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City of Hamilton Project Team Members

Leila Fazel Todd, BSc, MLA, OALA, CSLA
Landscape Architect
Landscape Architectural Services

Cynthia Graham, MLA, OALA, CSLA
Supervisor
Landscape Architectural Services

Daryl Bender
Project Manager
Alternative Transportation

Jarrad Johnston
Technician
Landscape Architectural Services

Consultant Project Team Members

Brad Smith, BLA, OALA, CSLA, ASLA
Senior Landscape Architect and
Project Manager

Sarah Lynn Saari, BLA, OALA, CSLA, ASLA
Landscape Architect

Carolina Schmitz, B. Arch.
Landscape Designer and
LEED Green Associate

Jeff Bonnett, BA, Dip. Applied Arts
Landscape Designer

Anita Geier, BComm, DipBA, CPSI
Office Controller

The 2015 City of Hamilton Recreational Trails Master Plan Update project team would also like to thank O’Connor Mokrycke Consultants for their work and dedication to the original 2007 City of Hamilton Recreational Trails Master Plan report.
1.0 STUDY INTRODUCTION
The public demand for high quality connected trail systems is increasing as the City of Hamilton continues to grow. Trails within the City of Hamilton facilitate city-wide travel and are an important resource in connecting parks, recreational centres, schools, commercial sites, cultural and institutional centres, transit facilities and residential neighbourhoods. In 2007 the Recreational Trails Master Plan was approved by Council and since its inception has been a framework for the City for implementing the trail network. However, as the City and surrounding communities grow and new infrastructure is developed there is a need to revisit and update the Recreational Trails Master Plan. This City-wide update addresses trails and trail infrastructure and will make recommendations for new connections throughout the City, for active transportation and recreation for residents and visitors alike.

The update of the Recreational Trails Master Plan was developed with the review and comments of trail users, Hamilton’s trail partners and organizations, the public, government agencies and City Departments. The Recreational Trails Master Plan was based on an overall vision and report goals identified at the beginning of the project to successfully implement a connected and continuous trails network. These goals are supported by a number of objectives which were used to establish the content of the master plan update:

**Planned:** Trails will be considered an integral component of all community planning and development.

**Connected:** Trails will serve to connect the urban and rural communities of Hamilton, both internally and externally, and will link key destinations. Improved wayfinding will be incorporated into the trails network.

**Diverse:** The trail system will be designed to appeal to a wide range of users, abilities and interests.

**Inspiring:** Trails will promote and encourage use and enjoyment of the City’s natural, cultural and recreational features.

**Accessible:** Where possible, the trail system will provide opportunities for four-season use, and will include a core network of trails that are accessible to people of all ages and abilities.

**Safe:** Safety, security and user comfort will be considered in the design and management of the trail system.

**Sustainable:** The trail system will be developed and managed in a manner that preserves the environment, is financially responsible, and encourages opportunities for partnership and stewardship.

In order to guide the future development of Hamilton’s trail system in a manner consistent with Federal, Provincial and Municipal legislation and policy, this updated Recreational Trails Master Plan includes recommendations that aim to accomplish the following:

- Integrate components of the existing recreational trail system, including those planned in the 2007 report;
- Propose new (2015) trail initiatives and incorporate them with 2007 trail initiatives. This will help to alleviate gaps in the overall trails system;
- Integrate new trail accesses, routes, and crossings with existing conditions and planned City infrastructure projects (e.g. Highway 403, Lincoln Alexander Parkway, Red Hill Valley Parkway, waterfront, Niagara Escarpment, GO transit stations);
- Complement the City’s transportation system to support multi-modal mobility;
- Encourage inter-regional trail connections;
- Strengthen partnerships with other trail organizations and groups;
- Continue to build upon physical, economic, sustainable, and environmental design standards;
- Further develop maintenance and management standards;
- Identify new trail amenities to provide a better user experience;
- Priority recommendations for implementation and development; and
- Integrate off-road trails with the planned on-road cycling networks to better address broader community land use and transportation goals and objectives.
The goal of the Master Plan is to guide the development of a connected, comprehensive, accessible and sustainable multi-use trails network throughout the City of Hamilton and to surrounding communities to improve health and wellness for pedestrians, cyclists and trail users.

1.1 A History of Trails in Hamilton
Multi-use trails within Hamilton have been routed through parks, hydro corridors, natural areas, communities, and provide linkages through and between schools, surrounding communities, woodlots, community centres, parks, and to bridges over highways (e.g. Red Hill Valley Parkway, QEW, Lincoln Alexander Parkway).

The existing trail network within the City has provided a strong fabric of multi-use trails that complement the on-road routes identified in the City’s Transportation Master Plan. The planning process for new trail initiatives included a thorough review of the existing network and in total over 87 kilometres of new trails have been proposed. Proposed initiatives are to connect and provide users access to parks, schools, planned neighbourhoods, conservation areas, the waterfront, transit stations, the escarpment, and work together with existing trails and trail initiatives to alleviate gaps within the network. New initiatives are discussed in greater detail in Section 2.2.4.

Based on the online survey data from the public consultation process (see Appendix A), trails in the City of Hamilton are primarily used for hiking (40.74%), walking and jogging (41.40%). Below is a brief list of some of the City’s major trails:

City of Hamilton Trails
- Battlefield Creek Trail
- Breezeway Trail/Confederation Park
- Chedoke Radial Recreational Trail
- Cootes Drive Trail
- Desjardins Recreational Trail
- Escarpment Rail Trail
- Hamilton Harbour Waterfront Trail
- Harvey Park Trails
- Park corridor trails between T.B. McQuesten Park (Upper Wentworth) to Upper Ottawa Street
- Pier 4 Park Trail
- Red Hill Valley Trail
- Great Lakes Waterfront Trail
- East Mountain Trail Loop

Figure 2: Bayfront Park trail
Hamilton’s trail system provides opportunities to participate in varying levels of physical activity and enjoy distinctive natural and cultural features. The trail network enables residents and visitors to enjoy and appreciate the City’s built and natural environments. These connections contribute to achievement of the City’s goals related to current Municipal land use, sustainable development, transportation, and economic development goals. Many trails within the City include both natural and cultural heritage components that contribute to the overall user experience of trails. Trails within Battlefield Park for example allow the user to experience cultural elements such as the Battlefield Monument and Battlefield House Museum.

Pedestrians and cyclists account for a high proportion of trips generated within downtown Hamilton (Active Transportation Benchmarking Program, 2014). Multi-use trails, together with the on-road system, provide viable and valuable alternatives to automobile usage throughout the City. In an effort to seamlessly integrate the trail system, the City has continuously and strategically partnered with other agencies, including the Hamilton Conservation Authority, Bruce Trail Conservancy, and the Royal Botanical Gardens to integrate and promote a city-wide trail system. The Recreational Trails Master Plan will continue to build on the relationships with various trail partners and organizations to implement the trail system.

1.2 The Benefits of Trail Development

ACTIVE2010 (2005) is the Province’s strategy to increase levels of physical activity among Ontarians for personal health benefits, and to reduce overall health care costs. The Ontario Trails Strategy is a long-term plan prepared in 2005 as part of the ACTIVE2010 Strategy. It establishes strategic directions to assist in the planning, management, promotion, and use of trails in Ontario, and was developed in collaboration with other Provincial ministries and a wide range of stakeholders. The Ontario Trails Strategy (2005) focuses on all single and shared-use outdoor designated trail networks in urban, rural and wilderness settings that are used for recreation, active living, utilitarian and tourism purposes including but not limited to:

- Trails with natural (e.g. hiking, cross-country skiing) or treated surfaces (e.g. bicycle greenways, paths or lanes)
- On-road bicycle routes
- Walkways, boardwalks and sidewalks
- Trails located on transportation and utility corridors
- Access roads (e.g. for forestry and mining) designated for trail use
- Trails that are integrated with public transit services
- Waterway routes (e.g. along designated Canadian heritage rivers)

The Ontario Trails Strategy (2005) also identifies a number of potential benefits to communities that can be realized through trails and trail-related activities such as:

Support for Active Living

- Having access to trails encourages an active lifestyle.
- Almost half of Canadians age 12 and over report being physically inactive and 26% of youth between the ages of 12 and 17 are overweight or obese (Statistics Canada, 2005).
- It is likely that urban residents may utilize trails for unstructured fitness and recreation...
including walking, cycling and jogging, all of which are well suited to outdoor trails.

- As an example, 30 minutes of brisk daily walking is all that is needed for improved fitness levels, and health benefits (Ontario Trails Strategy, 2005).
- The Ontario Trails Council states that with “access to safe and affordable recreation, people can prevent and manage health afflictions such as high blood pressure, diabetes, heart disease and stroke, and circulatory and respiratory problems” (Ontario Trails Council, 2016).

**Social Benefits**

- Trails can help build the social fabric of a community, physically connecting neighbourhoods and outlying communities together, and encouraging casual interactions. Several city trails, such as the Red Hill Valley Trail, have been developed in a collaborative manner with community volunteers and local sponsors.
- By linking shopping, entertainment, workplaces, and parks, trails can help to promote alternative transportation, and contribute to economically and environmentally sustainable and liveable communities.
- Accessible to people of all income brackets, age groups, and cultures.
- Trails provide unstructured recreation that can be enjoyed in solitude, by families, and as group activities.
- Trails are available to all ages and the associated activities (e.g. bird watching, walking, cycling, cross-country skiing, etc.) can be relatively inexpensive in comparison to other recreation activities that have user fees or require expensive equipment.
- With appropriate design, many urban trails can be made physically accessible to a wide range of skills and abilities.
- Many trails can be used in all seasons, through a variety of activities.
- Trails offer leisurely opportunities to appreciate and enjoy nature, and the surrounding community.

**Environmental Benefits**

- Trails support both urban and rural recreational lifestyles and can support broader environmental and ecological
objectives through the protection of greenspace corridors.

• By rationalizing and re-routing random and informal paths, designed trails can serve to keep users away from sensitive environmental areas.

• The use of trail maps and interpretive signage can help to enhance appreciation and awareness of nature and promote environmental stewardship.

**Economic Benefits**

• Trails promote a high quality of life for communities and indicate a desirable city to both live and operate a business.

• Trails can be used to connect key destinations such as natural areas and parks, cultural heritage features, or other community amenities and in doing so can encourage visitation by both local residents and tourists.

• Trails can create both jobs directly and indirectly through construction as well as relating to tourism and visitation. This might include restaurants, lodging, food, and beverage.

• Many trail users purchase local goods to support their trail activities (e.g. bikes, jogging gear, hiking shoes, etc.) These purchases contribute to the local economy through jobs and taxes.

• The ACTIVE2010 Ontario Trails Strategy states that “a home near a trail can offer a pleasing view, quieter streets, recreational opportunities and a chance to get in touch with nature”.

• Property values on or adjacent to trail networks increase and generally sell for 5-32% more than those farther away (Dunbar, 1999).

### 1.3 Trails and Health

The ACTIVE2010 Ontario Trails Strategy states that trails provide accessible, widely available, and low-cost opportunities to meet the physical activity needs of most Ontarians. Regular physical activity plays a role in the prevention of several chronic diseases such as cardiovascular disease, diabetes, cancer, hypertension, obesity, depression, and osteoporosis (Warburton, 2006). In Canada, only 15% of adults and 7% of children and youth participate in enough physical activity for optimal health and development (Colley, 2011a, 2011b). This is complicated by the fact that that Canadians who are classified as overweight or obese have increased over the last 30 years. For the City of Hamilton, this has been significant with adult rates surpassing the Ontario population rate, 59.8% versus 50% (2007/08), respectively (City of Hamilton, 2010). In 2007/08, adolescents 12-17 years of age were classified as overweight or obese in 14.4% of Hamilton youth versus 18% of Ontario youth (City of Hamilton, 2010).

Trails help connect people of all ages to the places they live, work and play, and they provide an ideal setting for walking, bicycling and other modes of recreational physical activity and active transportation (Troped, 2011). People who reported walking, hiking, or bicycling on a trail at least once a week are twice as likely to meet physical activity recommendations (Rodriguez, 2009). In most cases, living near trails or having trails in one’s neighbourhood has been associated with people being 50% more likely to meet physical activity guidelines (Rodriguez, 2009). Furthermore, connectivity of roads, sidewalks, bike paths, and trails are positively associated with increased levels of physical activity and decreased levels of obesity (Frank, 2007).

Trails provide other important health benefits as well:

• Associated with lower rates of obesity and type 2 diabetes (Glazier, 2007)

• Promotes mental health (National Recreation and Park Association, 2010)

• Reduces health inequities (Provincial Health Services Authority, 2009; Active Living Research, 2011; Coen, 2006)

• Promotes social interaction (Henrik, 2009 and Gees, 2006)

Lastly, research suggests that community trails are a cost-effective means for promoting physical activity and potentially reducing medical expenses. Using data from the National Medical Expenditure Survey, a study in the USA found that for every $1 spent on trails, there was almost $3 in savings in direct medical costs (Troped, 2011). With physical inactivity and obesity costing the Greater Toronto and Hamilton Area $4 billion each year including $1.4 billion in direct medical costs, (Medical Officers of Health in the GTHA, 2014) investing in trails has the potential for significant savings.
1.4 The Organization of the Master Plan Report

The Recreational Trails Master Plan has been developed with the objectives of linking to external trail networks; improving access to trails; improving connectivity throughout the City; encouraging alternative transportation; enhancing recreational and health benefits; and promoting awareness and use of existing trails. The goal of the Recreational Trails Master Plan Update is to create a document that addresses route planning, trail standards, and the development of priorities. The structure of the master plan report has been organized to reflect the intent that it be utilized as a working tool. Sections are organized as follows:

| 1.0 | Study Introduction |
| 2.0 | The Trails Network |
| 3.0 | The Implementation Plan |
| 4.0 | Summary of Recommendations and Next Steps |
| Appendix A | Summary of Public Engagement Activities |
| Appendix B | Summary of Existing Policies and Plans |
| Trail Network Maps |
| Figures |
| Tables |

Overall the master plan report focuses on several key areas including:

- Guiding the development of a comprehensive multi-purpose trail system;
- Identification and classification of recreational off-road trails in accordance with their use and character;
- Collaborative trail management and development standards that meet varying commuting needs and opportunities in a manner consistent with municipal land use, transportation, cultural heritage and sustainable development policies;
- Design methods intended to create trail gateways and scenic vistas to enhance a positive public image of the City of Hamilton and to improve the local user and tourist experience;

- Economic impacts of trails including expansion and redevelopment of the commercial core;
- Preservation and conservation of wooded areas and sensitive ecological habitat;
- Significant natural features such as the wetlands streams will be protected by new trail development;
- Consideration of applicable City of Hamilton policies, by-laws, documents, guidelines and recommendations which include but is not limited to:
  - Hamilton Official Urban and Rural Plans
  - Transportation Master Plan
  - Secondary Plans
  - Zoning By-Law(s)
  - Pedestrian Mobility Plan
  - Active Transportation documents
  - Transportation Demand Management documents
  - Accessibility Design Guidelines
  - The Cultural Plan (“Love Your City”)
- Trail facilities developed to serve expanding residential communities; and
- Trail safety and security in the community associated with trails. The level of service provided will be appropriate to the needs of both the rural and urban residents.
2.0 THE TRAILS NETWORK
The main goal in developing the Recreational Trails Master Plan Update was to establish key strategic priorities that will facilitate a continuous and connected trail system to accommodate recreational and commuter travel. The project approach to develop the master plan update included extensive public consultation and a rigorous and comprehensive review of the existing network and associated facilities. The public and stakeholder consultation process is discussed in greater detail within Appendix A: Summary of Public Engagement Activities.

Each consultation event formed a key component of the project and ultimately led to the development of this document. In order to create an updated master plan report we must first review what was previously completed in 2007.

2.1 Understanding What Has Already Been Done: Recreational Trails Master Plan (2007)

The City of Hamilton Recreational Trails Master Plan (2007) is a comprehensive document which prescribes a multi-use, recreational trail system throughout the City of Hamilton. This system links both the current and proposed off-road as well as on-road systems into a fully integrated, City-wide based network. This document is intended to guide the development and management of trail systems, throughout the City from the present into the future, providing clear direction and assist with decision making.

In 2007, the City of Hamilton completed the former Recreational Trails Master Plan (prepared by O’Connor Mokrycke Consultants). The master plan was adopted by Council and included:

- Completion of a comprehensive multi-purpose trail system;
- Identification and classification of recreational off-road trails in accordance with their use and character;
- Collaborative trail management and design development guidelines;
- A proposed network of off-road and on-road routes;
- Network implementation recommendations;
- Suggestions to raise awareness about Hamilton trails, encourage trail use and educate users on trail usage and etiquette;
- Trail maintenance recommendations; and
- Implementation of applicable City of Hamilton Official Plan and Transportation Master Plan policies and recommendations.

The 2007 plan has been the guiding document for City trail development for the past nine years. A number of soft and hard infrastructure projects have been realized throughout the City of Hamilton based on the implementation strategies identified within the document.

