levels will correspond to those identified for the road(s) upon which they are located.

Standards: Priority A: Obstructed drainage systems causing flooding that poses a hazard to the users or deterioration that poses an immediate safety hazard to the users.

Priority B: Partially obstructed drainage systems causing intermittent water backups that do not pose an immediate safety hazard but that if left unchecked over time will adversely affect the integrity of the trail and any other trail infrastructure or the surrounding environment (natural or urban settings, public or adjacent private properties).

Service Level:

Priority A: Clearly marked as soon as practicable, but not greater than 4 hours from the time of becoming aware of the situation or condition. Repair within 24 hours. Where repair is not immediately possible the damaged section of trail must be closed and signed immediately.

Priority B: Repair within 30 days.

F. Trail Furnishings and Amenities

Outcome: The main outcome of maintaining trailside furnishings and amenities is an enhanced quality of life by making these assets accessible to the public in a manner that is safe and that will maximize the lifespan of the asset.

Description: The standard applies to all furnishings and related amenities.

Standards:

Priority A: Damage/condition that presents an immediate hazard (public liability). Priority B: Damage/condition that impairs the intended function of the asset.

Priority C: Damage/condition that will shorten the lifespan of the asset if left unchecked, and/or damage/condition that is unsightly (excessive dirt, graffiti).

Service Level:

- Priority A: Repair or removal as soon as practicable, not longer than 24 hours after becoming aware of the condition.
- Priority B: Within 30 days for repair, but remove damaged portion within 48 hours of becoming aware of the situation to prevent/discourage further damage or prevent the damage from becoming a hazard.
- Priority C and D. Schedule into planned maintenance and attend to as soon as is practicable. In the case of graffiti containing hate messages, this should be attended to within 24 hours.

G. Grass Cutting

Outcome: The outcome of grass cutting is to maintain aesthetic conditions along the edge of the trail bed and to maintain a clear zone along the edges of the trail that is free from obstacles and potential hazards.

Description: Grass cutting maintains turf at a uniform height which is beneficial to the grass plant, encourages a more dense turf, reduces thatch build-up and discourages

the establishment of some weed species. Regular mowing also helps to slow down the process of vegetation invading the trail bed from the edges.

Not all trails will have mown edges. In woodland and wetland areas, pruning and brushing is typically the only vegetation maintenance to be undertaken.

Standards: The height of cut will range between 75 and 125mm depending on location, point of time during the growing season and the mowing standard being applied in the immediate surroundings (where applicable).

Service Level: To correspond to service level in adjacent area (where applicable). Where there is no mowing in the adjacent area (i.e. naturalized area), two cuts per active growing season should be applied, the first in late spring or early summer and the second in mid to late fall.

H. Pruning and Brushing

Outcome: The outcome of pruning is a safer trail environment for users through the removal of plant materials that obstruct trailside signs and block sightlines along the trail.

Description: Pruning involves the cutting of branches along trail edges that encroach into the clear zone and or operating area of the trail. All pruning is to be performed using trained personnel and correct horticultural technique.

Standards: Branches and brush are to be cut to eliminate sightline obstructions or encroachments that could impact on trial users.

Priority A: Assigned to trail intersections, trail crossings of roadways, sharp curves and all areas where branches pose an immediate hazard by encroaching significantly into the operating area of the trail.

Priority B: Assigned to straight sections of the trail and areas where branches may be encroaching into the clear zone of the trail, or slightly into the operating area of the trail. Priority B is considered to be more of a preventative maintenance operation.

Cuttings may be chipped on site and placed appropriately or used as mulch for new plantings. If not chipped on site, they should be removed except in the case of trails through woodlots or in environmental buffer areas. In woodlots, buffers and other naturalized settings, cuttings can be placed in a naturalistic manner away from the trail bed. Cuttings can also be used to discourage traffic on unauthorized side trails that are to be closed. Where invasive species are being pruned and/or removed, cuttings must be disposed of in an approved manner.

Service Level:

Priority A: Within 48 hours of becoming aware of the condition. Where this is not possible, signing should be erected in both directions along the trail at least 30m in advance of the obstruction followed by pruning and removal as soon as practicable after the signs have been erected.

Priority B: Within 96 hours of becoming aware the problem, or scheduled into the annual maintenance program, whichever comes first.

Summary

Operations in consultation with Risk Management should:

- Consider the program outlined above as a starting point for developing a trail maintenance program that is effective and within the County's means.
- Develop maintenance priorities for designated routes as part of the trail maintenance program.
- Continue to share trail maintenance experiences among area municipalities with the goal to develop consistent maintenance standards.
- Consider development of a data management system that would track maintenance schedules, monitor problem areas, and assist with decision- making regarding trail maintenance.
- Regularly evaluate the results of applying the trail maintenance program with the goal to improve it over time. Part of this evaluation should involve feedback from the trail users in a structured format.

11.2 Maintenance Tasks

The following describes a suggested list of main trail maintenance considerations for tails within the County of Brant. All of these tasks shall be done during spring, summer and fall, as the trails are not maintained in the winter. Those tasks to be completed, in a specific season are identified as such.

11.2.1 Surface Treatment

- Rake and re-grade gravel surface soil, or chipped mulch on trails in spring, summer and fall as needed. Compact all fill areas. The trail surface should be maintained as relatively flat and uniform except the more remote nature trails.
- Resurface with gravel or mulch as needed, filling low / bare areas.

- Asphalt trails should be swept with a tractor-mounted broom, a minimum of two times per year or as needed. The first sweeping should be in spring to remove the winter accumulation of debris.
- Mark broken and damaged asphalt with spray paint and arrange to repair/replace the asphalt and granular base. Do not fill cracks with tar as it tracks on pedestrian shoes, unless trail is also used as a service vehicle route.
- Any plant material pushing through asphalt trails should be treated with soil sterility, ideally in spring or summer. The push-up can then be heated with torch and flattened out with a maul.
- Trails with wooden decking should be carefully monitored for any damage to the support beams and decking material. Any broken or rotting wood should be replaced promptly.

11.2.2 Erosion

- Continually monitor all trails for erosion damage. Fill eroded channels with appropriate material and compact. Any serious damage should be given immediate attention while diverting trail traffic or closing trail for safety reasons.
- Reshape or redirect runoff channels to avoid damage due to run-off.
- Clear all culverts under trails to avoid clogging and / or flooding.
- Check water bars to ensure they are intact and functioning properly on trial slopes. If they are damaged or removed they should be replaced.

