

2012

Walking Trail Study, Village of Brussels, Municipality of Huron East



*PLAN 641/PLAN 414/REC 425, School of
Planning, University of Waterloo*

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**Brussels Walking Trail
Village of Brussels, Municipality of Huron East
Huron County**

**Prepared for
The Village of Brussels, ON**

**By
PLAN 414/REC 425, Heritage Workshop, School of Planning,
University of Waterloo, ON
In cooperation with
The Heritage Resources Centre**

**Reviewed by
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APRIL 2012



**Heritage Resources Centre
Centre des ressources du patrimoine**

April 30, 2012

Janice Hawley
Economic Development Officer
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72 Main Street S POB 610
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Dear Jan:

Re: Village of Brussels Heritage Trail Student Project

In accordance with the January 2012 contracts between the Heritage Resources Centre, the County of Huron and the Township of Huron East, please find attached the subject project report.

It should be pointed out that the work contained in this report is based on student work carried out as part of a senior undergraduate course in Heritage Planning and Heritage Tourism which is an elective course in the School of Planning, University of Waterloo. While the work was supervised by me and the staff of the Heritage Resources Centre its primary role was a learning exercise and it is not offered as a professional undertaking.

Nevertheless, it is hoped that the results will be of use to the County of Huron and the Township of Huron East.

Yours Sincerely

Robert Shipley PhD, MCIP, RPP CAHP
Director, Heritage Resources Centre

ACKNOWLEDGEMENTS:

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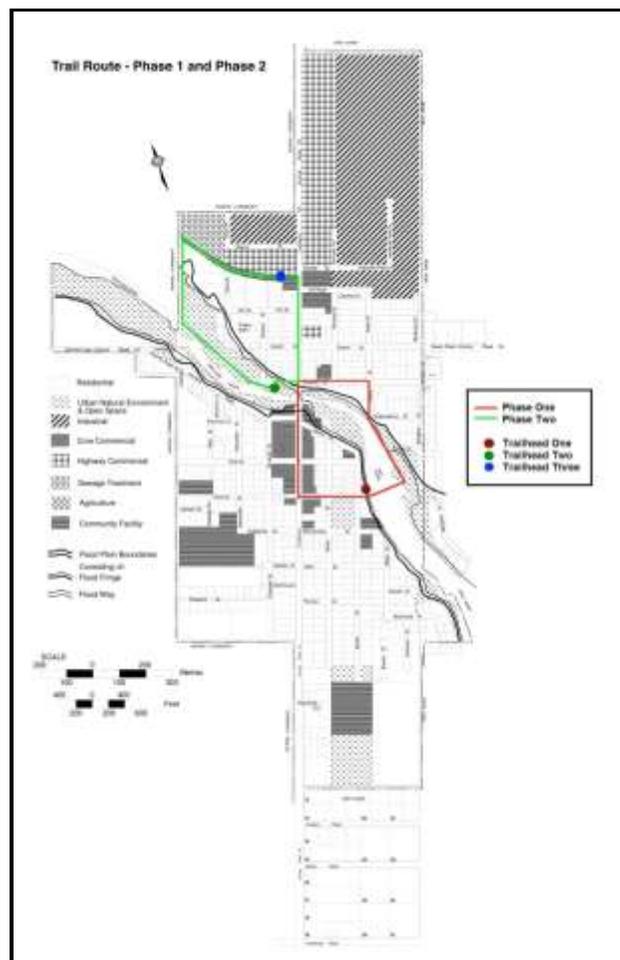
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1.0 EXECUTIVE SUMMARY

- This study was conducted by students from the University of Waterloo, School of Planning under the direction of Professor Robert Shipley and the staff of the Heritage Resources Centre
- It was undertaken between January and April 2012 with support from the County of Huron, the Township of Huron East and the Huron Business Development Corporation
- The purpose was to assess the potential for a Heritage Trail in the Village of Brussels and provide feasible direction for the eventual development such a trail
- This report recommends the walking trail be implemented in two phases:
 - *Phase One* could be accomplished in approximately one year to provide a focus for the trail and make targeted improvements in a specific areas
 - *Phase Two* would primarily be the rural portion of the trail
- Information from Case Studies is provided in the last section of the Report



(Proposed Trail Route in the Village of Brussels)

**Note Phase One in Red, and Phase Two in Green*

2.1 Purpose

The purpose of this report is to outline recommendations in relation to the proposed construction of a walking trail in the Village of Brussels, and provide a set of best practices through case studies (See Section 12.0) as well as provide trail design, material, promotion, and policy recommendations.

2.2 Overview

This report is prepared in cooperation with the Heritage Resources Centre (HRC) and the University of Waterloo Heritage Planning Workshop students following consultation and field work with the Village of Brussels stakeholders, community members and project personnel.

Recommendations outlined in this document will focus on the implementation of a recreational-use trail in the Village of Brussels, being a small rural community with a population of approximately 1,000, located in the municipality of Huron East along the Maitland River. This study provides an assessment of the projected costs and benefits with trail implementation, to be described as *Phase One* and *Phase Two*.

3.0 STUDY AREA

The Village of Brussels is located within the Huron County, Ontario, part of the Municipality of Huron East. The study area is primarily focused on neighbourhoods adjacent or in close proximity to the Maitland River and the associated Mill Pond. It will also connect to the former Grand Trunk Railway tracks.

The former Grand Trunk Railways tracks were located in the north side of Brussels, alongside the sewage treatment plant and agricultural land. The full historic map of the Village of Brussels is an extracted map of the former railway (See Map 1).

Logan's Mill is located on the west side of the Mill Pond, at the end of Flora Street. Beside Logan's Mill is the walkway on top of Brussels Mill Dam; the dam leads to Brussels Conservation Area.

On the east side of the Mill Pond, across the Brussels Mill Dam, is the Brussels Conservation Area. The Conservation Area consists of a washroom facility, picnic area, playground equipment, walking trails and a Butterfly Garden (MVCA, 2012). The Butterfly Garden is located along one trail close to the Mill Pond. The garden wraps around three concrete plaques and eight stone benches. The Brussels Conservation Area eventually leads on to a residential street, Albert Street and Dunedin Drive. On Dunedin Drive are three original 1880s buildings, the Melville Presbyterian Church, Dunedin Manor and Leckie-Hoy House (Huron East, n.d.).



Map 1: former Grand Trunk Railway and Brussels Rail Station
(Extracted from *Brussels Historic Map*)

4.0 CONCEPTS/APPROACH

4.1 Methods

4.1.1 Public Consultation

On Monday February 13, 2012, a stakeholder meeting was held at the University of Waterloo, between three stakeholders from Brussels and 20 students who were assigned Brussels for their group project. In attendance were Sandra Weber (Huron County Senior Planner), David Blaney (Town Councilor and Historian) and Janice Hawley (Economic Development Officer of the Municipality of Huron East)

On Saturday March 3, 2012, public consultation was held with David Blaney, Kathy Nichol and Sandra Weber at the Village of Brussels in Cinnamon Jim's. David Blaney accompanied the team through parts of the residential area adjacent to the North side of the Maitland River and provided helpful information, such as the ownership of the properties along the potential trail area, the flood season and historical background of properties along the walk.

Sandra Weber provided a GIS map of the ownership of all the properties along the Maitland River and Mill Pond, and up to the former railway tracks.

Kathy Nichol recommended that more of the downtown of Brussels, like the gazebo on Turnberry Street, be incorporated into the proposed trail. The gazebo on Turnberry Street, in the middle of the block, is located where a storefront had previously occupied but had burned down in a fire. The trail would go south on Turnberry Street, then east on King Street, eventually leading the user to the Mill Pond and Logan's Mill. Another recommendation from Brussels residents was to walk further south on Turnberry Street and then go east on Flora Street, passing through Victoria Park, before ending at Logan's Mill.

4.1.2 Field Work

On Saturday March 3, 2012, five students explored and walked through Brussels, Ontario. They took pictures and made identified areas that would be aesthetically pleasing to people and areas that would pose potential hazards. Some aesthetically pleasing areas were the Butterfly Garden in the Brussels Conservation Area and the view along the Maitland River. Some potential hazards are the floodplain areas along the Maitland River, where flooding typically occurs during the months of May and June, and the former railway tracks, which is overgrown with vegetation.

In the early morning hours on Saturday March 24, 2012, three students drove to Brussels. Due to the weather conditions on March 3, 2012, the majority of the team did not have a chance to walk the former railway tracks, visit the gazebo on Turnberry Street or walk down King Street. The team was able to take more pictures and notes about the study area.

4.1.3 Comparative Studies/Research:

Six case studies of other trails in Ontario were studied in depth and recommendations from each case study were applied towards the proposed Brussels trail (See Section 12.0).

4.2 Limitations and Considerations

There are two limitations and considerations that need to be taken into account. There are the property ownership and liability concerns as well as floodplain hazards along the Maitland River and Mill Pond.

The majority of the properties along the Maitland River and Mill Pond are privately owned (See Map 2). Permission should be obtained from the owners of the properties, and follow the recommendations outlined in Section 10.3 of this report.

The floodplain areas surrounding the Maitland River and Mill Pond flood during the months of May and June. Even though the majority of the floodplains along the Maitland River are privately owned, permanent structures were prohibited from being established, because of the flooding and the hazards associated with flooding.



Map 2: Private and Public Ownership of Lands in the Village of Brussels
(Huron County Planning Map)

5.1 Origins

The Village of Brussels was established in 1855, however the area was known by two other names, Ainleyville, Brussels and Dingle. The original name of Brussels was Ainleyville, of William Ainley, who was the first settler to lay out a town site on the Maitland River. The name Dingle came about when the local post office was built and the postmaster subsequently named the post office. It is believed that the postmaster named the post office after his home village, Dingle Peninsula in Ireland (Municipality of Huron East, n.d.). Around that time period, the Grand Trunk Railway, also known as the Great Western Railway, constructed the Brussels Railway Station. The workers of the Grand Trunk Railway, named the station Brussels after their homeland of Belgium. As there were three names in the village, leading to a lot of confusion. On December 24, 1872, the name was changed to Brussels when the village was officially incorporated (Village of Brussels, 2003).

5.2 Downtown Brussels

The oldest part of Brussels was built in the 1860s. Brussels experienced several significant fires since the 1860s, with the last substantial fire occurred in 1980 when the Olympia Restaurant was destroyed (Parks-Mintz, 2010). That was when Brussels decided to build all of their buildings out of brick as oppose to wood. Fortunately, when Brussels rebuilt their business district, the buildings retained its original architecture from the late 1800s and mid-to late Victorian streetscape (Parks-Mintz, 2010). When a small fire burned down a building on the block (date unknown), a gazebo was built on the site (See Figure 1).



Figure 1: View of front entrance of gazebo, facing East.
(Contemporary Photograph, Melinda Liu, 2012)

5.3 Logan's Mill and Brussels Mill Dam

In 1859, William and James Vanstone built a flourmill, sawmill and gristmill at the site of the future Logan's Mill (MVCA, 2012). A wooden dam was also built onsite. Twice the mills were destroyed by fire, the first was in October of 1871 and the second in 1911 (Municipality of East Huron, n.d.). Between 1914 and 1915, John Logan built Logan's Mill, a cement gristmill. Mr. Logan also put a cement cap on the dam (Municipality of East Huron, n.d.). The mill operated until 1967, where it was no longer profitable due to the age of its equipment and small size (Municipality of East Huron, n.d.). The property was sold in 1972 and is now under the ownership of the Maitland Valley Conservation Authority. The Brussels Mill Dam is adjacent to Logan's Mill. Brussels Mill Dam was constructed across the Maitland River in 1986, where the Mill Pond was dredged, a man-made island was created in the middle of the dam and erosion-control structure was built along the river to help mitigate flooding (Municipality of East Huron, n.d.).

5.4 Brussels Rail Station

The Brussels Rail Station was built in 1873 in the North side of Brussels, officially opened on July 1st, 1873 (Municipality of East Huron, n.d.). The Grand Trunk Railway Brussels Rail Station was part of the South Branch Wellington, Grey and Bruce railway branch, was the largest railway station in the world at Confederation and connected Sarnia, Ontario to Portland, Maine (The Canadian Encyclopedia, 2012). By 1919, the Grand Trunk Railway faced financial ruin after they built a transcontinental line. Eventually the federal government stepped in and placed all of Grand Trunk Railway under the management of the Canadian National Railways in 1923 (The Canadian Encyclopedia, 2012).

In 1970, passenger service to Brussels stopped and in 1975 part of the station was dismantled and relocated to another site in Brussels, where it serves as the Optimist Club House (Municipality of East Huron, n.d.). The last train ran through Brussels in 1989, after which the rail line was abandoned.

5.5 Architecture

The Village of Brussels is home to a variety of architecture typical of the late 19th century; most notably the Carnegie inspired Brussels Public Library, the Melville Presbyterian Church and residential estates.

Brussels had the honour of being one of 111 Ontario towns to have a Carnegie library, with a Carnegie grant of \$7,000 (Municipality of Huron East, 2012). Prior to the establishment of the Brussels Public Library, there was the Mechanics' Institute Library and Reading Room, established in 1874, however it was located above a store on Holmes Block and had experienced a fire at one point (North Huron, 2010). There was controversy over the location of the library; eventually a lot at the corner of Turnberry Street and Mill Street was purchased. On January 14, 1910, Brussels Public Library opened to the public (See Figure 2) (North Huron, 2010). Common elements of Carnegie libraries consisted of "an exposed basement, a centrally located main entrance, classically columned porticos and a symmetrical arrangement of windows" (Municipality of East Huron, 2012). During World War II, the basement of the library facilitated local Red Cross-related activities.



Figure 2: View of Front Entrance of Brussels Public Library, facing West.
(Contemporary Photograph, Melinda Liu, 2012).

In 1857, the original Melville Presbyterian Church was established (Village of Brussels, 2003). In 1914, the Church was torn down and a new Church was built on Dunedin Drive, across the street from Dunedin Manor. The Presbyterian Church was one of only two churches built with this design by the same architect who designed the other church in Stratford (See Figure 3).



Figure 3: View of Front Entrance of Melville Presbyterian Church, facing North.
(Contemporary Photograph, Melinda Liu, 2012).