2.2 The Trail Master Plan Update Process

This report update proposes a wide variety of trail projects of differing sizes and complexity throughout the City of Hamilton. Some projects require further design and analysis, while others are smaller expansions or upgrades to existing trails or trail amenities. The Hamilton Recreational Trails Master Plan was updated between March 2015 and May 2016. All trail initiatives within the 2007 report were updated and new initiatives were added to the report. The planning process for new trail initiatives included a thorough review of the existing network and in total 55 trail initiatives were proposed totaling over 87 kilometres of new trails city-wide. New initiatives are discussed in greater detail in Section 2.2.4. Extensive public involvement, that helped to shape and guide the master plan update, included:

- Eight (8) public consultation meetings between April and September 2015;
- Stakeholder meetings between April and September 2015;
- Trail questionnaires, issued in both paper and electronic format;
- Key agency liaisons and discussions;
- Input from City of Hamilton Cycling Advisory Committee and various City Department staff;
- Online survey available April 2015 to October 2015
- Online promotion
- Feedback email for general comments
- A new strategy in consultation was applied for this city-wide project: bringing the project to people rather than bringing people to the project.
### Table 1: Summary of Public Consultation Activities

<table>
<thead>
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<th>Activity</th>
<th>Details</th>
</tr>
</thead>
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<tr>
<td><strong>Timeline:</strong></td>
<td>April 2015 - September 2015</td>
</tr>
<tr>
<td><strong>Public Information Session #1</strong></td>
<td>Wednesday, April 22, 2015 - Hamilton Environmental Summit, Royal Botanical Gardens</td>
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<tr>
<td><strong>Public Information Session #2</strong></td>
<td>Thursday, May 21, 2015 - Building Momentum Hamilton, Tim Hortons Field</td>
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<tr>
<td><strong>Public Information Session #3</strong></td>
<td>Saturday, June 6, 2015 - Let’s Talk Trails Table (Chedoke Stairs)</td>
</tr>
<tr>
<td><strong>Public Information Session #4</strong></td>
<td>Sunday, June 7, 2015 - TrailHead Ontario 2015 Conference and Community Trails Day, McMaster University</td>
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<tr>
<td><strong>Public Information Session #5</strong></td>
<td>Friday, July 10, 2015 - Let’s Talk Trails Table (Hamilton Farmer’s Market)</td>
</tr>
<tr>
<td><strong>Public Information Session #6</strong></td>
<td>Sunday, August 9, 2015 - Festival of Friends, Ancaster Fairgrounds</td>
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<tr>
<td><strong>Public Information Session #7</strong></td>
<td>Friday, August 21, 2015 - Let’s Talk Trails Table (Bayfront Park)</td>
</tr>
<tr>
<td><strong>Public Information Session #8</strong></td>
<td>Thursday, September 24, 2015 - Ward 13 Dundas Town Hall</td>
</tr>
<tr>
<td><strong>Stakeholder Consultation</strong></td>
<td>Staff consulted with eight project stakeholders over the course of the project including the Royal Botanical Gardens, Hamilton-Burlington Trails Council, Bruce Trail Conservancy, Hamilton Cycling Advisory Committee, Halton Conservation Authority, Hamilton Conservation Authority, Niagara Escarpment Commission, and the Ontario Federation of All-Terrain Vehicles.</td>
</tr>
<tr>
<td><strong>Let’s Talk Trails Questionnaire</strong></td>
<td>A 13 question paper questionnaire was created for the first public consultation event (Hamilton Environmental Summit). A total of 33 participants completed the questionnaire as well as marked up existing city trails mapping with comments.</td>
</tr>
<tr>
<td><strong>Online Survey</strong></td>
<td>A 10 question online survey was created using Survey Monkey and promoted through various methods. A total of 309 responses were received between April 2015 and September 2015.</td>
</tr>
<tr>
<td><strong>Project Promotion</strong></td>
<td>Project information was posted on the City of Hamilton website and through the corporate Twitter account which included a project description, project updates, information regarding public consultation, and a link to the online questionnaire. The project was also promoted by placing posters at Municipal service centres.</td>
</tr>
<tr>
<td><strong>Let’s Talk Trails Tables</strong></td>
<td>Staff hosted three Let’s Talk Trails tables which were stations located at high traffic venues used to gather feedback from the public. At each event an information booth was set up to provide the opportunity for visitors to answer specific questions via sticker dot voting to determine priorities. Visitors could also write their general comments about trails in Hamilton on a large sheet of a paper.</td>
</tr>
</tbody>
</table>
Key steps have been expanded to reflect work previously completed as part of the 2007 Recreational Trails Master Plan and analysis of this work to inform the development of this master plan report. The steps used to develop this document included:

1. Collecting and assembling relevant background data and information
2. Reviewing and refining route selection guidelines
3. Reviewing previously developed trails network initiatives and identifying potential new routes
4. Reviewing existing trail initiatives by conducting comprehensive field investigations and site visits
5. Preparing trails network mapping
6. Preparing route priorities and implementation strategies
7. Finalizing updated trail networks with refined trail initiatives

2.2.1 Trails Master Plan Opportunities

The 2007 Recreational Trails Master Plan established trail design principles. Several of those design principles have been expanded upon below as opportunities relevant to this Recreational Trails Master Plan:

• Multi-purpose recreation trails generally service varying skill levels. In order to encourage higher activity levels among Hamilton’s residents Hamilton’s trails are oriented to less experienced trail users where possible;

• Promoting recreational trails as alternative modes of transportation and mixed land uses can bridge the gap between urban form and health. This can create healthy and sustainable communities to combat increased commuting time and physical inactivity attributed by sprawling urban form;

• Urban and rural recreational trails address different needs and opportunities;

• Public safety should be addressed in multiple ways. The trail design standards address the needs of specific users and varying skill levels. Conflicts between users may require some trails be single purpose and seasonal, while others be multiple use and all weather trails. Where multiple uses exist or are anticipated, surface treatment and width standards should be addressed accordingly;

• Hamilton is unique within the regional context balancing the relationship between the built environment and the natural geography of the Niagara Escarpment bisecting the City, Cootes Paradise and a large industrial sector on the Harbour. The trail system should maintain the balance between built and natural settings through its guidance in strengthening the overall trail network;

• The Recreational Trails Master Plan Update should function as one component to create a sustainable trail and cycling network. In order to do this, the Plan should collaborate with both Public and Private sector groups that promote sustainability;

• Trails should not only be used for recreation (e.g. exercise) and commuting (e.g. transportation). They should also function as a linkage to community facilities, such as parks, community gardens, etc.; and

• Wayfinding should be an integral part of the trail design to improve safety, navigability and educational opportunities.

2.2.2 Guidelines for Trail Development and Route Selection

Trails within the City facilitate city-wide travel and are the primary resource in connecting parks, recreational centres, schools, commercial sites, cultural and institutional centres, transit facilities and numerous residential neighbourhoods. One of the key 2007 Recreational Trails Master Plan deliverables was the development of design guidelines and standards for trail facilities throughout the City.

The design guidelines, identified in Section 4.0 of the 2007 Recreational Trails Master Plan, were a thorough development of trail classification and standards which reflected the desire for a more diverse system of on-road and off-road facilities. The 2007 document identified a trail hierarchy which comprised of three different trail types. Facility types were also noted for each of the different trail classification. This Recreational Trails Master Plan Update discusses and expands upon those classifications and guidelines to reflect current industry standards and best practices. This information can be found within Section 2.3.

As the City of Hamilton undertakes the task of implementing the trail network and proceeds with detailed design for key linkages, there may be some scenarios where alternate routes, not
originally identified in this report update, are a more feasible alignment. There may also be scenarios where opportunities offered by unopened road allowances, hydro corridors, abandoned rail corridors, open space, future roadway improvements, partnerships and funding initiatives become available.

The existing trail system has its strengths and this Recreational Trails Master Plan Update represents an opportunity to assemble, investigate and prioritize opportunities that link together the existing trails system and to extend trails to connect to a regional system.

2.2.3 Inventory of Existing Trails and Fieldwork Methodology
An initial step in the development of the Master Plan Update was the documentation and assessment of 2007 trail initiatives. It is important to understand the infrastructure which is currently in place, and to ensure that the Master Plan Update is built upon what has already been completed.

One of the primary goals of the Master Plan Update was to develop a connected and continuous network of trails and to provide linkages between the City’s urban and rural areas. A detailed desktop and field review of all 2007 trail initiatives and recommended new trail initiatives was undertaken. Fieldwork was completed for all fifteen Wards over several weeks between July and October 2015. To assist in reviewing each site, current available GIS mapping and the Hamilton Bikeways, Trails and Parks Map were studied.

Fieldwork consisted of qualitative written observations, noting existing trail or route conditions, features and photographing all sites. Site photographs were taken with either an S.L.R. or digital camera using a 50mm equivalent lens. Sites were visited either on foot, by mountain bike, by car or a combination for efficiency purposes. Prior to commencing fieldwork, draft initiative sheets and mapping were developed based upon available data. The 2007 Master Plan report mapping was updated to reflect the current mapping prior to fieldwork. Once all fieldwork was completed the mapping was further updated. Potential alignments were reviewed with aerial photographs where available and verified in the field.

Analysis of Fieldwork
One goal of the report was to review opportunities for expanding and improving trails on a city-wide basis. While the primary focus was on off-road multi-purpose recreation trails, opportunities to improve on-road links were also considered. In this regard, sites were considered using a number of criteria including, but not limited to, general location, degree of difficulty rating, classification, trail gradient, accessibility rating, ownership, and links to other trails.

These are summarized by ward, noting ward number and initiative number. Existing and new trail initiatives are summarized in Table 3 and Table 4.

2.2.4 The Proposed Trail Network
The City of Hamilton is situated in close proximity to many environmentally and culturally interesting places and already has trails that offer a diverse range of experiences. Some trails are disconnected from others and a priority for trail development is to fill in the missing local links and expand the network to reach beyond its current coverage.

The Recreational Trails Master Plan Update is based on a hierarchy of trail types that reflect type of use, location, and environmental considerations. Throughout the process many other opportunities were identified for the creation of trail segments connecting new neighbourhoods to the network, and extending the local trail system to link other municipalities and areas of environmental and cultural significance. These trails are to be considered in long term planning processes and should continue to be investigated and implemented as opportunities arise.

a) Individual Ward Characteristics
The trail network includes trail planning in all fifteen City Wards. The Recreational Trails Master Plan is divided into the individual City Wards (Maps 1 to 15) for the purposes of describing the trail system projects by individual Ward in greater detail. Table 2 summarizes the individual characteristics, built and natural features, and recreational trail design opportunities within each Ward.
### Table 2: Summary of Individual Ward Characteristics

#### Ward 1: Chedoke-Cootes

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban ward, situated in the west end of Hamilton below the Niagara Escarpment and west of Downtown</td>
<td></td>
</tr>
<tr>
<td>Located within the Hamilton Conservation Authority and Conservation Halton watersheds</td>
<td></td>
</tr>
<tr>
<td>Bordered by the Niagara Escarpment to the south, Queen Street to the east, Hamilton Harbour and Cootes Paradise to the north, and a green corridor running from Cootes Drive and Ancaster Creek.</td>
<td></td>
</tr>
<tr>
<td>Divided by Highway 403 corridor running from the north-east to south-west.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Built and Natural Features</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains portions of the Hamilton-Brantford Rail Trail, Chedoke Radial Recreational Trail (and Chedoke Stairs), Bruce Trail, and Hamilton Harbour Waterfront Trail</td>
<td></td>
</tr>
<tr>
<td>Hamilton Harbour</td>
<td></td>
</tr>
<tr>
<td>Cootes Paradise</td>
<td></td>
</tr>
<tr>
<td>The Niagara Escarpment and Bruce Trail</td>
<td></td>
</tr>
<tr>
<td>McMaster University</td>
<td></td>
</tr>
<tr>
<td>McMaster Innovation Park</td>
<td></td>
</tr>
<tr>
<td>Chedoke Civic Golf Course</td>
<td></td>
</tr>
<tr>
<td>Dundurn National Historic Site</td>
<td></td>
</tr>
<tr>
<td>Hamilton Military Museum</td>
<td></td>
</tr>
<tr>
<td>Royal Botanical Gardens</td>
<td></td>
</tr>
<tr>
<td>Trans-Canada Trail</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recreational Trail Design Opportunities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection from Cootes Drive to Osler Drive (Main Street West) and to McMaster University.</td>
<td></td>
</tr>
<tr>
<td>Connection from Longwood Road through Churchill Park to Sterling Street.</td>
<td></td>
</tr>
<tr>
<td>Connection from Macklin Street N. under Highway 403 through Kay Drage Park/ Cathedral Trail to Christ the King Cathedral.</td>
<td></td>
</tr>
<tr>
<td>Connection from Mountain Avenue and Hillcrest Avenue to Beckett Drive.</td>
<td></td>
</tr>
<tr>
<td>Connection beside Chedoke Municipal Golf Course along Beddoe Drive and Studholme Road.</td>
<td></td>
</tr>
<tr>
<td>Trail (bridge) connection over railway line connecting Locke Street to the Hamilton Harbour Waterfront Trail, south of Bayfront Park.</td>
<td></td>
</tr>
<tr>
<td>Connection through CN Yard (within City easement) to Stuart Street.</td>
<td></td>
</tr>
</tbody>
</table>

#### Ward 2: Downtown

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban ward situated in the centre of the city below the Niagara Escarpment</td>
<td></td>
</tr>
<tr>
<td>Smallest ward, and is located within the Hamilton Conservation Authority watershed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Built and Natural Features</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>City Hall</td>
<td></td>
</tr>
<tr>
<td>Jackson Square</td>
<td></td>
</tr>
<tr>
<td>Gore Park</td>
<td></td>
</tr>
<tr>
<td>Bayfront Park</td>
<td></td>
</tr>
<tr>
<td>Pier 4 Park</td>
<td></td>
</tr>
<tr>
<td>First Ontario Centre</td>
<td></td>
</tr>
<tr>
<td>Hamilton Farmer’s Market</td>
<td></td>
</tr>
<tr>
<td>Whitehern Historic House &amp; Garden</td>
<td></td>
</tr>
<tr>
<td>West Harbour GO Station</td>
<td></td>
</tr>
<tr>
<td>Recreational Trail Design Opportunities</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td></td>
</tr>
<tr>
<td>• Boulevard trail connection along southern side of Strachan Street between James Street and Ferguson Avenue. Portion of trail pending completion.</td>
<td></td>
</tr>
<tr>
<td>• Connection from Queen Street (Beckett Drive) to John Street S. crossing under James Mountain Road.</td>
<td></td>
</tr>
<tr>
<td>• Boulevard trail connection along Burlington Street from Bay Street (Pier 4 Park entrance) to Ferguson Avenue/ Eastwood Park.</td>
<td></td>
</tr>
<tr>
<td>• Connection from Hunter Street East to Escarpment Rail Trail</td>
<td></td>
</tr>
<tr>
<td>• Caroline Street North Connection through Central Park (Central Park Master Plan)</td>
<td></td>
</tr>
</tbody>
</table>

**Ward 3: Hamilton Centre**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Urban ward situated in the lower city below the Niagara Escarpment and east of Downtown</td>
</tr>
<tr>
<td>• Located within the Hamilton Conservation Authority watershed</td>
</tr>
<tr>
<td>• Approximately 1/3 of Ward is comprised of industrial and commercial land including U.S. Steel Canada and ArcelorMittal Dofasco</td>
</tr>
<tr>
<td>• The Escarpment Rail Trail is situated on the Niagara Escarpment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Built and Natural Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hamilton General Hospital</td>
</tr>
<tr>
<td>• Hamilton’s Children Museum</td>
</tr>
<tr>
<td>• St. Peter’s Hospital</td>
</tr>
<tr>
<td>• Tim Hortons Field</td>
</tr>
<tr>
<td>• Gage Park</td>
</tr>
<tr>
<td>• The Niagara Escarpment and Bruce Trail</td>
</tr>
<tr>
<td>• Trans-Canada Trail</td>
</tr>
<tr>
<td>• Industrial and Port facilities</td>
</tr>
<tr>
<td>• Rail infrastructure</td>
</tr>
<tr>
<td>• Compact residential fabric</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recreational Trail Design Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• On-road connection along Burlington Street from Ferguson Avenue and Eastwood Park to Gage Avenue.</td>
</tr>
<tr>
<td>• Boulevard trail connection along Ottawa Street S. from Lawrence Avenue trail connection to Pipeline Trailhead (parking lot at Main St. E. and Gage Park).</td>
</tr>
<tr>
<td>• Trail (bridge) connection over CN tracks with connection to Escarpment Rail Trail. Investigate alternative connection south of Gage Park.</td>
</tr>
</tbody>
</table>

**Ward 4: East Hamilton**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Urban ward situated in the lower city below the Niagara Escarpment</td>
</tr>
<tr>
<td>• Located within the Hamilton Conservation Authority watershed</td>
</tr>
<tr>
<td>• Almost ½ of Ward is comprised of industrial and commercial land including ArcelorMittal Dofasco</td>
</tr>
<tr>
<td>• The Escarpment Rail Trail and Red Hill Valley Trail border the Ward</td>
</tr>
</tbody>
</table>
### Built and Natural Features
- Hamilton Museum of Steam and Technology
- Centre on Barton
- Pipeline Trail
- The Niagara Escarpment and Bruce Trail
- Trans-Canada Trail
- Red Hill Valley
- Hamilton Harbour and Windermere Basin
- Industrial and Port facilities
- Rail infrastructure

### Recreational Trail Design Opportunities
- Connection from Woodward Avenue to Globe Park through the Museum of Steam and Technology and Red Hill Valley trails.
- Connection on hydro corridor from Barton Street to Lawrence Avenue with connection to Pipeline Trail.
- Connection from Barton Street to Museum of Steam and Technology (Proposed Pipeline Trail).
- On-road connection Roxborough Park along Glengrove Avenue to connect to future Red Hill Valley trail bridge.
- On-road connection along Burlington Street from Ottawa Street N. to Parkdale Avenue N.
- Upgrade existing Pipeline Trail from Main Street and Ottawa Street to Barton Street East and Strathearn Avenue

### Ward 5: Red Hill

#### Description
- Urban ward situated in the lower city below the Niagara Escarpment
- Located within the Hamilton Conservation Authority watershed
- Includes the beach strip up to the Canal Bridge and the ship canal which separates the cities of Hamilton and Burlington
- The Escarpment Rail Trail and Red Hill Valley Trail border the Ward

#### Built and Natural Features
- St. Joseph’s Community Health Centre
- Eastgate Square
- Confederation Park
- Beach Strip
- King’s Forest Public Golf Course
- Greenhill Valley
- Queen Elizabeth Way (QEW)
- Lincoln Alexander Parkway
- Red Hill Valley Parkway
- The Niagara Escarpment and Bruce Trail
- Trans-Canada Trail
- Breezeway Trail and the Great Lakes Waterfront Trail
- Numerous waterfalls
- Battlefield Creek and Stoney Creek Valley

#### Recreational Trail Design Opportunities
- Lake Avenue Park connection.
- Hydro corridor trail connection west of Cochrane Road to Greenhill Avenue, Rosedale Park and Kings Forest Golf Course.
- Connection along closed road allowance/boulevard from Bruce Trail to Battlefield Park and west to Greenhill Avenue.
- Trail (bridge) over Red Hill Valley Parkway connecting Eugene St. and Glengrove Avenue (Ward 4).
- On-road connection along Centennial Parkway from future GO Station (Confederation) to Confederation Park and westerly to Kenora Avenue.
- Connection through Sam Manson Park to Nash Road.
- Upgraded trail connection across Quigley Road south of King Street E.
- Connection at existing lift bridge to Great Lakes Waterfront Trail.
## Ward 6: East Mountain

### Description
- Urban ward situated in the east end of Hamilton Mountain on the Niagara Escarpment
- Located within the Hamilton Conservation Authority watershed
- Divided by the Lincoln Alexander Parkway and includes the interchange with the Red Hill Valley Parkway

### Built and Natural Features
- Mount Albion Conservation Area
- Mount Albion Falls
- Kimberly Stairs The Niagara Escarpment
- Mohawk Sports Park (Bernie Arbour Stadium)
- The Niagara Escarpment and Bruce Trail
- East Mountain Trail Loop
- Solomon Trail
- Mountain Brow Trail
- Chedoke Radial Recreational Trail
- Trans-Canada Trail
- Lincoln Alexander Parkway

### Recreational Trail Design Opportunities
- Boulevard trail connection along Stone Church Road to Albion Falls bridge over Red Hill Valley Parkway.
- Boulevard trail connection along Upper Ottawa Street from park corridor trails south of the Lincoln Alexander Parkway to Stone Church Road.
- Trail link from Pritchard Road to Eramosa Karst Conservation Area (Upper Mount Albion Road).
- Connection along Mountain Brow Blvd. from Mohawk Road E. to Limeridge Road.
- Connection from Mount Albion Pedestrian Bridge to redhill parking lot at terminus of Mud Street.