11.2.3 Litter Removal

- Check garbage and recycling receptacles regularly according to intensity of use; empty when close to full and replace plastic garbage bags.
- Garbage and recycling containers should be cleaned and sanitized annually in fall or spring.
- Ensure that garbage left along length of trails by users or blown onto trails from adjacent roadways is checked and picked up on a regular basis. If excess litter becomes a problem, ensure that receptacles are placed in a strategic manner.

11.2.4 Mowing and Chipping

- Mow grass on both sides of trail right-of-way with an acceptable regularity and degree of maintenance consistent with the maintenance objectives.
- Nature trails require sensitive vegetation control on a semi-regular basis. This will ensure the trail is not crowded / blocked while maintaining a natural character.
- Encourage healthy grass growth with aeration and natural fertilizer in accordance to establish maintenance objectives.

11.2.5 Pruning

- Major limbs or trees which are in poor condition and adjacent to the trail should be removed with the use of a hand saw or chain saw. Branches, limbs and other debris should be removed entirely or in the case of natural trails, they should be piled out of sight from the trail to encourage wildlife use. This is to be done in winter and summer.
- Branches leaning into the trail right-of-way should be pruned back using pruners or loppers. Prune off at ground level any woody sapling growth in the right-of-way. Use standard nursery practices, especially ensuring to cut branches flush at the main stem or trunk.

11.2.6 New Plant Material

- Newly planted areas should be fertilized on a regular basis, using a natural component whenever possible (i.e. manure, humus, etc.).
- Remove any dead plants as soon as possible and replant in spring or fall.

11.2.7 Windfalls

- Continuously monitor trails for fallen trees, limbs, and debris throughout all seasons and coordinate their removal as soon as possible.
- If material cannot be cleared immediately, eliminate dangerous hanging branches and trunks or ‘leaners’; cut a path through fallen tree debris to allow users access.
- Redirect pedestrian traffic during removal / clearance process or close trail to ensure user safety.
- In manicured areas, remove all debris entirely; in natural areas, debris and trunk may be left to encourage wildlife but should be deposited out of sight from the trail.
- Ensure trail is returned to its intended condition; this may involve repairs to the trail surface.

11.2.8 Structures

- Inspect all structures for safety and stability, including washroom facilities, railings, stairways, benches and bridges. A major inspection should be carried out on a semi-annual basis and a monthly check is also useful in preventing major damage or accident.
- Replace any broken or damaged parts immediately to prevent accident or further damage. Close bridge or stairway, redirecting traffic until repairs are complete.

- Maintain a refinishing schedule (carry out during spring and summer) for trail amenities to keep structures in good condition. Paint or stain over graffiti damage and repair any vandalized structures as soon as possible. This will help to prevent the instigation of recurrent vandalism.
- Inspect stream bed upstream of bridges to ensure that there are no logs or branches which have the potential of flowing downstream, jamming under bridges and causing potential flooding.

11.2.9 Signage

- Monitor trails to ensure that signs have not been removed or repositioned. Replace any missing signs as soon as possible even if a temporary sign is required.
- Replace any damaged signs as soon as possible to maintain high trail quality and direction.
- Evaluate signage on a regular, yearly basis to maintain finish and message quality. Re-paint or stain as necessary.
- Straighten and secure sign posts during spring and summer months.
- Install any necessary seasonal signs with appropriate sign posts and remove them promptly when their message is no longer necessary.

11.3 Operations

In order to plan, schedule and evaluate maintenance activities, an operations system is necessary. The following guidelines summarize the development of this system.

1. *Establish Maintenance Objectives*

   These objectives will vary from trail to trail depending on user traffic or special trail features such as an ecologically sensitive area. The major objectives include ensuring user safety and maintaining the trail and its amenities at a level consistent with the design and planning standards.

2. *Evaluate Trail Needs*

   This process includes making lists of maintenance tasks and seasonal requirements needed to satisfy the maintenance objectives.

3. *Develop a Maintenance Program*

   Amalgamate the maintenance tasks and seasonal requirements into a preliminary schedule; this will be used to determine the number of personnel required to complete the tasks. With this information, an initial inventory of equipment, including motor vehicles can be determined. With this program, the maintenance budget

becomes a factor in all decisions, whether established by the Trail Technical Committee or by the maintenance division itself.

4. Establish a Trail Monitoring System

In order to facilitate prompt repairs along the trail system, or to determine if the trail needs additional seasonal maintenance, regular trail inspections are important. Thorough inspections of the trails, reporting all deficiencies and their locations should be reported in a log format.

5. Schedule and Record Maintenance

Regular maintenance should be scheduled on a yearly or seasonal basis. This will form the basic structure of the maintenance program for which labour and equipment can be allocated. However, special maintenance (windfalls or vandalism, other unplanned occurrences) must also be given attention during scheduling. These schedules will become the basis for work orders; these work reports should be filed pertaining to each individual trail detailing trail conditions and activity summaries.

6. Maintenance Evaluation

The trail activity logs and work reports should be reviewed regularly, at least on a yearly basis to determine excessive trail use, vandalism, damage or environmental degradation. This information shall be communicated to the trail planning and routing authorities in order to reassess trail routes. This evaluation may eventually result in the closure, up-scaling, down-scaling or re-routing of trails.

12.0 IMPLEMENTATION STRATEGY AND SUMMARY OF RECOMMENDATIONS

12.1 Introduction

The Brant County Trail Master Plan should be adopted by Council as a long term guide to the development of a County-wide trail system. The Plan is intended to be flexible such that it can adapt to change, budgets and unforeseen opportunities and constraints. The implementation strategy is organized according to high (short-term), medium (mid-term) and low priority (long-term) objectives.

As a guide for future development, the Brant County Trail Master Plan must recognize that changes in priorities will occur. To implement this plan, it will be important to understand that specific locations and routings as well as timing and details will evolve through community consultation and detailed technical studies as required. While it is understood that these adjustments can be made, they must also occur within the overall intent and structure of this master plan. To ensure that this does happen, it is important to re-affirm key assumptions:

- Routes under consideration are still valid and should proceed to implementation.
- Trail projects, particularly on-road cycling routes are part of the Environmental Assessment process for municipal infrastructure projects.
- Trail projects are supported and commented upon by the various County departments.
- Existing trail projects are being evaluated to recognize potential improvements to routing, design and maintenance.
- The Trail Master Plan is updated on a regular five year basis.

The Implementation Strategy has four main components:

- Network Priorities - rationale, considerations and listing of short, mid and long term projects.
- Construction Costs - probable capital construction costs in 2013 dollars for priority projects.
- Funding - potential sources of funding.
- Implementation Process - a five-step process.