A well-known and exquisite residential estate, Dunedin Manor, is located on Dunedin Drive (See Figure 4). Dunedin Manor was built in 1887 for Dr. W.J.R. Holmes and modeled after Scotland's Dunedin Castle (Huron East, n.d.). Dunedin Manor is well known as one of the five great Victorian estates located in south-western Ontario, with stained glass windows, carved tiger and cherry woodwork, high ceilings and original plaster moldings (Huron East, n.d.). Dunedin Manor looks over the Maitland River.



Figure 4: View of Dunedin Manor, facing South.
(Contemporary Photograph, Melinda, Liu, 2012).

6.0 TRAILS

Walkers, runners, cyclists, and people with mobility aids typically use Multi-Use Trails. In order for these trails to be accessible to everyone, it requires trails that have a harder surface, like asphalt, and increased sight visibility along the trail in order for recreation users to have a clear visual of the trail and other users on the trail.

6.1 Economic and Social Benefits

Trails are considered a desirable asset to the community. Trails are a sustainable form of tourism and recreation, becoming the preferred form of recreation and exercise. Cities, towns and regions are seeing the economic and social benefits of having a well-designed and well planned trail system. Some trail systems have been a catalyst for increasing tourists, improving the quality of life of local residents and increasing in the potential to attract new development into the community (Stantec Consulting Ltd., 2000). Trails provide economic benefits to the local economy both during construction and operation. The community is united throughout the construction, operation, maintenance and promotion phase of the trail project. Communities are able to interact with different neighbourhoods and people of different backgrounds. Trail projects can help promote partnerships among local businesses, individuals and government. The social benefits include accessibility, sense of community, improved health, linkages of heritage resources and preservation of natural resources (Stantec Consulting Ltd., 2000).

6.2 Accessibility and Health

Trails are accessible to all levels of physical ability, people of all income levels and are readily available for recreational activities. Trails help promote increase physical activities, such as walking and biking, which help decrease the risk of illness. Active participation would reduce the cost of medical care, decrease workplace absenteeism, provide a low cost recreational activity and reduce the cost of institutional care (Stantec Consulting Ltd., 2000).

6.3 Resources

Trails provide more opportunities for recreational users to appreciate their surroundings, such as heritage and cultural sites. It also encourages them to seek out educational activities. Trails through former railway lines may be a valuable source of vegetation, where stretches of indigenous plant materials may have been preserved (Stantec Consulting Ltd., 2000). Trails along the floodplains and forest areas would serve to educate recreation users, while preserving the majority of the land from development and disturbance.

6.4 Limitations

There are two major limitations of trails, funding and maintenance. Funding will dictate the type of material used to construct the trails and the length of the trail. Without adequate funding, the trail may not be accessible to everyone, especially those in wheelchairs as they require hard trail surfaces. Maintenance is another limitation, where depending on the material of the trail, there may need to be additional maintenance performed throughout the season to ensure that the trail is well maintained and free of debris or hazards.

7.0 ENVIRONMENTAL ASSESSMENT

This section will review the environmental implications the trail may pose on the natural environment, provide information regarding floodplain and railway restoration as well as maintenance recommendations.

7.1 Natural Environment

The Brussels trail will be laid through a variety of natural features. The Maitland River runs through the center of town and represents a major attraction to local citizens and visitors. Every spring, the Maitland River floods much of the lower portion of the village then retracts following the spring thaw. The floodplain covers a great extent of the location of the proposed trail and will limit its use for much of the spring season. Much of the vegetation along the river in Phase 1 consists of manicured grass. A wet-land area is located near the dam consisting mainly of tall grass-type vegetation.

Phase two displays a different variety of vegetation. The area that extends from the north-west portion of Dunedin street backs onto wet grassland, also flooded every spring. This area has a variety of grasses and trees, including black willows. This area extends out of town and changes primarily into an agricultural landscape.

A Dam is located on the southern portion of the river separating the Mill pond and the lower Maitland River. The dam was originally built in the early 1900s to facilitate and control water power to the Logan Mill. Not too long after it was built, a fire destroyed the original mill and it was then reconstructed in 1924. Dams have the ability to alter river ecosystems and hydrology both upstream and downstream. According to the Food and Agriculture Organization (FAO 2002), this affects water quality, quantity, and habitat for wildlife and fish. Having been a part of the river system for an extended period of time, the river does not flow as it had before the dam was built.

The Brussels Conservation Area can be found across the dam from the Logan Mill and consists of a playground, picnic tables, benches and a butterfly garden. In the center of town, a second park area can be found consisting of a gazebo and variety of flower gardens. This area was created amongst buildings in the main core after a building was destroyed in a fire.

The northern portion of town displays an old railway line belonging to the Grand Trunk Railway. Grasses have over-grown the old railway line and are lined with trees.

7.2 Impact on surrounding area

Overall, the impacts of this trail should be fairly minimal, as the majority of the trail is already laid out through already-existing sidewalks and park trails. The most impact on the land will be in *Phase Two*, where the trail will cut through the wet grassland section of the river side, where the material being used will be less permeable than that of the natural environment. It is recommended that when choosing a material it should be durable as well as permeable. Due to the loss of some vegetation, floodwaters may increase with a less permeable surface. This has the potential to cause the river to move at a slightly faster speed due to less area for water retention (less land to hold water).

Potential impacts affecting the natural area due to the implementation of a trail include:

- People walking off path and damaging vegetation

- People walking off path and creating new trails for short-cuts
- Increase in car visitation requiring the need for an increase of parking spaces
- Increase in car visitation increasing the amount of car fumes
- Increase in pedestrians and visitation can lead to an increase in litter

7.3 Possibilities for Restoration

Opportunities for ecological preservation and restoration can be found in both phases of the trail creation.

7.3.1 Floodplain

Investment in native grasses and flowers could be incorporated along the pathway. These are both attractive and could be classified as a pollination stop over. These plants will help the floodplain retain and clean the water. Native plants, especially in the wet grassland area are recommended as they provide great ecological services to water flow. Vegetation in the floodplain helps to slow water speeds and filters nutrients from nearby agricultural fields before being integrated into the water system. These also have the ability to stabilize soil and to reduce erosion-prone areas.

This report also recommends the preservation of the black willow/wet grassland area. Black willows are commonly found in wet areas along riverbanks and work well to provide foliage for animals to eat and make habitats. Foliage also provides soil stability. While this tree species has many benefits, black willows grow tall quickly and die off at a young age. After these trees fall, they may be left as a source of nutrients for the land. However, an over-abundance of fallen trees may prove to be a safety hazard or eye-sore. It may prove to be a better option to find a species of tree that is slower growing, better suited for the area.

7.3.2 Railway

The introduction of native plants and trees will be beneficial to the railway corridor. This phase of the trail would see the industrial area of the city as well as the waste water treatment plant. In the future, it is recommended to plant new native plants along this route, whether it be trees or a native meadow plants. It is recommended that trees be planted to reduce the visibility of these places and increase the tree stand in Brussels. With the addition of native species, Brussels must also ensure that there is a counter-plan to remove invasive species that are in the area. We can see that there are plenty of opportunities for restoration and preservation within the area. This report recommends that in the future, an ecological restoration plan be created.

7.4 Trail Maintenance

Trail maintenance is one of the most important aspects of creating a trail. The majority of maintenance will need to occur during winter and spring. During winter (pending the trail will be allocated for winter use) a snowplow will be needed to clear the trail for users. This will need to be done after every snowfall and ice/sand may need to be applied to ensure ice does not promote a safety risk, such as slips and falls.

The trail will also need to be maintained in the late spring. After the yearly flooding has retreated, debris will need to be removed from the trail. Due to the freezing and thawing of the ground in winter, there may be effects on the trail ground-material. For example, asphalt tends to sink, split, become uneven and develop potholes due to the thawing and freezing events. These will need to be tended to ensure the trail has a smooth surface not allowing for any hazards to trail-users.

During the spring-fall months, storm events are likely to occur. These can cause high winds and lightning which may have the ability to collapse trees. Maintenance crews need to ensure there are no large limbs blocking the pathway. Wood from these storms has the potential to be reused into woodchips for local flower gardens.

8.0 OPPORTUNITIES AND PROMOTION

The proposed walking trail provides the opportunity to attract more people to the village of Brussels, and to retain visitors for a longer period of time once they have begun their visit, hopefully leading to opportunities for more outside-money to be spent in Brussels. Promoting the trail is important to this project. If nobody knows about the trail, then it cannot effectively play a role in reinvigorating the community. Print promotion opportunities in the surrounding areas, as far as Kitchener-Waterloo and London, are numerous and reach a large and highly relevant audience. Online promotion opportunities are also extensive. Leveraging social media and opportunities to distribute information regarding the trail and the Village of Brussels without incurring advertising costs are readily available. Hosting information on the websites of local municipalities and organizations will also help people find the information they seek, hopefully culminating in a visit to the Village. A focus on low-cost promotion and distributing information strategically is the key focus of this section.

8.1 Trail Opportunities

The proposed walking trail provides an opportunity to add an attraction to the Village citizens interested in scenic walks or fitness, and to provide additional visitors with yet another activity that could grab their attention. This is the goal for which Brussels community leaders have indicated they have for the trail: an impressive and attractive piece of infrastructure. It is important to get the message out about this new piece of infrastructure if Brussels is to expect an increase in visitors. The trail provides a new and simple way to experience all of the sights the Village has to offer, from the riverfront to historic homes and buildings. It is importance to generate visitors to Brussels, as well as keep them in the Village once they have arrived. This makes the process of promoting the trail and the Village important. If the stakeholders are to contribute money to the project, there must be a plan in place to ensure the trails success and meet its expectations. There are many means through which Brussels could promote itself and its new trail, but this report outlines print and online promotion opportunities, in the context of the Village and in its current situation, the most effective and cost-efficient methods currently available.

8.1.1 Print Promotion Opportunities

The local newspaper, *The Brussels Citizen*, should continue running articles regarding the progress and decisions made regarding the trails' construction. This should include its opening, as they did on March 8, 2012, when an article entitled "Brussels University Project Promising says Hawley" was the front page

story. This will essentially be free-of-cost publicity, which achieves the goal of informing the local community without having to expend advertising dollars. In terms of the surrounding community, Brussels is relatively close to two large cities: Kitchener/Waterloo/Cambridge, as well as London. The Waterloo Record, which is the major newspaper in Waterloo Region, has an extensive focus on local news. The London Free Press is an attractive option in another large, nearby city. Trying to reach readers in these nearby markets is a goal for the promotion process because of the circulation of these newspapers; many people interested in rural communities such as Brussels will be reached with the message of the new walking trail. Also, the many print publication promotion opportunities which exist in and around Brussels should be explored, including regional and local newspapers in communities such as Goderich.

8.1.2 Print Promotion Recommendations

As community leaders in Brussels want people outside of the village to hear about the trail, print publications throughout Huron County and surrounding areas should be included in the scope of the promotion process. Spending promotion dollars on print advertising would probably be an unnecessary expense considering the effectiveness of word-of-mouth publicity in small communities such as Brussels. Also, making additional resources available such as a physical brochure in businesses and community buildings such as the library provides citizens with a readily available source of information that includes detailed information regarding the trail. It also provides people with direct communication from those community leaders who are planning and maintaining the trail rather than relying on word-of-mouth communication or media coverage.

8.1.3 Online Promotion Opportunities

Online promotion opportunities for the trail include Regional websites, which could provide information regarding the trail include:

1. www.ontarioswestcoast.ca, which has a hiking guide for Huron County in a .pdf file viewable in web browsers. This website is easily found by people interested in trails in Huron County, who will possibly make up a sizable portion of the trails' users.
2. www.huroncounty.ca, another site which has a "newsroom" page of news regarding the county. Posting an article regarding the construction of the trail and its opening date could also lead some people towards Brussels at the time that the trail officially opens to the public.
3. www.villageofbrussels.ca, The Village of Brussels own website, is an obvious choice for hosting information about the trail, as people who are searching for information specifically about the village will quite possibly be interested in visiting the village and taking a walk.
4. www.huroneast.com, The Municipality of Huron East's website has several pages that could host information about the trail, such as "sports and recreation." The community calendar on the website could also be made to include the opening date of the trail, so that interested citizens in the municipality will have a better chance of becoming aware that the trail is being constructed.

5. www.mvca.on.ca, Also, considering that the trail will likely run along the river at some of its points, the website of the Maitland Valley Conservation Authority could be a useful website on which to host information, considering their “news & updates” section on the homepage, and the information regarding specific conservation areas, such as the Falls Reserve Conservation Area.

6. www.facebook.com/www.google.com, It is also important to note that with the rise in popularity of social networking, many people may search websites such as facebook or Google Plus for information regarding a town or an piece of infrastructure the way that they would search for similar things on a search engine such as Google. Social network “pages” (dedicated web pages on larger social networking sites which display information about a certain person, place, or thing) are of interest to the public because they allow the people in charge of a web page to communicate with interested people directly, and to get messages out to interested parties in a way that is comfortable to them. By having a facebook “wall” on which anyone can post an inquiry or a suggestion, communication with interested parties for the betterment of the trail and the village of Brussels will more easily take place, and there will be yet another source of information for interested people to find online.

8.1.4 Online Promotion Recommendations

Considering once again that the trail is not a consumer product, and its success is not based on usage or any kind of direct monetary return (use of the trail is, of course, free of charge), online promotion for the trail does not need to have a selling-based approach. The goals of promotion should be to inform citizens regarding the Brussels trail specifically. Most users of the trail will likely be people who are stopping by on their way through town, or people who came to Brussels specifically. Another factor of this low-budget approach is that the websites mentioned above will hopefully, in most cases, be willing to host information free of charge, considering that these organizations are affiliated in some way to Huron County and the local government in Brussels. Getting into contact with those who maintain these websites and make decisions regarding them should be quite simple considering the local connections. There should be two main focuses for the online promotion efforts of the trail. The first is to provide news updates and post news stories on relevant local websites which offer news for the local area corresponding to important dates regarding the trails’ construction, opening, and perhaps its route and composition. The second focus area should be on informing: creating a wide net of information resources regarding the trail, and distributing this information among relevant websites that will be easily found when performing a web search increases their chances of learning about the Brussels trail and visiting the Village. Using social networking sites as part of this informing process is also a free and easy-to-manage possibility, with the additional benefits of easy dialogue between those providing and maintaining the trail (the village of Brussels) and those who are interested in using the trail. The suggestions that users and interested parties can bring to those in charge of the trail could be very valuable, and these pages are also an additional way of distributing information about the trail. An official “Village of Brussels” facebook and Google Plus page, and perhaps a presence on other social networks could help to build community and communication within the Brussels area and among those interested in the walking trail. Also, this type of direct communication with the citizens of Brussels could help to identify those citizens who are passionate about the project or with civic improvements in general, and work to create and foster more leadership for the future in the village.

