



# CITY OF CAMBRIDGE TRAILS MAINTENANCE

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## Trails Maintenance Report

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**Project Location:**  
50 Dickson Street  
Cambridge, ON

**Prepared for:**  
The Corporation of the City of Cambridge  
50 Dickson Street  
P.O. Box 669  
Cambridge, Ontario  
N1R 5W8

May 5, 2010

Revised  
August 12, 2010





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**MTE File No:**  
34336-100

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# **Trails Maintenance**

## **INTRODUCTION**

Recreational trails improve quality of living in Cambridge by providing links between communities, promoting physical activity, and cultivating an appreciation for the natural environment. In 1996, the original Cambridge Trail Study was completed and has recently been updated in 2010. The Trails Master Plan report prepared from the 2010 study identifies existing trails, potential future trail connections including constraints and opportunities and includes design guidelines. This study also included a review of the existing maintenance program and Trails Maintenance Manual (April 1999). As such, maintenance is discussed in the Trails Master Plan however, this document has been created as an update to the Trails Maintenance Manual and works in conjunction with the Trails Master Plan.

This update to the Trails Maintenance Manual specifically addresses issues pertaining to the maintenance of existing city trails. Continued growth of the city in the past two decades has increased the demand for such recreational trails, and put greater pressure on the maintenance of existing trails. Thus, it was deemed necessary to update the city's trail maintenance and expansion strategy to better reflect current standards, challenges, new criteria and issues affecting the trail network.

## **STUDY PROCESS**

This study involved an extensive review of the previous Trails report from 1996, and was further expanded through additional research, conducted in three main phases. Background research began with identifying trail network expansion opportunities, by considering the Region's transit and land use plans. Future growth opportunities and the need for new trail connections were recognized. A thorough review of best practices was also conducted, contacting several neighbouring municipalities for information about their trail systems and methodology. Current maintenance needs within the City of Cambridge were examined, including an investigation of current parks and trails maintenance staff were interviewed. Feedback from the Project Steering Committee, Cambridge Trails Advisory Committee (CTAC) and senior staff was also obtained. A series of Public Information Centres (PIC) were held to receive community feedback as well as the distribution and receipt of several questionnaires.

The second phase of analysis and plan development consisted of a preliminary draft of the study report and an update of the existing maintenance manual, based on the research conducted in the first phase. These drafts were then presented to the steering committee, CTAC and the public. In phase three, trail funding opportunities were explored and final drafts of the report and maintenance manual were prepared.

## **CONTACTS**

During the process of the Trails Master Plan, communication for maintenance (regular and emergency), budgeting and staffing was identified as a key element. This included the recommendation for a "hotline" number for the public to identify maintenance concerns or needs.

The following is a summary of phone numbers of the various trail contacts.

### **Trails Maintenance**

City Hall Parks Main Number: (519-740-4681)

Trail Maintenance: Don Bridgman

Parks Contacts:

Riverside Park – Chris Ziemski

Churchill Park – To be determined in Spring 2011

Soper Park – To be determined in Spring 2011

### **Design and Planning of Trails**

Alex Koch, Coordinator of Design and Development

Susan Reise, Landscape Architect

### **Environmental Components**

City of Cambridge

April Souwand (Senior Environmental Planner)

Roger Brown (Manager of Horticulture/Forestry Services)

Grand River Conservation Authority (519-621-2763):

Resource Planners – John Brum and Melissa Larion

Aquatic Biologist – Jennifer Wright

Region of Waterloo

Albert Hovingh (519-575-4500 x4813)

### **Cambridge Trails Advisory Committee (CTAC)**

Bill Kirby, CTAC Chair

### **Accessibility Contact**

Andrea Riley, Accessibility Coordinator (519-740-4681 x4689)

## **Section One**

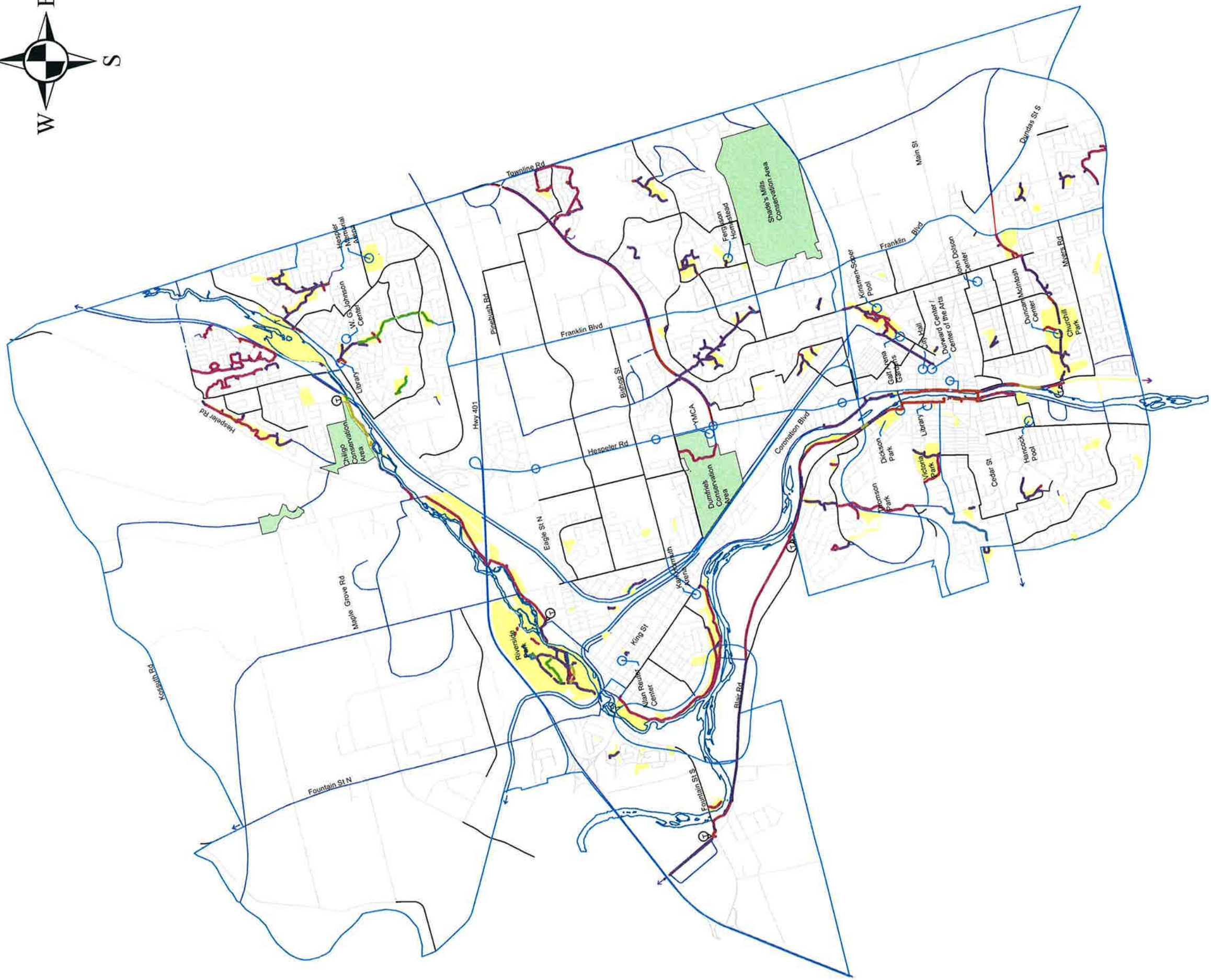
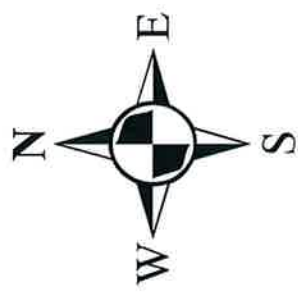
### ***Total Trail Sections Maintained by CSD***