12.2 Network Priorities

12.2.1 Rationale

The identification of priorities for development of the various routes in the proposed trail network is based on a range of considerations:

- Take advantage of opportunities for combining or "piggy-backing" the trail project with planned and funded road and linear utility construction and upgrade projects.
- Recognize comments and aspirations of the Parks and Recreation Advisory Committees, Council and public regarding priorities.
- Development trails where user demand is greatest.
- New residential developments are to integrate trails as part of their required site infrastructure.
- Complete gaps in the existing network.
- Provide linkages between major and minor communities within the County.
- Provide linkages with regional and national trails at the County boundaries where possible.
- Provide an equitable distribution of trail routes creating loops and linkages that improve access to recreation centres, schools, downtowns and open space systems where possible.

Development of the trail network in combination with other regularly funded projects, such as road and infrastructure improvements where possible, is crucial. These projects are reviewed and updated on an annual basis and ensuring that the trail components are added at the earliest opportunity is critical. The most cost-effective way to implement on-road trail infrastructure which requires physical road modifications such as widening and pavement markings is to implement these changes at the time the road is being resurfaced or reconstructed. Where phasing of a road re-construction along its length is planned over several years, the trail development too will require phasing and may result in the trail not having the most desirable quality along its length initially. In the interim, route signage may be required if traffic volumes, speed and truck traffic permit. However, over time and as the reconstruction projects move forward, the ultimate plan will be achieved with its recommended facility type (cycle lane and widened pavement).

12.2.2 Trail Priorities – Short Term Priorities 1-4 Years

Community Identifier	**Trail Route**	**Length**	**Estimated Cost Implication**
Brant, Oakland, Onondaga	Designate a section of the LE & N trail for equestrian use and install signage and amenities	4 Km	$ 5000
10	Develop an on-road bike route from the Hamilton to Brantford Trail to Onondaga/Six Nations/Haldimand County	10 Km	$75,000
Brant West	Construct and internal paved walking loop at the Burford Community Centre	800 m	$ 96,000
Paris	Construct remaining 350 m of Nith Trail in Lions Park	350 m	$35,000
15	Construct a 3m multi-use trail on Rest Acres Rd.	15 Km	$315,000
	Develop a bike lane on King Edward St. from Rest Acres Rd. to Misener Rd.	1 Km	$132,000
South Dumfries	Formalize and construct trail loops within Jacob's Wood Park	1 km	$50,000
All Areas	Formalize 6 existing cycling routes and sign to Book 18 guidelines	183 Km	$183,000
Sub-total			**$891,000**

Medium Term Priorities 5-8 Years

Community Identifier	Trail Route	Length	Estimated Cost Implication
Brant, Oakland, Onondaga	Design and Install interpretive and wayfinding signage on the Brantford to Hamilton Trail in the County section	7.8 km	$8,000
	Develop Bike Skills/ BMX biking Facility		$150,000
Brant West	Develop a trail from Lions Park to Bishopsgate Rd./Brant Rod and Gun Club (450 m owned by Brant Rod and Gun Club)	1.7 Km	$204,000
Paris 16	Create a bike lane on Paris Rd. from Dundas St. to Powerline Rd.	6 Km	$330,000
	Create access from Lions Park to the Nith Peninsula subdivision and provide connectivity to Dundas St. /Rest Acres Rd.	500 m	TBD by Developer
	Develop 3.0 - 5.0 m trails in the Watts Pond area in coordination with subdivision developments	2.5 km	TBD by Developer
1a	Acquire land to complete the Penman's trail behind Elm St. and link to Penman's Dam	90m	TBD
	Nith Path Downtown Paris		TBD
South Dumfries	Develop a north-south multi-use trail linking neighbourhoods from west of Jacob's Wood to German School Rd. in concert with subdivision development	3 Km	TBD by Developer
Sub Total			**$692,000**

Long Term Priorities 9+ Years

Community Identifier	Trail Route	Length	Estimated Cost Implication
Brant, Oakland, Onondaga	Re-paving of the TH & B trail	12 Km	$600,000
9	Develop on-road connection from Mt. Pleasant to Newport and Grand Valley Trail	7.8 Km	$58,500
	Investigate development of the LE and N Trail from Oakland Rd. to Jenkins Rd.	1.4 Km	$5,000
Brant West	Construct a multi-use trail and/or bike lane on Hwy 53 from Bishopsgate Rd. to Minshall St.	1.2 Km	$300,000
	Investigate on and off-road connections from Scotland to the TH & B trail	1.2 Km	$5,000
Paris	Develop 3.0 m trail along Dundas St. From Green Lane to Curtis Ave.	650 m	$162,500
	Develop 3.0 m trail on Green Lane from Dundas St. to East River Rd.	1.6 Km	$160,000

Paris	Develop the former railway lands behind Capron St. from Grand River. St. to Market St.	750 m	$97,500
	Connect Cleaver Rd. to Powerline Rd. through a combination of on-road bike lane sand off-road multi-use trails. Connections to be developed through Grandville subdivision and look back to Rest Acres Rd. and the Brant Sports Complex	1.5 km	TBD by Developer and County
	Maintain and enhance nature trails in the Nith Peninsula (Barker's Bush)	2.5 km	$40,000
	Investigate use of an un-opened road allowance that could be developed into a multi-use trail that runs north of Watt's Pond Rd. to Drumbo Road and provide a connection to Pinehurst Conservation Area	4.8 km	$5,000
	Develop trails on the west side of the Grand River on the Golf North (Paris Links Golf Course) property	1.5 km	TBD by Developer

South Dumfries 8 & 8a	Construct a paved on-road bicycle lane along Park Rd. N. between Powerline Rd. and Governor's Rd., east to St. George Rd. Sign Bike Route from the urban boundary to the County border at Lockie Rd.	13.2 km	$1,854,000
13	Construct either a multi-use trail 3.0 m wide in the boulevard or a 1.5 m paved shoulder bicycle lane on Hwy #5/Beverly St. to Hwy #24. Continue the bicycle lane on Blue Lake Rd. to East River Rd.	2.4 Km	$360,000
	Sign and mark a bicycle lane on Blue Lake Rd from Hwy 24 to East River Rd.	2.4 Km	$18,000
Sub Total			**$3,660,500**
KNOWN COSTS TOTAL			**$5,243,500**

12.3 Construction Costs

The identification of construction costs for the Brant County Trail Master Plan is based on estimated unit costs for various trail network components. These unit costs are based on recent construction projects from similar Ontario municipalities in Ontario and expressed in 2013 dollars. The lengths of the various trails proposed in the master plan together with the estimated unit costs provide the basis for the calculation of the probable cost to construct the trail network. The unit costs are based on the following assumptions:

- Unit costs assume typical / average site conditions for construction relative to soils, grade and drainage, among other considerations.
- Cost estimates for on-road bikeways assume one lane on both sides of the road.