PRACTICAL MILLING

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FIRST EDITION

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WATER POWER

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power. When the wheel is in action, the water acts under the influence of two forces, one, that of the pressure of the column at A and the other the centrifugal force generated by the rotation of the wheel itself.

Bucket Wheel—Fig. 338 is an impulse wheel, called the Pelton, operated by the impetus of a jet of water projected tangentially on the buckets disposed on the rim of wheel. These buckets are double, and the force is shown in the smaller cut, where the jet from N strikes the bucket b and is deflected from it at both sides. This wheel is adapted and used for very high falls.

Leaflet Turbine—Fig. 339 is a vertical Leaflet Turbine wheel. It has the wider form of axle as shown in Fig. 334-C. One of the turbine runners is shown in Fig. 340. On the next page (page Fig. 341) is another Leaflet turbine of horizontal type.



Fig. 339—Vertical Turbine
(Leaflet)



Fig. 340—Turbine Runner
(Leaflet)

Discharge—Turbine water wheels are said to react so many square inches of water, which means the theoretical discharge under any head due to an opening, measuring 1 square inch in cross section, that would equal the actual discharge under the same head. Thus a square inch of water means a stream issuing from an opening 1 inch square, and equal in length to the theoretical velocity in feet per second, due to the head. Under 4 feet head, the initial velocity would be 16.94 feet per second, equal to 6.98 cubic feet of water per minute. With a 16-foot head, the velocity is equal to 32.08 feet and discharge equal to 13.26 cubic feet per minute.

Head and Velocity—The initial velocity of falling water and the final velocity of falling bodies are as the square roots of the head of water and the height of falling bodies. Water falls as other substances with the same velocity and acceleration of velocity, the final velocity being greatest. From these laws governing spouting water the initial velocity due to a head of four feet is 16.4 feet per second, and that the initial velocity due to a head of 16 feet, equals twice that due to a 4-foot head, for

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Setting of Wheels—In Fig. 346 is an example of the setting of a pair of horizontal wheels (Leaflets) mounted on one horizontal shaft. The flume and tail race are constructed of concrete. The form of construction provides the necessity of a service or draft tube extending down and into tail water, as is also the case in Fig. 347, another type of construction, and the setting of a vertical wheel.

In both cases the formation of the pit or tail race below the wheel acts as a draft tube. In Fig. 346 the wall or rather the arch is carried down sufficiently to be below standing tail water, and anchors the air. The mouth of the discharge water wheel in Fig. 347 is also below the level of tail water.

It will be noticed that head gates are provided to shut off the water when necessary and that they are also provided with racks to prevent sticks, etc., from entering the flume or headway. Both the rack and head gates are necessary, especially with any form of flume or turbine wheel. Fig. 348 shows a rack installed in the flume to prevent foreign substance entering turbine.

Draft or suction tubes can be used advantageously in many locations, where, for

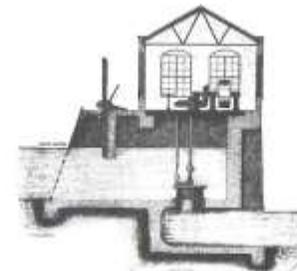


Fig. 337—Setting of Vertical Turbine in Open Penstock (Leaflet)

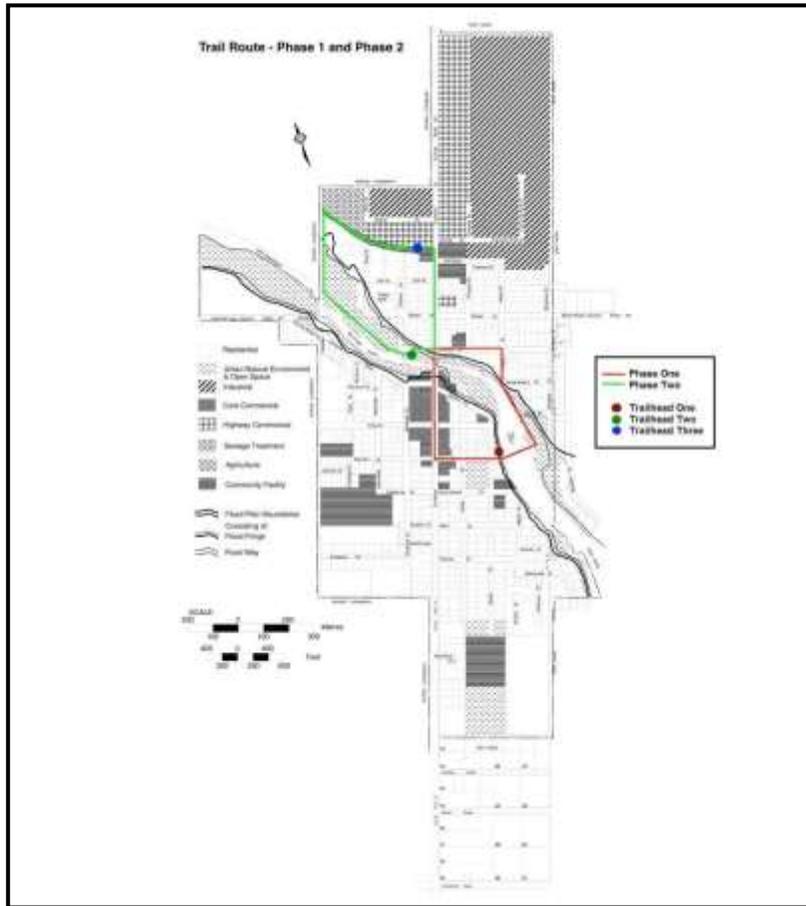
instance, a wheel set at the bottom of a fall, and at full water may be subject to "drowning" in case of back water caused by the water raising in the tail race considerably higher than normal sometimes to the extent of ten or four feet. There is a loss of head to that extent, and in addition the wheel must work retrograde, and against the water and atmospheric pressure.

The author operated a mill in which two turbines of the same make and size were run (separately) under normally, a 9-foot head. One turbine was set at tail water, the other was set in the same flume but about 30 inches above the floor, on a subbing. The draft tube, about 3 feet long, extended down into tailwater. Some times below was another dam, which had the tendency of backing up the water on the mill in the spring caused by heavy rains and melting snows. There was as much as 1 foot of backwater at times, shutting the mill down. The low set wheel was of course the first affected. The mill could operate the wheel that was high set, long after the other

Illustrations from this 1920s book on milling can provide the subject matter for interpretive signage. A turbine similar to this one now sits in front of Logan's Mill. These pictures explain how that artifact worked when the mill operated. (See Interpretive Signage pages 33 and 35)

9.0 TRAIL DESIGN

The trail design takes into consideration the historic and cultural assets of Brussels, incorporating the downtown, mill pond, Maitland River, and abandoned railway corridor. These community assets are worthy of inclusion along the trail and recognition through interpretive signage. This section will detail the proposed trail route, followed by suggestions for trail elements including materials, signage and decorative features.



Map 3: Phase One and Phase Two of the proposed Brussels trail
(Adapted from the Municipality of Huron East Official Plan Land Use map, 2009)

9.1 Trail Route

The proposed trail route forms a figure-eight through Brussels. It has been broken down into a two phase project; *Phase One* being the most simple to create while *Phase Two* will require more funding, resources and effort (See Map 3). Phase one could be implemented immediately, while phase two should be implemented at least one year later. Phase one is suggested as the first length of trail to install, because it follows existing surfaces (sidewalks, asphalt pathways) which will reduce initial costs. Phase one focuses on improving the core, by implemented public art and historical information around the mill (see sections 9.2.2. Signage; 9.2.3 Elements for Enhanced Experience). Phase one should be

used to spark community interest in the trail, and then subsequently branch out further from the core with *Phase Two*. *Phase Two* is larger, incorporates more natural landscape, and will cost more in surface material construction and agreements with private property owners.

9.1.1 Phase One

Phase One focuses on the downtown strip, mill pond, and Dunedin Drive. The trail loop begins at the mill, where a large grassy area provides space for a trailhead (see section 5.2.3 Elements For Enhanced Experience). The trail follows existing pathways, crossing the dam then continuing north on the existing asphalt path through the Brussels Conservation area. Exiting the Conservation Area, the trail continues north on Albert Street using a short section of roadway and sidewalk. At Albert Street and Dunedin Drive the trail heads west, traveling past the historic homes of Dunedin Drive. At Dunedin Drive and Turnberry Street the trail turns south, using the sidewalk to pass through the downtown core. As Turnberry intersects with Flora Street the trail heads east once more, passing the Brussels community park sports field to connect with the trailhead at the mill.

Phase One uses existing sidewalks and paved pathways, minimizing the cost of trail tread material. This section of the loop requires well-defined signage to create ‘sense of place’ (see section 5.2.2 Signage).

9.1.2 Phase Two

Phase Two resembles a more nature-based trail than *Phase One*, which utilizes historic elements. The *Phase Two* loop begins near the intersection of Dunedin Drive and Turnberry Street, slightly down Dunedin Drive where the grade from the street to the river bank is less steep. A deteriorating (hopefully restored) asphalt pad and ramp mark a good location to begin the trail. The trail then heads north-west along the river bank of the Maitland River until it intersects with the abandoned rail corridor. The trail then follows the abandoned rail corridor east until Turnberry Street where it then heads south, along the sidewalk, to the beginning of the loop at Dunedin Street.

Phase Two poses significantly more construction and preparation than *Phase One*. Following the bank of the Maitland River poses the risk of spring flooding –thus requiring a solid tread material such as asphalt or concrete which will not wash away (See Details in Section 7.2). The river bank also crosses upon private property so arrangements with landowners will be necessary. The abandoned rail corridor will require clearing and the laying of gravel surface material.

9.2 Trail Elements

Trail elements will build up the trail to create a ‘sense of place’ with the recognition of the trail as an important community asset. Trail elements include the base material of which the trail is built, signage directing the trails’ use, and features along its length including benches, gardens and public art.

9.2.1 Materials

The trail material forms the surface of the trail. When choosing a surface material consider: accessibility, cost to purchase and install, cost of maintenance, life expectancy, user acceptance, and satisfaction (RTC, 2007). Following are materials to consider for *Phase Two* construction (See Tables 1-3).

Table 1: Trail Materials and Cost Estimates, Stone Dust/Gravel

| |
|--|
| Stone Dust/Gravel |
| <p><i>Advantages</i></p> <p>Cheap installation cost Soft on joints (running) Blends with the natural environment (as compared with asphalt and concrete) If crushed and compacted properly, accessible for walkers, bikers, and wheelchair users (RTC, 2007; Saitta, 2011)</p> |
| <p><i>Disadvantages</i></p> <ul style="list-style-type: none"> • High and ongoing maintenance costs • Difficult to maintain a consistent surface quality • Rainfall causes a dirty surface, sometimes remaining for days after • Inaccessible to inline skaters; difficult for bikers on steep slopes and in loose gravel <p>(RTC, 2007; Saitta, 2011)</p> |
| <p><i>Cost Estimate</i></p> <ul style="list-style-type: none"> • Construction: \$27.50m. (City of Brantford, 2000. 1999 cost of \$25m +10% inflation) • Annual Maintenance: \$3.28m (in non-washout areas); \$10.50m (in washout/flood-prone areas). (Saitta, 2011. 2009 Cost estimates) |
| <p><i>Application</i></p> <ul style="list-style-type: none"> • Phase two, the abandoned rail corridor. |

Table 2: Trail Materials and Cost Estimates, Asphalt

| |
|--|
| Asphalt |
| <p><i>Advantages</i></p> <p>Accessible for walkers, bikers, inline skaters, wheelchair users Hard surface, will not wash away along flood plain Initially cheaper than concrete trails (RTC, 2007; Saitta, 2011)</p> |
| <p><i>Disadvantages</i></p> <ul style="list-style-type: none"> • Requires crack repair maintenance, sealing • Develops cracking caused by tree roots • Flexible surface which lasts longer with regular use to remain pliable • Life expectancy: 7-15 years <p>(RTC, 2007; Saitta, 2011)</p> |
| <p><i>Cost Estimate</i></p> <ul style="list-style-type: none"> • Construction: \$49.50m (City of Brantford, 2000. 1999 cost of \$45m +10% inflation) • Annual Maintenance: \$5.39m (Saitta, 2011. 2009 Cost estimate) |
| <p><i>Application</i></p> <ul style="list-style-type: none"> • Phase two, following the river bank of the Maitland River |
| |

Table 3: Trail Materials and Cost Estimates, Concrete

| Concrete |
|--|
| <p><i>Advantages</i></p> <ul style="list-style-type: none"> • Accessible to walkers, bikers, inline skaters, and wheelchair users • Best consistency of surface. Resists washing or breaking apart • Longest lasting material. Life expectancy of 25+ years • Suitable for urban areas with severe climate swings and areas prone to flooding • Retains a cleaner surface during and after rain <p style="text-align: right;">(RTC, 2007; Saitta, 2011)</p> |
| <p><i>Disadvantages</i></p> <ul style="list-style-type: none"> • Initially expensive • Hard on joints (running) • Considered less natural-looking <p style="text-align: right;">(RTC, 2007; Saitta, 2011)</p> |
| <p><i>Cost Estimate</i></p> <ul style="list-style-type: none"> • Construction: \$55m² (Sidewalk cost: British Columbia MTI (2011)) • Annual Maintenance: \$1.85m (Saitta, 2011. 2009 Cost Estimate) |
| <p><i>Application</i></p> <ul style="list-style-type: none"> • Phase two, following the river bank of the Maitland River –cost permitting |

** Note that woodchips and packed earth, although common trail materials, are not considered. These natural materials pose accessibility challenges due to an uneven surface, have a short life span due to decomposition, and require constant maintenance (RTC, 2007).*

9.2.2 Signage

Trail signage keeps users on-route, and has the ability to enhance the user experience when historic and natural elements are outlined and interpreted. See the Cambridge to Paris Rail Trail case study for an example of signage use, particularly interpretive signs (See Section 12.3).