## Ward 7: Central Mountain

### Description
- Urban ward, situated in the centre of Hamilton Mountain on the Niagara Escarpment
- Located within the Hamilton and Niagara Peninsula Conservation Authorities watersheds
- Divided by the Lincoln Alexander Parkway

### Built and Natural Features
- Limeridge Mall
- Sackville Hill Senior’s Centre
- Sam Lawrence Park and Mountain Brow Park
- T.B. McQuesten Park
- Solomon Trail
- The Niagara Escarpment and Bruce Trail
- Juravinski General Hospital
- Lincoln Alexander Parkway
- Mount Hamilton Cemetery

### Recreational Trail Design Opportunities
- Connection along hydro corridor from Limeridge Mall to future hydro corridor trails in Ward 11.
- Boulevard trail connection along Rymal Road E. from Upper James Street W. to Upper Sherman Avenue.
- Trail connections (on-road and off-road) from Upper James Street through neighbourhoods and parks to connect to Billy Sherring Park.
### Ward 8: West Mountain

**Description**
- Urban ward, situated in the west end of Hamilton Mountain on the Niagara Escarpment
- Located within the Hamilton and Niagara Peninsula Conservation Authorities watersheds
- Divided by the Lincoln Alexander Parkway

**Built and Natural Features**
- Chedoke Radial Recreational Trail
- William Connell Park
- Mohawk College of Applied Arts and Technology
- Chedoke Hospital
- St. Joseph’s Healthcare Campus
- Lincoln Alexander Parkway
- The Niagara Escarpment and Bruce Trail
- Numerous waterfalls
- Portions of the Tiffany Creek and Twenty Mile Creek watershed

**Recreational Trail Design Opportunities**
- Trail connection from Tivoli Drive to Mohawk Road W. through Olympic Park.
- Connection from Garth Street through reservoir to William Connell Park trails.
- Connection from Upper James Street to William Connell Park.
- Boulevard trail upgrade along Fennel Avenue W. through Mohawk College and Hillfield Strathallan College campuses.

### Ward 9: Heritage Stoney Creek

**Description**
- Urban and rural ward that straddles the Niagara Escarpment and is situated in the east side of Hamilton
- Located within the Hamilton and Niagara Peninsula Conservation Authorities watersheds
- 1/5 of the Ward is located below the Escarpment

**Built and Natural Features**
- Town of Stoney Creek
- Battlefield House Museum and Park
- Heritage Green Sports Park
- Devil’s Punch Bowl Conservation Area
- The Niagara Escarpment and Bruce Trail
- Felker’s Falls Conservation Area
- Eramosa Karst Conservation Area

**Recreational Trail Design Opportunities**
- Trail link from Pritchard Rd. to Eramosa Karst Conservation Area (Upper Mount Albion Rd.).
- Connection from Mud Street W. to Green Mountain Road through the Heritage Green Sports Park.
- Trail link from escarpment and waterfalls to First Road W.
- Trail development from Heritage Green Sports Park to Echo Valley Drive.
- Upgrade to existing trail from Ridge Road to Mountain Avenue S.

### Ward 10: Stoney Creek

**Description**
- Urban ward situated below the Niagara Escarpment with an industrial and commercial corridor south of the QEW
- Located within the Hamilton Conservation Authority watershed
| Built and Natural Features | Mohawk College STARRT Institute  
|                           | Lake Ontario shoreline and Great Lakes Waterfront Trail  
|                           | The Niagara Escarpment and Bruce Trail  
|                           | Queen Elizabeth Way (QEW)  |
| Recreational Trail Design Opportunities | Boulevard trail connection along Dewitt Road from Ridge Road to Dundee Drive. Connection allows pedestrian access to the brow (two way cycling).  
|                                           | Connection from Millen Road to Third Private Road with cycling to Dewitt Road (two way cycling).  |

**Ward 11: Glanbrook, Saltfleet, Winona, Binbrook**

| Description | Primarily a rural ward with five pockets of urban development (Binbrook, Mount Hope, Twenty Road, Summit Park, and Winona)  
|             | Located within the Hamilton, Niagara Peninsula, and Grand River Conservation Authorities watersheds  
|             | Majority of Ward 11 is located on top of the Escarpment  |
| Built and Natural Features | Fifty Point Conservation Area  
|                           | Binbrook Conservation Area (NPCA) and Lake Niapenco  
|                           | Vinemont Conservation Area  
|                           | Chippewa Rail Trail (Trans-Canada Trail)  
|                           | Dofasco 2000 Trail  
|                           | John C. Munro Hamilton International Airport  
|                           | Queen Elizabeth Way (QEW)  
|                           | Lake Ontario shoreline and Great Lakes Waterfront Trail  
|                           | The Niagara Escarpment and Bruce Trail  |
| Recreational Trail Design Opportunities | Hydro corridor trail connection from Glancaster Road Chippewa Rail Trail.  
|                                           | Hydro corridor trail connection from Chippewa Rail Trail and Nebo Road to Fletcher Road.  
|                                           | Connection from Binbrook Road E. to Highway 56.  
|                                           | Boulevard trail connection along Ridge Road from Dewitt Road to Devil’s Pungbowl Conservation Area.  
|                                           | Barton Street Pedestrian Promenade development.  
|                                           | Connection from Jones Road to future Collector Road C.  
|                                           | Connection along Twenty Road from Glover Road to Trinity Church Road.  
|                                           | Connection along Upper James Street from hydro corridor trail north of Twenty Road W. to Chippewa Road E. (Greenbelt Route).  
|                                           | Connection from White Church Road to Airport Road W.  
|                                           | Connection along White Church Road from Upper James Street to Glancaster Road.  
|                                           | Connection from Fairgrounds Community Park to Binbrook Sports Complex with connections north to future development and south to Fletcher Road parkette.  
|                                           | Future connection from Summerlea West Park to Fletcher Road parkette.  
|                                           | Connection from Highway 56 to NCPA entrance.  
|                                           | Connection from Swayze Road to Cemetery Road along Highway 56.  |
### Ward 12: Ancaster

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Mix of urban and rural uses</td>
<td>• Located within the Hamilton, Niagara and Grand River Conservation Authorities watersheds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Built and Natural Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Redeemer University College</td>
</tr>
<tr>
<td>• Part of the Dundas Valley Conservation Area</td>
</tr>
<tr>
<td>• Iroquoia Heights Conservation Area</td>
</tr>
<tr>
<td>• Tiffany Falls Conservation Area</td>
</tr>
<tr>
<td>• Meadowlands Conservation Area</td>
</tr>
<tr>
<td>• Fieldcote Museum</td>
</tr>
<tr>
<td>• Ancaster Fairgrounds</td>
</tr>
<tr>
<td>• Ancaster village core</td>
</tr>
<tr>
<td>• Meadowlands Power Centre</td>
</tr>
<tr>
<td>• Ancaster Business Park</td>
</tr>
<tr>
<td>• Highway 403</td>
</tr>
<tr>
<td>• Lincoln Alexander Parkway</td>
</tr>
<tr>
<td>• The Niagara Escarpment and Bruce Trail</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recreational Trail Design Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Trail link connecting Filman Road along Bruce Trail and Filman Road Side Trail.</td>
</tr>
<tr>
<td>• Upgrade to on-street bike lane from Mohawk Road to Bruce Trail.</td>
</tr>
<tr>
<td>• Meadowlands Trail System from Highway 403 to Garner Road. Multiple sections to complete system, connect natural areas, stormwater ponds, neighbourhoods and future hydro trails.</td>
</tr>
<tr>
<td>• Meadowlands hydro corridor trail connection from Tiffany Creek to hydro corridor trails east of Southcote Road</td>
</tr>
<tr>
<td>• Boulevard Trail along Glancaster Road from Garner Road to Twenty Road</td>
</tr>
<tr>
<td>• Hydro corridor trail connection from Glancaster Road (east) to hydro corridor west of Trinity Road.</td>
</tr>
<tr>
<td>• Trail connection from Shaver Estates Park (Weldon Lane and Myers Lane) to Tollgate Drive.</td>
</tr>
<tr>
<td>• Trail connection from Shaver Estates Trail to Hamilton Drive.</td>
</tr>
<tr>
<td>• Trail connection from Hamilton Drive to Panabaker Drive.</td>
</tr>
<tr>
<td>• Connection west of Highway 6 from hydro corridor trails to White Church Road and Glancaster Road.</td>
</tr>
</tbody>
</table>

### Ward 13: Dundas

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Urban and rural ward</td>
<td>• Located within the Hamilton and Halton Conservation Authority watersheds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Built and Natural Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dundas Valley Conservation Area</td>
</tr>
<tr>
<td>• Borer’s Falls Conservation Area</td>
</tr>
<tr>
<td>• Historic village core of Dundas</td>
</tr>
<tr>
<td>• Large section of the Royal Botanical Gardens</td>
</tr>
<tr>
<td>• Cootes Paradise</td>
</tr>
<tr>
<td>• The Niagara Escarpment and Bruce Trail</td>
</tr>
<tr>
<td>• Hamilton-Brantford Rail Trail</td>
</tr>
</tbody>
</table>
### Recreational Trail Design Opportunities

- Connection from Governors Road east to Main Street Staircase and east to Thorpe Street.
- Connection from Osler Drive and Spencer Creek Trail east to Edwards Memorial Park.
- Upgrade to old rail bed and foot path from Bond Street to west end of Cascade Park.
- Dundas Valley Trail Link, Governor’s Road to King Street West. Upgraded or second trail adjacent to Bruce Trail.
- Connection through hydro corridor from Valley Road and York Blvd. to Valley Community Centre Park.
- Connection along Old Guelph Road from York Blvd. to Royal Botanical Gardens entrance.
- Upgrade existing path to formalize a connection from Highland Park Drive to Trans-Canada Trail through Sanctuary Park.
- Trail (bridge) connection over railway line from the Bruce Trail to Spencer Gorge Wilderness Area.

### Ward 14: Wentworth

#### Description
- Primarily a rural ward
- City’s largest ward
- Contains many small rural communities
- Located within the Hamilton, Halton and Grand River Conservation Authority watersheds

#### Built and Natural Features
- Hamilton-Brantford Rail Trail
- Lafarge 2000 trail
- Westfield Heritage Village
- African Lion Safari
- Christie Lake Conservation Area
- Crook’s Hollow Conservation Area
- Valens Conservation Area
- Spencer Gorge Conservation Area and waterfalls
- Beverly Swamp Conservation Area
- The Niagara Escarpment and Bruce Trail
- Highway 403
- Highway 5 and Highway 6
- Contains communities of Greensville, Lynden, Jerseyville, Freelton, Valens, Hayesland, Strabane, Westover, Kirkwall, Sheffield, Rockton, Troy and Copetown

#### Recreational Trail Design Opportunities
- Connection from Harvest Road parking lot to Highway 5.
- Connection from 10th Concession West east to Valens Road and Valens Reservoir.
- Cycling connection along west side of Highway 6 from Carlisle Road to Edgewood Road.
- Connection along Highway 8 from Concession 5 to Beverly Community Park.

### Ward 15: Flamborough

#### Description
- Mix of rural and urban
- Located within the Hamilton and Halton Conservation Authority watersheds
- Borders the City of Burlington
### Built and Natural Features

- Spencer Gorge/Webster's Falls Conservation Area and waterfalls
- Progreston waterfalls
- Mountsberg Conservation Area
- Borer’s Falls Conservation Area
- Dundas Peak
- Joe Sam’s Leisure Park
- Contains communities of Waterdown, Carlisle, Freelton, Millgrove, and Mountsberg
- Highway 5 and Highway 6
- The Niagara Escarpment and Bruce Trail

### Recreational Trail Design Opportunities

- Borer’s Creek trail connection from Highway 6 to Rock Chapel Golf Centre and through residential neighbourhoods to the east.
- Connection from Mosaic Drive northeast through future neighbourhoods to Centre Road.
- Connection from Borer’s Creek Trail to new communities planned to the north.
- Trail connection from hydro corridor to Parkside Drive to Robson Road.
- Loop trail through new community south of Highway 5 with connection to hydro corridor trails.
- Hydro corridor trail connection from Arrowhon Natural Area to Mountain Brow Road.
- Connection from King Road along Mount Brow Road.
- Connection from Fallswie Road E to Borer’s Fall Conservation Area parking lot along Rock Chapel Road.
- Connection from Northlawn Avenue to Parkside Drive.
- Connection from Chudleigh Street to Dundas Street E.
- Connection through future planned communities from Mosaic Drive to Highway 6.

*Figure 5: Asphalt trail along the Chedoke Radial Recreational Trail*

*Figure 6: Many trails in Hamilton are routed through scenic and natural areas*
### Table 3: Summary of 2007 Trail Initiatives