- Estimates do not include cost of property acquisition, utility relocations, driveway, entrance restorations, permits or approvals.
- Estimates do not include costs of major site-specific projects such as bridges, railway crossing, retaining walls, staircases, etc.
- Inflation factors are not included.
- Soft costs, feasibility studies, design development, detailed design and contract drawings and contract administration is not included.
- Taxes are not included.

As each trail project is considered for construction, a detailed assessment as part of the design process will be required to determine site specific conditions, design details and detailed cost estimates.

Unit Price Schedule

Source-Oxford County Trails Master Plan (2013)

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
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
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 2013 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

Table 13- Unit Price Schedule

12.4 Potential Sources of Funding

The basic method of project funding for trail development for Municipalities is through tax revenue. However, there are a wide range of other possible cost-sharing opportunities that should be considered to augment these funds. These opportunities include trails in both new developments as well as in the established urban and rural community areas.

New developments provide important opportunities for development of the trail network. Specifically, these include:

- On-road facilities in new subdivisions should be funded and built by the developer as part of the subdivision agreements.
- Off-road facilities in new subdivisions should be encouraged through the planning process to make connections to the existing and proposed community network.
- On-road facilities on existing arterial and collector roads in growth areas that are to be widened to accommodate growth may be funded through Development Charges.

Brant County should also pursue other outside funding sources to support and fund the proposed trail network including:

- Partnership funding with other Brant County organizations (as done with the TH& B Rail Trail.
- Corporate donations for capital and on-going operations (such as the SC Johnson Trail).
- Local Service Clubs such as Lions, Rotary and Optimists.
- Projects built by other agencies such as the Grand River Conservation Authority
- Volunteer groups.
- Private Citizen Donations and bequeaths.
- Targeted fund raising and / or sponsorship programs.
- Federal and Provincial gas tax and grant programs.
- Ontario Commuter Cycling Program grants.
- Partnership funding with other agencies such as the Brant County health Unit for initiatives related to health promotion and active lifestyles.
- Canada-Ontario Infrastructure Program.
- Ontario Trillium Foundation.
- Human Resources Development Canada - supports personnel positions to various groups.
- Corporate Environmental Funds - e.g. - Shell Oil and Mountain Equipment Co-op.

- Trans Canada Trail Foundation.
- Other future funds and programs that may be forthcoming.

12.5 Implementation Process

The Brant County Trail Master Plan is a guide to future development of the trail network in the County and as such it should be re-evaluated and updated as it is implemented. As the timing and details related to specific routes and facility types are considered through community consultation and technical evaluation. The plan can be reviewed and updated on an on-going basis. During this process, however, it is also important not to lose sight of the overall direction and trail network concept.

To assist the County of Brant and it various departments in the implementation of the Trail Master Plan, a five step process is recommended to confirm the feasibility of each route at the time of implementation.

Step 1 - Preliminary Review

- Identify trail project and communicate opportunities with other departments.
- Evaluate fit of trail project relative to capital roads forecast - short and long term priorities (if project requires on-road facility).
- Assess nature of project to identify if project may permit recommended trail facility in a cost effective manner.
- Assess whether project requires a feasibility assessment for implementing trail as part of the road program.

Step 2 - Feasibility Assessment

- If confirmed in Step 1, conduct a brief feasibility review.
- Confirm feasibility of route relative to Master Plan and route selection criteria.
- For on-road segments, collect and confirm roadway information - traffic volumes, collision data and truck traffic, etc.
- Conduct field review of route segments to identify related issues – eg. sight lines, etc.
- Determine if public consultation is required / desirable.
- Undertake functional design and estimate construction.
- Prepare cost / benefit evaluation- timing, costs, efficiencies, alternatives, course of action, etc.

Step 3 - Detailed Design, Tender and Implementation

- Complete detailed design.
- For on-road segments, design is done as part of the road re-construction work.

- Evaluate pre-tender cost estimates relative to cost effectiveness and whether to proceed with construction.
- Tendering and contract administration - part of road works (if on-road) or separate (if off-road).

Step 4 - Monitoring Phase

- Monitor design and usage to ensure they are functioning in the intended manner.
- Review need for upgrades / modifications as required.

Step 5 - Planning Update

- Update the Brant County Trail Master Plan, and Official Plan to reflect changes in policy and network routes.

Ongoing network management is an important activity in the trail development process. It is recommended that the proposed trail network be documented and updated using the County's Geographic Information System (GIS). As new trail segments are added, they should be added/updated as part of the implementation process. Updating the facilities component of the network regularly will help reduce the cost of to update the entire Master Plan when required. In addition, the network could be added to the County website in an interactive map format for the public and development industry.

12.6 Summary of Recommendations

1) Provide a network of trails for alternative modes of transportation, for residents, visitors and tourists to the County.
2) Liaise with the Tourism Advisory Committee regarding trail development and trail events.
3) Continue to foster relations with neighbouring communities and service delivery agencies regarding development of new trails, maintenance of trails and special trail projects.
4) Collaborate with Economic and Tourism Development to promote trails E.g. Trails Maps, Social Media, Website, etc.
5) Continue to plan for trails development in growth areas. Ensure that new development areas are provided with sidewalks and/or trails for walking /cycling only. Develop cycling lanes on selected collector I rural roads as road improvements are undertaken.
6) Work with trail providers to develop / support a network of trails in the County that offer a range of trail uses appropriate to the location (hiking / walking, cycling, mountain-biking, ATV, snowmobiling, equestrian) in Conservation Areas, crown lands, private lands, etc.