All trail signage should embody the same design and construction elements, so they are immediately recognizable by trail users (City of Brantford, 2000). Consistent use of a trail logo unifies all signs, while decorative landscaping around sign posts improves visibility (City of Brantford, 2000). Trail signage is categorized into: information boards, directional markers, and interpretive signs.

Information Boards are best placed at trailheads to provide an overview of the trail system (See Section 9.2.3 Elements for enhanced experience). Information boards should be large and visible from a distance, so as to identify the trail to users and passing motorists (City of Brantford, 2000). Information boards include the following information (City of Cambridge, 2010):

- **Orientation to the trail system**
 - Route map: Trail system and sign's location relative to the network.
 - Location of special attractions
- **What trail users can expect**
 - Length of each trail phase
 - Surface types
 - Maximum trail grade, difficulty rating
- **Regulations**
 - Identify permitted uses
 - Hours of permitted use. Seasonal closure (e.g. river flooding)
- **Donor recognition** (optional)

Directional markers are used to keep trail users on-route. They are small and simple in design, and used at every intersection and connection point to cue trail users' direction (City of Brantford, 2000). The trail logo and a directional arrow must be included. Directional markers are very important in *Phase One*, where the trail makes multiple direction changes. At each directional change, consider implementing a directional sign. In spots requiring traffic warning (e.g. along Albert Street in phase one), downsized standard traffic signs (with the trail logo attached) are suggested (City of Brantford, 2000). Directional markers must be consistent and predictable, either on posts (best visibility) or on the ground. On-ground markers can be painted or sandblasted into a sidewalk (City of Cambridge, 2010).

Interpretive signage develops awareness and appreciation for the trail's incorporated natural and historic features (Ashbaugh, 1971). In Brussels, the mill, abandoned rail corridor, and Maitland River are all deserving of interpretive recognition. Each of these features can be correlated with the Village's history and development, answering how the landscape of Brussels acquired its current form. These three elements are correlated with the trail's suggested trailhead locations. Therefore interpretive signage can be incorporated alongside information boards at these locations. Phase one includes historic and cultural features that would also benefit from interpretive signage, for example signage detailing the fire and subsequent gazebo between 439-449 Turnberry Street (Figure 5 and page 28).

Interpretive signage must balance between too much information which can overwhelm visitors, and too little information which does not stimulate inquiry (Ashbaugh, 1971). Few people will take the time to read long statements while walking a trail. The Cambridge to Paris Rail Trail case study (See Section 12.3) presents an example of interpretive signage which is quick to read and visually stimulating. Information is compiled into bright collages with pictures and very short paragraphs (See Figure 5). One panel details the former rail-line's history, while another details the Grand River's environmental importance and conservation; similar historic and natural element which can be interpreted in Brussels.



Figure 5: View of interpretive signage, Canadian General Towers Trailhead, Hwy #24, Cambridge.

**Note: Railway and river information is presented in quick-to-read paragraphs with supporting images (Contemporary Photo, Margaret Ostermann ©, 2012)*

9.2.3 Elements for enhanced experience

Trailheads serve as access points to the trail. Located at the trailhead, and throughout the trail, elements for an enhanced trail experience include: benches, gardens, and public art. Trailheads are best located where the system is highly visible to passing motorists, near community centers, or parks (City of Brantford, 2000). In Brussels, 3 trailheads are suggested. In *Phase One*, the grassy area surrounding the mill is suggested as a trailhead. In *Phase Two*, a trailhead is suggested near the asphalt ramp and pad descending from Dunedin Drive to the Maitland River bank. Another trailhead is suggested along Turnberry Street at the entrance to the abandoned rail-line section of the trail (see location of trailheads on Map 3 in Blue). Trailheads often include (City of Brantford, 2000):

- **Parking facilities**
 - Difficult to incorporate at these locations in Brussels
- **Trash Receptacles**
 - Cost estimate \$165 each (1999 cost of \$150 +10% inflation)
- **Signage**
 - Information Boards and Interpretive signage (see section 5.2.2. Signage)
- **Washrooms and Drinking fountains**
 - Difficult and costly to incorporate in Brussels. Signage with nearby facilities is an option
- **Benches, Picnic Areas, Informal activity space**
 - Bench cost estimate \$385 each (1999 cost of \$350 +10% inflation)
- **Gardens and public art** (see below)

Beyond the trailhead, benches and rest areas should be spread at regular intervals throughout the system. The conservation area and gazebo on Turnberry Street (see Figure 6) of *Phase One* already provide good rest stop locations. Additional benches could be added outside of the mill at the trailhead. *Phase Two* suffers from flooding along the Maitland River, making benches more difficult to incorporate. However rest areas need not be benches, instead, large rectangular-cut boulders –which will not wash

away- can be formed into seating areas (City of Brantford, 2000). The exact location and interval of seating should be assessed on a site-specific basis, combined with scenic views, points of interest, and shade (City of Brantford, 2000).

The popularity of community gardens is increasing. Brussels already benefits from the Butterfly Garden in the conservation area, and community gardens maintained by the Girl Guides group. If these, or other groups, are willing to take on the responsibility, more community gardens are suggested along the trail. *Phase Two* offers garden opportunities at the rail-line trailhead, and perhaps at the Dunedin Drive trailhead above the floodline. Gardens are especially effective at drawing attention to signage and public art. Sustaining a garden contains many challenges: long-term maintenance, volunteer management, and sometimes difficult growing environments (RTC, 2007). The Sheridan Nursery website provides plant suggestions for low maintenance and native gardens at: http://www.sheridannurseries.com/products_and_services/product_selection/sheridan_garden_classics

Public art can range from murals and sculptures to historic machinery. Art provides not only community identity, but trail identity. The rail corridor and mill speak to Brussels' industrial history, making them important elements for the community. These elements are suggested to be featured with interpretive signage, but would benefit also from public art. The turbine resting outside the mill provides a perfect opportunity for public art (See Figure 6). A restorative finish and a small garden will transform the turbine into a functional piece. Public art could also be commissioned to represent Brussels' identity, perhaps the importance of the Maitland River or small-town neighbourly values.



Figure 6: Turbine in front of the mill, Sports Dr. looking South.

**Note: with a restoration to the finish, the turbine provides an opportunity for public art and also interpretation. See page 28.*

(Contemporary Photo, Alannah Robinson ©, 2012)

9.3 Challenge Level and accessibility

The proposed Brussels trail is of easy to moderate difficulty. The land is relatively flat, save a short uphill walk on Albert Street and a significant grade on a short section of the pathway over the dam, both of phase one. Neither phase of the trail is very long while frequent rest stops will alleviate fatigue.

The City of Cambridge Trails Master Plan (2000), states that the Accessibility Advisory Committee discourages woodchip and packed earth trails as they pose accessibility challenges to wheelchair and mobility devices. However, the committee approves that stone dust and asphalt trails are accessible, so long as they are maintained adequately to provide an even surface. Trail information boards should include trail conditions –length, maximum grade and its location, and surface types- so that trail users know what to expect before departing (See Section 9.2.2).

The width of multi-use trails is recommended to be 3 metres (City of Cambridge, 2000). Construction width is applicable to phase two where tread material will be laid. A 3 metre width allows for users to safely pass each other.

9.4 Views and Incorporated Features

The following section provides a brief overview of incorporated elements and scenes along the trail routes. Figures 7-10 are located in *Phase One*. Figures 11-13 are located in *Phase Two*.

9.4.1 Phase One



Figure 7: The Mill, Sports Dr. looking South

**Note: The large grassy area surrounding the mill provides space for a trailhead*
(Contemporary Photo, Vanessa Hicks ©, 2012)



Figure 8: Crossing the dam, near Flora St. and Sports Dr. looking East
(Contemporary Photo, Alannah Robinson ©, 2012)



Figure 9: Footbridge in the Brussels Conservation Area, looking North-East
(Contemporary Photo, Alannah Robinson ©, 2012)



Figure 10: Gazebo and garden between 439 and 449 Turnberry St.
(Contemporary Photo, Alannah Robinson ©, 2012)

9.4.2 Phase Two



Figure 11: Maitland River and Dunedin Dr. looking West from Turnberry St.
**Note: Asphalt pad and ramp in distance. Location for trailhead 2.*
(Contemporary Photo, Alannah Robinson ©, 2012)



Figure 12: Abandoned rail corridor, looking West
(Contemporary Photo, Vanessa Hicks ©, 2012)



Figure 13: View from abandoned rail corridor, looking South
(Contemporary Photo, Alannah Robinson ©, 2012)



Some historic pictures of Logan's Mill provided by local residents.

10.0 POLICY/LEGISLATION

Before moving forward on any project concerning a walking trail within in the town of Brussels, the Huron County Official Plan must be consulted and critically analyzed in order to comply with as well as implement policy. Luckily for the proponents of the walking trail, the Huron County Official Plan advocates for projects such as walking trails for a variety of reasons. However, developers must be careful to conform to the rest of the plan as well.

10.1 Compliance with the Huron County Official Plan

Section 3.2: Community Direction

Section 3.2 of the Huron County Official Plan concerns the community's direction. Within this section, it clearly states that the community is a proponent *"For recreation, culture, and heritage the community wishes to provide opportunities for all age groups and abilities. Recreation includes culture, education, tourism, athletics, and leisure activities. Residents are encouraged to be actively involved in organizing recreational and cultural activities in their community"* (Huron County, 2012). A walking trail, perhaps, is the best project to conform to this direction as it satisfies many of the outlined characteristics. Individuals of all ages are able to enjoy a walking trail while it also has the potential to attract a moderate amount of tourism to the town. Regarding culture and education, the trail would take users past areas of cultural significance to the town of Brussels (i.e. Logan's Mill), while school groups could use it for educational purposes along the water or in the natural sections of the trail.

Section 6: Environment

Regarding precautions to be taken during the implementation of the walking trail, Section 6, concerning Environment of the *Huron County Official Plan* appears to be the area of focus. Section 6.1 (Community Values) states *"the community values a healthy environment including the quality of the water and air"* (Huron County, 2012). As the current proposal calls for the trail to run parallel with the Maitland River, this section of the Official Plan is important to keep in perspective as to not affect the water integrity. Erosion created by constant use of the path will be taken into consideration along the banks while a natural buffer may also be explored to combat issues of trash.

Section 6.3: Community Policies and Actions

Section 6.3 of the Official Plan points out that *"the protection of natural areas will occur through the decision of property owners, the community, and local plans"* (Huron County, 2012). This implies that the responsibility of natural preservation is not the responsibility of an individual, but rather achieved through the cooperation of the community as a whole. Section 6.3 is a policy that should be kept in mind during the draft process of landowner agreements regarding the use of private property for the trail. Section 6.3 also states *"local plan policies will ensure that development respects areas of natural hazards"* (Huron County, 2012). Since the proposed trail does encroach on the region zoned as a floodplain, section 6.3 may be an obstacle to overcome. It will require cooperation between both the developer and the county in order to come to a mutual agreement regarding floodplain use.

10.2 Zoning

As it stands, the proposed trail route would pass through many different zoned regions. Sections of the trail would pass through regions zoned residential, agricultural, floodway, and mobile home (Huron County, 2012). To deal with this, zoning amendments may be necessary for sections of the trail in order for the project to be moved forward. Although it is not anticipated, re-zoning of some of these regions to allow for the walking trail to come through could be costly and time consuming. As it currently stands, the cost to for a Huron County zoning amendment is \$1,560 (Huron County, 2012).

10.3 Easements and the Ontario Federation of Snowmobile Clubs (OFSC)

Currently, the Village of Brussels is home to a section of snowmobile trail that, in some areas, occupies the path of the proposed walking trail. The snowmobile trail is seasonal structure, meaning that it would not interfere with the proposed walking trail during months of heavy (winter) usage. The reason the snowmobile trail is relevant to the current proposed walking trail concerns the right of way easement that the OFSC has with private landowners. A right of way easement is an agreement that allows a private property to be used for a trail while ownership is retained (Ontario Federation Snowmobile Clubs, 2011). The structure and legality specifics offer the trail developers some direction as to how to proceed regarding private property agreements.

It is important for developers to recognize that each landowner and their property will have different needs from one another and it is crucial to structure a land use agreement to suit these needs. One property may require a buffer of some variety between the trail and the dwelling while others may not require any buffer whatsoever, as there will be adequate distance between the two to cancel out noise issues. For legality reasons between both the developer and the landowner it is essential to have a physical copy of the agreement kept on file for both side.

Looking at the OFSC landowner agreements, there are sections that must be included in the trail landownership agreements. The first section of concern will be regarding maintenance. The OFSC ensures private property owners that any portion of the trail will be monitored and maintained at all times to ensure that the integrity of the property is respected (Ontario Federation of Snowmobile Clubs, 2011). This agreement will need to be included in any walking trail private property agreement as it will be the biggest concern for landowners. The other pressing issue that landowners will bring up is the ownership of the property once provincial or municipal signs are placed on the property. The OFSC points out in their agreements the presence of government signs does not revoke the ownership of one's property (Ontario Federation of Snowmobile Clubs, 2011).

In the event that a legal action has to be taken by a property owner regarding a trail-related issue, the trail's owners must demonstrate liability. The OFSC, for example, offers protection for any losses in relation to the trail on the property (Ontario Federation of Snowmobile Clubs, 2011). The OFSC also provides defense costs related to trail incidents, while also providing legality claim protection (Ontario Federation of Snowmobile Clubs, 2011). Given the nature of walking trails and the chance that petty crime or trespassing may occur, any private property use agreement with the walking trail should at least consider including such liability backing. By providing such legal backing, private property owners may be more inclined to allow the use of their land knowing there is a safe net.

11.0 RECOMMENDATIONS

The following provides a summary of the recommendations found in this report, touching on trail design, materials, signage, tourism, promotion, preservation, restoration and maintenance.