<table>
<thead>
<tr>
<th>Ward</th>
<th>Init.</th>
<th>Status</th>
<th>Trail Initiative Name</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ancaster Creek Trail</td>
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<tr>
<td>Ward 1</td>
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<td>Proposed Multi-Use Trail</td>
<td>Churchill Park Trail</td>
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<td>Proposed Multi-Use Trail</td>
<td>Removed - Unable to construct trail along water as per RBG recommendations</td>
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<td></td>
<td>3</td>
<td>Removed - Unable to construct trail along water</td>
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<td></td>
<td>4</td>
<td>Completed - York Blvd. Trail (Bike Route) Link</td>
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<td></td>
<td>5</td>
<td>Proposed Multi-use &amp; Upgraded Trail</td>
<td>Kay Drage Park Trail</td>
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<td>6</td>
<td>Proposed Multi-use Trail</td>
<td>Chedoke Rail Trail Extension</td>
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<td>7</td>
<td>Completed - Alignment follows Chedoke Rail Trail</td>
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<td>8</td>
<td>Proposed Multi-Use Trail</td>
<td>Beddoo Drive Link</td>
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<td>9</td>
<td>Completed - Longwood Road and Aberdeen Avenue Bike Route</td>
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<td>10</td>
<td>Completed - Victoria Park Link (2007)</td>
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<td>11</td>
<td>Completed - York Blvd. Road (Bike Route) Link</td>
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<td>Completed - Dundurn to Burlington Bike Route</td>
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<td>Completed - Barton Street to Dock Road Bike Route</td>
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<td>4</td>
<td>Proposed Upgraded Trail</td>
<td>Chedoke Rail Trail, Claremont Link</td>
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<td>Removed - Not required as initiative within 2015 Trail Master Plan Update</td>
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<td>Ward 3</td>
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<td>Proposed On-road Route</td>
<td>Burlington Street Link</td>
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<td>Status</td>
<td>Trail Initiative Name</td>
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<td>4</td>
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<td>Removed - Trail connection not feasible</td>
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<td>Completed - Windermere Basin Loop</td>
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<td>2</td>
<td>Completed - Woodward Avenue Connector (Bike Route)</td>
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<td>Proposed Multi-Use Trail</td>
<td>Museum of Steam and Technology Link</td>
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<td>Hydro Corridor, Barton Street to Lawrence Avenue</td>
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<td>Removed - No improvements required to existing natural footpath</td>
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<td>Completed - QEW/ Van Wagners Beach Road Link</td>
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<td>Glenburn Court-Battlefield Creek Trail</td>
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<td>Removed - Not required as initiative within 2015 Trail Master Plan Update</td>
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<td>Proposed Multi-Use Trail</td>
<td>Hydro Corridor, Lawrence Avenue to Greenhill Avenue</td>
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<td>Removed - No improvements to existing natural footpath</td>
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<td>Completed - Arbour and Anchor Road Trails (2012 - 2014)</td>
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<td>Proposed On-road Route</td>
<td>Mud Street, Mountain Brow Boulevard</td>
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<td>Completed - Mount Albion Trail Extension (2006)</td>
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<td>Proposed Blvd. Trail</td>
<td>Upper Ottawa Street, Stone Church Road Link</td>
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<td>No Existing Trail Initiatives were planned within Ward 7</td>
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<td>Removed - Unnecessary trail connection through Mohawk College/St. Joseph Healthcare property</td>
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<td>Proposed Multi-Use Trail</td>
<td>Olympic Park, Twin Pad Arena Link</td>
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<td>Completed - West Fifth St, Tyrone Dr. to Brantdale Ave. (Bike Route)</td>
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<td>4</td>
<td>Removed - Boulevard trail connection no longer required due to planned cycling lane infrastructure along Rymal Road W</td>
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<td>Trail Initiative Name</td>
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<td>Ward 8</td>
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<td>Proposed Multi-Use Trail</td>
<td>William Connell Park Link</td>
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<td>Ward 9</td>
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<td>Proposed Blvd. Trail</td>
<td>Valley Park Link</td>
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<td>Proposed Multi-Use Trail</td>
<td>Heritage Green Link</td>
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<td>Proposed Multi-Use Trail</td>
<td>First Road West Link</td>
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<td>Completed - Escarpment/ Felkers Link (East Mountain Trail Loop)</td>
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<td>Completed - Frances Avenue Link (Bike Route)</td>
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<td>Completed - North Service Road Link (Bike Route)</td>
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<td>Completed - Lakeview Drive Link (Bike Route)</td>
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<td>Completed - North Service Road Link (Bike Route), Jones to McNeilly</td>
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<td>Completed - North Service Road Link (Bike Route), McNeilly to Winona</td>
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<td>Completed - Baseline Road Link (Bike Route), Winona to Fifty Road</td>
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<td>Completed - North Service Road Link (Bike Route), Fifty to Baseline</td>
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<td>Completed - Baseline Road, North Service Road to Fifty Point</td>
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<td>6</td>
<td>Removed - Not required as initiative within 2015 Trail Master Plan Update and trail is no longer within Cycling MP</td>
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<td>Ward 11</td>
<td>7</td>
<td>Proposed Multi-Use Trail</td>
<td>Hydro Corridor, Glancaster Road to Chippewa Rail Trail</td>
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<td>Proposed Multi-Use Trail</td>
<td>Hydro Corridor, Chippewa Rail Trail to Fletcher Road</td>
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<td></td>
<td>9</td>
<td>Removed - Future hydro corridor connection not high priority for development within City</td>
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<td>Proposed On-road Route</td>
<td>Binbrook Road-Highway 56 Link</td>
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<td>11</td>
<td>Removed - Future hydro corridor connection not high priority for development within City</td>
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<tr>
<td>Ward 12</td>
<td>1</td>
<td>Removed - trail maintained by HCA and not on City of Hamilton property</td>
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<td>Proposed Multi-Use Trail</td>
<td>Filman Road Link - North Segment</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Removed - trail not on City of Hamilton property</td>
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<tr>
<td></td>
<td>4</td>
<td>Removed - trail access was removed therefore no trail access upgrade is required.</td>
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<tr>
<td>Ward</td>
<td>Init.</td>
<td>Status</td>
<td>Trail Initiative Name</td>
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<td></td>
<td>Proposed On-road Route</td>
<td>Filman Road Link - South Segment</td>
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<tr>
<td>6</td>
<td></td>
<td>Completed - Wilson Street Link (Bike Route)</td>
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<td>Proposed Multi-Use Trail</td>
<td>Meadowlands Trail System Link</td>
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<td>Proposed Multi-Use Trail</td>
<td>Meadowlands Hydro Corridor Link</td>
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<td></td>
<td>Proposed Blvd. Trail</td>
<td>Glancaster Road Link</td>
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<td></td>
<td>Proposed Multi-Use Trail</td>
<td>Hydro Corridor, Trinity Road to Glancaster Road</td>
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<tr>
<td></td>
<td>1</td>
<td></td>
<td>Removed - Not feasible within RBG lands and removed at their request</td>
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<td></td>
<td>2</td>
<td>Proposed Multi-use &amp; Upgraded Trail</td>
<td>Spencer Creek, Main Street and Thorpe Street Link</td>
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<tr>
<td></td>
<td>3</td>
<td></td>
<td>Completed - Governor’s Road (Bike Route)</td>
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<tr>
<td></td>
<td>4</td>
<td>Proposed Multi-Use Trail</td>
<td>Spencer Creek, Mercer Street and Governor’s Road Link</td>
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<td></td>
<td>5</td>
<td>Proposed Multi-use &amp; Upgraded Trail</td>
<td>Cascade Trail Link</td>
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<td></td>
<td>6</td>
<td>Proposed Foot Path</td>
<td>Dundas Valley Link</td>
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<td></td>
<td>Proposed Multi-Use Trail</td>
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<td></td>
<td>2</td>
<td></td>
<td>Removed - Future hydro corridor connection not high priority for development within City</td>
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<td>3</td>
<td></td>
<td>Removed - Future hydro corridor connection not high priority for development within City</td>
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<td>4</td>
<td>Proposed Multi-Use Trail</td>
<td>10th Concession West, Valens Link</td>
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<td></td>
<td>5</td>
<td></td>
<td>Completed - Middletown Road/ Safari Road to Strabane (Bike Route)</td>
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<td></td>
<td>1</td>
<td>Proposed Multi-Use Trail</td>
<td>Borer’s Creek Trail Link</td>
</tr>
</tbody>
</table>
Ward Init. Status Trail Initiative Name
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Ward 15
2 Proposed Multi-Use Trail Flamborough YMCA Trail Link
3 Proposed Multi-Use Trail Waterdown Pipeline Trail Link
4 Completed - Trail alignment on the north end of Joe Sam’s Park along Concession 5 E is not required.
5 Proposed Multi-Use Trail Parkside Drive-Robson Link
6 Proposed Multi-Use Trail Kerns Road-Waterdown South Link
7 Proposed Multi-Use Trail Highway 5-Mountain Brow Link
8 Completed - Main Street Link (Bike Route)
9 Removed - Not required as initiative within 2015 Trail Master Plan Update
10 Completed - Carlisle Trail Loop (Bike Route)
11 Completed - Campbellville Road Link (Bike Route)

**c) Proposed 2015 Trail Initiatives**

The online survey identified trail linkages and connectivity as a high community priority. Trail connectivity strategies within the City of Hamilton should focus on removing previously identified gaps, overcoming barriers, and providing trail linkages to existing neighbourhoods and newly planned communities. An integrated loop trail system has the potential to be a valued community asset in addition to economic promotion.

The management and maintenance of trails is a large commitment and undertaking, however can arguably be the most important aspect of trail development. An improved comprehensive inventory of trails that describe in greater detail the length, difficulty, level of accessibility could be clearly identified and marked on trail route signage. Continued development of improved guidelines and policies for trail management that address innovative development methods, context sensitive solutions, trail safety, and strict development regulations in natural areas is on-going. The table below summarizes all 55 proposed trail initiatives, location, and trail amenity recommendations.

<table>
<thead>
<tr>
<th>Table 4: Summary of 2015 Trail Initiatives</th>
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<tbody>
<tr>
<td>Ward</td>
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<tr>
<td>Ward 1</td>
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2.3 Trail Design Construction Considerations

A trail network travels through a variety of landscapes and offers a range of physical challenges, good wayfinding techniques, accessible options, connectivity, and has supporting facilities and services. Trail design and maintenance directly impact the decisions of a user to return and utilize the trail network. Better quality trail design and construction will attract users and alleviate long-term maintenance measures.

Trail users vary widely in terms of age and physical ability, and expectations of what the trail experience should be. A cohesive, innovative, and high quality trail is a strong community asset where user experience, enjoyment, and safety are maximized.

2.3.1 How to Use the Trail Guidelines

The following trail development and maintenance guidelines are intended to apply to City-owned multi-use recreation trails. These guidelines have been developed to assist with making informed decisions about trail design and implementation. The guidelines provide general information about trail users needs and abilities. Summary tables have been included to highlight key design recommendations and considerations in addressing features associated with various trail types.

The standard recommendation typically aims to achieve trail design standards that illustrate acceptable conditions based on widths, accessibility, safety, and maintenance. Trail standards may change based on site-specific locations and conditions.

Figure 7: Asphalt trail in the T.B. McQuesten Community Park
The information presented within these guidelines is based on currently accepted trail design practices (Trails for All Ontarians Collaborative, 2006) and experience gained during initial years of trail implementation. The guidelines are not intended to be prescriptive but rather should be treated as a reference to be consulted during the planning, development, and construction of each individual project. The guidelines do not include all trail design standards for all locations, nor should they replace sound engineering judgment. Multi-use recreation trails connected to or through City parks are intended to utilize the applicable trail style and standard. These guidelines are not meant to be detailed solutions to site-specific problem areas. Specific and detailed site inventory should be undertaken as part of the analysis for any trail development within the City. Where trails are operated by a Hamilton trails partner, the standards applied will be those developed and approved by that external partner; however, the partner will be encouraged to utilize the appropriate City standards to ensure integration of both systems.

2.3.2 Trail Users and Needs

Based on the online survey data from the public consultation process, trails in the City of Hamilton are primarily used for hiking (40.74%), and walking and jogging (41.40%). Trail user characteristics and preferences are critical in the development and implementation of the trail network. Within the City the potential trail users can include pedestrians, cyclists, in-line skaters, and users with mobility aids. This plan recognizes that many users with mobility assisted devices utilize trails where surface types and grades permit. The design and trail classification in this plan considers and provides opportunities for these user groups. The following sections briefly describe each user, their typical use of trails, and the general trail design parameters that should be considered. Based on the survey data, cyclists and pedestrians walking and jogging constitute approximately 68.4% of all urban trail users in Hamilton.

a) Pedestrians

Pedestrians are generally divided into sub-categories such as:

• Walkers;
• Hikers;
• Joggers and Runners.

Walkers

Walking is typically enjoyed by a wide range of individuals of all levels of physical activity and health. Walkers represent a variety of interests and motives including leisure, relaxing, socializing, exploring, connecting with nature, meditation, fitness, or dog walking. 85% of Canadians walk for leisure and recreational reasons. 82% of Canadians confirmed that they would ideally like to walk more often than they currently do (Health Canada, 1998). Trails can provide Canadians of all ages with this opportunity.

The ACTIVE2010 Strategy (2005) recommends that all adult Ontarians walk a minimum of 30 minutes daily or participate in some other equivalent activity. A 2001 study found that 28% of Ontarians cited a lack of pleasant places to walk or bicycle as a barrier to participation in physical activity (Canadian Fitness and Lifestyle Research Institute, 2001). The top five reasons for walking as a mode of transportation in Canada are (Health Canada, 1998):

• exercise and health (62%)
• pleasure (30%)
• practicality and convenience (24%)
• environmental concern (10%)
• saving money (9%)

In addition to using sidewalks, parking lots and urban plazas, the utilitarian walker typically will use trails that are convenient, well designed, and properly maintained. Where no sidewalks are provided and there are no road shoulders, the Ontario Highway Traffic Act allows pedestrians to walk on the edge of the roadway, facing oncoming traffic (Ontario Highway Traffic Act, 1990).

Walking trails need to consider users who may have sensory, cognitive or ambulatory difficulties, as well as:

• Walkers with baby strollers;
• Walking aids (e.g. medical scooters etc.);
• Walking as rehabilitation or therapy;
• Walking in pairs or groups (e.g. school groups, nature walks);
• Walking for utilitarian or transportation purposes; and
• Expect more amenities (e.g. benches, etc.).
**Hikers**
Hikers may challenge themselves to cover longer distances. They may also walk on shoulder sections of rural roadways, which are considered less safe and less interesting to the majority of leisure walkers. Hikers may utilize trails for:
- Day trips that range from several kilometres in length;
- More interested in the natural environment;
- More skilled at navigation;
- Self-sufficient and expect fewer trail amenities (e.g. benches, rest nodes); and
- Typically more attracted to challenging terrain and rural areas.

**Joggers and Runners**
Sharing more profile characteristics with distance hikers than with leisure walkers, runners and joggers’ primary trail use motives are fitness and exercise. Their use of on-road and off-road trails is typically distance-orientated (e.g. jog for 5km, 10km, 15km, etc.) and they tend to use trails at higher speeds than leisure walkers and hikers.

**b) Cyclists**
The City of Hamilton cycling network includes dedicated bicycle lanes, cautionary on-road bicycle routes, multi-use paths, and on-road routes. Hamilton’s Cycling Master Plan report (2009) discusses efforts to link on-road cycling routes with the off-road trail network stating that cyclists utilize both off-road trails and on-road facilities depending on their intended origin and destination. However, when cyclists use or cross a public roadway they are considered vehicles by law and are expected to follow the same traffic laws as motorized vehicles (Ontario Highway Traffic Act, 1990) and it should be noted that cycling on sidewalks is illegal in Hamilton.

The mechanical efficiency of bicycles allows users of all ages to significantly increase their travel speed and distance, allowing them to experience trail corridors differently. Road bikes are built to perform differently than mountain bikes; as such, the trail conditions and standards for both types of bikes differ. Mountain bikes can more easily navigate stonedust surfaces and natural ground trails, where road bikes typically require asphalt trails or pavements. Fitness levels and motivation of the individual cyclist vary as well. Although cyclists have the right to access the extensive existing public roadway system, with the exception of QEW, Highway 403, Lincoln Alexander Parkway, and the Red Hill Valley Parkway, many inexperienced cyclists feel unsafe sharing the road with automobiles (Hamilton Transportation Master Plan, 2007). In Hamilton, cycling mode shares are much higher in Downtown than in the lower density suburban areas for utility walking and cycling trips (Hamilton Transportation Master Plan, 2007).

c) **In-Line Skaters, Skateboarders, and Non-motorized Scooters**
Not all trails in Hamilton are intended to accommodate in-line skating, skateboarding, and non-motorized scooters. In-line skaters and skateboarders prefer smooth, hard surfaces, and dislike loose sand, gravel, fallen branches, and puddles as these can be significant hazards. Although skateboarders and non-motorized scooter users can quickly become pedestrians by dismounting, they too are vulnerable to significant grade changes and require considerable maneuvering space.

d) **Wheelchairs (Motorized and Non-motorized)**
The Accessibility for Ontarians with Disabilities Act (AODA) is proposing many changes in order to improve accessibility for persons with a disability, including access to trails. Community members may rely on motorized and non-motorized wheelchairs. The ability of a wheelchair to negotiate a trail will depend upon both the type of trail, and existing terrain, and wheelchair. Where terrain allows accessible trails are to be developed, there may be a need to obtain input from stakeholders to determine the trail surface and width required prior to implementation.

e) **All-Terrain Vehicles, Dirt Bikes, and Snowmobiles**
All-Terrain Vehicles (ATV), dirt bikes, and snowmobiles are recreational vehicles that are used year-round. More than 100,000 snowmobiles access the Ontario Federation of Snowmobile Clubs’ trail network each season (Ontario Federation of Snowmobile Clubs, 2005) and the Ontario Federation of All-Terrain Vehicle Clubs has 10 clubs, 6 chapters and over 2,100 km of mapped trails across Ontario (The Ontario Federation of All-Terrain Vehicle Clubs, 2005). Although the trails survey demonstrated results
that users would like ATV trails built, it should be noted that ATV’s, dirt bikes, snowmobiles, and motorized vehicles that are not for accessibility purposes are prohibited from travelling along municipal roads and trails within the urban portion of the City of Hamilton. Secondly, there are certain risks associated with riding ATV’s, dirt bikes, snowmobiles, and motorized vehicles, if municipal by-laws are not respected and safety precautions are ignored. Disobeying the municipal by-law could potentially cause harm to pedestrians if they encounter a motorized vehicle while using the trail.

2.3.3 General Trail Design Parameters

Careful consideration should be given to the physical, aesthetic, and environmental protection requirements for each trail type in the network. In many instances the physical design criteria related to operating space, design speed, stopping distance, alignment and clear zones are often governed by the needs of the fastest or most common user group on the trail network. Stopping sight distances for trails are typically governed by the distance required for cyclists since pedestrians can typically stop almost immediately regardless of trail configuration.

Trail user operating space is a measurement of user horizontal space required and often includes additional distances to the trail surface - commonly known as clear zones. Table 5 describes optimal operating spaces for different trail uses and is based on the recreation trail design standards and guidelines for the Trans-Canada Trail (2006).

<table>
<thead>
<tr>
<th>Trail User Type</th>
<th>Recommended Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>One way travel (two pedestrians)</td>
<td>1.8m</td>
</tr>
<tr>
<td>One way travel (one cyclist)</td>
<td>1.2m</td>
</tr>
<tr>
<td>Two way travel (two pedestrians)</td>
<td>2.4m</td>
</tr>
<tr>
<td>Two way travel (two cyclists)</td>
<td>3.0m</td>
</tr>
</tbody>
</table>

2.4 Accessibility and AODA Requirements

The Accessibility for Ontarians with Disabilities Act (Government of Ontario, 2005) states that “the people of Ontario support the right of persons of all ages with disabilities to enjoy equal opportunity and to participate fully in the life of the province.” The stated goal of the AODA is “to make Ontario accessible for people with disabilities by 2025”. Approximately one in eight Canadians suffer from some type of physical disability. Mobility, agility, and pain-related disabilities are by far the most common types, each accounting for approximately 10% of reported disabilities nationally (Social Development Canada, 2010). Disability increases with age: from 3.3% among children, to 9.9% among working-age adults (15 to 64), and 31.2% among seniors 65 to 74 years of age. Disability rates are highest among older seniors (75 and over), with fully 53.3% in this age group reporting a disability (Social Development Canada, 2010).

Within the AODA, Bills 118 and Bill 125 recognize the need to provide for accessibility standards, improve opportunities and facilitate the removal of barriers in order to enable persons with disabilities to fully participate in the life of the province (Government of Ontario, 2005). The Accessibility Standards for the Built Environment and the Integrated Accessibility Standards (O. Reg. 191/11) are standards that apply to new trail development. The intent is to help remove barriers in buildings and outdoor spaces for people with disabilities. The standard applies to new construction and extensive renovation. The guidelines and criteria set out in these documents apply to the development of recreational multi-use trails and sidewalk facilities, but are not mandatory for the design of on-road cycling facilities.