7) Designate the use of the former L.E. & N. rail-line from Conklin Rd. to the Mt. Pleasant Nature Park for equestrian use.
8) Install wayfinding signage for all trail systems modeled after the TH & B. sign program.
9) Install tourism and interpretive signs where appropriate.
10) Integrate cycling routes into existing trails maps. Establish 2 - 3 routes of various lengths that can be showcased in each ward, where possible. These loops will include in-pavement cycling facilities and will require the incorporation of improvements and safety measures as road works are undertaken.
11) Ensure risk management measures are implemented such as building and maintaining trails to defined standards, undertaking regular inspections, undertaking trail repairs promptly when identified, providing training for trail workers.
12) Investigate all opportunities for cost-sharing and funding sources for trails development, as opportunities arise including; partnerships I collaborative ventures, planning applications I parkland dedication, sponsorship programs such as Adopt-a-trail, eligible grant programs.
13) Include a review of the Trails Master Plan as an annual agenda item at Parks and Recreation Advisory Committee Meetings.
14) Require developers of new residential subdivisions to provide lands appropriate for the integration of a system of neighbourhood trails into subdivision development and to provide connections between neighbourhood trails and the regional trail systems.
15) Develop marketing and promotion materials to encourage and support trail utilization.
16) Develop and market trail experiences routes with a goal to increase tourism and overnight stays.
17) It shall be the policy of the County to maintain a system of multi-use trails for non-motorized traffic throughout the County. Council shall regard the trail system as a component of the County's transportation infrastructure and shall encourage and promote the use of the trails by residents as a healthy, active transportation choice.
18) Connections to the trail system with other recreation facilities, the downtown and other commercial areas, educational institutions and residential neighbourhoods should be included whenever possible in new developments and areas of revitalization.
19) Install bicycle racks and bike lockers for short-term use at major destinations and start installing drainage grate covers that are bicycle friendly, placing priority on the recommended cycling routes.

13.1 - APPENDIX 1: GLOSSARY OF TERMS

The definitions in this section are intended to define terms as they are used in this Trail Master Plan.

ANSI: Areas of Natural and Scientific Interest; represents lands and waters containing important natural landscape or features that is important for natural heritage, protection, appreciation, scientific study or education.

Corduroy: A structural unit composed of a series of logs or other material placed perpendicular on the trail to provide a method of crossing wet areas.

ESA: Environmentally Sensitive Area; Areas identified to be of local interest and is designated and managed by a municipality. It may represent the habitat of vulnerable, threatened or endangered species.

Gradient: The steepness of a trail, measured by rise-over-run.

Outslope: The downhill slope of a well-constructed trail that allows water to drain.

Sight Distance: The distance a person can see along an unobstructed line of sight.

"Scramble" area: A designated area where off highway vehicle (OHVs) operators are not restricted to the use of trails or pathways. The operator is able to travel wherever they like unless the area is posted as “Closed.Swale”: A low lying or depressed and often wet stretch of land. It does not direct water, but rather holds it and allows it to gradually infiltrate the soil.

Switchback: A technique for moving a trail up steep sides lopes. The transition is made by way of a flat landing or pad.

Trail Kiosk: A large signage board with trail map, information and self-guiding trail brochures for certain trails.

Trailhead: This is a developed recreation node at which a pathway, usually intended for walking, hiking, cycling or equestrian traffic, begins. These usually include vehicular or bicycle parking, trash I recycling receptacles and signage.

Tread: The actual portion of a trail upon which users travel, or the typical width of the dirt footprint.

Water Bars: A rock, earthen, or log barrier, or excavated channel, angled across a trail to divert the runoff water off of a trail. These are most appropriately placed where there is a high velocity or volume of water and a large slope.

13.2 - APPENDIX 2: REFERENCES

Printed Material

Brant County Heritage Committee; *County of Brant Heritage Driving Tour; N.P.; Ontario; 2006*

ENVision - The Hough Group; *City of Kawartha Lakes Trails Master Plan; N.P.; Ontario; 2006*

Ontario Ministry of Health Promotion*; Active2010 Ontario Trails Strategy; Queen's Printer for Ontario; Toronto, Ontario; 2005*

Stantec Consulting Ltd.; *Guelph Trail Master Plan; N.P.; Ontario; 2005*

Welsh, **Mary***; An Overview of Brant County Trails; N.P.; Ontario; December 2006*

Websites

County of Brant; *www.brant.ca*

Grand River Conservation Authority; *www.grandriver.ca*

Ministry of Natural Resources; *www.mnr.gov.on.ca*

13.3 - APPENDIX 3: LIST OF INTERVIEWEES

The following individuals participated in interviews, either by telephone or in-person, and provided valuable input throughout the master planning process.

- Doug Hanna, Paris Parks Foundation
- Leslie Atkinson, Recreation Coordinator
- Mary Welsh, Brant Waterways Foundation
- Clark Merritt, Equestrian Rider
- Ron Eddy, County of Brant Mayor
- Shirley Simons, County of Brant Ward 2 Councillor
- Murray Powell, County of Brant Ward 3 Councillor
- Brian Coleman, County of Brant Ward 5 Councillor
- Joan Gatward, County of Brant Ward 5 Councillor
- Gary Givens, Burford Lion's Club
- Dan Andrews, Trans Canada Trail
- Cindy Jessume, County of Brant Public Health
- Deb Jones, Paris Runner's Den
- Lisa Dalpe, Paris Business Improvement Area
- Egon Otten, City of Brantford Parks and Recreation
- Mark Pomponi, County of Brant Development Services; Brant County Heritage Committee
- Eric Rowan, County of Brant, Manager Economic Development and Tourism
- Nora Fueten, Brant County Heritage Committee
- Duncan Ross, Brant Cycling Club

13.4 - APPENDIX 4: STAKEHOLDER WORKSHOP

COMMENTS Areas of Strong / General Consensus

- Linking communities within the County was discussed as being important for a cohesive trail network and community building.
- Directional and interpretive signage was discussed by many of the groups as being important.
- Designating / specifying the permitted uses on each trail are important in order for people to understand what the trail's intended use is.
- Linking new developments with current areas via community trail system was seen as an important priority for The County of Brant (development community needs to be involved with supporting the infrastructure).

Areas of Disagreement or No Consensus

- Some groups thought that trails should be as accessible as possible, however, due to topography and trail use and type of activity, it was understood that not all trails in the County needed to be accessible.
- It was discussed by a few groups that The County of Brant should work towards achieving accessible trails and "do what they can" to make trails accessible, though some trails may not be appropriate to designate as fully accessible.
- Some groups believed that trail sharing was not possible, while others believed that education and trail etiquette / yielding are imperative for trail sharing to be successful.
- Some groups believed that certain uses were incompatible and therefore, trails should have a single use; while other groups believed that separating uses was not the answer.
- Motorized uses – most groups preferred these to be separated from other uses; although one group provided an example where motorized uses co-exist with non-motorized uses.
- The major conflict of users discussed by many groups was that between motorized uses and horses.