11.1 Trail Design

It is recommended that the trail is implemented in two phases, *Phase One* focus on Brussels downtown strip, mill pond and Dunedin Drive. The trail loop begins at the old mill, where a large grassy area provides space for a trailhead. The trail follows existing pathways: crossing the dam then continuing north on the existing asphalt path through the Brussels Conservation area. Exiting the conservation area, the trail continues north on Albert street using a short section of roadway and sidewalk. At Albert Street and Dunedin Drive the trail heads west, traveling past the historic homes of Dunedin Drive. At Dunedin Drive and Turnberry Street the trail turns south, using the sidewalk to pass through the downtown core. As Turnberry intersects with Flora Street the trail heads east once more, passing the Brussels community park sports field to connect with the trailhead at the old Mill. *Phase One* utilizes existing sidewalks and paved pathways, minimizing the cost of trail tread material. This section of the loop will require well-defined signage to create 'sense of place'.

Phase Two resembles a more nature-based and begins near the intersection of Dunedin Drive and Turnberry Street, slightly down Dunedin Drive where the grade from the street to the river bank is less steep. A deteriorating (hopefully restored) asphalt pad and ramp mark a good location to begin the trail. The trails then heads north-west along the river bank of the Maitland River until it intersects with the abandoned rail corridor. The trail then follows the abandoned rail corridor east until Turnberry Street where it then heads south, along the sidewalk, to the beginning of the loop at Dunedin Street.

11.2 Trail Material

It is recommended that the trail consist of solid tread material such as asphalt or concrete as the bank along the Maitland River poses the risk of spring flooding. It is also recommended that the abandoned rail corridor is cleared of debris and the path outlined with gravel surface material.

11.3 Trail Signage

It is recommended that consistent signage, design and construction elements are used through both phase one and phase two of the trail implementation. Consistency is recommended to be in the form of information boards, directional markers and interpretive signage. Information boards should be placed at trailheads to provide an overview of the different phases and components of the trail. The implementation of information boards will help create focus community members and visitors on the trail as an attraction to the village. Directional markers should be small and simple in design, and used at every intersection and connection point to keep trail users on route. Interpretive signage should be

placed at natural and historical points throughout the trail. Each sign will outline to trail users the historical significance of the mill, abandoned rail corridor and Maitland River

11.4 Tourism and Promotion

It is recommended that information regarding the trail development and implementation is kept in news circulation in both the local Brussels community and the surrounding Huron County communities. The advertising and publicity around the development and implementation of the trail will create stronger community support and generate traffic along the trail.

In addition to maintaining news circulation in Brussels and surrounding communities, it is recommended that online promotional tools be utilized to promote the trail development and implementation. Current online promotional tools that can be utilized for promotion are www.ontariowestcoast.ca, www.villageofbrussels.ca, www.huroncounty.ca, www.huroneast.com and www.mvca.on.ca. These websites are hiking and community guides that provide information on the local and surrounding area. Promotion on these online promotional tools will increase awareness and education around the trail as well as provide interested visitors with the necessary construction, route and heritage information about the trail prior to usage.

11.5 Preservation and Restoration

It is recommended that an ecological restoration plan is developed to include the implementation of vegetation, native trees and plants. Vegetation should be used to line flood plains to control the flow of water and reduce erosion in prone areas. Native trees and plants should be planted to reduce the visibility of the industrial area and waste water treatment plant, this will help line the trail route and provide foliage for animals and soil stability

11.6 Trail Maintenance

It is recommended that maintenance be conducted seasonally with the bulk of maintenance conducted in the Winter and Spring due to the high level of precipitation and water flow. If the trail is open during the Winter, snow will need to be removed after every snowfall and maintenance should consider using sand to line the trail to reduce ice and slippery surfaces. The trail will need considerable maintenance due to the flood line retreating exposing debris and uneven surfaces in the Spring.

12.1 Iron Horse Trail

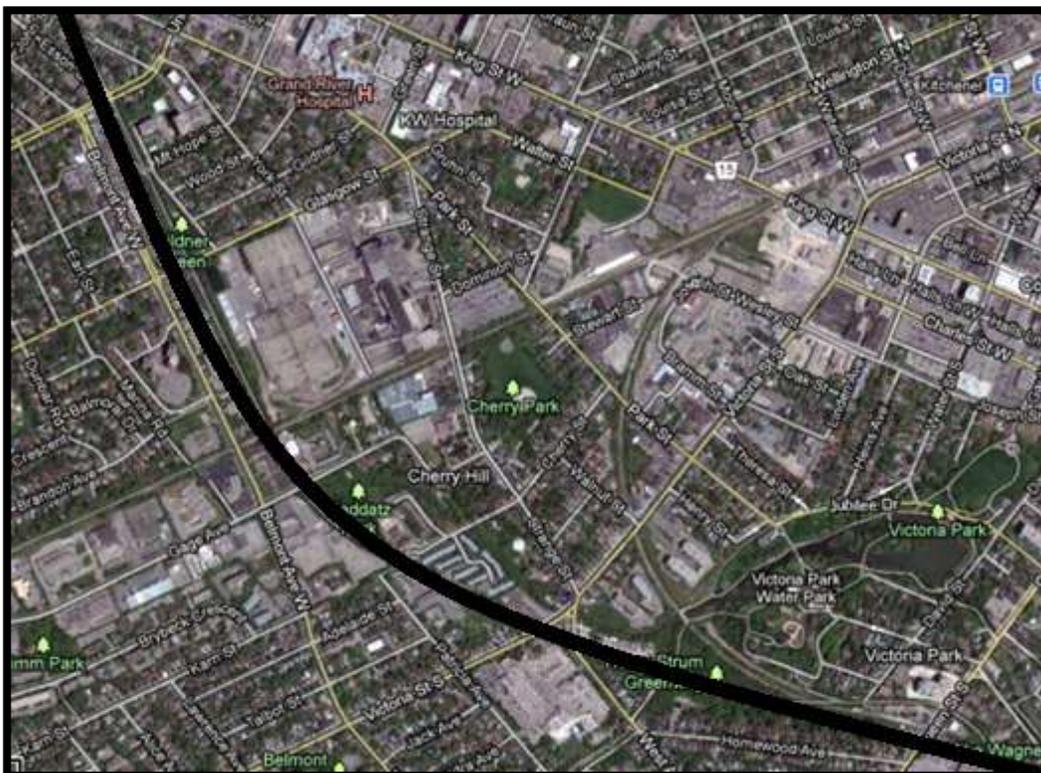
**Case Study: Iron Horse Trail
Utilizing Existing Structures**

By: Alannah Robinson

Overview:

This case study will focus on the Iron Horse Trail located in Kitchener/Waterloo Ontario. The Iron Horse Trail is a good example of a trail utilizing existing structures in the development of the trail as well as runs through urban communities located in Kitchener/Waterloo. This can be applied to Brussels in order to inform the public about information related to the trail based on the usage and feedback from the Kitchener/Waterloo’s trail. Specifically, this case study evaluates the use of the urban environment, resources and community perceptions, this research will be listed in the recommendations section.

Iron Horse Trail is located between Erb Street West, Waterloo and Erb Street West Kitchener, Iron Horse Trail is a good example of a master plan and demonstrates effective use of the urban environment which can be used as an example to plan a trail that Brussels. The Iron Horse trail stretches for 5.5km and is made of asphalt with a sidewalk link. The Iron Horse Trail features a link between Kitchener and Waterloo, part of the Trans Canada Trail, Interpretive history of the railway along the route as well as access to parking Uptown Waterloo. The trail was formally railway corridor and is currently most popular with rollerbladers. The location of the trail can be seen in the map below, as outlined in black.



Master

Plan:

A Master plan (or Management Plan) is a document which outlines all the management practices that have, are, and will occur on the trail, including history, land agreements, and future possibilities. The following is the URL to access the master plan to the Iron Horse Trail and other surrounding trails: http://www.city.waterloo.on.ca/Portals/57ad7180-c5e7-49f5-b282c6475cdb7ee7/RL_documents/rlsmp10Oct2008.pdf

This URL contains the master plan for Iron Horse trails. The website lists all the facilities located on the trail and how the trail is maintained and developed over time. This is a useful resource for the city to create and publish as it enables people to easily see and understand the issues associated with the trail, outline potential plans and techniques oriented towards solving problem. This creates transparency amongst the city and community members. Transparency enables open lines of communication in order to establish understanding the future of the trail on which they can comment to further improve the trail or maintenance of the Iron Horse Trail.

City of Kitchener/Waterloo Website:

Figure 2: City of Kitchener/Waterloo Region (2012).

www.city.waterloo.on.ca

The City of Kitchener/Waterloo (2012) has a website page dedicated to their city parks and is used to inform tourists on local trails, trail use and maintenance. The website provides maps of the location of the trail, possible trail routes as well as quick historical facts about the surrounding area. This is a useful resource to promote trails in the Kitchener/Waterloo community and more specifically the Iron Horse Trail. As a recommendation for further promotion for the Iron Horse Trail, the City of Kitchener/Waterloo should develop an informative website specifically dedicated to the Iron Horse Trail with photo's, promotional videos, historical informational and primary uses of the trail.

Figure 3: Explore Kitchener/Waterloo Tourism Website (2012).

www.explorewaterlooregion.com/tours-and-trails/cycling-trails

A second website, as seen in Figure 3: Explore Kitchener/Waterloo Tourism Website (2012) was developed to provide tourism related information to residents and visitors to the Kitchener/Waterloo area. This gives less information about the park and trail, but more pictures for potential visitors and tourists to look at. This website gives a brief overview of the history of the Iron Horse Trail and the predominate purpose of the trail however the information is limited and directs website visitors to Kitchener Community Services which is located at City Hall or the Charles Street Transit Terminal. This lack of accessible detailed information may deter residents and tourists to further seek out information about this trail which may hinder the trail usage over time.

Community Perceptions of Iron Horse Trail:

In early February, an article was printed in the Kitchener Chronicle (local Kitchener newspaper) which outlined a possible relocation of the Iron Horse Trail for the accommodation of a new residential condo building. The article outlined several residential opinions about the trail location, several comments included:

“The Iron Horse Trail belongs to the citizens of Waterloo, It’s been a part of our history”

-Pauline Shang Au

“The proposal for moving the Iron Horse Trail are just absurd. I am a big supporting of having

development around (transit station areas), having said that, this development is not appropriate for the uptown in its present form. There is no way to have a vibrant streetscape if you have a development that is parking-oriented”

-Michael Druker

“What I’m concerned about is that it is very difficult to access Park Street right now at the Iron Horse Trail and I know traffic is going to be diverted to King Street”

-Diane Freeman

The public opinion in the implementation or relocation of a trail has a significant impact on building decisions and can have a ripple effect on the local community. This has a direct connection with the Brussels Trail as the implementation of a trail through the city and along the river will have a direct impact on the local community.

In another forum for residents and tourists to leave their impression of the Iron Horse Trail, there is a website where people can record their experience while on the trail and the significance the trail has for several community members. A few quotes outlined below demonstrate the importance this trail has for community members.

“The trail connects my workplace and the urban environment around my work place. The trail is a way of keeping a creative tension open, so I can feel a deep connection between the two communities of Kitchener/Waterloo community”

-Christa Van Daele

“This trail is a symbol of the two cities in collaborating and cooperating to create something that will join the two cities in unity. It is seen as a natural corridor to feel connected to nature while still in an urban area.

-Joan Mckinnon

The public opinion around the Kitchener/Waterloo area support the Iron Horse Trail and value the trail as a natural extension of the Kitchener/Waterloo community. The above newspaper article and voice recordings of community member’s perceptions of the Iron Horse Trail are important factors when deciding major changes. The focus of community member input can be translated to the Brussels trail and the numerous community member input and perceptions that need to be collected by the City of Brussels in order to provide a meaningful trail that is available to all local residents and tourists.

Recommendations

The Iron Horse Trail has several direct links to the Brussels Trail that is looking to be implemented by the village of Brussels. Similar to the Brussels community, the Iron Horse Trail uses a pre-existing rail way as a part of the community and urban landscape also both communities’ involved strong public opinions with desired input on the trail development and implementation. The following recommendations for the Iron Horse Trail can have direct application to the Brussels community and trail plan.

1) It is recommended that the City of Brussels transparency in terms of trail development and implementation in order to maintain community support and interest

2) Based on the information provided on the City of Kitchener/Waterloo website about the Iron Horse Trail, It is recommended that the City of Brussels takes an active approach in using easy to access materials such as web pages to inform public of trail developments

3) As seen with public opinions regarding the Iron Horse Trail, It is recommended that the City of Brussels survey community members and stakeholders about the importance and impact a trail would have on the community prior to the implementations so public opinion is considered before construction takes place.

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4) It is also recommended that the City of Brussels revisit city master plans and zoning by laws in order to determine future development and construction in order to minimize trail relocation and negative publicity prior to the development of the Brussels Trail

12.2 Howard Watson Nature Trail

1.0 Introduction

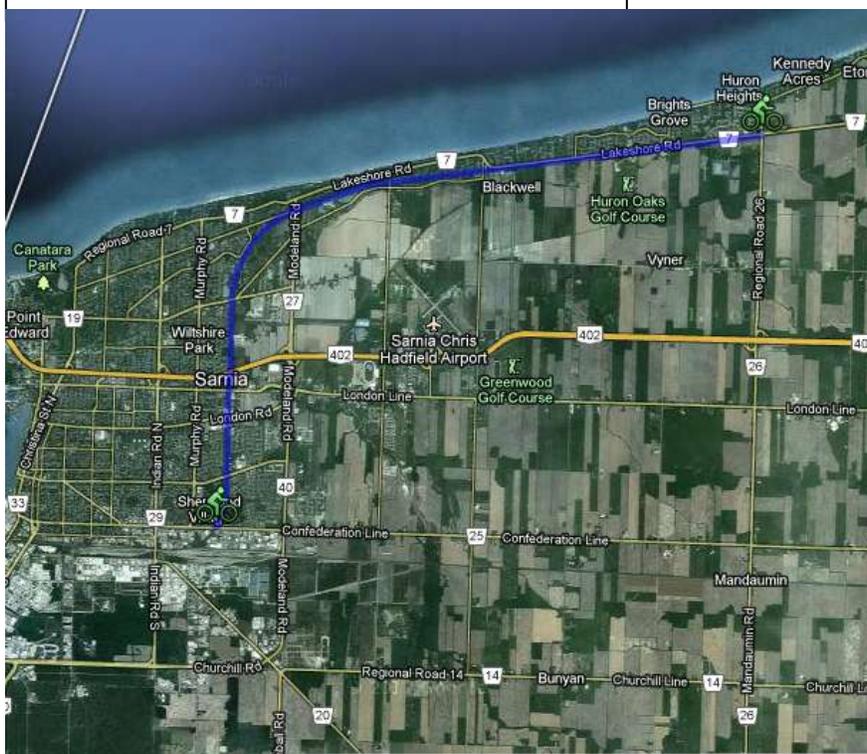
The village of Brussels, Ontario (pop. 1,300) is currently undergoing an ambitious plan to introduce a nature trail to their small farming community. The project is aimed at promoting the village of Brussels to outside regions in hopes that visitation to the town increases. Ideas for the trail are currently preliminary so it is important for planners and developers of the trail to study and take inspiration from existing trails in Ontario. What works and what are things to maybe avoid are important for Brussels as there is little room for error. The Howard Watson Nature Trail represents an idea for a “rail-to-trail” project that could potentially work in the town of Brussels although it would be at a much smaller scale. The following report examines the highlights and grey areas of the Howard Watson Nature Trail while putting them in a Brussels, Ontario context.