AODA criteria which must be considered include: operational experience, width, longitudinal or running slope, cross slope, total slope, surface, changes in ground level and signage. When designing and implementing trail facilities, reference to the guidelines outlined in the Integrated Accessibility Standards is recommended. Referring to these standards will ensure all user groups needs are accommodated and satisfy the requirements of the AODA to the greatest extent possible, given the context of each trail’s location,
the surrounding environment and trail type experience desired. Sections 80.6, 80.8, and 80.9 of the Integrated Accessibility Standards provide technical requirements for recreational trails, which includes:

- Minimum clear width 1.0m
- Minimum head room clearance of 2.1m above trail
- Surfaces are to be firm and stable
- Maximum longitudinal slope of 10%
- Maximum cross slope of 2%
- High tonal or textural changes to distinguish edges
- Standards also address changes in ground level, openings in the surface, edge protection (e.g. near water); and
- Signage shall be easily understood and detectable by users of all abilities. It is important to ensure that signage, mapping, and messaging clearly communicates accessible trails, enabling users to make informed personal decision about which pathways to use.

Trails for All Ontarians Collaborative (2006) provides an in depth discussion of the application of Universal Trail Design principles. Universal Trail Design is a concept that takes into consideration the abilities, needs, and interests of the widest range of possible users. It requires planning and developing a range of facilities that can be experienced by a diversity of users of all abilities. Principles of Universal Trail Design can be summarized as follows:

- Equitable use: provide opportunity for trail users to access, share and experience the same sections of trail rather than offering separate facilities;
- Flexibility in use: provide different trail user options to accommodate for a variety of user experiences;
- Simple, intuitive, and perceptible information: whether conveying trail information through signage, maps or a web site, communicate using simple, straightforward forms and formats with uncomplicated graphics and/or text;
- Tolerance for error: design trails and information systems to minimize exposure to hazards, and indicate potential risks or challenges that may be encountered by users;
- Low physical effort: trails may provide for challenge but should not exceed the abilities of the intended users; where appropriate, rest areas should be made available; and
- Size and space for approach and use: trails and amenities should provide trouble free access, comfort and be user friendly.

Trails should be designed to be accessible to all levels of ability, where possible and practical. It must be recognized however, that not all trails throughout the system can be fully accessible. Steep slopes are one of the most significant barriers for individuals with physical disabilities. Designing trails to be within the threshold (5%) for universal access will not only overcome this barrier but it will also help to reduce potential trail surface erosion.

The following recommended by the Trails for All Ontarians Collaborative (2006) are some additional considerations for making new and existing trails accessible:

- Designers should consult current municipal standards available;
- Where trails require an accessibility solution that is above and beyond what is normally encountered, the City of Hamilton’s Access and Equity Committee should be consulted early on in the process to determine the practicality and desirability of designing a fully accessible trail;
- Should a fully accessible trail be appropriate, the accessibility representative must be consulted during the detailed design process to ensure a suitable design is developed. Where a fully accessible trail is not achievable the accessibility representative must be consulted to confirm a suitable alternative; and
- Work collaboratively with the City of Hamilton’s Access and Equity Committee to consider developing signage that clearly indicates trail accessibility conditions, that allows users with mobility-assisted devices to make informed decisions about using a particular trail prior to traveling on it.

City of Hamilton Barrier-Free Design Guidelines (Version 1.1, 2006)
The City of Hamilton has historically been proactive in accommodating the needs of persons with disabilities. In 2001, the Province
of Ontario passed the Ontarians with Disabilities Act (AODA) with a new piece of legislation enacted to address accessibility issues in 2005. The AODA defines a barrier as: “ anything that prevents a person with a disability from fully participating in all aspects of society because of his or her disability, including a physical barrier, an architectural barrier, an informational or communications barrier, an attitudinal barrier, a technological barrier, a policy or practice; (obstacle).”

In response to the AODA the City of Hamilton established the Advisory Committee for Persons with Disabilities. The Committee recommended that the City's Barrier-Free Design Guidelines be updated. Recognizing that the Guidelines are almost 10 years old, and that augmentative and support equipment for persons with disabilities has changed over that timeframe. The Hamilton Guidelines identify barriers and obstacles, and presents design requirements that, consistent with the Ontario Building Code (O.B.C. 1997), should be considered as a minimum requirement for all City of Hamilton projects.

2.5 Personal Security and CPTED

Principles of Crime Prevention through Environmental Design (CPTED) should be applied to help address trail use security issues, particularly in locations that are: infrequently used, isolated, or have previously encountered security issues. To the extent possible, trails should be designed to allow users to feel comfortable, safe, and secure. Several design aspects that take into account CPTED principles when designing and implementing trails are (Crowe, 2002):

- The user should have the ability to obtain help when using trails. Signs should inform users of where they are along the trails system and include local emergency contact information for fire, police, and ambulance services;
- Good visibility for natural surveillance by other people and trail users by locating routes through well-used, lit public spaces;
- Provide escape routes from isolated areas at regular intervals;
- Design adequate sight lines and sight distances for users;
- Provide trailhead parking and transit access in highly visible areas;
- Minimize routing of trails close to woodlot edges, water features, dams, and places where danger typical occurs;
- Design underpasses and bridges so that users can see the end of the features as well as the areas beyond; and
- Place caution signage if dangerous and isolated areas are unavoidable and indicate those areas on overall and individual trail signage mapping.

<table>
<thead>
<tr>
<th>Table 6: CPTED Principles</th>
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</thead>
<tbody>
<tr>
<td>The four main underlying principles of CPTED are (Crowe, 2002):</td>
</tr>
<tr>
<td>1. Natural Access Control</td>
</tr>
<tr>
<td>2. Natural Surveillance</td>
</tr>
<tr>
<td>3. Territorial Reinforcement</td>
</tr>
<tr>
<td>4. Maintenance</td>
</tr>
</tbody>
</table>

2.6 Trail Lighting and Trail Safety

The National Bicycle and Pedestrian Clearinghouse (1996) found that numerous studies have clearly documented that trails do not contribute to an increase in crime and vandalism. If anything, because most trails area populated with happy users and managed by public agencies, they are generally safer and cleaner than the corridor prior to development.

Where applicable, trail lighting on high-use trails and stairs has been utilized. Lighting placement is subject to level of service, location, and risk management. Trail lighting is often an expensive and somewhat controversial trail development subject. Very few municipalities make the decision to light their entire trail system for numerous reasons which include:

- Installation costs;
- Scale and scope of lighting a specific route;
- Location of power supplies in remote areas along the trail network;
- Staffing time and material cost to properly monitor and maintain lamp fixtures and replace broken and burned out bulbs on a regular basis;
- Vandalism;
- Energy consumption;
- Perceived safety and CPTED principles;
• ‘Dark sky’ concerns and excessive light pollution, especially in those areas that are residential and adjacent to natural areas;
• Potential detrimental effects on flora and fauna, especially light pollution in natural areas such as woodlots; and
• Human eye inability to adapt to high contrasts resulting from brightly lit and dark shadowed areas adjacent to one another.

Lighting the entire trail system is not recommended, however there may be certain locations where lighting attractions and facilities (e.g. major parks or heavily used routes to major destinations) might extend use and enjoyment. Trail lighting along a route needs to be made on a site-specific basis.

An option for reducing lighting costs is to use solar powered and LED lighting. Solar and LED lighting solutions can increase safety and security while providing an environmentally responsible option with minimal natural environment disruption. Solar lighting can also eliminate the cost of running electrical wire from nearby transformers and eliminates the destruction caused by digging trenches for underground wiring, where possible.

2.7 Trail Hierarchy and Surfacing
This Recreational Trails Master Plan discusses three (3) main classes of off-road multi-use recreational trails within the City network hierarchy. The City’s Cycling Master Plan addresses all on-road cycling routes. Some multi-use trails along street right-of-ways exist and more are planned. They are identified herein, but are implemented as traffic projects. Table 7 discusses the three main classes of trails in Hamilton as well as their characteristics.
### Table 7: Trail Hierarchy and Surfacing

#### 1. TYPE 1, CLASS A – Multi-Use Recreation Trail

| Description and Connectivity | • City-wide functions and important transportation and commuter routes connecting communities, neighbourhoods, parks, community facilities, commercial sites, institutions and residential areas  
• 4-season potential transportation corridor with opportunities for significant connectivity through the City  
• Provide access to major destinations throughout the City  
• Some connect to surrounding municipalities |
| Typical Location | • Ideally located outside of the road right-of-way in continuous linear corridors  
• Can be located within the road right-of-way |
| Design Characteristics | • Trail width of 5.0m - 6.0m  
• Asphalt surfaces  
• Accommodates two-way traffic  
• Designed to meet or exceed minimum accessibility requirements  
• Preferred 4-season maintenance for year-round walking, cycling, transportation and recreational uses  
• Typically designed to highest standards relative to other trail hierarchy types to accommodate high use volumes, destination-oriented traffic, widest range of use abilities and important links to major community facilities  
• Year-round connections between areas of housing, employment, transit, commercial services, retail, community facilities and other destinations  
• Supports pedestrian convenience and walkability and a range of active transportation opportunities |
| Hamilton Examples | • Great Lakes Waterfront Trail  
• Hamilton Harbour Waterfront Trail  
• Cootes Drive Trail  
• Glenside Trail |

#### 2. TYPE 1 & 2, CLASS B – Multi-Use Recreation Trail

| Description and Connectivity | • City-wide function and available as a transportation route during the spring, summer and fall seasons and possibly winter  
• Local routes within City-owned parkland between points of interest and neighbourhood park facilities  
• Maintenance access routes within parks and around storm water management ponds |
| Typical Location | • Ideally located outside of the road right-of-way in continuous linear corridors (off-road)  
• Within City-owned parkland  
• Some locations, particularly in developed neighbourhoods, they provide short connections between off-road segments  
• On urban arterial, collector or rural roads where there is ample right of way between the edge of the road (curb for urban cross section and shoulder for rural cross section) and the limit of the right of way to maintain a minimum separation between the road and the trail (boulevard multi-use pathways) |
| Design Characteristics | • Typically 3.0m - 4.0m wide  
  • Trail surface can be compacted granular or asphalt. Hard surfaces will be situation dependent  
  • Site-specific locations may be boardwalk or other (e.g. tar and chip) to respond to site conditions  
  • Accommodates two-way traffic volumes  
  • Generally maintained for 3-season use; winter maintenance should be considered for school routes  
  • Meets minimum accessibility requirements whenever possible. Uses may be limited by the nature of the trail location, trail alignment, width and surface type.  
  • Designed for moderate to high volume usage and wide range of users |

| Hamilton Examples | • East Mountain Trail Loop  
  • Red Hill Valley Trail  
  • Chedoke Radial Recreational Trail |

<table>
<thead>
<tr>
<th>3. TYPE 3, CLASS C – Recreation Trail</th>
</tr>
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</table>

| Description and Connectivity | • Trails designed for recreational purposes that may include the use of private and public lands  
  • Created by the City or volunteer group that has an established arrangement with the City where the trail is on public land, or with the land owner where the trail is located on private land |

| Typical Location | • Established woodlots  
  • Natural areas  
  • Typically not connected to Class A or Class B trails |

| Design Characteristics | • Width will vary, but typically 1.0m - 2.0m depending on location  
  • Natural earth/native soil surface; some locations they require a granular surface or boardwalk  
  • Accommodate two-way travel with maneuvering required  
  • Provide limited access, with no special accommodations made for specific user groups (e.g. bicycles, strollers, mobility-assisted devices)  
  • Minimal maintenance (dictated by municipal by-laws, natural area management plan, etc.)  
  • Typically does not meet minimum accessibility requirements |

| Hamilton Examples | • Valley Inn Road trail  
  • Jackson Heights Park trail |
The Bruce Trail through Hamilton is an excellent example of a natural surface trail (Class C).
Several options for trail surface materials exist, each with its set of advantages and disadvantages, relating cost, availability, efficiency of installation, seasonal accommodation, maintenance requirements, and compatibility with various trail users groups. Table 8 illustrates the most commonly used trail surfacing materials along with some advantages and disadvantages. No single trail surface material is appropriate in all locations. Material selection during the design stage must be considered on a site-specific basis, location, and anticipated user group. Within Hamilton and surrounding municipalities, asphalt is the most commonly used hard surface trail material with stonedust the most extensively accepted granular surface.

<table>
<thead>
<tr>
<th>Trail Type</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asphalt</strong></td>
<td>• Smooth, consistent surface</td>
<td>• Moderate-high installations costs</td>
</tr>
<tr>
<td></td>
<td>• Adapts well to surrounding grades</td>
<td>• Full base excavation required that can potentially harm tree roots</td>
</tr>
<tr>
<td></td>
<td>• Easily negotiated by a wide range of trail user groups</td>
<td>• 15-20 years typical lifespan depending on installation quality</td>
</tr>
<tr>
<td></td>
<td>• Relatively easy installation by skilled trades</td>
<td>• Improper base preparation can often lead to long-term maintenance problems</td>
</tr>
<tr>
<td></td>
<td>• Easy and durable for winter maintenance</td>
<td>• Cracking can occur near the edges. Grass and weeds can invade cracks and speed deterioration</td>
</tr>
<tr>
<td><strong>Stonedust and Limestone Screenings:</strong></td>
<td>• Mixture of fine particles and small diameter crushed stones</td>
<td>• Full base excavation required that can potentially harm tree roots</td>
</tr>
<tr>
<td></td>
<td>• Levels and compacts very well and creates a smooth surface that accommodates a wide variety of trail users</td>
<td>• Considered moderately permeable surface</td>
</tr>
<tr>
<td></td>
<td>• Easy to spread and re-grade when surface deformities develop</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Inexpensive</td>
<td></td>
</tr>
<tr>
<td><strong>Pit Run:</strong></td>
<td>• Mixed granular material containing a wide range of particle sizes from sand to cobbles</td>
<td>• Not recommended or appropriate for trail surfacing as it creates an unstable surface and does not meet AODA requirements.</td>
</tr>
<tr>
<td></td>
<td>• Excellent for creating a strong sub base</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Relatively inexpensive</td>
<td></td>
</tr>
<tr>
<td><strong>Granular ‘B’:</strong></td>
<td>• Similar characteristics to Pit Run</td>
<td>• Not recommended or appropriate for trail surfacing in an urban environment to meet AODA requirements.</td>
</tr>
<tr>
<td></td>
<td>• Regulated particle sizes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Excellent for creating strong, stable and well drained sub-bases and bases</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Relatively inexpensive</td>
<td></td>
</tr>
<tr>
<td>Trail Type</td>
<td>Advantages</td>
<td>Disadvantages</td>
</tr>
<tr>
<td>-----------------------------</td>
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<td>-------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Stonedust (and other granular materials) | Granular ‘A’:  
  • Similar characteristics to Granular ‘B’  
  • Smaller maximum particle sizes  
  • Excellent for trail bases  
  • Can be appropriate for trail surfacing in rural areas and woodlots.  
  • Easy to spread and re-grade when surface deformities develop | • Potential risk for erosion on slopes  
  • User difficulty negotiating the surface due to particle size ranges and uneven particle sorting that can occur over time with surface drainage |
|                             | Clear stone and/or Pea Gravel:  
  • Crushed and washed granular  
  • Uniform particle sizes, no sand or fine particles included  
  • Excellent bedding course for trail drainage structures  
  • Can be excellent base for asphalt trails | • Not recommended or appropriate for trail surfacing as it creates an unstable surface and does not meet AODA requirements. |
| Wood Chips and Wood Shavings | • Bark or wood chips  
  • Excellent for 3 season use and for low winter activity  
  • Particle sizes range from fine to coarse depending on product  
  • Supple feel and natural appearance  
  • Aesthetically appropriate for woodlot and natural area settings  
  • Very low cost  
  • Easy to install  
  • Permeable | • Unmaintained. Trail type is considered a foot path  
  • Deteriorates over time  
  • Material source must be carefully researched to avoid unintentional importation of invasive species  
  • Difficulty negotiating surface due to range in particle sizes and uneven sorting of particles that can take place over time with surface drainage  
  • Weed growth |
| Earth Surface (Natural Ground) | • Desirable and cost-effective for use on tertiary trails  
  • Blends visually with surroundings  
  • Generally does not require additional material  
  • Very inexpensive | • Unmaintained. Trail type is considered a foot path  
  • Potential risk for erosion on slopes  
  • Difficulty negotiating surface due to range in particle sizes and uneven sorting of particles that can take place over time with surface drainage  
  • Existing soil conditions can pose problems (e.g. poorly drained and permanently wet soils generally do not make good trail surfaces)  
  • Not good for wet seasons or winter conditions |
| Wood (e.g. bridges, boardwalks) | • Highly attractive  
  • Renewable material that creates a solid and level travel surface  
  • Permeable  
  • Can allow for continual trail access over debris, steep areas, wet areas, and seepage areas | • Permits and approvals due to likely location in wet areas  
  • Costly installation  
  • High maintenance costs |
2.7.1 Boulevard Multi-use Trails

Bicycles are recognized as vehicles, as defined in the Ontario Highway Traffic Act (HTA) R.S.O., 1990. As such, they can operate on public roadways with the same rights and responsibilities as motor vehicles. Bicycles however, are not permitted on controlled access freeways such as the QEW, Highway 403, Lincoln Alexander Parkway, and the Red Hill Valley Parkway or any roadways designated for ‘no cycling’ by a municipal by-law. The HTA contains a number of policies relating to bicycles, including bicycle lanes on municipal roadways, vehicles interacting with bicycles, and regulating or prohibiting bicycles on certain highways.

The Ministry of Transportation recently addressed many of the policies which pertain to cycling and trail development through Ontario’s Cycling Strategy, Bill 31, and the Ontario Traffic Manual Book 18. Possible changes and recommended amendments will continue to be considered by the Ministry. As the provincial law is updated, the City should be aware of how the changes will impact the implementations for enforcement of safe cycling and trail development city-wide.