Important Directions

- Many of the groups suggested that ATV groups / riders needed to further develop a trail system of their own, much like Ontario Snowmobile Clubs have done.
- Many groups believed that using existing rail corridors and open space linkages was important for trail system development.

- Ensuring that new developments include trail linkages into their development plans was praised by all groups as being an important aspect for The County of Brant to pursue.
- Creating points of interest along trails was encouraged by many participants; these may include environmental, cultural or historical features; i.e. nesting grounds along the Grand River, cobblestone houses, rail trestles, etc.
- Liability (maintenance, injury, etc.) was a concern throughout much of the discussion.
- Trail safety and maintenance were important concerns for all groups.

By analyzing the comments from the interviews and stakeholder workshop, it is clear that there are overlapping issues, concerns and themes that were discussed. These will be investigated and addressed as the plan evolves during the course of the study.

Following the stakeholder workshop / design charrette, a questionnaire was formulated to be posted on the County of Brant website and possibly be included in any mailings that take place, in order to gain insight into the general public's thoughts and concerns regarding trails within the County. The results of the questionnaire will be reviewed, documented and integrated into the final Trail Master Plan.

13.5 - APPENDIX 5: TRAIL USER QUESTIONNAIRE

TRAILS MASTER PLAN
COUNTY OF BRANT

TRAIL USER QUESTIONNAIRE

The County of Brant is currently undertaking the preparation of a Trails Master Plan, a long range document that will communicate the community's vision for trail planning and strategies for development in the future. As part of the research component to understand user needs, we would appreciate your assistance in filling out this questionnaire. Your comments will help to establish the need for and identify facilities that will be required to support a comprehensive trail system. Please return the completed questionnaire to the address noted at the bottom of the last page or to your local Customer Service Centre in Burford, Oakland, Onondaga or Paris. All information collected is confidential and will be used for statistical purposes only.

1. Are you a resident of the County of Brant?

   _____Yes _____No

2. In what community do you reside?

   _____

3. What is your gender?_____Male _____Female

4. In which age group are you? (Please circle **one** number.)

   1. UNDER 10 YEARS
   2. 10-19 YEARS
   3. 20-29 YEARS
   4. 30-39 YEARS
   5. 40-49 YEARS
   6. 50-59 YEARS
   7. 60-69 YEARS
   8. 70 YEARS OR OLDER

5. Do you currently use the existing trail system within the County of Brant?

   _____Yes _____No

   If yes, how often do you use the trails? If no, proceed to Question #13

   _____Daily _____Weekly_____Monthly_____Seasonally

6. What trails do you currently use? Check as many as apply.

   _____Cambridge to Paris

   _____SC Johnson (Paris to Brantford)

   _____Dundas Valley Trail (Brantford to Dundas)

   _____Grand Valley Trail

_____City of Brantford Trails

_____LE & N (Brantford to Mount Pleasant)

_____Conservation Areas, please specify _____

_____Local Parks, please specify_____

_____Other, please specify_____

7. What do you use trails for? Check as many as apply.

_____Walking/Hiking/Jogging

_____Cycling

_____Rollerblading

_____Horseback Riding

_____ATV/Motorized Vehicle

_____Snowmobiling

_____Cross-country skiing / Snowshoeing

_____other, please list_____

8. Do you belong to a recreational group that uses the existing trail system in the County?

_____yes, please specify_____

_____No

9. Please list your top three destinations and/or points of interest that you use the trails to reach or wish to enjoy in the future. (Include areas such as access points, connections to neighbourhoods, natural features, cultural attractions, restaurants etc.)

1._____

2._____

3._____

10. Do you use the trails to get to work?

_____Yes, please specify how often_____

_____No

11. What do you use trails for? Check as many as apply.

_____Walking/Hiking/Jogging

_____Cycling

_____Rollerblading

_____Horseback Riding

_____ATV/Motorized Vehicle

_____Snowmobiling

_____Cross-country skiing / Snowshoeing

_____other, please list_____

12. Do you belong to a recreational group that uses the existing trail system in the County?

_____yes, please specify_____

_____No

13. Please list your top three destinations and/or points of interest that you use the trails to reach or wish to enjoy in the future. (Include areas such as access points, connections to neighbourhoods, natural features, cultural attractions, restaurants etc.)

1._____

2._____

3._____

14. Please list your top three destinations and/or points of interest that you use the trails to reach or wish to enjoy in the future. (Include areas such as access points, connections to neighbourhoods, natural features, cultural attractions, restaurants etc.)

1._____

2._____

3._____

15. Do you use the trails to get to work?

_____Yes, please specify how often_____

_____No

16. How do you access the trail system?

Do you currently drive to access the trail system? _____

Do you cycle / walk to access the trail system? _____

Other? (Please specify) ____

17. How far would you be willing to travel to access trails in the County?

____.5 - 2 km ____2 - 5 km ____5 - 10 km_____10+ km

18. Rank the three most important features or amenities to be included in the trail system?

_____ Rest areas _____Trail Heads _____ Washrooms

_____Lighting _____ Bike Racks _____Parking

_____Garbage Cans _____Trail Maps _____Picnic Areas

_____General Signage_____Interpretive Signage

_____Art in Public Spaces_____River Access/Portage Areas

19. Investing in public recreational trails is for the “public good” and helps create a healthier community that benefits all residents, not just users of trails. Do you support the continued development of a comprehensive trail system throughout the County of Brant?

_____Yes _____No

What are your reasons?

_____

_____

_____

Additional Comments:_____

_____

_____

_____

For further information please contact:

Kathy Ballantyne,
Parks and Facilities Manager
66 Grand River St. N.
Paris, ON N3L 2M2
519-442-6324 ext. 3027
kathy.ballantyne@brant.ca

13.6 - APPENDIX 6: CULTURAL FEATURES LISTING

(Associated with the sub-areas shown on MPS: Cultural Features Map)

SOUTH DUMFRIES

SD1 Harrisburg Cemetery - Harrisburg Rd. (behind Harris Church Park)

SD2 Cherry's Hotel and Store, 1901 - 97 Harrisburg Rd.

SD3 Residence, 1B90 - 109 Harrisburg Rd.

ST. GEORGE

SD4 Trail Wreck on Grand Trunk Rail Bridge, 1BB9 - 124 St. George Rd.

SOS Snowball Grist Mill, 1B71 - 41 Main St. S.

SD6 Howell Block - 34-36 Main St. S.

SD? Sunnyside, 1BBB - 13 Main St. S.