## 2010 SUMMARY OF EXISTING CONDITIONS

As part of the Trails Master Plan Study, a GPS survey of the existing trails network was completed. This included collecting data such as trail alignment, signage and structures (culverts, benches, etc.) along the trails within the City. The majority of trails within the City are either stonedust or asphalt. **Table 1** below summarizes the trail surface inventory.

<b>Table 1: Trail Surfaces</b>		
	Length (m)	% of Total
Asphalt	31057	45%
Stone Dust	27885	41%
Concrete	3550	5%
Wood Chip	2182	3%
Dirt	1411	2%
Grass	1128	2%
Gravel	1111	2%
Interlock	437	1%
TOTAL	68,760	100%

**Figure 1** illustrates the overall existing trail network with existing surfaces identified. The various trail types have different maintenance requirements. For example, asphalt trails are generally maintained within the winter months where the various other trail types are not. The attached Figure 1 should be updated as new trails are created or existing trails modified to reflect current annual conditions.



**Legend**

- ASPHALT
- CONCRETE
- DIRT
- GRAVEL
- STONE DUST
- WOOD CHIP
- Parks
- Conservation Area



The Corporation  
of the City  
of Cambridge



**FIGURE 1** Scale: As Shown

**OVERALL TRAIL NETWORK**



## **Section Two:**

### ***Risk Management***

## **RISK MANAGEMENT**

Risk management is a key element in the maintenance of trails. It influences the decisions made in trail development and trail type as well as levels of staffing and funding. There are several components that are necessary to ensure risks to public safety are mitigated, most preferably in a proactive manner.

In order to ensure a proactive approach, regularly scheduled inspections and a "hotline" for public contact are key. The inspection report, discussed further in Section Seven, includes a component for immediate maintenance/risk identification. Risks should be identified, logged and addressed as soon as possible. In addition, any incidents should also be logged. Coordination and communication between maintenance and parks planning staff is essential. Areas where incidents may be recurring potentially require design revisions. As such, it is recommended that maintenance managers, parks managers and trail planning staff walk all trails together once per year to identify areas of concern and complete an assessment with respect to risk and risk management.

In addition to the trails in general, many trails have structural elements such as bridges, ramps and retaining structures. An Engineering Conditions Assessment should be carried out by a qualified professional every 5 years. The information obtained through these assessments can then be used in the capital planning process.

Risks within the trails will also vary by season as well as by annual conditions. Seasons/years which are wet and encourage quick growth may require higher frequency in maintenance. Elements such as response to flood damage or overgrowth of trails often result in the need to enhance the level of service to meet trail standards. During these times of high need, the City should consider contracting services on an as required basis.

It should be noted that risk management should be completed on a daily basis and should not be limited to regular inspections. All issues and concerns should be documented as they occur and addressed as soon as possible.

Further specific maintenance practices to ensure safety is outlined in Sections Five and Seven.

## **Section Three**

### ***Accessibility Considerations***

The City of Cambridge does not have an approved set of accessibility standards or guidelines. The City currently uses a combination of the City of London 2007 Facility Accessibility Design Standards; the Guidelines and Best Practices for the Design, Construction and Maintenance of Sustainable Trails for All Ontarians 2006; and the City of Kingston's Facility Accessibility Design Standards 2009.

The Province of Ontario is drafting legislation to address accessibility. Currently the standards are in draft form. It is expected that the Province will enact the legislation in the near future. Once the Provincial legislation has been finalized, the City should undertake an audit to ensure that its standards, practices and trails meet the minimum standards required by provincial legislation.

When completing maintenance activities or modifying existing trails or related parking areas, the following guidelines should be followed.

### **SPACE REQUIREMENTS**

Space-related accessibility requirements are typically based on the mobility needs of wheelchairs, scooters, and other mobile devices. The physical needs of disabled individuals are diverse and the specifications for their equipment may also vary significantly, so for the purposes of simplification, standard dimensions of 760mm × 1220mm for wheelchairs and 660mm × 1370mm for scooters are utilized. The space required for a wheelchair to make a 360-degree turn is a clear floor space of 2440mm.

### **GROUND & FLOOR SURFACES**

Ground surfaces utilized on recreational trails will influence the level of accessibility. Potentially irregular surfaces such as hardened earth or stonedust may be difficult to traverse in a wheelchair or even on foot. Slippery surfaces pose a hazard to all users, especially to seniors and those who have difficulty walking. When a recreational trail must pass over a grate, spaces shall not exceed 13mm wide in any direction, and must be placed so that the long dimension lies perpendicular to the dominant direction of travel. Openings that exceed 13mm in width may catch wheelchair wheels or canes that are used on the trail.

### **PROTRUDING & OVERHEAD OBJECTS**

Ensuring clear paths is of critical importance for all trail users. Overhead hazards may be particularly dangerous to the visually impaired or pedestrians who become distracted. The minimum clear headroom in pedestrian areas shall be 2100mm.