2.0 Study Area

2.1 Location

The Howard Watson Nature Trail is located within Lambton County, which is situated in southwestern Ontario. Beginning in Sarnia, Ontario the trail stretches for 16 kilometers north to the small suburban community of Brights Grove, Ontario (Ontario Trail Council, 2012). The trail begins in Sarnia’s Sherwood Village before heading north

Figure 1: The Howard Watson Nature Trail



Sarnia’s Sherwood Village before heading north

through Sarnia’s retail sector. The trail then continues northeast following the scenic Lakeshore Road, which hugs the shoreline of Lake Huron. The Howard Watson Nature Trail then ends in the village of Brights Grove (see Figure 1).

2.2 Trail History

The initial idea for a natural trail within the Sarnia area began in 1983 by the Lambton Wildlife Incorporated (LWI) community group (Lambton Wildlife Inc., 2010). The group had begun to advocate for the trail following the decision by the Canadian National Railway (CN) to abandon the railway corridor that ran from Sarnia northward to such communities as Thedford, Ontario. The LWI's appeal was accepted by the Sarnia councilors and the beginning of a three-year trial period was to start in 1988 (Lambton Wildlife Inc., 2010). However, this trial period would be on the condition that the LWI would fully fund the venture themselves. Through donations and fundraising, \$24,000 was raised for the "rail-to-trail" project and the three-year trial began in 1988 as planned (Lambton Wildlife Inc., 2010). The "trial" label was lifted one year later after outpouring support from the community and the trail was officially labeled the Howard Watson Nature Trail, in honor of a former Sarnia councilor who backed the project (Lambton Wildlife Inc., 2010; Bluewater, 2008).

2.3. Materials and Development

One of the interesting aspects of the Howard Watson Nature Trail is that it combines several trail varieties into one while also bringing civilization and nature together. Along the urban portion of the trail, there are stretches of pavement, which are used to encourage bicycle use in the city. However, as you get further outside of the Sarnia region the trail turns to more of a natural surface. The natural



Figure 2: Gravel Material

surface ranges anywhere from gravel (see Figure 2) to dirt to grass as the trail pass through the Lambton County countryside space (Ontario Trail Council, 2012)..

In terms of miscellaneous materials on the Howard Watson Trail, the designers have ingeniously created the trail with the its past use as a railway visible. In the countryside

portion of the trail all of the waterway crossings are created to incorporate the old railway's trestles (see Figure 3). This is an important reminder of the previous use of the area and creates a rustic sense. The railway tracks themselves have been removed from the route, however there are still areas where the path that they would have taken can still be seen.

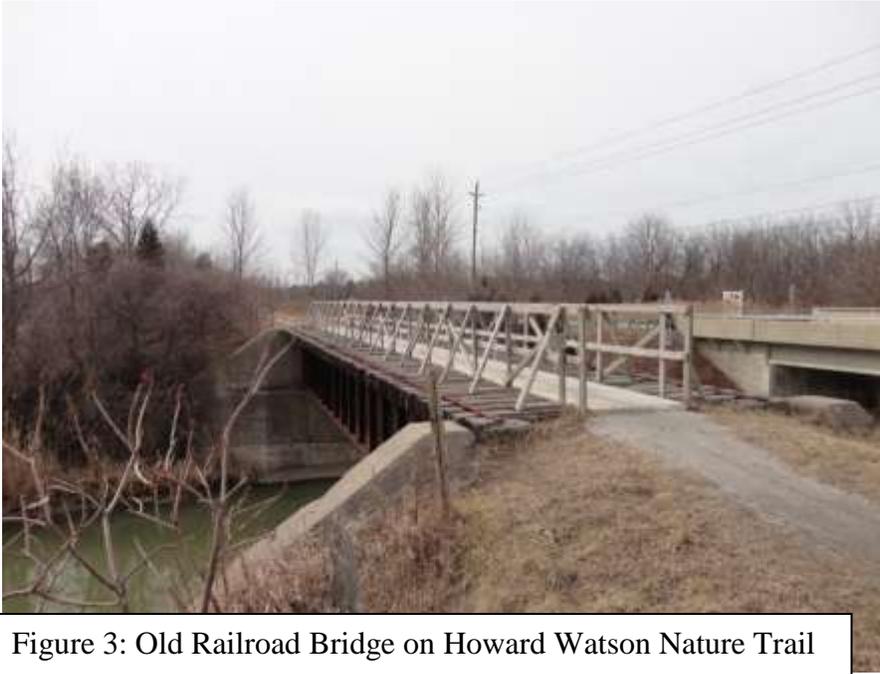


Figure 3: Old Railroad Bridge on Howard Watson Nature Trail

3.0 Areas of Success

3.1 Accessibility

The Howard Watson Nature Trail offers Lambton County residents, whether they are in Sarnia or from one of the surrounding small communities, ample opportunities of use. Access points can be found along the heavy traffic flow roads such as; Confederation Line, London Road, Michigan Avenue and Lakeshore Road. This set up is crucial to the trail's success as it ensure that a high percentage of the population comes in contact with the trail regularly and is thus aware of its' existence. Access points on main roads also helps to encourage residents to use the trail for recreation and leisure as it is close to home and is in areas frequented regularly. If the access points to the trail were to be located in remote or isolated areas it may deter potential users because of the unfamiliarity of the access points or due to distance.

3.2 Setting Variation/Adaptability

One of the unique features of the Howard Watson Nature Trail is changing landscape, urban to rural, that follows the 16 kilometer trail (Tourism Sarnia-Lambton, 2012). Beginning in the city limits of Sarnia, the trail quickly transitions into the urban center of the city (see Figure 4). The trail at this point is relatively bike friendly as it begins with a flat dirt material before moving onto concrete in the city center. This could be seen as an attempt to encourage bicycle use on the portion of the trail that is located in the urban center. As the trail continues onwards it begins to once again leave the urban environment for the rural setting. As the Howard Watson Nature Trail heads out of the city, the trail transitions back to the dirt surface it began with. Continuing northward towards the community of Brights Grove the trail becomes more hazardous for bikes due to the wild nature of the environment



Figure 4: Howard Watson Trail, Downtown Sarnia

surrounding the trail. However, walking is a perfect option for this section of the trail as it offers comforting natural views and is accessible to pedestrians. Each portion of the trail offers a different focus however, combined together the Howard Watson Natural Trail provides a bit of everything for its users.

4.0 Areas of Concern

4.1 Trail Maintenance

Recently, path goers have raised the issue of trash on the Howard Watson Nature Trail (Marshall, 2012). Users have reported litter sprawled across the path and in the vegetation as well as dog feces not picked up and left on the path (Marshall, 2012). Since the path's inception in 1988 the City of Sarnia has taken responsibility for the trail's maintenance (Lambton Wildlife Ltd., 2010). The recent trash problems have brought the City of Sarnia's commitment to the trail in question. If maintenance is not of concern to the city than there is a need for other parties such as volunteer groups to take control

of the duties. Efforts are being taken by the community to help clean up the trail such as annual sponsored community clean ups in which citizens take to the trail and pick up trash.

4.2 Criminal Activity

The Howard Watson Nature Trail has also experienced, although a small amount, crime on its path. There have been incidents involving women being attacked by perpetrators on the trail when they are alone although it is not a reoccurring theme. Other criminal activity such as trespassing on private property (see Figure 5), narcotics, underage drinking, and vandalism have appeared on the trail's route since its inception. It is easy to see why there is such an array of criminal activity on the Howard Watson Nature Trail. The trail, as mentioned, stretches for 16 kilometers however very few of that 16 kilometers



Figure 5: No Trespassing Sign on Private Property

is in urban areas where the trail is visible, with only 6 kilometers of the 16 kilometers is in an urban space (Ontario Trail Council, 2012). There are many stretches of the trail that are secluded and not adequately lit which draws criminal activity, as there is a minimal chance of anyone seeing the events occurring.

5.0 Application to Brussels, Ontario

The Howard Watson Nature Trail offers multiple suggestions to the town of Brussels when considering a nature trail, as well as some cautious warnings. Much like the Howard Watson Nature Trail, the trail in Brussels will cross both urban and natural environments. The key to making such a diverse trail work is ensure that the transition from one environment to another is a smooth one that does not make the users feel unsure or uncomfortable. The Howard Watson Nature Trail accomplishes this perfectly as the trail enters the urban center of Sarnia from the surrounding agricultural lands. Developers of the Howard Watson Nature Trail ensured that the trail would penetrate through some of the busiest districts of Sarnia without having to compete with the constant traffic. This is done so by putting the trail away from the roads, such as cutting through residential properties, rather than having

them crisscrossing and running parallel with the main roads. Although Brussels is significantly smaller than Sarnia and the traffic is not nearly as heavy, pedestrian and automobile interaction is important to consider. When Brussels trail users enter the urban portion of the trail coming from the natural portion it will be important to ensure that they are not concentrated on Turnberry St. as it receives the heaviest traffic flow of Brussels and senior citizens may feel weary walking along side it. Having the trail emphasize the quieter back streets seems to be the proper method.

One of the aspects that Brussels should take away from the Howard Watson Nature Trail that could head as a warning would be the aforementioned maintenance. As previously explained maintenance of the Howard Watson Nature Trail seems to be lacking at times, which is unacceptable to the community. As it currently stands the Howard Watson Nature Trail has a joint volunteer and municipality agreement in regards to the maintenance but it seems to be debatable regarding efficiency. The town of Brussels has indicated that they will almost certainly rely on volunteers to take care of the maintenance of the new nature trail. Based on the evidence seen in Sarnia, a city of 75,000, regarding the lack of efficient upkeep one has to worry how a town of just over 1,000 people will respond to their town's trail. While visiting the potential sites in the town of Brussels it became apparent that there was already evidence of vandalism that had failed to be cleaned up in areas (i.e. Logan's Mill). It would be in the town's best interest for a contract to be signed with a local/regional maintenance company in order to ensure the proper attention will be given to the nature trail when its implemented. A well-maintained trail is an attractive trail in the eyes of trail goers.

Perhaps one of the best ideas for Brussels to take away from the Howard Watson Nature Trail regards the implementation period. As mentioned the Howard Watson Nature Trail took an implementation approach of a trial basis in order to judge the viability and popularity of the trail in the community. This should be something for the village of Brussels to consider. It would be recommended to divide the project into phases (e.g. 3 or 4) over a designated period. This is recommended, as a trail project such as the one being explored right now could be a large financial gamble on a small community such as Brussels. By implementing the project in phases over a designated period of time it would allow for funds to be collected and distributed in intervals instead of putting all the financials into one go of things. The phase implementation technique also allows the village to pull out of the project at anytime if they feel their financials will not be recovered from the project. This would not be able to occur on a trail project that is built in one phase, as all of the financials would be laid down in a lump

sump. For a small village such as this, there is not an endless supply of money so the council needs to be smart when spending it. If the project proves to be a flop in terms of revenue and tourism it is important for them to be able to stop the financial bleeding early on.

6.0 Conclusion

Although not identical in terms of the project, the Howard Watson Nature Trail offers some suggestions and some warnings to the developers of the Brussels trail. Variation in landscape is inevitable and transition is important for trail users. Developing a plan that matches that of the project's available finances is important to ensure that costs are covered and that the project is the right fit for the community. On the other hand it is important to have a concrete plan in terms of maintenance or run the risk of questionable maintenance practices, as seen on the Howard Watson Nature Trail. Without question the trail in Brussels will need to go through an initial trial and error period in the beginning to get the fit however any outside influence it can receive could prove to be invaluable.

12.3 Cambridge to Paris Rail Trail

Case Study: Cambridge to Paris Rail Trail

The Use of Interpretive Signage and Connectivity.

By: Margaret Ostermann

Overview

This case study will focus on the *Cambridge to Paris Rail Trail* connecting the City of Cambridge with the town of Paris, Ontario. The *Cambridge to Paris Rail Trail* is a good example of connectivity between urban areas and the use of interpretive signage. The connection of the trail into larger networks shows the collaboration of efforts between multiple organizing bodies. Like Cambridge and Paris, Brussels is rich with history –particularly the mill and rail line- which deserve interpretive recognition along a trail.

Study Area

The *Cambridge to Paris Rail Trail* holds distinction as one of the first abandoned rail lines to be converted to recreational trail use in Ontario. The trail forms a section of the rails-to-trail network owned and operated by the Grand River Conservation Authority. The 18km route follows the old roadbed of the Lake Erie and Northern Railway corridor to connect Cambridge with Paris, Ontario. The trail route cuts through Carolinian Forest to showcase the natural environment, while paralleling the Grand River to feature scenic views.



Cambridge to Paris Rail Trail facing south at the 76km marking.

The Grand Valley Railway extended its electric passenger trolley line through Paris into Galt in 1904. Not long after, the Lake Erie and Northern Railway purchased the stretch of railway in a bid to eliminate competition. After falling into disuse the rails of the line were removed in the summer of 1991. In December of 1991 the Grand River Conservation Authority purchased the route for an eventual trail, which was proudly opened in 1994.