SOB St. George School, 1B93 - 39 Beverly St. W.

SD9 Adelaide Hunter-Hoodless Homestead, circa 1830 - 359 Blue Lake Rd.

SD10 Bruce's School S.S. No. 13, 1909 - 96 McLean School Rd.

SD11 Smith I. Wait House, circa 1B7S - 86 McLean School Rd.

SD12 Mayhill Villa I Lewis C. Cope Residence, circa 1B67 - 380 Branchton Rd.

SD13 Stone Railway Bridge, 1BS4 - Branchton & Glen Morris Rd. E.

GLEN MORRIS

SD14 Samuel Latshaw Residence, 1B60 - 448 McPherson School Rd. SD1S McPherson School, S.S. No. 10, 1870 - 283 McPherson School Rd. SD16 Woman's Institute, circa 1B60 - 17 Dunbar St.

SD17 Glen Morris United Church, 1B49, and Manse, 1BS6 - 451 East River Rd.

SD1B Glen Morris Hotel, 1B44 - 474 East River Rd.

SD19 Residence, 1BB2 - 11 Forbes St.

SD20 Glen Morris School, S.S. No. 14, 1B3S - 43 Princess St.

SD21 Grand River - (under Glen Morris Bridge)

SD22 Kelley Stone Barn, circa 1BSS - 848 West Dumfries Rd.

SD23 John Maus Residence, 1B60 - 289 Pinehurst Rd.

SD24 Maus School, S.S. No. 11, 1B47 - 705 Paris Plains Church Rd.

SD2S West Dumfries Chapel (Paris Plains Church), 184S- 705 Paris Plains Church Rd.

SD26 George Brown Residence, 1B62 - 207 West River Rd.

SD27 Charles & Margaret O'Neail Residence, circa 1861 - 899 Keg Lane Rd.

SD2B Matthew Deans Residence, 1BSB - 963 Keg Lane Rd.

PARIS

P1 Paris Junction - Market St. at Brydges St.

P2 Penman's No. 1 Mill, 1B74 - 140 West River St.

P3 Charles Mitchell House, 1B40's - 16 Broadway St. W.

P4 Paris Public Library, 1904 - 12 William St.

PS Paris Baptist Church, 1BBS - 25 Broadway St. W.

P6 Gouinlock House, 184S - 42 Broadway St. E.

P7 Paris Presbyterian Church, 1B93 - 164 Grand River St. N.

PB Captain Cox House, 18B6 - 184 Grand River St. N.

P9 Whitlaw House, 1B6B - 1 Banfield St.

P1O Baird House, 1B70 - 194 Grand River St. N.

P11 Elmhurst, 1B9S - 201 Grand River St. N.

P12 Hiram Capron House, 1B31 - 8 Homestead Rd.

P13 Penmarvian, 1845 (rebuilt 1887) - 185 Grand River St. N.

P14 Hamilton Place, 1844 - 165 Grand River St. N.

P15 Original Storefront, 1890 - 111 Grand River St. N.

P16 Arlington Hotel, 1850's - 106 Grand River St. N. (at William Rd.)

P17 Alexander Graham Bell Plaque - 91 Grand River St. N.

P18 Asa Wolverton House, 1851 - 52 Grand River St. N.

P19 Dr. Sowden House & Dispensary, 1845-1851 - 5-7 Burwell St.

P20 St. James Anglican Church, 1838 - 8 Burwell St.

P21 Old Town Hall, 1845 - 13 Burwell St.

P22 Rev. Thomas Henderson House, 1842-1845 - 22 Church St.

P23 Hugh Finlayson House, pre 1841 - 40 Dumfries St.

P24 Old Paris Inn, 1852 -40 Dundas St. W

P25 Sacred Heart Roman Catholic Church, 1857 - 17 Washington St. P26 Levi Boughton House, 1852 - 19 Queen St.

P27 Charles Arnold House, 1840's - 2 Arnold St.

BETHEL

BE1 Bethel Stone United Church, 1864 - 154 Bethel Rd.

BE2 Perley School, 1844 - 157 Bethel Rd.

BE3 Ameronto Post Office, 1900 - 213 Bethel Rd.

BE4 Apps Mill Nature Centre, 1846 - 308 Robinson Rd.

BES The Alexander Carlyle Cottage, circa 1840's - 1030 Co/borne St. W

MOUNT VERNON

MV1 Colbome St. W - 8 kilometres west of Brantford

BURFORD

B1 Dr. Hervey Ross Home, 1851 - 110 King St.

B2 Stuart House, 1886 - 55 Maple Ave. N.

B3 Windrush Farm, circa 1850 - 38 6th Concession Rd.

B4 Post Office, 1915 - 126 King St.

BS Burford Armoury, 1906 - 150 King St.

B6 Sprowl House, circa 1835 - 155 King St.

B7 Burford Pioneer Cemetery, 1799 - King St. & Potter Dr.

B8 Oil Pump Jack, 1959 - 14 Potter Dr.

B9 Former Hall's Nursing Home, 1887 - 377 Maple Ave. S.

B10 Holt House, 1885 - 363 Maple Ave. S.

B11 Metcalf Home, 1881 - 280 Maple Ave. S.

B12 Fairfield Plains United Church, 1868 - 187 Maple Ave. S.

B13 Williams House, 1891 - 114 Fairchild Rd.

814 Harley Museum, 1927 - 141 Harley Rd.

B15 Terryberry House, circa 1900 - 88 Highway #53

B16 Stage Rd. - Burford Township

B17 Farrington House, 1883 - 306 Highway #53

B18 Pollard House, 1865-1868 - 378 West Quarter Townline Rd.

B19 Residence, 1860 - 300 Bishopsgate Rd. B20 Residence, 1870 - 270 Bishopsgate Rd. B21 Bishopsgate Rd. - Burford Township.

SCOTLAND

S1 Duncombe's Uprising, 1837 - Simcoe & Talbot St.

S2 Residence, 1891 - 27 Talbot St.

S3 Scotland United Church, 1850 - 10 Church St. W

OAKLAND

O1 Battle of Malcolm Mills, 1837 - King St. S.

O2 Malcolm's Mill / Vivian's Mill - King St. S., west of Lion's Park

O3 Mordecai Westbrook Home, circa 1860 - 129 Oakland Rd.

MOUNT PLEASANT

MP1 McEwen House, circa 1850 - 849 Mount Pleasant Rd.

MP2 Eadie - Wilson Home, 1850 - 756 Mount Pleasant Rd.