### **ACCESSIBLE ROUTES**

Paths and walkways should allow a full range of mobility for their users. This includes not only users of scooters and wheelchairs, but also those pushing strollers or people travelling in pairs. The recommended trail width for multi-use trails is 3.0m. Accessible routes shall have a running slope not steeper than 1:25 (4%), and have a cross slope not greater than 1:50 (2%). Accessible routes less than 1830mm wide should have an unobstructed passing space of not less than 1830mm in width and length, located not more than 30m apart.

Except at stairs and elevated platforms, where the edges of an accessible route is not level with the adjacent surface, the edges shall be protected by a colour-contrasting curb of at least 75mm high where the change in level is between 200mm and 600mm, and by a guard which meets the requirements of the Ontario Building Code where the change in level is greater than 600mm. Accessible routes having a slope steeper than 1:25 (4%) shall be designed as ramps. Designated areas for snow piling are to be provided at exterior accessible routes, located away from pedestrian routes.

## **CURB RAMPS**

To ensure a smooth transition on and off of a roadway, curb ramps should be incorporated. Flaring the sides of curb ramps eliminates the risk of pedestrians unexpectedly stepping off an edge. While smooth transitional ramps are ideal for wheelchairs and other devices, they pose a risk for visually impaired individuals who may not identify the transition between sidewalk and roadway. City of Cambridge municipal guidelines should be followed at locations of street crossings, trail parking areas and other points of entry/exit to trails as appropriate.

## **STAIRS**

Stairs are generally not recommended on the trails. Where they are necessary, the following guidelines should be considered. A flight of stairs should have uniform riser heights and uniform tread depths. The rise should not exceed 180mm or be less than 125mm. The run should not exceed 355mm or be less than 280mm, measured from riser to riser. Detectable warning surfaces should be incorporated, and risers may not be open. It is recommended that handrails for stairs be installed on both sides. Designated areas for snow piling are to be provided at exterior stairs, located away from pedestrian routes.

## **PARKING**

Minimizing travel distances for disabled individuals is particularly important outdoors, where weather conditions and ground surfaces can make travel both difficult and hazardous. The accessible route of travel from the parking area to the entrance of the trail should be well-marked and free of steps or curbs. Parking areas should consider barrier free spaces as appropriate at trail locations.

## **BOARDWALKS**

Where boardwalks are provided, they shall have a minimum width of 2000mm, and incorporate surfaces constructed of firm, non-slip materials. Where wooden planks are used, they shall be laid perpendicular to the direction of travel and have joints no wider than 6mm, so as to prevent wheels or canes from becoming caught.

In addition, any future boardwalks or crossings required should be sufficiently wide to accommodate standard maintenance equipment, such as a "Gator" to improve efficiency in maintenance routines. Any crossing replacements that are completed should also accommodate these criteria.

## **Section Four:**

### ***Environmental Considerations***

As many of the City's trails are near areas with environmental sensitivities or near watercourses, care must be taken during maintenance. These areas are identified on the attached **Figure 2**. It is recommended that staff be shown these areas at the start of every spring season and trained by senior staff or other appropriate person on activities that are both appropriate and inappropriate within the designated and regulated areas.

## 1. DESIGNATED AREAS

PSW (Provincially Significant Wetland)	- Provincial importance
ESPA (Environmentally Sensitive Policy Area)	- Regional importance
LSNA (Locally Significant Natural Area)	- Local importance

- In these areas, there may be rare or sensitive individual plant species or vegetation communities (plants that are found together) (ex. Maple-Beech forest)
- They may also be designated because they are performing important ecological functions (like groundwater discharge providing base flow to a stream).
- Where trails go through these specially designated areas, the trail location and design has gone through a review to make sure the location of the trail is in an acceptable area. It is important that trail maintenance work stays on the trail and material is not stored or dumped beside the trail. No vehicles are taken outside the trail route, and no significant changes to drainage patterns are undertaken.
- Should questions arise regarding maintenance activities in these areas, the City's Environmental Planner should be contacted.
- GRCA Regulated Areas:
  - GRCA Regulated Areas may consist of areas within flood plains and areas of slope instability. Modification to Regulated Areas require the application for Fill Permits to the GRCA to complete such things as grading works which may impact these Regulated Areas. Permits and accompanying plans must be followed during work in these areas.

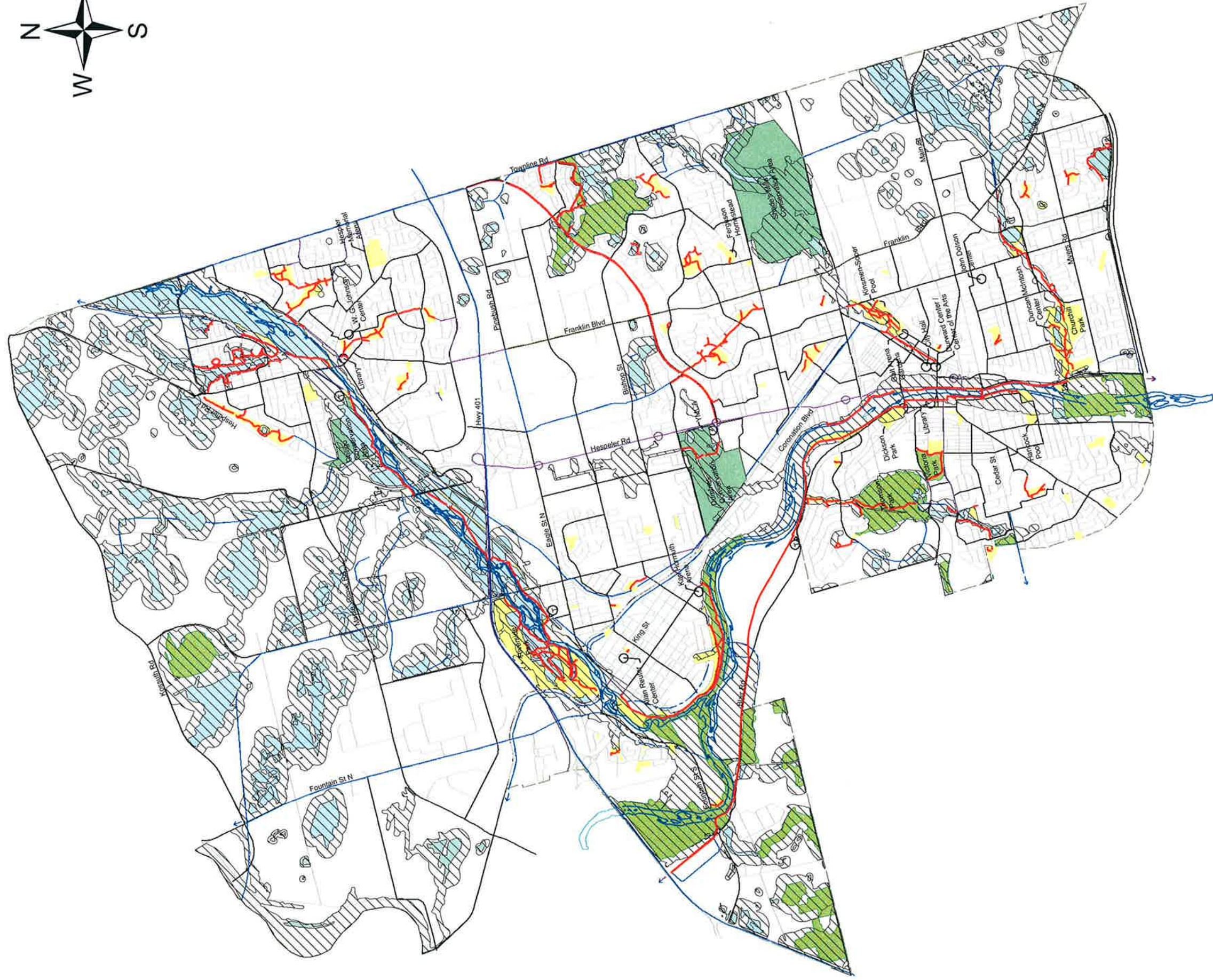
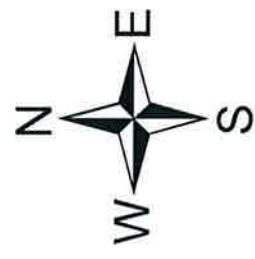
## 2. WORK NEAR WATERCOURSES