Boulevard multi-use trails can be used when boulevard characteristics are suitable and should be developed on a site-specific basis. Intersecting roadways are of particular concern as motor vehicles may not be anticipating the speeds at which some users of boulevard trails may be traveling.

Where boulevard trails are implemented on one or both sides of a road, it is reasonable to assume that they can accommodate pedestrians, therefore it is not recommended to install both a trail and sidewalk on the same side of a street. All boulevard trails should be clearly marked (e.g. shared use signage; etiquette) so that users are aware the trail is not pedestrian only. Using a standard application of asphalt instead of concrete helps to convey shared use.

2.7.2 On-road Trail Connections

Where public lands are not sufficiently wide and access agreements for trails on private lands are not feasible, it may be necessary to provide connecting links for trails as a combination of sidewalks for pedestrians and on-road bike facilities for cyclists. Pedestrians, scooters, in-
line skaters, and users with mobility-assisted devices are expected to use sidewalks in urban areas and road shoulders in rural areas. Cyclists (typically as per local by-law) are required to use roads. Bicycles are required to obey all of the same rules and regulations as automobiles when operating on public roadways. Signage requirements and development standards for on-road bicycle systems should be developed within the City in conjunction with the Ministry of Transportation (MTO) Bikeways Planning and Design Guidelines, the Transportation Association of Canada (TAC) Bikeway Traffic Control Guidelines (Second Edition, 2012), and the Ontario Traffic Manual Book 18 – Cycling Facilities.

Within the City of Hamilton, accommodations for cyclists are jointly provided by on-road and multi-use trails; both form an integral connection.

2.7.3 Trail Development in Hydro Corridors
The City of Hamilton contains numerous hydro corridors located within various city wards. Hydro corridors are examples of linear connections that provide excellent opportunities for trail development and continue to be considered for the development of trails in Hamilton. In urban and rural settings hydro corridors have sufficient length with sufficient easements to provide direct connections to a variety of destinations. When designing trails in hydro corridors compatibility with adjacent land uses must be considered.

Many rural towns, destinations, and parklands can be connected within Hamilton using hydro corridors. Hydro corridors are a great way to facilitate long distance trail travel. Preceding detailed trail development, the local utility agency as well as Hydro One should be consulted.

2.8 Trail Crossings
Trail crossings of roadways can often be quite dangerous. One of the most challenging aspects of trail design is accommodating trail users when crossing roads. Several design options can be implemented to alleviate the hazardous aspects of trail crossings including:

- Grade separated crossings (bridges and underpasses);
- Directing trail users to cross at existing signalized or stop-controlled intersections;
- Utilizing mid-block pedestrian signals; and
- Utilizing mid-block crossing locations with pedestrian islands or refuges.

Within the City of Hamilton, trail crossings would likely require modifications for multi-use trails to accommodate cyclists as expecting cyclists to dismount and become pedestrians is not ideal.

Mid-block Crossings
Mid-block crossings facilitate crossings to places that people want to go but that are not well served by the existing traffic network. Both
existing and projected pedestrian volumes should be investigated when assessing the need for a mid-block crossing.

Guidelines for the typical design elements for a mid-block crossing are as follows (Traffic Engineering Council Committee, 1998):

- Refuge islands are typically a minimum of 6m in length
- Refuge island width should be at least 1.8m wide, but 2.4m is preferred to accommodate wheelchairs in a level landing 1.2m wide plus 0.6m wide detectable warning devices on each side. The 2.4m width will also accommodate bicycles in the refuge
- Curb ramps are provided to allow access to the roadway and island for wheelchair users, and detectable warning devices (0.6m in width) should be placed at the bottom of the curb ramps
- The pathway on the island is constructed of concrete, not asphalt. The visually impaired can better detect the change in texture and contrast in colour supplemented by the detectable warning devices to locate the refuge island
- Appropriate tapers are required to diverge traffic around the island based on the design speed of the roadway
- The pathway on the island can be angled so that pedestrians are able to view on-coming traffic as they approach the crossing
- Illumination should be provided on both sides of the crossing

2.8.1 Minor and Major Roads
Trail crossings of minor roads should include the following:

- Open sight triangles at crossing points;
- Trail access barriers;
- Consideration of signage along roadways in advance of crossing points to alert motorists of trail crossings;
- Consideration of signage along trails to alert trail users of upcoming roadway crossings;
- Alignment of crossing points to achieve perpendicular crossings of roadways for shortest crossings and optimal sightlines;
- Curb cuts on both sides of roads.

Pavement markings, to delineate crossings, should not be considered at uncontrolled trail road intersections as users are required to wait for traffic gaps before crossing these locations to avoid a false sense of security. Pavement markings should be designed to adhere to Highway Traffic Act (HTA) regulations, including Ontario Traffic Manual Book 15 and Book 18 for uncontrolled intersections.

2.8.2 Active Railways
Railway crossings can be extremely dangerous for all trail users and therefore extra caution should be applied to assure their safe design. When at grade railroad crossings are necessary, non-motorized crossings should be at a right angle to the tracks, this can be achieved by either separate paths or widened shoulders. It is strongly recommended that appropriate traffic control devices be installed at intersections of railway tracks and trails. These include:

1. Pavement markings;
2. Signage; and
3. Lift gates.

Trails Adjacent to Canadian National (CN) Right of Way (Canadian National Railway, 2010)
To help ensure the safety of railway operations and users of a trail, CN requires that trails running parallel to the railway should be a minimum of fifty (50) feet (15.24m) from the track centreline. Where the railway right of way is on an elevated embankment, the trail should not be closer than either thirty-five (35) feet (10.67 m) from the foot of the embankment or fifty (50) feet (15.24 m) from the centerline of the track, whichever is greater. Additional setback distances may be required to accommodate future track expansion. For further detail please refer to the CN guidelines.

Trail Crossings across CN Right of Way (Canadian National Railway, 2010)
Trail crossings of active railway lines must be designed, approval, and implemented in conjunction with Canadian National Railway (CN) and should be consistent with Draft RTD-10 Road or Railway Grade Crossings: Technical Standards and Inspection, Testing and Maintenance Requirements (2002) available from Transport Canada.
The detailed design of trails that cross, are adjacent to, or otherwise utilizes CN property must consider all factors that could potentially affect the safety of trail users. Any encroachment on CN’s right-of-way, no matter how well protected, can increase user risk. From a railway perspective, CN will not knowingly increase the public safety risk by any degree where it is unnecessary to do so. Equally critical is the safety of railroad operating and maintenance personnel who function in proximity to these installations. Trails constructed within CN right of ways will require approval from CN and must be designed in accordance with their policies. In order to increase user safety, it is recommended that where an informal rail crossing has been established that a formalized trail crossing be created.

2.8.3 Bridges
Throughout the City-wide trail system, there are and will be crossings of drainage ditches, creeks, highways, or shallow ravines. Where possible, trail network should make use of existing bridges that are located in suitable areas, including pedestrian bridges, vehicular bridges and abandoned railway bridges.

New bridge structures should be designed on a site-specific base. The Canadian Highway Bridge Design Code (CHBDC) specifies requirements for the design evaluation, and structural rehabilitation design of highway bridges in Canada (CHBDC, 2002). The code also includes provisions for the design of pedestrian bridges for trails. Designing for a bridge along a trail often requires an Environmental Assessment (EA) to determine the optimal location and this can be a lengthy process. The following are general design considerations for bridge structures:

- Prefabricated steel truss bridges are often practical, cost effective solutions;
- Railings should be required if bridge height exceeds 0.6m above the surrounding grade, and should be designed with rub rails to prevent entanglement of bicycle pedals and handlebars;
- Site-specific construction of bridges may be suitable for short crossings;
- When considering barrier free bridge accesses, appropriate hardened surfaces should be employed on trail approaches. Also, bridge deck boards should be suitably spaced to allow for ease of passage by mobility-assisted devices; and
- It is recommended that deck boards run perpendicular to the travel paths.

2.8.4 Underpasses and Tunnels
Underpasses should be wide enough to accommodate all trail users whether they are walking, hiking, cycling, in-line skating, in a wheelchair or other forms of transportation. Where feasible, it is suggested that trail widths through underpasses be equal to or greater than that of approaching trails. Tunnels and underpasses are also areas that typically attract illegal and dangerous activities. Trails through tunnels and underpasses should consider all aspects of trail safety, lighting, and CPTED guidelines to ensure users feel safe and secure.
2.9 Trail Structures

2.9.1 Gates and Barriers

Many trail types typically include some form of gates or access barriers to control user activity, movement, and safety. Access barriers are intended to allow free flowing passage by permitted trail user groups and prohibit entrance by others. Trail barriers typically require mechanisms to allow service and emergency vehicles access, especially in storm water management pond areas. Depending on site conditions, it may be necessary to provide additional treatments between access barrier ends and limits of trail right of ways. Additional treatments can consist of plantings, boulders, fences, or barrier extensions. There are many designs for trail access barriers in use by different trail organizations and municipalities. Although each municipality is different, trail access barriers can generally be grouped into three categories:

1. Offset Swing Gates;
2. Single Swing Gates; and

2.9.2 Swing Gates

Offset swing gates are similar to single swing gates, except that their barriers are paired and offset from one another. Although they can be effective in limiting access by unauthorized users, some groups including cyclists (especially cyclists pulling trailers) and wheelchair users, can have difficulty negotiating offset swing gates if there is inadequate spacing between gates.

Single swing gates are primarily used in urban locations, they combine ease of opening for service vehicles (especially around storm water management areas), with the ease of passage of bollards.

2.9.3 Bollards

Bollards are the simplest and least costly barrier and range from permanent, direct buried wood or metal posts, to more intricately designed cast metal units that are removable by maintenance personnel. Often on a site-specific basis a collapsible bollard is considered in the design of a trail. Typically an odd number of bollards (usually one or three) are placed in trail beds in order to create a centreline to define two directions of travel for trail users to follow. Although removable bollard systems provide flexibility to allow service vehicles access, they can be difficult to maintain as the metal sleeves or pins placed below grade can be damaged by equipment, water, and moisture and can become jammed with trail bed gravel, debris, and ice.

2.9.4 Elevated Trail Beds and Boardwalks

Elevated trail beds and boardwalks can be used where trails pass through sensitive environments such as marshes, wetlands, swamps, woodlands or to by-pass congested urban areas. In natural areas, without implementing features like this, trail users will tend to walk around features and gradually over time create wider and more obstructive trails on the natural environment.

Low profile boardwalks have been successfully employed by trail managers across Ontario, especially by organizations like the Bruce Trail Conservancy. Where trails are in high profile locations, where it is necessary to provide fully accessible trails and users other than pedestrians, or where trail surfaces must be greater than 0.6m above the surrounding grade, more sophisticated boardwalk designs and installations are necessary. This is likely to include engineered footings or abutments, structural elements and railings these should be designed by a trained professional (e.g. structural engineer, landscape architect). Low profile boardwalks may also require an engineered footing.
2.9.5 **Switchbacks and Stairs**

In many situations access is required to connect trail areas separated vertically by topography. Pedestrian, motorized and some self-propelled users are capable of ascending grades of 30% or more whereas the AODA requires grades to not exceed 8% for accessibility. Where trails ascend or descend at more than 8% grades it may be important to consider alternative slope ascending methods. Two alternatives to consider that have been implemented in the City of Hamilton are switchbacks and stairs (e.g. Chedoke stairs, Dundurn stairs).

Switchbacks are constructed with turns of approximately 150 degrees and are used to decrease trail grades. Properly constructed switchbacks provide outlets for runoff at regular intervals, thus reducing erosion potential. Implementing switchbacks typically require grading, signage, and barriers (rub rails). Switchbacks can be difficult to implement in wooded areas without significant impacts to surrounding trees and vegetation.

In the City of Hamilton, along steep slopes of the escarpment often stairs are the only solution. Following Niagara Escarpment Commission’s approval if a new set of stairs is implemented, a bike trough is a standard element. Where there are existing stairs without a trough, they will be upgraded dependent upon the life span of stairs following a complete assessment.

2.10 **Trail Signage**

Trail signage is one critical aspect to unify trail systems, improve wayfinding, and introduce themes for simplified route identification. Signage assists with wayfinding, trail connectivity, and trail stewardship. A standardization method to developing and structuring trail signage should include a hierarchical approach for improving overall wayfinding. Other municipalities have taken this approach using a variety of methods including:

- Establishing an overall concept theme or innovative method for signage;
- Creating uniform design standards to reflect hierarchical structure for signage, including materials and fabrication, design fundamentals (colour, balance, unity), graphics, mounting structures, and orientation; and
- High quality, durable (including resistance to ultraviolet radiation), vandal resistant quality materials and finishes.

Signage serves many important functions including:

- Informing users of their responsibilities while on the network;
- Providing information regarding safety (e.g. maximum travel distances, upcoming hazards, junctions, and crossings);
- Providing trail user etiquette instructions;
- Wayfinding;
- Fitness and well-being (including QR codes);
- Specifying information about routes, nearby services, and trail–related events; and
- Providing interpretation of local historical, cultural, natural, and other resources.

As the City of Hamilton trail system advances and is implemented, new signage will be required to introduce and provide additional information on trails. This includes, but is not limited to trail;
style, use, accessibility, degree of difficulty, length, directional information, and interpretive signage. All signage developed in the City must adhere to applicable AODA guidelines.

2.10.1 Signage Strategy and Typical Branding

Trail themes and branding can add local flavour to individual trails or loops, creating an overall unique trail network quality. Themes also unify trail network routing, signage, facilities, and features. It is recommended that the City of Hamilton logo, trail destinations, and key distances be included on all signage types. It is important that any locally branded signage incorporate and support regional, provincial, and national trail marks where trails route through Hamilton (e.g. Great Lakes Waterfront Trail, Greenbelt Route, Trans-Canada Trail) to ensure continuity for trail users.

A brand can also be used to draw visitors and trail users to different attractions and destinations along the trail or within the City (e.g Love Your City, Love Your Trails). A brand will not only promote trail system use but it can also draw new visitors to local activities and venues. Common trail branding measures can include:

• A design that is timeless, in-scale, and visually integrated with the landscape without creating unnecessary clutter;
• An overall theme or innovative technique (instead of text) such as colour coding routes or a symbol or graphic concept to illustrate degree of difficulty and establish physical fitness ratings, similar to alpine downhill ski symbols (e.g. blue circle, green square, black diamond);
• Clearly, concisely, and consistently communicate information related to identification, direction, regulation, and operation of the trail; and
• Ensuring night visibility by using reflective materials in locations where low light and night usage is anticipated.

It is important that all multi-use trail signage be integrated with on-road bike signage.

2.10.2 Signage Types

The design and construction of networks should incorporate a hierarchy of signs each with a different purpose and message to trail users. Hierarchy of signage types are typically organized into a group of signs with unifying design and graphic elements, materials, and construction techniques. The unified system becomes immediately recognizable by trail users and can strengthen the branding element. Below are a group of signage types:

a) Gateway Signage

Gateway signage, typically the largest type of signage, is intended to set the tone for the entire trail system and is usually located at trail entrances along key routes into the City from adjacent municipalities (e.g. Great Lakes Waterfront Trail from Burlington to Hamilton). Gateway signage is utilized to create a sense of welcome, arrival, and safety. It also presents an opportunity to establish trail use conventions, punctuate historic significance, and establish theme. It incorporates trail amenities such as benches, trash receptacles, and information and directional kiosks.
b) Orientation and Trailhead Signage

Orientation and trailhead signs are characteristically located at key destinations such as attractions, and major network junctions. Trailheads are an important part of the trail network and trailhead signage should provide orientation to trail network through mapping, additional network information (trail distances, key features), and rules and regulations for the overall network. Trailheads can also serve as a landmark for trail users. In some municipalities orientation signage has also been used as an opportunity to sell advertising space and assist with trail funding and cost sharing. In Hamilton, the Red Hill Valley trails contain numerous trailheads.

c) Trail Etiquette Signage

Trail etiquette signage should be posted at public access points to clearly articulate permitted trail uses, regulations, and laws that apply to the specific routes and the overall trail network. Signage should include trail etiquette, safety, and emergency contact information. Trail etiquette signage can also include friendly reminders to trail users (e.g. “Please stay on the Trail”, “Stoop and Scoop”). At major and minor trailhead locations, this information can be incorporated into trailhead signage. In other areas this information can be integrated with trail access barriers and bollards.
d) Regulatory Signage
Regulatory signs are required throughout the trail network to improve trail user safety. Regulatory signage typically informs users of dangerous areas (e.g. deep water, steep slopes), sensitive or protected areas (e.g. wetlands, woodlots), and other items such as invasive plants (e.g. poison ivy, giant hogweed) and private lands. Where traffic control signs are required (e.g. stop, yield, curve ahead, etc.), it is recommended that recognizable traffic control signs be used in conjunction with the Ministry of Transportation for Ontario’s (MTO) guidelines and standards for on-road routes.

Figure 21: Caution signage example

e) Route Markers and Trail Directional Signage
Route markers and trail directional signage should be located at regular intervals throughout the trail network (e.g. every 500m, 1000m, etc.) at trail junction points and key intersections. The purpose of route marker signage is to provide users with orientation and simple visual graphics alerting them that they are on approved network routes. More recently route marker signage and trail direction signage have included innovative wayfinding techniques such as QR Codes and distances to local cultural attractions and resources (e.g. bike shops, B&B’s, hardware stores, restaurants, etc.).

Figure 22: Directional signage example at entrance to the Red Bridge

Figure 23: Directional signage example at the Eramosa Karst Conservation Area

Figure 24: On-road directional signage
f) **Interpretive Signage**

Interpretive signs are typically placed at locations along trails that signify a historical feature, environmental feature, or feature that is culturally significant to Canadian or local heritage. They are highly graphic, easy to read, and must be designed on a site-specific basis. This type of signage should be strategically located in highly visible locations to minimize vandalism potential. Interpretive signage can also be used to improve education and trail stewardship initiatives along trail routes to reiterate proper trail etiquette, detail safety precautions, rules, and regulations for specific trails. The Bruce Trail contains numerous locations where interpretive signage is present.