MP3 Optimist Nature Park, circa 1920's - 755 Mount Pleasant Rd.

MP4 Marquis House, circa 1870's - 726 Mount Pleasant Rd.

MPS Grantham House, circa 1840 - 722 Mount Pleasant Rd.

MP6 Hardy Store I Devlin's Bistro, 1834 - 704 Mount Pleasant Rd.

MP7 Mount Pleasant Pioneer Cemetery 1802 - Mount Pleasant Rd. at Burtch Rd.

MPS Phelps House, circa 1860's - 382 Burtch Rd.

MP9 All Saints' Anglican Church and Cemetery, 1845 - 688 Mount Pleasant Rd.

MP10 Bryning Manse, circa 1830 - 676 Mount Pleasant Rd.

MP11 United Church, 1863 - 669 Mount Pleasant Rd.

MP12 Brucefield, circa 1840 - 657 Mount Pleasant Rd.

MP13 Lake Erie & Northern Railroad Station, 1916 - 649 Mount Pleasant Rd.

MP14 Tennant House, circa 1850's - 646 Mount Pleasant Rd.

MP15 Phelps' House, circa 1860's - 641 Mount Pleasant Rd.

MP16 Emily Townsend House, circa 1860's - 637 Mount Pleasant Rd.

MP17 Townsend Mansion, 1848 - 597 Mount Pleasant Rd.

MP18 Biggar Home, 1825 - 571 Mount Pleasant Rd.

MP19 The Phelps-Guest Home, circa 1840's - 538 Mount Pleasant Rd.

MP20 The Bell Homestead, 1858 - 94 Tutela Heights Rd.

BURTCH

BU1 RC.AF. Wireless Training School - 248 Burtch Rd.

BU2 Burtch Barn, circa 1840 - 373 Cockshutt Rd.

BU3 Burtch Baptist Church, 1869 - 348-352 Cockshutt Rd.

NEWPORT

N1 The Newport School, 1872 - 84 Newport Rd.

N2 Thomas House, 1835 - 255 River Rd.

CAINSVILLE

CA1 Bow Park Farm, circa 1860's - 136-140 Oxbow Rd.

LANGFORD

LA1 Langford Church, 1868 - 1601 Co/borne St. E.

LA2 Langford School, 1886 - 1694 Co/borne St. E.

ONONDAGA

ON1 Salt Springs Church, 1822 - 61 Salt Springs Church Rd.

ON2 Residence, circa 1880 - 360 Salt Springs Church Rd.

ON3 James & Norma MacDonald, circa 1835 - 382 Salt Springs Church Rd.

ON4 Onondaga School, 1874 - 734 Highway #54

ON5 Onondaga Hall, 1874 - 42 Brantford St.

ON6 Six Nations of the Grand River - Highway #54

ON7 Chiefswood, 1853-1856 - 1037 Highway #54

MIDDLEPORT

ON8 Former Logan Hotel & Port Area, 1840 - 1150 Highway #54

ON9 Middleport General Store, 1850 - 1154 Highway #54

ON10 St. Paul's Anglican Church, 1868 - 1159 Highway #54

ON 11 Italianate White Brick House, circa 1880's - 1218 Highway #54

ON12 Large Barn, 1905 - 1302 Highway #54

ON13 Cherwell House, circa 1850's - 301 Big Creek Rd.

ON14 Howden Home & Barns, 1883 - 291 Baptist Church Rd.

ON15 The Second Onondaga Baptist Church, 1857 - 330 Baptist Church Rd.

ON16 Octagonal Silo - Highway #54

PEDESTRIAN CHARTER - For the County of Brant.

Walking is the most ancient and universal form of travel. It is also an important form of exercise and recreation. Every personal trip involves walking, alone or in combination with taking public transit, driving or cycling. A pedestrian is a person moving from place to place, either by foot or by using an assistive mobility device. Pedestrians include residents and visitors of all ages and abilities. In order to travel safely, conveniently, directly and comfortably, they require an urban environment and infrastructure designed to meet their travel needs. To ensure walking is a safe, comfortable and convenient mode of urban travel, the County of Brant respects the following principles:

Accessibility Walking is a free and direct means of accessing local goods, services, community amenities and public transit. Environmental Sustainability Walking relies on human power and has negligible environmental impact. Equity Walking is the only mode of travel that is universally affordable, and allows children and youth, and people with specific medical conditions to travel independently. Personal and community safety an environment in which people feel safe and comfortable walking, increases community safety for all. Health and well-being walking is a proven method of promoting personal health and well-being, Community Cohesion and Vitality. A pedestrian-friendly environment encourages and facilitates social interaction and local economic vitality.

To create an urban environment in all parts of the County that encourages and supports walking, the County of Brant will:

- uphold the right of pedestrians of all ages and abilities to safe, convenient, direct and comfortable walking conditions.
- provide a walking environment within the public right-of-way and in public parks that encourages people to walk for travel, exercise and recreation.
- support and encourage the planning, design and development of a walking environment in public and private spaces (both exterior and interior) that meets the travel needs of pedestrians.
- provide and maintain infrastructure that gives pedestrians safe and convenient passage while walking along and crossing streets.
- ensure that residents' access to basic community amenities and services does not depend on car ownership or public transit use.
- set policies that reduce conflict between pedestrians and other users of the public right-of-way.
- create walkable communities by giving high planning priority to compact, human-scale and mixed land use.
- encourage research and education on the social, economic, environmental and health benefits of walking as a form of travel, exercise and recreation.

- promote laws and regulations that respect pedestrians' particular needs.
- advocate for improving the provincial and federal regulatory and funding frameworks that affect the Citys ability to improve the pedestrian environment.
- work with individual citizens, community groups and agencies, businesses and other levels of government to achieve these goals. An urban environment that encourages and facilitates walking supports community health, vitality and safety. It increases use of public transit; decreases car dependence; reduces conflict between vehicles and pedestrians; leads to cleaner air; green public space; and supports green tourism. Such an environment creates opportunities for the informal social interaction that is one of the main attributes of a vibrant, liveable urban community; and further, that all other local area municipalities be encouraged to adopt a Pedestrian Charter."

Principles of a Pedestrian Charter

- Accessibility, increased inclusive mobility, reduction of auto-dependence.
- Well designed and managed spaces and places for people.
- Improved integration of networks, Better and more connected walking routes.
- Land Use Planning that Supports Walking.
- Safe Roads, Reduced road danger.
- Prevention of crime and fear, Personal and Community Safety.
- More supportive leaders.
- A culture of walking