- Many of the watercourses in Cambridge provide excellent fish habitat. When working on trail maintenance near watercourses, take extra precautions so that erosion and siltation do not add sediment to the watercourse. Also, do not leave piles of earth or wood chips in the floodplain beside a creek for an extended period of time.
- If maintenance is required that requires stockpiling of material for extended periods of time for larger maintenance projects, stockpiles should be surrounded by appropriately installed silt fence.
- Work on a creek, such as culvert, bridge, or bank stabilization replacement may require a permit from the Grand River Conservation Authority and/or the Ministry of Natural Resources. Do not perform the work until it has been confirmed that the necessary permits are in place. If these permits are required, they will be accompanied by an Erosion and Sediment Control Plan. Measures on this plan must be incorporated into the construction.
- Some of the watercourses in Cambridge, most notably Mill Creek in Soper Park, and Churchill have undergone what is called "natural" channel design. The concrete or stone lining has been removed, the creek has been moved to give it natural



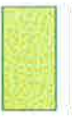
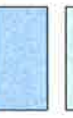


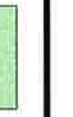
meanders, and native vegetation such as dogwoods or cattails are planted along the edges. The creek is allowed to flood in the spring, and trails may occasionally be topped over with floodwaters. Many Cambridge parks (ex. Churchill, Riverside, and Soper) are in the floodplains of their resident watercourses and flooding is a natural occurrence.

### **3. TREE REMOVAL**

- Tree removal (hazard trees) should be carefully considered. Consultation with the City's Forestry department should occur prior to the removal of any trees.
- If it is in a designated area, be careful not to damage other trees, and leave the felled tree in the woodlot area.
- Felled trees should be cut into 1.5m lengths and left on the forest floor.



**Legend**

-  Trails
-  GRCA Regulation Limit
-  ESPA
-  Significant Wetland
-  MNR Wetland
-  Parks
-  Conservation Area



**FIGURE 2** Scale: As Shown  
**ENVIRONMENTALLY SENSITIVE AREAS**



## **Section Five:**

### ***Classification, Clearing and Maintenance Requirements for Trails***

Revised trail standards and sections were completed with the 2010 Trails Master Plan Update. These are provided on the following pages. Surrounding the trail, a “maintenance box” is identified which should be cleared in order to provide safe usage of the trail. The recommended standards for the maintenance box are a 3.0 meter vertical distance and a 4.0 meter horizontal distance. The 4.0 meter horizontal distance is a result of the 3.0 meter minimum trail width and a minimum 0.5 cleared area on each side of the trail. It is important to note that this is a minimum standard. The City is encouraged to provide a wider cleared area adjacent to the trail where appropriate.

There may be some locations where it is difficult to achieve a 4.0 meter horizontal width. In those situations, it is advisable to reduce the trail width slightly and maintain a 0.5 meter area cleared at the side of the trail if possible. A wider cleared area should be provided wherever possible to improve sight lines and reduce places of entrapment where necessary.

This maintenance box and other routine inspections should be reviewed on all trails regularly, preferably monthly, and more frequently during high growth seasons. Frequency of inspection should increase during this time. Should City crews be unable to maintain the trails to the standard during these times, the City may opt to contract work to ensure standards are maintained.

In addition to maintenance of the “box”, the following elements should be considered in the maintenance and upgrade of trails:

- Trails should be constructed/reconstructed wherever feasible to a width of 3m
- Stonedust is the recommended surface for all trails prone to flooding.
- Grades of 0% to 3% are preferred
- Grades in excess of 5% should have an asphalt trail surface
- Signage types and locations are identified on the figure guidelines below
- Refuse receptacles should be maintained at trail entrance and exits only and not be embedded within the trail
- The City should continue to investigate new materials that ease the removal of graffiti and should respond to vandalism and graffiti as quickly as possible where there is a problem identified
- An engineering condition assessment should be undertaken for all trail structures every five years. Based on the assessment, replacement of structures should be included in the City’s maintenance plan and Capital budget.
- Boardwalks and other structures that currently inhibit accessibility for maintenance equipment should be replaced with structures able to accommodate both machinery width and load over the course of time.