![Figure 25: Interpretive signage panel in the Eramosa Karst CA](image)

g) **Urban Fitness Trails**

Several City of Hamilton parks contain urban fitness trails with fitness stations and signage. This new way to exercise allows trail users to use their smartphone to scan codes, watch instructional videos and follow the trail for a full workout at any level. If users do not have a smartphone, the fitness instructions are also displayed on the signs at each fitness station.

The City of Hamilton’s QR urban fitness trails are located in 10 parks. Each trail features seven QR signs that take the participant through a full workout, from warm up to cool down, with beginner, intermediate and advanced options.

Current QR Urban Fitness Trail Locations include:

- Bayfront Park - 200 Harbour Front Drive, Hamilton
- Chedoke Radial Recreational Trail - (golf course entry) 563 Aberdeen Avenue, Hamilton
- Fairgrounds Community Park - 305 Fall Fair Way, Binbrook
- Joe Sam’s Leisure Park - 752 Centre Rd, Waterdown
- Meadowlands Park - 160 Meadowlands Blvd, Ancaster
- Newlands Park - 137 Lynbrook Drive, Hamilton
- T.B. McQuesten Community Park - 1199 Upper Wentworth St. Hamilton
- Southampton Estates Park - 185 Thames Way, Mount Hope
- Lake Pointe Park - Springstead Ave & Westhampton Way, Winona
- Strabane Park - 1315 Brock Rd (7th Concession and Brock Rd.), Flamborough

![Figure 26: Fitness circuit signage (with QR codes) in T.B. McQuesten Community Park](image)

![Figure 27: QR example on Urban Fitness Trail signage](image)
QR Fitness Trails provide free alternative fitness opportunities, guided routines by certified trainers, a family-friendly exercise experience, three skill level options, and enjoyable outdoor recreation. QR Trails established in Hamilton are funded by the Ministry of Tourism, Culture and Sport through the Sport and Recreation Communities Fund.

2.11 Trailheads and Trail Amenities

Major trailhead areas are typically located at key community destinations (e.g. community centres). They are highly visible and assist with setting the tone for the trail system. In some locations it may be possible to share trail amenities with other community facilities or other partners (e.g. schools, trail clubs, Conservation Authority, recreational facilities). Minor trailheads are located at secondary entrances and typically include smaller parking and trail facilities. A well-designed major or minor trailhead usually incorporates the following features:

- Regular and accessible (handicapped) parking with an appropriate number of spaces in relation to the anticipated level of trail use, with flexibility to increase space numbers where warranted by future demand;
- Simple access to and from trails;
- Trail access barriers;

Figure 28: Red Hill Valley Trailhead signage

Figure 29: Washroom facility at the Dundas Driving Park

Figure 30: Parking lot at Armes Lookout along Mountain Brow Boulevard
• Ample room to load and unload equipment;
• Bicycle parking facilities;
• Appropriate trail signage types (including overall trail network map);
• Trail information kiosk (can be incorporated with trail signage);
• Waste receptacles;
• Lighting (site-specific); and
• Spaces for informal activity, seating, and or picnic areas (more often associated with a major trailhead).

2.11.1 Seating and Rest Areas
Seating and rest areas along the trail provides opportunities for trail users to simply rest, relax, and take a break. Typically young children, older adults, and users with disabilities need to rest more frequently. Benches are the most common form of seating, but walls of appropriate height and width, large flat boulders, and sawn logs are some alternatives depending on trail settings (e.g. logs might be more appropriate in rural settings or adjacent to natural features). Where rest areas are planned, the design should consider a 1m wide level area with a curb or other appropriate wheel stop for mobility-assisted devices in accordance with current AODA standards. Staging areas, trail nodes, and heavily used trails typically require a higher density of seating opportunities (e.g. heavily used trails may have seating at approximately 500m intervals).

2.11.2 Bicycle Parking
Bicycle parking should be placed adequately along trail routes to allow users to confidently secure their bicycles while pausing to enjoy nearby attractions, walking along trails, or activities when they reach their intended destination. Key locations for bicycle parking can include trailheads, major trail nodes, trail junctions, and lookouts. Generally bicycle parking facilities should:
• Be placed along key trail routes, junctions, and destinations;
• Enable bicycles to be securely locked to devices without being damaged;
• Be placed in public view;
• Maintain clear zones;
• Present no hazards to cyclists and pedestrians;
• Be easily accessible from roads or trails; and
• Be arranged so that parking maneuvers will not damage adjacent bicycles.

2.11.3 Trail Closures and Rehabilitation
Trails within the City of Hamilton will be constantly evolving and as a result it might be necessary to permanently or temporarily close sections of trails. Reasons for temporary trail closures can include flooding, culvert washouts, and general trail construction. Whenever possible trail users will be notified in advance of trail closures by appropriate signage (often posted at trailheads) and alternate routes that can be taken to avoid the closures. Another method for informing trail users of trail closures could be notifications on the City of Hamilton Corporate Twitter page.

Permanent trail closures may be required at some point in the life cycle of trails, especially in the case of trails located in woodlots and other natural settings. When closing a section of trail permanently it is recommended that the

Figure 31: Many trails throughout the city offer seating, trash receptacles, lighting, and other trail amenities
surrounding landscape be rehabilitated to match existing conditions. Often this may involve seeding with a native seed mixture or plantings trees and shrubs.

2.12 Public Art Along Trails

Trails can be a platform for public art and used to highlight the natural and cultural elements within the city. The City of Hamilton Public Art Master Plan (2008) describes a vision for public art in Hamilton and identifies and prioritizes potential sites and opportunities for new public art projects within the city. Within the report public art priority sites along trails were identified, specifically along Waterfront Trails, Red Hill Valley Trail, and the Pipeline Trail.

The Pipeline Trail Master Plan (2015) identified four sites for public art along the trail:
1. The western Trail Head, which is located immediately adjacent to the intersection of Ottawa and Main Streets.
2. Urban node at Kenilworth Avenue.
3. Entrance to Andrew Warburton Park.
4. The northern terminus at the Museum of Steam and Technology.

The public art at each of the above sites is educational and tells a story to the trail user about the rich cultural history of the city. All four of the above locations have been incorporated into the Public Art Master Plan. The City has identified over 200 sites within the Public Art Master Plan for public art and will continue to investigate public art in conjunction with trail development.

2.13 Trails in Natural Areas and Environmental Buffers

Routing trails through natural areas is a critical component to the trail network and provides users the opportunity to get close to nature, explore the outdoors, interpret nature, and find relief from the often busy urban environment. Trails in natural areas need to balance public access to significant features and protection of the environment and sensitive ecological elements.

When designing trails through natural areas it is important to consider that development and site alternations may not be permitted in specific areas (e.g. Provincially Significant Wetland, significant coastal wetlands, and significant habitat of threatened and endangered species) and additional studies (e.g. Environmental Impact Statement, Tree Protection Plan) may be required prior to the trail design stage.

Where trails are to be located in natural areas it is important that they be sited and designed appropriately and that the area be monitored for effects of inappropriate use or overuse. If trails are not carefully planned, designed, constructed, and maintained people will create their own trail routes sometimes in sensitive locations where it would be preferable not to have trails at all. The ACTIVE2010 Ontario Trails Strategy (2005) discusses that by leading users along well-worn paths, trails keep users away from more sensitive features that might not be able to withstand traffic. Well-developed trails provide environmental buffers, such as boardwalks and bridges that protect delicate wetlands while allowing users to experience varied plant and animal wildlife. Proper planning, design and construction of trails, coupled with public education can go a long way to achieving balance between use and protection. Prior to routing trails within or through natural areas, the appropriate conservation agency partner and applicable City Departments must be consulted.

When designing trails through natural areas and environmental buffers it is important to consider the following:
• Avoiding areas identified as sensitive and endangered habitats;
• The ecological significance and sensitivity of the natural area and appropriate mitigation and design measures;
• Consider alternate routes throughout the design process;
• Education opportunities and viewing lookouts;
• Specific construction recommendations, including guidelines to minimize disturbances;
• Current best management practices to prevent vegetation damage;
• Timing restrictions for construction (e.g. Migratory Birds Convention Act);
• Develop guidelines for trail restrictions and trail closures, including timing or seasonal restrictions where sensitive species are present or sensitive activities occur; and
• Appropriate signage
• Part 2 Development Criteria of the Niagara Escarpment Plan (NEP). As part of the condition of approval for requiring an NEC development permit, the NEC circulates their notice of decision to surrounding residents within 120 metres of the proposed development. Before a permit is issued the NEC allow a mandatory 14 day appeal period during which time the approval may be challenged. This regulatory matter will override any public process held prior to the development permit application.

2.14 Creating New Trails in Established neighbourhoods
Creating trails within established neighbourhoods can be one of the most challenging aspects of implementing this master plan. Often, it may be necessary to seek additional public input for trail development. Where new trails are being implemented or significant improvements are being made to existing trails within or nearby existing communities, differing levels of consultation (e.g. public, Conservation Authority, NEC, etc.) may be required to advance the project through the detail design and implementation stages. The level of consultation required for individual projects will depend on project location, design approvals required, scope, complexity, and whether the project is identified in the Recreational Trails Master Plan initiatives or other planning policies such as the Urban and Rural Official Plans.

2.15 Lease Agreement and Land Acquisition
Within the overall trail system, a concerted effort has been made to implement proposed trails within public (City) ownership or on public property. In some circumstances with trail development, the ownership within particular alignments will need to be verified to confirm whether or not lands are currently privately owned (e.g. RBG, HCA, Hydro One, etc.), have lease agreements, or are privately held. There are many ways to acquire land for trail development, including:

Private
Land can be purchased outright by either non-profit or a public entities. This option may be the simplest, but it can prove costly. It could also require reaching agreements with multiple landowners, particularly if the trail corridor is routed through private lands.

Easements
An easement is a right to use another person’s real estate for a specific purpose; in this instance trail development. Easements can be negotiated with private landowners as well as with public entities, such as the City or utility companies. Because the land is not being purchased, the cost is typically less than a purchase agreement.

Land Donations and Land Lease
A landowner can donate property to an agency or organization. Tax credits may be available for land donated for conservation purposes. In the case of a land lease, the land is rented from the landowner for a set amount of time. Leases can come from a variety of sources, including railroads, utility companies and the City.

Purchase and Lease Back
The City could explore purchasing property and lease it to the previous owner for a specified period of time. This arrangement may include use restrictions and may be useful if the landowner wants to sell the land but wishes to continue using it, such as for grazing animals.

Eminent Domain and Expropriation
Property, or parts of property, can be forcibly taken from the landowner for use by the general public. This method is not recommended because it can create resentment toward the trail by the former landowners.

2.16 Insurance, Liability, and Risk Management
Insurance, liability and risk management concerns will be considered during the design, construction and maintenance phases and will include consultation with Risk Management and Legal Services. The responsibility of the City of Hamilton as owner of the lands is defined in the Occupier’s Liability Act. The Act allocates a common duty of care owed by all property owners to anyone entering onto the property to ensure that the entrant is reasonably safe while on the premises. In order to encourage public entities to open their land for recreational use, immunity is provided for recreational landowners.
by allowing them a “reduced duty of care” in which “a person who enters (the) premises .... shall be deemed to have willingly assumed all risks” (Occupier’s Liability Act, 1990). In order to qualify for this reduced duty of care the following criteria apply:

1. The entry must be for the purpose of a recreational activity;
2. The premises are recreational trails reasonably marked by notice as such.

The option to provide lighting on trails must be taken into careful consideration as a lit trail may create the perception that it is safe to walk at night. Users who would not normally use an unlit trail may be lulled into a false sense of security and use a trail that is lit. Refer to Section 2.5 for personal security and CPTED and Section 2.6 for trail lighting and safety.

During design it will be determined if the trail lighting is a reasonable precaution to take in terms of ensuring trail users navigational safety. For instance, if the trail serves as a necessary link between two points, which is frequently used as a means of traveling (as opposed to recreational use), then it is reasonable to provide lighting on that trail to ensure safety to the user and prevent injury caused by tripping and falling.

2.17 Public Outreach and Trail Promotion

The Recreational Trails Master Plan also focuses on the promotion of trail use and trail activities. Promotion can include education, outreach and stewardship initiatives which are used to raise awareness of the health, environmental, social and economic benefits of investing in trail infrastructure. Promoting the trail network should be encouraged. The following sections outline some successful methods that adjacent municipalities have used to promote their trails network.
2.17.1 Community Based Social Marketing

Community-Based Social Marketing (CBSM) is one approach to achieving broad sustainable behavior in communities. It combines knowledge from psychology and social marketing to leverage community members’ action to change behavior. CBSM is more than education; it is spurring action by a community and for a community. Using CBSM techniques can lead to increased trail awareness and use. Key CBSM tools can include:

- Prompts: remind individuals to engage in trail use;
- Commitments: have individuals commit or pledge to engage in trail use;
- Norms: develop community norms that trail use is the right thing to do; and
- Vivid communications tools with engaging messaging and images.

CBSM tools for the City to continue employing are:

- Increasing community engagement, volunteer opportunities, partnerships, education and communication strategies that enhance development and operations of the trail system;
- Using community events to talk to residents one-on-one or in community groups;
- Having staff attend community events to promote trails, developing a portable display system to use at events would be beneficial;
- Using various media types to deliver updates on trail implementation and to launch public information campaigns on education and stewardship (e.g. share the trail, keep dogs on leashes, trail etiquette, etc.);
- Displaying trail information in brochures and marketing pamphlets at various approved locations throughout the city that are vivid with engaging messages and images; and
- Creating prompts to remind residents about the trail system and its benefits. Prompts can include maps, brochures, water bottles, stickers, car magnets, key chains etc. Prompts can be giveaways at events or used for fundraising.

2.17.2 Hamilton Trail Map, Signs, and Brochures

Interpretive programs and signs, brochures, and education programs, offer endless opportunities to raise trail awareness. Providing positive guidance towards responsible trail use is an integral part of managing trails.

In Hamilton there are two types of trail mapping: printed and online digital maps and maps on trail signage. Maps inform users about routes and provide the occasion to educate users through messages of trail etiquette. Maps can be updated with the release of new additions as the system grows, making the initial investment pay for itself over time. Other opportunities may also be available to produce a regional based map in conjunction with trail groups (e.g. Hamilton Burlington Trails Council). Hamilton has developed their own online mapping specific to trail use and all cycling infrastructure. The City has a production of mapping and is updated bi-annually.
2.17.3 Trail Ambassadors

Many municipalities have successfully implemented trail ambassador programs. These often involve teaming a City staff member with summer students or similar groups. Students attend events and functions organized by businesses, agencies, camps, and related recreation programs, and promote the trail network within the City of Hamilton. Trail ambassadors travel the trails and hand out brochures, provide assistance, and monitor conditions.

Trail ambassadors are available to the public and can gather important data on user satisfaction. As the trail system in Hamilton grows and depending on available funding the City of Hamilton should explore the merits of an ambassador program. In the interim, training maintenance staff (as is currently done), to observe trail conditions as part of their role is an effective way to assist.

2.17.4 Partnerships

Developing partnerships with businesses, local developers, and other agencies that provide services to large sectors of the community should continue and be advanced. In many municipalities there is a strong interest in partnering with agencies to promote trails and their use as a healthy lifestyle choice.

Partnerships can comprise jointly produced promotional and educational literature in magazines, materials distributed through offices, or links to agency websites. Several of Hamilton’s trail partners include the Royal Botanical Gardens, Hamilton Conservation Authority, Trans-Canada Trail Association, McMaster University, Hamilton Cycling Club, Hamilton Naturists Club, the Hamilton Waterfront Trust, the Hamilton Burlington Trails Council and the Bruce Trail Conservancy. Each organization operates using different planning and administrative standards regarding trails.

Partnerships with trail associations, school environmental groups and community organizations should be encouraged for planting programs, trails development, Earth Day activities, walking and running events, Smart Commute initiatives. Contribution of staff for these events is a simple, cost effective way to promote the trail network and can provide visibility through media coverage.

It is mutually beneficial for the City of Hamilton and other agencies to recognize partnership efforts. Media recognition is a positive way of showing appreciation for partnership contribution, furthermore it is a simple and cost effective way to raise trail awareness and encourage use. When contributions are made that improve trail conditions such as; the provision of trail amenities or creation of links across private properties, partners should be recognized for their contribution through donor signs and plaques. Many trails within adjacent municipalities and across Canada have been implemented this way. Public awareness and education are of paramount importance in responsible trails use, reduction in user conflicts and the prevention of environmental damage, and should be part of the marketing and promotion of recreational uses.

Figure 35: The City of Hamilton has numerous trail partners, including the Bruce Trail Conservancy
3.0 THE IMPLEMENTATION PLAN

Figure 36: Bayfront Park trails gateway feature
The City of Hamilton Recreational Trails Master Plan offers a proposed network of trails and a set of recommendations to recognize, realize and share in the economic, health, transportation and environmental benefits that a trail system offers. The below sections discuss network implementation, a scoring system for establishing priorities for development, promotion, and trails maintenance.

### 3.1 The Trails Network Implementation Strategy

The implementation of the Recreational Trails Master Plan will be accomplished through both short and long-term actions. The development of the trail network will be achieved only through a collaborative effort with other trail agencies and stakeholders. The success of this plan requires champions and leadership to move from the plan and design stage to the funding and implementation stage. Section 3.1.3 discusses interdepartmental collaboration in greater detail. The formal relationships between individuals and organizations and their operational practices are important factors in determining whether trail initiatives are implemented successfully. Where planned trail initiatives are in the Niagara Escarpment Plan (NEP) the Niagara Escarpment Commission (NEC) must be consulted prior to development.