Stone dust or fine gravel surfaces the *Cambridge to Paris Rail Trail*, forming a smooth, wide pathway. Characteristic of railway right-of-ways, the trail corridor is fairly level, making it accessible for people with all manner of abilities. A short but steep grade occurs at the The Murray Overlook, but is forewarned on the trailhead information boards for wheelchair users. The Rail Trail offers fantastic

opportunities for hiking and biking; cross-country skiing is popular along the trail during the winter months.

Three points grant access to the trail, each featuring: parking, information kiosks, garbage bins, and –not operated by the Grand River Conservation Area but available nearby- food and washroom facilities. The access points are located in: Cambridge (The Canadian General Tower Trailhead), Glen Morris (at the old railway station site, Forbes St.), and Paris (Jean Rich Foundation Trailhead).



The Canadian General Towers Trailhead, Highway #24, Cambridge, Ontario.

Connectivity

Not merely an 18km stretch of trail, the *Cambridge to Paris Rail Trail* contributes to four larger trail networks. In Cambridge, the rail trail is incorporated into the larger *Cambridge Heritage Trail Network*. Portions of the *Cambridge to Paris Rail Trail* also form sections of the *Grand Valley Trail* system, a 260km footpath from Lake Erie to the town of Alton, near Orangeville, Ontario.

Most publicized is the *Cambridge to Paris Rail Trail's* inclusion in the *Hamilton-Brantford-Cambridge Trails* network. The network began unintentionally, but came to link four separate trail projects to form a 77km long network. The *Hamilton to Brantford Rail Trail* is considered the beginning of the network. Undertaken by Hamilton Region and the GRCA, it forms the first 32km of the network. The *Gordon Graves Memorial Pathway* forms the next section, winding through the City of Brantford. The network then continues from Brantford to Paris on the *S.C. Johnson Trail* which was installed by the GRCA in 1996 to complete the network. The *Cambridge to Paris Rail Trail* forms the final leg of the trail network.

opportunities and education programs. The format is similar to the railway history panel, with multiple sub-sections of grouped information and photographs.

Each kilometre of the trail is marked, as part of the *Hamilton-Brantford-Cambridge Trail* network. The distance markers provide both recognition of trail donors and a method for



Example of Trail Boards

tracking progress along the long trail.

Funding:

The Grand River Conservation Foundation is a sub-division of the GRCA, which acts to organize and funnel donations from individuals, foundations, groups and businesses to GRCA projects. The foundation raised \$1.5 million to cover the land purchases and development costs for four rail-trail projects (including the *Cambridge to Paris Rail Trail*) under the GRCA.

Cowan Foundation has made a three year (2010-2012), \$75,000 contribution to help the GRCA renew the 77km *Hamilton-Brantford-Cambridge Trail* network. This breaks down to \$325 per year, per kilometre of the trail network.

Mountain Equipment Co-op has also donated \$15,000 towards the 77km network, for the purpose of increasing and enhancing directional and interpretive signage. Both the Cowan Foundation and Mountain Equipment Co-op mentioned in statements the importance of maintaining the trails at no direct cost to the community.

Application to Brussels

- *Rail-Trail*: The abandoned rail line through Brussels is blocked heading east (from Turnberry Street) by industrial use. However, the west section of the rail line in Brussels is public property, potentially linking to Bluevale and Wingham.
- *Connectivity*: The trail's connection in larger networks –particularly the *Hamilton-Brantford-Cambridge* trail network- shows the promotional capabilities and usability inherited upon each trail when part of a larger network. Partnership between cities, municipalities and the conservation authority shows that a network is the incorporation of many divisions, not just the burden of one organizing body. Finally, the entire network need not be created at once, but as a compilation formed over many years.
- *Interpretation*: It is important to examine and interpret the features the trail crosses to make the most of the recreational experience. Historical and environmental information gives the trail context and more memorable value. Collage-style information boards are visually appealing and quick to read.
- *Financing*: Generous support from businesses can provide significant lump donations.

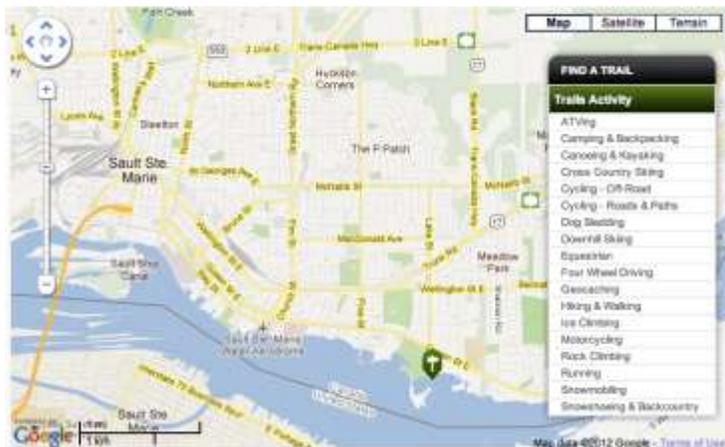
12.4 Belleview Trail

Case Study: Belleview Park Trail

Tianna Burke

Belleview Park, located in the heart of Sault Ste. Marie, is a good example of a master plan and how to advertise a trail that Brussels can use as an example. The Belleview Park trail stretches for 2.4km and is approximately 17 hectares in size made of asphalt.

Stretching along the walkway are shops, workplaces, floral beds, playgrounds, along the St. Mary's River. The trail extends from not only Belleview Park, but throughout the St. Mary's River towards the Sault Locks. The location of the park, which the trail runs through, can be seen in the map below.



Master Plan:

A Master plan (or Management Plan) is a document which outlines all the management practices that have, are, and will occur on the trail, including history, land agreements, and future possibilities.

The website:

(<http://www.cityssm.on.ca/contentadmin/UserFiles/File/CityDepartments/PWT/MasterStrategyBelleview%20Park.pdf>), contains the master strategy plan for Belleview Park and its trails. In this it lists all the facilities located on the trail and how these will be maintained over time and developed. Under each of these facilities and areas, issues are also listed and recommendations for solving them. This is a useful

| TRAIL STATS | |
|---|--|
| LENGTH: | 2.4 km |
| DIFFICULTY: | ** |
| ACTIVITIES: | Hiking & Walking, Running, Snowshoeing & Backcountry |
| CHARACTER: | Urban |
| SURFACE: | Asphalt |
| AMENITIES: | Parking, Picnic Areas, Designated Rest Areas |
| OTHER: | |
| LOCATION | |
| REGION: | Northeastern Ontario |
| SUB-REGION: | Algoma Country |
| CLOSEST TOWN(S): | Sault Ste. Marie |
| TRAILHEAD: | GPS |
| SEASONS / HOURS | |
| Year-round | |
| CONTACT INFO | |
| NAME: | City of Sault Ste Marie, Admin |
| PHONE: | 705-759-2500 |
| EMAIL: | Email Us Now |
| WEB SITE | |
| For more information, including maps, please visit www.city.sault-ste-marie.on.ca | |

Figure 1 From the Ontario Trails Council Website

item for the city (or owner of trail) to create as it enables people to easily see the issues that it faces and potential ways to solve them. This creates transparency amongst the city and it's citizens to the future of the trail on which they can comment and include suggestions to. It also creates a document that managers and city people can pass down through employee shifts, informing them of the vision for future and present management.

Sault Ste. Marie Website:

The City of Sault Ste. Marie (2010) has a website page dedicated to their City parks and let's tourists know what they may find within them, especially Bellevue as it's the largest. On this website there is no real promotion for people to use the walkway, whether they be tourists or for people who work in the downtown area. Having a greater variety of pictures on the website may draw more people to use these spaces.



Figure 2: City of Sault Ste. Marie (2010).

http://www.cityssm.on.ca/Open_Page.aspx?ID=512&deptid=1

A

second

website, seen below, was found was by Tourism Sault Ste. Marie (2012). This gives less information about the park and trail, but more pictures for potential visitors to look at. For this trail to be efficiently

used and advertised, a website page must be created which gives information about the trail specifically. This includes its location, length, potential stops along the trail (playgrounds, restaurants, waterfront, museums, etc). This will help to not only promote the trail portion that is within the park, but the portion that extends all along the riverfront.

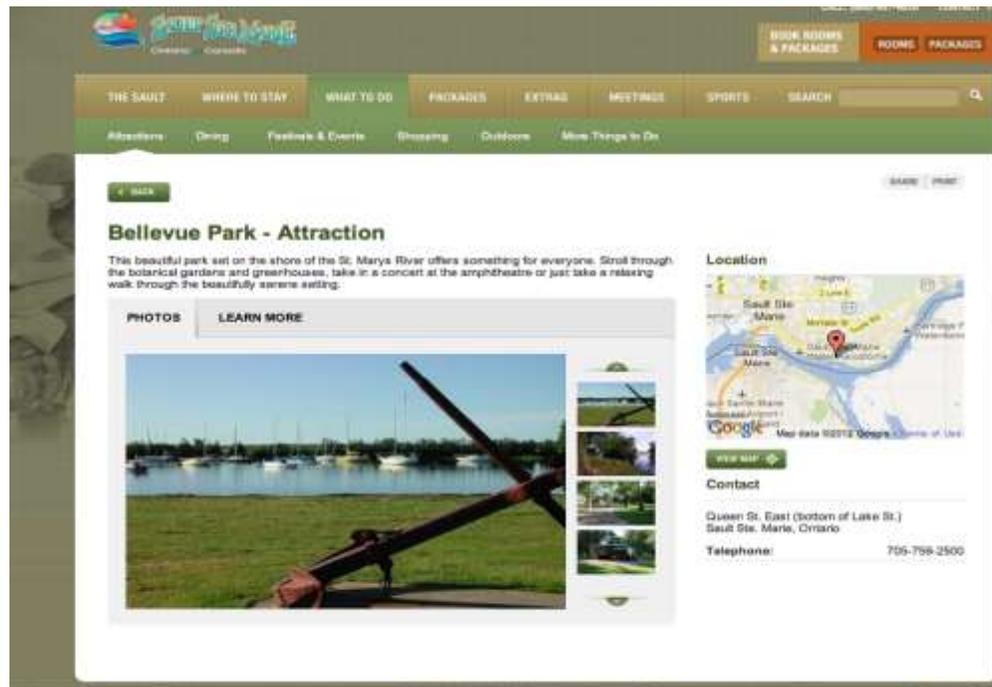


Figure 3: Tourism Sault Ste. Marie (2012).

<http://www.saulttourism.com/what-to-do/attractions/listing.aspx?listing=19>

Ontario Trails Council:

Bellevue Park Trail is a member and advertised by the Ontario Trails Council. This Council was established in 1988 and works to “increase the number, length, variety and accessibility of trails throughout the province; Promote the safe and responsible use of trails; and act as a provincial resource center for trail information” (Ontario Trails Council, 2012). This is a great place to advertise a trail because over forty thousand visitors from across the globe use this website as their first choice for looking up trail information in Ontario. These trails are anything from urban trails in city centers (such as Bellevue Park Trail) or wilderness trails (such as through Algonquin Park).

OTC Web Site Statistics* for 9 months (January – September):

- Total number of pageviews **962,716**
- Average of **107,000** pageviews per month
- July peak **157,264** pageviews
- Total of **312,000** visitors for 9 months
- Average of **35,000** total visitors per month
- July highest total visitors **52,922**

Figure 4: Viewing States from Ontario Trails Council (2012)

Viewers are able to look up trails based on region, activity, or city and find the trail that best suits them to travel to, or to use within their own community.



Figure 5: <http://www.ontariotrails.on.ca/>

Social Media:

Bellevue Park has taken the modern step to creating a facebook page to help advertise its Park and trail. Although this page currently does not have a lot of information on it, it could be developed into an efficient marketing tool. Festivals and park activities could be promoted through the facebook page, as well as specials for restaurants along the routes.



Recommendations and conclusions:

There are many things that Brussels can take from this case study of Bellevue Park Trail in Sault Ste. Marie.

- It is recommended that a management plan be created. This will help ensure trail transparency, maintenance and future plans are all accounted for.
- It is recommended that a trail webpage be available on the Brussel's city website. This will allow for promotion of the trail specifically. This can include a map of where it is, what it passes, and things to do along the trail.
- It is recommended that Brussels trail be added to the Ontario Trails Association website. This will provide great promotion to the trail as there are a variety of people who use the site on a frequent basis.
- It is recommended that other social media possibly be used. This is a modern technique, but can be useful for promoting local businesses along the trail or creating a photo-base.

12.5 Laurel Creek Conservation Area

Laurel Creek Conservation Area: A Case Study of Online Media and Promotion

Matthew Rodgers

February 5, 2012

Overview:

This case study will focus on the Laurel Creek Conservation Area Trail located in Waterloo, Ontario. The Laurel Creek Conservation Area Trail is a good example of a park area with excellent online resources designed to inform interested individuals of details regarding it. This can be applied to Brussels in order to inform the public about information related to the trail as well as encourage feedback from trail users, as a well-designed website can allow for all of these things. Specifically, this case study evaluates the use of online media to promote the trail. Resources related to this research will be listed in the Recommendations section.

Laurel Creek Conservation Area:



Images retrieved from www.grandriver.ca

Located in North Waterloo, Ontario, Laurel Creek Conservation Area offers three multi-purpose trail loops. They are used for hiking/walking in the summers, and as cross-country ski trails when conditions allow in the winter season. The area includes over 8km of trails in total, running around the edge of a small lake. Canoeing and camping are also offered as activities at the site.

Master Plan for Laurel Creek Conservation Area:

A Master plan (or Management Plan) is a document which outlines all the management practices that have, are, and will occur on the trail, including history, land agreements, and future possibilities.

Website URL: http://www.grandriver.ca/CurrentStudies/LaurelPlan2004_Complete.pdf

This URL contains the master plan for Laurel Creek Conservation Area. It includes information regarding the physical conditions and biophysical resources of the site, existing uses, management practices, issues/opportunities/stakeholder input, and a recommendations & plan implementation section. This is a useful resource for municipality which owns and operates a trail site to create, as it helps compile information regarding the issues that the municipality faces associated with the trail, and outlines potential courses of action for problem solving. It also provides a lasting vision for a trail system which can be referenced by future legislators and by citizens as well.