## **Section Six:**

### ***Budgeting and Costs***

There are generally 5 sources of funding for trails maintenance as follows:

- Trail Maintenance Budget
  - This covers materials only and contractor fees including culverts, paving, etc. Flooding trails are the most taxing on the budget.
- Parks Budget
  - A portion of the parks budget is earmarked/portioned specifically to trails within it. If trail standards are not being met, a case needs to be presented to increase this budget.
- Trails Advisory Committee Fund
  - This comes from a 50/50 split of DC and Capital and will be \$200,000 from 2012 – 2019
  - Funding is for the improvement of existing trails and the development of new trails
  - Staff and CTAC currently make the determination of priority
  - It is proposed that the funding be split as 40% for redevelopment of new trails and 60% towards the creation of new trails
- Community Services Department (CSD) Capital Maintenance Fund
  - This fund is for life and safety maintenance on all CSD structures of which a portion will go to large trail structures (e.g. Riverside Boardwalk upgrade)
- Capital Budget
  - This is for special projects and is identified on an individual basis

Several recommendations were made in the Trail Master Plan with respect to maintenance funding as follows:

- The City's Trail Maintenance operating budget and staffing should be reviewed annually.
- The City should consider increasing Trail Maintenance operating budgets proportionally as the trail network is increased.
- 40% of the annual trails Capital Budget account should be allocated for redevelopment of existing trails and 60% be allocated to development of new trails.
- The City should initiate further discussion with the Region regarding the maintenance of boulevard trails adjacent to Regional Roads. Responsibilities and costs incurred for maintenance should be established proactively.

- An engineering conditions assessment should be undertaken for all trail structures every five years. Based on the assessment, replacement of structures should be included in the City's maintenance plan and Capital Budget. The engineering conditions assessment will also need to be budgeted for.

The current budget of \$38,000 in the trails maintenance fund should be reviewed annually in concert with the level of service being provided. The study identified that the current level of service is acceptable to the public. In order to maintain or improve the level of service/decrease exposure to risk, the trails budget will need to be increased with an increased number of trails or length of trails. The current budget of \$38,000 allows for approximately \$560/km of trail. Assuming the current level of service, each kilometer of trail added should add a proportionate amount to the current budget. This should also include inflation, etc. over time. The necessity to contract work should also be reviewed annually and compared against the budget to ensure it is sufficient.

**Section Seven:**  
***Inspection and Maintenance Background***  
***Schedules and Forms***

In order to improve trail maintenance operations for the City of Cambridge, a survey of neighbouring municipalities was conducted to determine best practices.

1. How do you currently determine your maintenance program needs (emergency based, regular scheduling, combination, etc.)
2. What practices do you undertake as part of your regular maintenance?
3. How many FTE's do you have dedicated to trail maintenance?
4. Do you have dedicated equipment for trail maintenance?
5. How are complaints/issues/concerns tracked and how do the notifications come about?
6. Is there software or a means for scheduling maintenance?
7. What are the key problem areas – park/trail specific, creek crossings?
8. What are the key problem features – trail type, furniture, etc.?
9. Are there specific features within a trail that makes it easier or more difficult to maintain? (trail width, surface treatment, trash receptacles, etc.)
10. What would you like to see within a maintenance program/manual that is not currently completed or documented?
11. What type of documentation would you like to track with respect to trails maintenance to assist over the long term?

The matrix found in Appendix A identifies responses and research obtained from other local municipalities.

There are several keys to a successful maintenance program. These include adequate staffing, scheduling of maintenance activities, simplified maintenance forms, training of seasonal staff annually and communication with Trails Planning and Design staff to assist in prioritization of projects and review of standards.

#### **MAINTENANCE SCHEDULING:**

From April to November, inspections should be made regularly, relative to the amount of traffic on each trail. During the off-season, trails should be inspected on a less frequent basis. A major review of all trails is recommended in Spring once Winter is over. There should also be next-day inspections after every major storm and weather event. Trail inspection frequency should be based on material type/durability and traffic volumes. For surface maintenance, packed earth trails should be inspected at least three times annually, stonedust at least twice annually, and asphalt once annually in the spring to check for pot holes. Refurbishment and replacement of larger items such as signs, benches, bridges, railings, and gates only need to take place every 3-10 years, owing to their longer life spans.

#### **REGULAR MAINTENANCE PRACTICES:**

Grass-mowing and clearance of encroaching vegetation is an important part of trail maintenance. Timing should be weekly, bi-weekly, or monthly depending on the class of the trail and the growth season (spring/wet summer). The size of the clear zone on either side of the trail is also dependent on its class, as well as sightlines for cyclists. The maintenance "box" was discussed in previous sections. Culvert cleaning should be performed seasonally to ensure that drainage is not disrupted. Debris should be taken off site. Grading or grooming of trails should be performed once annually or on an as-needed basis after severe storms or flooding. Garbage should be collected weekly or bi-weekly. Collection is made much easier by placing garbage bins at the end of trails. This placement does not seem to impact the frequency of litter mid-trail. During the winter months, asphalt trails should be cleared after major snowfalls, and areas identified as slipping hazards may be sanded or de-iced as needed. The City should work Region to review Smart On Salt practices as they evolve. Non-corrosive de-icing materials are encouraged instead of salt so as to reduce corrosion and promote increased durability of any structures on the path, as well as reducing the environmental impact.

#### **EQUIPMENT:**

Gators or other small tractors should continue usage; other specialized equipment that may be useful includes trail groomers. Most work requiring specialized equipment should be contracted out rather than purchasing the equipment itself.

#### **PROBLEM NOTIFICATION:**

Continue to utilize a "hotline", a special phone line available for the public to send in notifications about trail problems, especially in the winter time. These complaints can then be forwarded to parks and trails managers whereupon they can be dealt with in an appropriate manner. In some municipalities, mower operators are trained to look for problems while they are performing their rounds.

## **SCHEDULING LOGISTICS:**

None of the studied neighbouring municipalities relied on specialized software for maintenance. Using regularly-kept logbooks to track inspections and maintenance work seems to be adequate for most purposes. Over time, the City may wish to incorporate an Infrastructure Management System with a Maintenance Program for scheduling and reporting purposes.

## **KEY PROBLEM AREAS:**

Washouts occasionally occur near Fountain St. and Blair Rd. after heavy rain, although this is atypical for the majority of the trail network that is within the floodplain. Trails within the floodplain should be constructed of stonedust to minimize costs and maximize ease of repairs. On the trail near Dam and Beaverville Rd., the trail is insufficiently constructed to allow trucks; only Gators or smaller tractors can access the area. This impedes maintenance and should be examined further.