#### 3.1.1 Establishing New Priorities

Throughout the project many opportunities were identified for the creation of trail segments connecting new neighbourhoods to the network, and extending the local trail system to link other municipalities and areas of environmental and cultural significance. These trails are to be considered in long-term planning processes and should continue to be investigated and implemented as opportunities arise (e.g. negotiated with new residential development plans, or in collaboration with other partners). This section recommends the following criteria in planning the development of the trail system:

* Field Observations
* Developing and redeveloping the trail network in highly utilized locations;
* Establishing main corridors connecting important community destinations (e.g. schools, community centres, major sports fields, etc.);
* Developing key City and Regional trail connections;
* Working with development charges and developer build scenarios;
* Developing Community Trail loops;
* Taking advantage of the re-development of lands;
* Linking trail sections to frequently visited destinations throughout the City;
* Allowing off-road trail access to current and planned transit nodes and stops;
* Establishing new subdivisions spine trail routes as part of the subdivision planning and design approval process; and
* Scheduling implementation with planned Provincial, Regional, and Local capital projects to take advantage of possible cost savings.

Over the long term when establishing priorities for new trail construction or improvements there are a number of factors that are considered, including (in no order of priority):

* Visibility and profile of the trail segment;
* Status of approvals and ease of construction;
* Contribution to existing route connectivity;
* Availability of capital budget;
* External partnerships and funding opportunities, such as grant programs; and,
* Timing of new development; and
* Ability to include trail development with road improvements (boulevard trails, cycle lanes, widened paved shoulders).
* Evident need expressed by the community.

#### 3.1.2 Scoring System for Establishing Implementation Priorities

The Recreational Trails Master Plan is intended for phased implementation of trail initiatives. The Implementation Plan takes into account all trail initiatives within each Ward and identifies specific initiatives as having priority for implementation.

In the determination of what trail segments are recommended to proceed in, a series of 10 criterion are applied to the list of trail initiatives. This aids in ranking the order by which trail initiatives will be investigated. For the trail initiatives that rank equally further considerations will be made based on the available funding and consultations with the Ward Councillor.
This is a dynamic system that staff regularly reviews to ensure that the priorities are implemented accordingly. Staff continues to act on opportunities for trail development as they arise, including negotiation of easements, implementation through subdivision agreements, or utilizing partnerships. Consequently, some projects may be advanced ahead of others.

3.1.3 Interdepartmental Collaboration
Trails serve important recreational, transportation, and public health benefits and the delivery of an effective network will require continued interdepartmental collaboration among City departments. At the start, plan implementation and coordination is the responsibility of a staff member. Although one group oversees the design and construction of trail initiatives, they will also require ongoing communication with, and support from other City of Hamilton departments, various committees, partners, local agencies, and trail related organizations. One staff member may lead the project but many are responsible for trail development which incorporates trail and other related initiatives including maintenance, education, enforcement, funding, and promotion.

3.1.4 Comprehensive Implementation
The Recreational Trails Master Plan is an evolving and dynamic plan. The timing and details, particularly the location of recommended routes and facility types will evolve through detailed technical reviews. It should be noted that the extensive efforts that established the overall network and trail direction must be respected when contemplating trail modifications. The following process, which has been used by adjacent municipalities, is recommended and will assist City departments (i.e. Public Works, Public Health, Planning and Economic Development, Community and Emergency Services) to collaborate together, share information, and facilitate implementation.

a) Preliminary Review
The first step is to communicate implementation opportunities. One of the key tasks is to monitor capital works forecast and recognize projects that have potential for incorporating trail development. Major aspects of this step are communication and collaboration. The review should:

- Compare trail initiative timing to short, mid, and long term implementation priorities identified in the Recreational Trails Master Plan;
- Investigate preliminary cost estimates and possible funding sources;
- Assess whether the nature of the project should include a trail (for those infrastructure projects where trails may not have been previously contemplated); and
- Inform the appropriate sections whether or not a feasibility assessment should be undertaken to confirm implementing the proposed trail as part of the project.

b) Feasibility Assessment
If a trail is confirmed through the above preliminary review process then a feasibility assessment should be undertaken which typically includes:

- Confirming route feasibility based on:
  - Reviewing the Recreational Trails Master Plan
  - Supporting route selection
  - Planning and design criteria
  - Conducting an off-road trail segments field check
  - Identifying other future issues
- Confirming present or close proximity to environmental features to help determine what Agency permit types may be required for boardwalks (e.g. Conservation Authorities, Department of Fisheries and Oceans Canada (DFO));
- Determining whether public consultation should be conducted and to what extent;
- Undertaking a trail functional design and estimating implementation costs, including construction and signage;
- Identifying less costly alternatives and how they may fit within the intent of the overall Recreational Trails Master Plan. This may include alternative parallel routes that meet the intent of the Recreational Trails Master Plan; and
- Recommending the approved course of action.

c) Detailed Design, Tender, and Implementation
Prior to construction, detailed design should be completed. This would involve design followed
by tendering and implementation. It is also possible that a decision not to proceed due to cost or other constraints may occur, the network should then be updated and an alternative route researched.

d) Monitoring and Maintenance
Trails should be monitored to ensure they function as designed. When necessary, trails should be modified and maintained to ensure continued safe use. Reducing long term maintenance requirements can be achieved by the following measures during trail construction:

• Remove stumps, roots and other materials which present safety concerns;
• Clearing limits should reflect trail type activity;
• Cut brush and tree stumps flush with the ground around trail tread surfaces and clear zones;
• Remove potential hazard trees and sharp protrusions in close proximity to trails;
• Cut back vegetation to adhere to vertical clear zones;
• Dispose of vegetative debris from trails construction and ongoing maintenance by removing brush or scattering materials in a proper manner (e.g. beside trail surface, down slope, etc.); and
• Plough and maintain key trails for year-round use pending available funding.

e) Plan Updates
The final part of the implementation process includes annually updating the Recreational Trails Master Plan network database and updating the general trail network as often as possible.

3.2 Outreach, Promotion, and Potential Funding Sources
Committing annual funding and staff resources are essential to the Recreational Trails Master Plan’s success. An annual capital and operating budget should continue to be identified based on upcoming implementation objectives and opportunities. Over the last several years outside non-municipal funding sources have been available for active transportation, cycling, pedestrian and trail related projects. This is due in part to the growing importance of their relationship to multi-modal transportation systems and overall community health benefits. Not for profit community organizations have access to other sources such as government or foundation grants or corporate funds that are not available directly to municipalities, and the continued involvement of local trail organizations and enthusiasts in trails development should be encouraged. Most available programs require co-payment from the municipality, and grants typically serve to boost, rather than replace municipal contributions. Outside funding opportunities may include some of the following organizations:

• Federation of Canadian Municipalities Green Municipal Fund;
• The Trans-Canada Trail Foundation;
• Corporate Environmental Funds, such as Shell and Mountain Equipment Co-op (MEC);
• Transport Canada’s MOST (Moving on Sustainable Transportation) and ecoMobility (TDM) grant programs;
• Ontario Ministry of Environment Community Go Green Fund (CGGF);
• Ontario Ministry of Transportation Demand Management Municipal Grant program;
• The Ontario Trillium Foundation;
• Ontario Trails Council (OTC);
• Corporate donations;
• Service Clubs such as the Lions, Rotary and Optimists; and
• Private citizen donations, sponsorship or bequeaths, this can also include a tax receipt for the donor where appropriate.

There are a range of trail initiatives that have been identified for the City of Hamilton. These which are of interest to the community and local organizations will compete for available trails development funding. Potential municipal sources of funds are:

• Municipal capital budget (e.g. for new trail development, including signs, trailheads, rest areas and other amenities along the trail);
• Maintenance and operations budgets (e.g., for signage replacement and improvements);
• Economic development and marketing funds (e.g. for trail brochure, mapping);
• Road improvements programs; and
• Funding and grant programs.
3.3 Managing Trails and Maintenance Expectations

In addition to the capital costs of implementing the Recreational Trails Master Plan, trail operating costs typically include: on-going maintenance, annual progress reports, mapping and signage updates, educational outreach and promotional programs.

Trail maintenance costs vary based on the service level standard. Typically maintenance budgets are based on the number of kilometres and increase maintenance budgets is relative to the added length of new trail infrastructure. Annual maintenance can include drainage and storm channel maintenance, sweeping, debris clearing, trash removal, graffiti removal, weed control and vegetation management, grass mowing along shoulders, minor surface repairs, repairs to trail fixtures. It should be noted that asphalt trails typically have lower maintenance costs than granular surfaces in the first 10 years.

An absolute dollar value for maintenance costs was not calculated as the budget for maintenance will need to grow in an incremental fashion along with trail network growth. Similarly staffing needs could change annually as trail networks expand and mature. Operation costs will be established for each trail initiative once capital costs have been determined.

3.3.1 Establishing a Trail Maintenance Plan

Trail maintenance management is a large undertaking that requires continual commitment and is also one key aspect of trail development. In order to meet trail expectations the overall trail network must be developed in a logical and hierarchal manner with uniform principles and a detailed network cataloguing. Enhanced trail maintenance is crucial to supporting year-round usage, accessibility, surfacing and location, monitoring programs, and appropriate funding for long-term maintenance measures. Sound application of design objectives for locations, route alignments, grade change considerations, and addressing maintenance and management requirements during initial planning and development stages will help eliminate future maintenance issues. Successful trails promote community participation.

To strengthen community involvement and trail stewardship local partnerships should be encouraged between private companies, developers, neighbouring municipalities, landowners, local governments, and advocacy groups. Partnerships are critical in creating community based resources that contribute to long-term success of a trail project. Research into other multi-use trails in Ontario suggests maintenance costs for trail segments within urban areas can be in the thousands per km per annum. These include trails in larger urban areas, and regional trails with higher volumes of users (e.g. upwards of 500 users per day). There is frequent discussion over whether granular-surfaced trails require higher or lower maintenance efforts than asphalt trails, when deciding what trail standard to build. It is suggested that routine maintenance costs are comparable for both types of surfacing. However, in areas where trails may be particularly vulnerable to flooding or washouts from nearby creeks, the cost of repairing granular-surfaced trails suggests that asphalt may be less costly when averaged over the long-term. Notwithstanding this, the reduced environmental impacts that are attributed to permeable surfaces should be considered when trail-building in natural areas. The ACTIVE2010 document suggests that trails help support environmental education and building a public commitment to environmental conservation (Ontario Trails Strategy, 2005).

It is recommended that an inspection manual be created to outline procedures for the short and long-term trails maintenance. This manual could include, timing and frequency of inspections, efficient methods for recording data, areas to record damages to trail infrastructure items (e.g. surfacing, drainage, structures, benches, amenities, lighting, etc.), and recommended measures for mitigation and repair. Implementing preventative maintenance and monitoring programs such as; regular site visits, replacing missing or damaged waymarkers and sign posts is a critical aspect of preventative maintenance. Trails are municipal assets and plans to move forward with the Recreational Trails Master Plan must be accompanied by a parallel effort to maintain trails in good condition. The general objectives of a trail maintenance and monitoring program are to:

- Provide safe, dependable and affordable levels of service;
- Reduce liability exposure;
- Preserve infrastructure assets;
• Protect natural environments;
• Enhance appearance and community health;
• Provide a reference framework against which to measure performance;
• Measure trail performance to enable adjustments and improvements to future trail implementation; and
• Provide the community with a reference for expectations.

3.3.2 Maintenance Partnerships
As previously noted, many of the trails within the Hamilton trails system are owned, operated or maintained by various trails partners. These partners include the Hamilton Conservation Authority, Bruce Trail Conservancy, Hamilton Burlington Trails Council, Royal Botanical Gardens, Waterfront Trust and Hydro One, Ontario Power Generation for hydro corridors. Where trails cross partner properties, partners should discuss maintenance standards and attempt to achieve the highest quality and most consistent level of service throughout the broader trail network.

3.3.3 Location and Trail Alignment Maintenance Considerations
• Consider natural and artificial site drainage;
• Locate routes to maximize seasonal experiences;
• Consider site topography;
• Avoid highly erodible areas;
• Avoid frequent stream or creek crossings;
• Minimize extensive switchbacks and long straight stretches;
• Avoid protected areas, sensitive habitats, and endangered species;
• Minimize contact with incompatible trail activities;

Figure 37: Interpretive kiosks, like this one in the Eramosa Karst CA, are a great way to promote trails
• Avoid toxic and harmful plant species (e.g. poison ivy, giant hogweed, and buckthorn); and
• Consider native plant species in conjunction with non-invasive and low maintenance species

3.3.4 Trail Surfacing Materials Maintenance Considerations
• Develop annual maintenance trail guidelines based on hierarchical classifications;
• Surface material availability;
• Supply and install surfacing materials costs;
• Life-cycle cost of maintaining surfacing and amenities;
• Accessibility and barrier free requirements (e.g. asphalt is more 'accessible' than stonedust); and
• Surface material type and relative maintenance required (e.g. snow removal, weeds, etc.)

3.3.5 Winter Maintenance of Trails
Trails within the City of Hamilton identified as winter maintenance candidates should be constructed to appropriate minimum standards which includes:
• Adequate surface drainage to prevent surface water ponding;
• Minimum width (not less than 3.0m) which allows for adequate access for maintenance equipment;
• Asphalt surfacing;
• No adjacent trail danger (e.g. a steep drop-off that could be a hazard and unsafe for equipment operators) and;
• Major connections between schools and those that are previously funded through operational budget

Figure 38: Winter maintenance is not available on all trails
4.0 SUMMARY OF RECOMMENDATIONS AND NEXT STEPS
4.1 Use of the Recreational Trails Master Plan

The Recreational Trails Master Plan is the overarching strategic document that provides a framework for how current and future trail development needs will be addressed. The plan describes, anticipates and plans for the strategic development of trails throughout the city and guides the next steps towards improving and expanding the trails network to promote trails in Hamilton. The Recreational Trails Master Plan also provides the public with clear identification of the role and function of trails within the city; how trails are intended to operate, how they relate to and impact on the land uses that they serve.

One of the primary purposes of the Recreational Trails Master Plan is to guide trail-related decision making and development. The plan also provides the need and justification for trail infrastructure projects in the form of trail initiatives. Throughout the report, recommendations are made for various initiatives which are integrated to strengthen and improve the City’s trail network and improve connectivity to surrounding communities. Section 3.0 The Implementation Plan takes into account all trail initiatives within each Ward and identifies specific priority initiatives for implementation.

4.2 Future Studies

There are certain aspects of the trail network that are beyond the scope of the Recreational Trails Master Plan Update. Different requests or recommendations came forward from the public or through stakeholder consultations that require further investigations and study prior to implementation. These are beyond trail initiatives that are recognized for all fifteen (15) wards. The following are a list of future studies and actions that are recommended as a result of discussions undertaken through the Recreational Trails Master Plan Update.

**All-Terrain Vehicle (ATV) Trails** – To investigate suitability and feasibility of developing ATV specific trails in City of Hamilton, a future study is recommended. Investigations would include the review of policies and procedures that need to be in place, research on the most appropriate area and route, consultation with the ATV community in Hamilton, and the establishment of design and construction guidelines.

**Alleyways as Trails** – Further studies and collaboration among City departments are recommended to investigate where the use of alleyways as trail connections is feasible pursuant to connecting residents to schools, parks, and commercial areas.

**Mountain Biking Trail Facility** – A Mountain Biking Trail Facility was proposed in the 2007 Recreational Trails Master Plan study for William Connell Park in Ward 8. Through detailed design and assessment of the ecologically sensitive areas William Connell Park is in, this option was eliminated. During the process of Recreational Trails Master Plan Update, a need for a full recreational assessment of different areas of the City for Mountain Biking Trail Facility(s) was recognized. This is recommended for further investigation and collaboration with other City departments.

**Regional Connectivity** – Further investigations are recommended to identify large-scale connection between the City of Hamilton and adjacent municipalities.

**Education and Promotion Opportunities for Trails** – Future studies and collaboration with other City departments are recommended to identify a variety of subjects (e.g. User Conflict Resolution) about trails that would benefit from education and promotion, and to identify some of the most effective methods of communicating this to the residents of Hamilton.

**Signage** – Further investigations are recommended to address the needs of trails signage throughout the City, including compatibility with existing signage programs, and AODA requirements.

4.3 Recreational Trails Master Plan Review and Updates

The Recreational Trails Master Plan is not intended to be a static document. It must be reviewed as often as possible to ensure it meets the trail development needs of the City. Changing community expectations or growth and development patterns can necessitate a review of the Plan’s primary recommendations.

The Recreational Trails Master Plan is intended to be used as a working tool which will allow City staff to review individual, phased trail initiatives.
while integrating those trails within the context of the entire network at any given location. The Plan leads the way for future expansion of the trails network.

There are a number of recommended steps that should be considered in order to advance the Recreational Trails Master Plan:

• Following full adoption of the complete Recreational Trails Master Plan, issue a media release and public notice announcing the completion of the plan;
• The Recreational Trails Master Plan should be posted in digital format on the City’s website and also made available in hard copy as requested;
• Systematically implement the recommended trail network initiatives;
• Coordination and implementation of trails shall be included in related capital infrastructure projects and funding shall be included as a portion of the project budget;
• Evaluate the effectiveness of preparing a pilot signage and wayfinding strategy for one key section of a certain trail;
• Prepare a detailed City-wide wayfinding signage strategy for all trails;
• Within 2 years facilitate the development of a digital map of the existing trail networks for publishing on the City website (the map shall be compatible with mobile device use);
• Ongoing updates of the geographic information system database for both the existing and proposed trails are essential to ensure maps are current. Annual geographic information system (GIS) updates and reviews for accuracy are recommended;
• Explore community based social marketing techniques and opportunities to work with local partners and other public agencies to promote the health and recreational benefits of the trails;
• Explore and recommend methods that recognize individuals, businesses and organizations that make exemplary contributions to the development trails in the City of Hamilton;
• Undertake a detailed analysis of lifecycle costs related to trails and prepare a report outlining findings and recommendations regarding the funding required to address these lifecycle costs for capital budget deliberations;
• Explore outside partnerships, cost-sharing and funding opportunities for the implementation of trails that are outside the responsibility of City of Hamilton; and
• Have fun, and remember that trails improve public health, lifestyles, and contribute in a positive manner to the character of our city.
REFERENCES


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