## **BEST PRACTICES:**

- Current trash disposal practices are adequate, with receptacles located at trail endpoints. Even without receptacles located midway along the trails, litter is not a major concern.
- Trail durability and maintenance requirements are directly related to how well the trail was initially constructed; hence all future trail construction should be carefully planned and monitored to ensure fewer problems in the future
- Preventative maintenance is another important aspect of keeping trails in good condition; specifically, trail surface deterioration, signage, waste, and vandalism are all aspects worth monitoring and treating before they become significant problems.
- Weed control is also important for preserving the lifespan of trail materials, as plant life can lead to damage and increased erosion. However, it is advised that eco-friendly means of control be used, and that maintenance practices refrain from utilizing harmful chemicals.
- Based on the needs of trail maintenance staff, all trails should at least be accessible by Gators or small tractors, and where possible, by pickup trucks.
- Strong communication efforts between parks staff and trails staff are essential to an effective trail maintenance program.
- If possible, a GIS tracking system should be implemented by the City of Cambridge to oversee its trails program. GIS will make the system easier to visualize and manage, allowing for improved organization of existing information and simplified planning for the future.
- Staff should be trained annually on trail components and related maintenance issues. A summary of the maintenance activities is provided on the attached Table 2.
- The following simplified maintenance form should be employed at the regular intervals as above. In addition, these should be readily accessible to staff to report any concerns as regular maintenance occurs.

**Table 2: Summary of Maintenance Activities**

Maintenance Activities	Comments
Removal and identification of hazards or safety concerns (ongoing)	Staff should be trained on recognition and reporting of potential risks or hazards and all field equipment should be equipped with incident/hazard reporting forms.
Structural repairs	Minor structural repairs may consist of elements such as minor repairs to stairs, retaining walls, etc. Larger elements will be budgeted annually and through the assistance of the Engineering Conditions Assessment to be completed every 5 years.
Surface Repairs	To be completed for all surface types based on inspections, storm events, damage and budgeted elements (e.g. change in surface material)
Smoothing of gravel in parking areas and at trail surface connections	
Culvert cleaning	This should be considered a high priority element in the spring to ensure free flow conditions and inspected after major storm events particularly in flood prone areas.
Painting, cleaning and sign replacement	
Bench repair, painting and refinishing	
Tree/shrub pruning, grass cutting (overall vegetation management)	To be based on the "maintenance box" in Section 5. Frequency will vary with seasonal growth and annual growing conditions.
Sweeping	
Litter pick up/removal from receptacles	
Gate repair	
Snow removal and maintenance of sand boxes	

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## Appendix A

### Feedback from Neighbouring Municipalities

Topic		Municipality				
Cambridge Questions	Guelph Questions	City of Cambridge	City of Guelph	City of Brampton	Town of Milton	City of Mississauga
How do you currently determine your maintenance program needs (emergency based, regular scheduling, combination, etc.)		<ul style="list-style-type: none"> <li>Most issues are addressed after being notified by the public (ie. Fallen trees)</li> </ul>	<ul style="list-style-type: none"> <li>Tasks performed on a seasonal basis include culvert cleanout and trailside pruning.</li> </ul>	<ul style="list-style-type: none"> <li>Major annual review taken in Spring, prior to peak season; inspections after all major weather events; acts of vandalism are handled as soon as they are reported</li> </ul>		
			<ul style="list-style-type: none"> <li>Tasks performed on a 3-5 year cycle include refurbishment of signs, cleaning and refurbishment of benches.</li> </ul>	<ul style="list-style-type: none"> <li>Trails swept once annually following winter, and prior to major events; "Primary" walkways receive higher levels of maintenance; 12 marked trails do not receive maintenance</li> </ul>		
			<ul style="list-style-type: none"> <li>Tasks performed on an as-required basis include moving or marking obvious hazards within 24 hours of their identification, inspection/monitoring of trail areas prone to damage following heavy storms, repair to vandalized items, minor repairs to structural elements such as bridges, trail surfaces, railings, benches, gates and signs.</li> </ul>	<ul style="list-style-type: none"> <li>Trail maintenance levels also depend significantly on material type and durability: Packed Earth requires seasonal inspection in spring, summer, and fall; Stonedust requires twice annual inspections in spring and fall; Asphalt requires annual inspection in the spring to check for potholes; Poured Concrete requires annual inspection; Concrete Pavers require twice annual inspection to check against differential settlement</li> </ul>		
What practices do you undertake as part of your regular maintenance?	What kinds of tasks are you currently performing for trail maintenance (during all 4 seasons) (i.e. are there weekly, monthly, and annual tasks)?	<ul style="list-style-type: none"> <li>Winter - emergency maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Mowing grass along edges of trails is performed on a regular basis. Depending on trail location this may be weekly, biweekly or monthly, width varies from 0.5m to 2.0m depending on municipality and location and helps to keep clear zone open. It can also help with weed control and the invasion of weeds into granular trail surfaces.</li> </ul>		<ul style="list-style-type: none"> <li>Tasks performed on a regular basis, such as biweekly or monthly, include: grass-cutting along trail edges in high-use areas, litter removal and trash receptacle maintenance (weekly for high-use areas) and biweekly for lower use areas, maintenance of trailside washrooms including portable units</li> </ul>	<ul style="list-style-type: none"> <li>Spring debris clearing</li> </ul>
		<ul style="list-style-type: none"> <li>Spring - washouts, dealing with flooding</li> </ul>	<ul style="list-style-type: none"> <li>There is regular garbage pickup (10 day cycle), with receptacles located at the ends of trail segments where they can be easily accessed for service vehicles.</li> </ul>		<ul style="list-style-type: none"> <li>Tasks performed on a seasonal basis include culvert clean-out, trailside pruning of vegetation, cleaning and refurbishment of signs (on a 3 to 5 year cyclical basis), cleaning and refurbishment of benches (3 to 5 year cycle)</li> </ul>	<ul style="list-style-type: none"> <li>Snow clearing</li> </ul>
		<ul style="list-style-type: none"> <li>Spring/Summer - stone dust in floodplain areas; grading, adding stone dust; emergency works such as bridge replacement; big ticket items are separate and not funded through maintenance budget; asphaltting determination made by Don (works with Public works on this component) and comes out of the parks/trails budget; keeping resources is difficult</li> </ul>	<ul style="list-style-type: none"> <li>Some are experimenting with in-ground garbage receptacles in high use areas where they are finding the need to empty overflowing containers more often than their regularly scheduled pickup. These are specially designed units that hold more, are set in vaults below grade. They don't blow or get knocked over, look better and don't need to be serviced as regularly.</li> </ul>		<ul style="list-style-type: none"> <li>Tasks performed on an as-required basis include moving or marking obvious hazards within 24 hours of their identification, inspection/monitoring of trail areas prone to damage following heavy storms, repair to vandalized items, minor repairs to structural elements such as bridges, trail surfaces, railings benches, gates and signs</li> </ul>	<ul style="list-style-type: none"> <li>Replacing worn pavement markings and bicycle symbols; replacing damaged signs</li> </ul>
		<ul style="list-style-type: none"> <li>There are many natural walking trails on which cutting back overgrown vegetation is the extent of maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Grading/grooming surface of granular trails is done once per year or as required after heavy storm events in areas prone to erosion.</li> </ul>		<ul style="list-style-type: none"> <li>Major renovation/replacement of large items such as bridges, kiosks, gates, parking lots, and asphalt trail surfaces was generally described as a 10-20 year cyclical item.</li> </ul>	<ul style="list-style-type: none"> <li>Repairing potholes</li> </ul>
		<ul style="list-style-type: none"> <li>Clearance pruning (3 feet on either side / 10 feet high) as well as grass cutting</li> </ul>	<ul style="list-style-type: none"> <li>Annual pruning of vegetation along the side of trails is important to stop woody vegetation from encroaching on the sides of trails and maintain sight lines which is especially important where number of users and speeds are higher.</li> </ul>			<ul style="list-style-type: none"> <li>Multi-use trails will be cleared according to the city's spring maintenance schedule</li> </ul>
			<ul style="list-style-type: none"> <li>Most conduct an annual safety audit, not necessarily specific to trails, often covered under the required general annual safety audit for parks, playgrounds and recreation facilities, personal security and safety.</li> </ul>			<ul style="list-style-type: none"> <li>Regular grass-cutting, tree-trimming, and vegetation-clearing will be provided as part of the parks and roadway maintenance programs</li> </ul>
			<ul style="list-style-type: none"> <li>Major renovation/replacement of large items such as bridges, kiosks, gates, parking lots, and asphalt trail surfaces was generally described as a 10-20 year replacement item.</li> </ul>			
How many FTE's do you have dedicated to trail maintenance?	Do city forces complete all of the maintenance, are there some tasks that you contract out (not including construction of new trails)?	<ul style="list-style-type: none"> <li>Between April 1 and end of November there are generally 2 FTE's</li> </ul>	<ul style="list-style-type: none"> <li>Most have trail patrols or supervisors (often by district) that review the trail conditions on a regular basis (as often as weekly) to assess conditions and prioritize maintenance tasks/keep an eye out for problem areas.</li> </ul>			
		<ul style="list-style-type: none"> <li>Off-season, there is limited staffing so maintenance is limited to "putting out fires" and only addressing major issues as they arise</li> <li>No preventative maintenance is undertaken</li> </ul>				
Do you have dedicated equipment for trail maintenance?	Do you use any specialized equipment for trail maintenance? If so, what?	<ul style="list-style-type: none"> <li>Contract/seasonal staff assist with operations between April and November</li> </ul>	<ul style="list-style-type: none"> <li>In most cases, parks crews, as part of their regular park maintenance role performed trail maintenance. Where extensive maintenance programs were reported, additional seasonal labour was added to the workforce (often summer students). For some cases volunteer "adopt-a-trail" programs were identified as useful for basic trail cleanup and monitoring.</li> </ul>		<ul style="list-style-type: none"> <li>In most cases, parks crews, performed trail maintenance as part of their regular park maintenance role. Where extensive maintenance programs were reported, additional seasonal labour was added to the workforce (often summer students). For some cases volunteer "adopt-a-trail" programs were identified as useful for basic trail cleanup and monitoring.</li> </ul>	
			<ul style="list-style-type: none"> <li>Most do the work with their own forces, only "contracting out" new trail construction or major trail upgrades (i.e. asphalt placement where specialized equipment is required).</li> </ul>		<ul style="list-style-type: none"> <li>In most cases, specialized equipment was not purchased for trail maintenance (the only exceptions were for trail grading and trailside weed removal)</li> </ul>	
			<ul style="list-style-type: none"> <li>The only special equipment noted for trail maintenance was a trail grader/groomer to level out the surface, and define trail edges.</li> </ul>			

Topic		Municipality				
Cambridge Questions	Guelph Questions	City of Cambridge	City of Guelph	City of Brampton	Town of Milton	City of Mississauga
How are complaints/issues/concerns tracked and how do the notifications come about?	How do you know where critical trail issues are? Do you perform safety audits, if so how often? Do you have trail patrols, do you rely on concerns raised by trail users and calling in to a "hot line"?	<ul style="list-style-type: none"> <li>• Winter issues are mostly directed to Chris</li> </ul>	<ul style="list-style-type: none"> <li>• Most have a call in/hot line for areas requiring emergency repairs, or areas where garbage containers are heavily used (pick up garbage within 48 hours of call in). None of the hot lines are trail specific, most often included with a parks or even citywide hotline for parks, roads, infrastructure.</li> </ul>		<ul style="list-style-type: none"> <li>• Regular trail inspections(daily to weekly) either by service vehicle (for long sections of rail trail) or by bicycle (for urban trails) was consistently cited as a key factor in documenting existing problems and identifying potential problems</li> </ul>	
		<ul style="list-style-type: none"> <li>• Significant issues (i.e. large fallen trees) will be addressed by Forestry</li> </ul>	<ul style="list-style-type: none"> <li>• Several have trained their mower operators to be more observant while mowing to take note of problem areas.</li> </ul>		<ul style="list-style-type: none"> <li>• Preventative or proactive maintenance, especially with regard to trail surface condition, signing, trash, and vandalism were cited as a key success factor</li> </ul>	
Is there software or a means for scheduling maintenance?			<ul style="list-style-type: none"> <li>• Some have a maintenance logbook to set out a schedule of tasks, priorities, standards to be achieved and method of tracking that the work has been completed. They report that this also helps in being able to predict which trails require the most maintenance.</li> </ul>			
What are the key problem areas – park/trail specific, creek crossings?		<ul style="list-style-type: none"> <li>• Access at Dam and Beaverdale Road difficult (no truck access only gators and smaller grooming equipment)</li> <li>• Riverbank access can be difficult</li> <li>• Washouts occasionally happen after periods of heavy rain, specifically near Fountain and Blair, although these are infrequent for most of the trail network</li> </ul>				
		<ul style="list-style-type: none"> <li>• Walking bridge at Rush St. to Speedsville Rd. experiences seasonal flooding</li> <li>• Path covered by woodchips/mulch rather than stonedust</li> <li>• Woodchips appear to be more durable after flooding</li> </ul>				
What are the key problem features – trail type, furniture, etc.?		<ul style="list-style-type: none"> <li>• Culverts and bridges all functioning quite well</li> </ul>	<ul style="list-style-type: none"> <li>• Many report that erosion is a big challenge, and that "trail hardening" with asphalt on the slopes is the best way to prevent further erosion.</li> </ul>			
		<ul style="list-style-type: none"> <li>• Worried about asphalt in floodplain areas and higher potential for washout/greater expense in repairs</li> </ul>	<ul style="list-style-type: none"> <li>• Some have tried other soil binding compounds for trails on slopes that are constantly eroded. Mixed success is reported.</li> </ul>			
		<ul style="list-style-type: none"> <li>• No major drainage concerns.</li> </ul>	<ul style="list-style-type: none"> <li>• Asphalt surfaces on trails have a life span of about 15-20 years. Many report that they are now having to go back and reconstruct many of their trails that were installed in 1970's and 1980's, they are finding them to be too narrow to meet today's volumes of use, variety of trail users and high demand for trails.</li> </ul>			
		<ul style="list-style-type: none"> <li>• Washouts occasionally happen after periods of heavy rain, specifically near Fountain and Blair, although these are infrequent for most of the trail network</li> </ul>	<ul style="list-style-type: none"> <li>• The most common complaints regarding trail maintenance included the condition of the trail surface, vandalism, broken glass on trail surfaces and litter.</li> </ul>			
Are there specific features within a trail that makes it easier or more difficult to maintain? (trail width, surface treatment, trash receptacles, etc.)	What are the most notable successes with trail maintenance, what are some of the things that continue to be a big challenge?	<ul style="list-style-type: none"> <li>• Prefer to keep trash receptacles at the entrances (otherwise difficult to maintain the access); trails are reasonably clean</li> </ul>	<ul style="list-style-type: none"> <li>• Trails that were properly constructed in the first place (adequate base, well compacted, properly drained), have the fewest problems from a maintenance point of view. Most do not use chemicals for weed control, occasionally "Round-up" is used under special circumstances or for problem areas. Some have been experimenting with alternatives such as steam and close mowing.</li> </ul>			
		<ul style="list-style-type: none"> <li>• Trash control is quite adequate, for the most part</li> <li>• Most trails have garbage bins located at the end of trails</li> <li>• No dumping issues as trails are located away from roads</li> </ul>	<ul style="list-style-type: none"> <li>• Preventative or proactive maintenance, especially with regard to trail surface condition, signing, trash and vandalism (including graffiti) were cited as a key success factor.</li> </ul>			
		<ul style="list-style-type: none"> <li>• Gators in summer are primary means of maintaining trails</li> <li>• Some of the smaller footbridges (i.e. at Beaverdale) cannot be crossed</li> <li>• Any new design standards should ensure that bridges are traversable by Gators and other small tractors</li> <li>• Cannot enter some tunnels</li> </ul>	<ul style="list-style-type: none"> <li>• Most do not light their trails. Lighting is costly to install, costly to maintain, and can create the perception of false safety. Some "target light" specific problem areas where there are nearby observers to report inappropriate activities.</li> </ul>			
			<ul style="list-style-type: none"> <li>• In most cases, respondents felt that they could do a better job at trail maintenance, but were limited by resources (staff and time).</li> </ul>			
What would you like to see within a maintenance program/manual that is not currently completed or documented?	Do you have written policies/standards for the maintenance of trails?	<ul style="list-style-type: none"> <li>• Coordination between parks staff and trails staff a necessity.</li> </ul>	<ul style="list-style-type: none"> <li>• Several reported having written policies that define how different types of trails will be maintained (what the maintenance goal/standard is, how that will be achieved etc). For those that do not have written policies, most are working toward this.</li> </ul>			
What type of documentation would you like to track with respect to trails maintenance to assist over the long term?		<ul style="list-style-type: none"> <li>• Would like to be able to track through GIS the repairs etc. completed</li> </ul>				

Topic		Municipality				
Cambridge Questions	Guelph Questions	City of Cambridge	City of Guelph	City of Brampton	Town of Milton	City of Mississauga
	Do you maintain any trails in winter? If yes, how do you decide which ones to do, and how do you prioritize within that list?		<ul style="list-style-type: none"> <li>A few maintain their trails in winter. Of those, none reported that they maintain all of their trails in winter, rather they choose to plow only their asphalt trails, and only in areas that are heavily used or are main connections for utilitarian purposes (connections to schools, main bicycle/pedestrian commuter routes). A reported average cost to maintain trails during winter was approximately \$350/km/winter, a cost that is very close to that for maintaining sidewalks during the winter months.</li> </ul>	<ul style="list-style-type: none"> <li>"Primary" walkways are typically sanded and salted within 24 hours after a snowfall; careful to use non-corrosive de-icing materials so as to prevent bridge deterioration</li> </ul>	<ul style="list-style-type: none"> <li>Trail maintenance during winter months was reported in very few cases, and only for high priority/main trails</li> </ul>	<ul style="list-style-type: none"> <li>All multi-use trails will be considered for snow removal as part of the sidewalk-clearing program</li> </ul>
	Do you carry a separate budget item for trail maintenance or do you have to squeeze this out of other budgets?	<ul style="list-style-type: none"> <li>\$38,000 budget is materials only, or to pay contractors – adequate at this time</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance is generally handled under Parks Operations budgets, sometimes tracked as a separate trail maintenance budget, most often grouped in with other parks maintenance budgets. These budgets address regular maintenance and upkeep tasks (materials and labour), but not major upgrades. Major upgrades (rebuilding, asphaltting, re-asphaltting, adding parking facilities, signage etc.) are carried under Capital budgets.</li> </ul>			
	Do you know how much you spend per year on trail maintenance overall, or better yet averaged out by kilometre?		<ul style="list-style-type: none"> <li>City of Guelph budgeted \$69,200 for maintenance tasks in 2004. Of this amount, approximately half is for materials, half for labour. This amount is to cover trail, parking lot and park road maintenance for all parks.</li> </ul>			<ul style="list-style-type: none"> <li>As low as \$25/km/year for rural or suburban trails, or as much as \$340/km/year for highly-maintained urban trails</li> </ul>



# Appendix B

## Trail Inspection Form