Online Media used by Laurel Creek Conservation Area:

Ontario Trails Website:

<http://www.ontariotrails.on.ca/trails-a-z/laurel-creek-conservation-area-trail>

The Ontario Trails Council offers a web-space to protected areas in Ontario in order to offer citizens a straight-forward, all in one database from which they can find information regarding protected areas throughout the province. As search options on the website consist of searching for a trail by region of the province and by city, this website would likely be used by citizens curious as to discover what their local area has to offer in terms of trails, or who are travelling to a region of the province and want to discover the trail options in that region.

Having a presence on this website could provide opportunities for people living outside of Huron County to learn about the Brussels Trails' existence.

Grand River Conservation Authority Website:



Image retrieved from <http://www.grandriver.ca/index/document.cfm?Sec=27&Sub1=127&sub2=0>

The Grand River Conservation Authority “manages water and other natural resources on behalf of 39 municipalities and close to one million residents.” The authority’s website, www.grandriver.ca, offers conservation areas pages on its website in order to promote themselves by offering the public information regarding general characteristics of an area, when trails can be used, etc. This site is among the first search results for Laurel Creek Conservation Area when using the Google search engine, and the site is appropriately highly detailed in terms of explaining what and where the conservation area is, the activities that can be undertaken there, and other useful information for interested citizens. The option of having information about the trail site in Brussels hosted on a local government agency’s could provide credibility and easy access to information for citizens interested in finding out more about the trail, though for the most part interested people will be searching for information about the

Brussels trail specifically when they visit such a site, meaning that the promotion opportunities for such an arrangement are quite limited.

Recommendations:

-Having a high degree of search-ability of information regarded to a trail or conservation area is key. Use Google search results wisely to ensure that information regarding the trail is easy to find for interested parties.

-Use whatever connections available to Brussels in order to distribute detailed information about the trail, most of which may be completely free to use. I suggest attempting to get information regarding the trail hosted on sites such as that of the Maitland River Conservation Authority: <http://www.mvca.on.ca/>, or perhaps other regional websites regarding recreation, attractions, etc. Essentially, spread the information around as much as possible and with good detail online, so as to make information very easy to find for those who are interested in it, and present the information well.

-This process can include creating an official Facebook or Google + page, a Twitter account, or hosting information on other websites such as that of the local municipality.

-Brussels is a rather small town with a rather small-scale walking trail idea. This idea fits within the town's ambitions well. Promoting the trail in a major way will probably be a waste of resources; success for the trail is to create a valuable and attractive piece of long-term infrastructure, but don't treat low usage as a failure. It is a walking trail, not an amusement park, so keeping the project and its goals in perspective and not overspending on the project is a good idea. Provide a good spread of information for those who come seeking the information, but pushing this information to a wider audience is not exactly necessary to the trail being deemed a success.

Case Study: Gordon Glaves Memorial Pathway and the use of a Multi-Use Trail/Bikeway Implementation and Design Plan

By Melinda Liu (20281579)

Overview

This case study will focus on the Gordon Glaves Memorial Pathway, part of the Trans Canada Trail located in Brantford, Ontario. The Gordon Glaves Memorial Pathway is a good example of how to get started on designing and planning trails and/or bike ways prior to implementation. This can be applied to Brussels in order to provide cost estimates, barriers to overcome, attractions/destinations to include and how to implement the proposed routes. Specifically, this case study evaluates the use of The City of Brantford's Website and the Multi-Use Trail/Bikeway Implementation and Design Plan. Resources related to this research will be listed in the Recommendations section.

Study Area

The Gordon Glaves Memorial Pathway is located in downtown Brantford, Ontario, and runs parallel to the Grand River (Ontario Trails Council, 2012). The Gordon Glaves Memorial Pathway is one of the four trails that is part of The Hamilton-Brantford-Cambridge Trails system. The Trails between Hamilton-Brantford-Cambridge are part of "Canada's first fully, developed, multi-use inter-urban trail system" (GRCA, n.d.), stretching approximately 80 kilometres, and has been formally recognized as being part of the Trans Canada Trail. The Gordon Glaves Memorial Pathway was constructed in early 1990s. In 1993, the trail was named after the late Gordon C. Glaves, a well known community volunteer (Ontario Trails Council, 2012). The main trail of the Gordon Glaves Memorial Pathway "is on top of a dyke built by the GRCA in response to the flood of 1974" (Grand River Country, 2010; Ontario Trails Council, 2012; GRCA, n.d.), where it provides a beautiful scenic view of the Grand River. This section of the trail is composed of tar and chip and connects to the Wilkes Dam, which is three kilometres Northwest of the trail (Grand River Country, 2010). The two tiered Wilkes Dam provides a

spectacular view of the Grand River (Figure 1), however only minimal information was available about the dam itself.



Gordon Graves Memorial Pathway is approximately 12 kilometres in length. It begins in Brantford Jaycees Trailhead, passes through Kanata Iroquois Village, Mohawk Chapel (a Six Nations Historic Site), Brant's Crossing and Earl Haig Park, Waterworks Park and ends at Wilkes Dam (GRCA, n.d.; Hamilton Conservation Authority, n.d.). At Brant's Crossing and Earl Haig Park, there is an alternate route that provides access to an additional eight kilometres of trails which leads to Bell Homestead across from the Grand River (Hamilton Conservation Authority, n.d.; GRCA, n.d.).

The surface of the trails are covered with stone dust or finer gravel, suitable for bicycles, and some sections of the trail in Brantford are paved (GRCA, n.d.; GRCA, 2012). The majority of the trail is accessible to wheelchair users (GRCA, 2012). Access has been provided to key points along the trail. The trails allows bicycling and hiking opportunities, and cross-country skiing in the winter months (GRCA, 2012). A warning is written specifically to the trail user that they must be aware of the vehicular traffic as some sections of the trail transects with busy roadways, and private laneways (GRCA, n.d.). The trail is owned, and maintained by the City of Brantford (Grand River Country, 2010; Hamilton Conservation Authority, n.d.).

[The City of Brantford's Website](#)

The City of Brantford's website provides a brief description of the sites along the trail, a Multi-Use Trail/Bikeway Implementation and Design Plan (to be discussed later on), guidelines to follow when on the trails (i.e., stay on the trail, respect all signs and laws, etc.) and things to note (i.e., the changing of trail conditions throughout the season) (City of Brantford, 2012). Overall, the website was only helpful in providing some basic information about the trail, there was not a lot provided to endorse the trail to the public and the history and/background of some of the attractions/destinations along the trail. It is recommended that the City improve their website to attract the attention of new and/or visiting recreation users. For example, they could create a video or post pictures of some of the attractions/destinations along the trail. Or hold bicycle tours once a month, to get bicyclists on the trails. The Grand River Conservation Authorities' website has a photo album with pictures of destinations along the Grand River and the trail, Figure 2.



Figure 2. View of the Grand River and Brant Park from the Gordon Glaves Memorial Pathway (GRCA, 2012a).

Also on the City's website, it provides pdf copies of two types of maps. The first map of Gordon Glaves Memorial Parkway provides users information of the various trail access points and the facilities (parking, washrooms, picnic tables, etc.) available. The map points out 16 points of interest, locations of kiosks with location maps, the Trans Canada Trail Pavilion and four sections of the trail where it is prone to seasonal flooding, silt and ice deposits (Figure 3) (City of Brantford, 2012b).



Figure 3. A trail kiosk provided at Lions Park, Brantford (Google Maps, 2009).

The second map of Gordon Glaves Memorial Pathway outlines Brantford’s recreational trails and bikeways. The map briefly talks about the Brantford Multi-use Trail/Bikeway Advisory Committee, who advises City Council on the design, development and delivery of facilities and programs that relate to the recreational trails and bike routes (City of Brantford, 2012b). Originally, the Brantford Multi-use Trail/Bikeway Advisory Committee was created in response to the publication of the 1999 Multi-use Trail/Bikeway Design and Implementation Plan. The map not only provides the location of the trail kiosks and warning areas, it also outlines the multi-use trails, pedestrian trails, bike lanes, bike routes (shared use), and secondary trails.

The above maps are posted in trail kiosks across the City of Brantford and are available in the resource section below. Trail kiosks and maps should be provided at major access points along the Brussels trail. For example, there should be a trail kiosk at the former Mill with a brief history provided on the side.

Multi-use Trail/Bikeway Design and Implementation Plan

The Multi-Use Trail/Bikeway Implementation and Design Plan was compiled by Stantec Consulting Limited to help the City of Brantford extend and enhance “the existing trail system and [create] a complimentary on-road bikeway system throughout the City” (Stantec Consulting Ltd., 2000) as part of the City’s Transportation Study. In the Transportation Study, over 120 kilometres of bikeways and trails were identified. Multi-use trail users “include walkers,

runners, cyclists, people with mobility aids and in some locations in-line skaters. Users will be of all ages, all levels of experience, and all levels of mobility” (Stantec Consulting Ltd., 2000).

The City of Brantford requested that major routes be proposed east-west and north-south of the City in an attempt to connect neighbourhoods, connect major destinations (the Grand River, Bell Homestead, etc), provide alternate routes to existing major routes, and facilitate the crossing of major physical barriers (railways, Highway 403 and the Grand River). The report proposed the creation of 12 primary routes, 14 neighbourhood routes and 12 connecting links in between the primary routes (Stantec Consulting Ltd., 2000). Each route was examined in depth, it included a description of the route, the destinations/attractions along that route, barriers crossed, connections to other routes, bikeway types and length of route. The proposed Brussels trail should have a study, like Brantford’s, to make sure that all the barriers are addressed and attractions are highlighted.

The report includes a table of the unit costs of construction for the proposed multi-use trails and bikeway routes. The table includes the cost to pave existing shoulders to provide a bike lane to the construction of new multi-use trails. The table is provided in the resources section. All numbers are based upon the 1999 dollar and is extremely detailed. This construction cost table may be helpful in terms of estimating the budget required in order to implement a trail in Brussels.

In regards to the implementation plan, Stantec Consulting Ltd., recommends that the City prioritize the projects, based upon the following criteria: road construction opportunities, ease of implement, public comments, public support and profile and comments from the Community Advisory Committee and Technical Steering Committee. They recommended that the first priority would be to complete the Trans Canada Trail route, implement the least expensive sections, and have the Council’s full commitment in order for the plans to move forward (Stantec Consulting Ltd., 2000). There has been no follow up or review plans released to the public in relation to the establishment of all of the proposed routes. Therefore, it is

unclear how much routes from the report was actually implemented or how much the actual construction costs deviated from the estimated costs. Although when comparing the Gordon Graves Memorial Pathway - Brantford Recreational Trails and Bikeways map with the proposed trails and bikeway map, it appears that the City had implemented some of the top priority routes in the last 11 years. The City's 2008 Transportation Study only specified their plans and goals for the public bus transit system for the next 10 years, with no mention of the trails or bikeways. An updated report should be released, discussing the results of the original report.

Recommendations & Conclusions

It is recommended that:

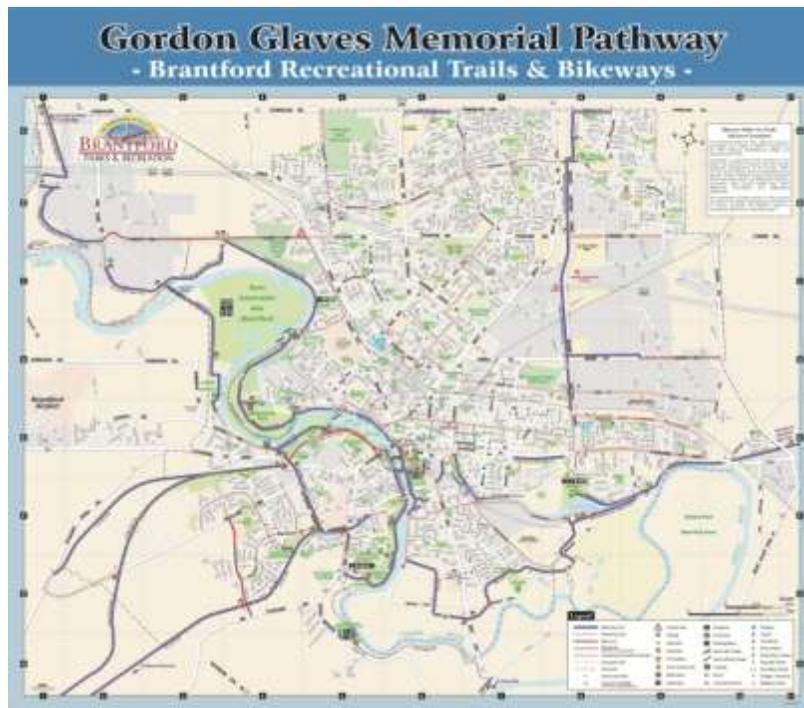
- Kiosks with location maps and/or background information be set up throughout the various access points of the Brussels trails;
- Access points should be clearly marked with signs;
- Floodplain areas should have warning signs;
- Brantford's construction cost table may be used as a method to estimate approximate construction costs;
- Have a website or webpage that introduces and talks about the Brussels trail;
- A trail map be provided on the website;
- Actively endorse the trail by holding events;
- Background and history of destinations/attractions be provided online; and
- Have pictures and/or videos that represent Brussels.

In conclusion, the City of Brantford has some good ideas, like the Multi-use Trail/Bikeway Implementation and Design Plan, trail kiosks, access points to the trail and warning signs in floodplain areas. However, there are lots that the City could do to help ensure the trails and bikeways' success. For example, incorporating the trails and bikeways into the Transportation Study and reviewing the study every 5-10 years. Or holding a scavenger hunt on the trail for youths, so they have an opportunity to explore various sections of the trail for themselves.

Map of Gordon Glaves Memorial Pathway with trail access points.



Map of Gordon Glaves Memorial Pathway – Brantford Recreational Trails and Bikeways



City of Brantford: Multi-use Trail/Bikeway Implementation and Design Plan
Chapter 4: The Implementation Plan

Table 4.1
Unit Costs of Construction

| | | | | 1999 Dollars |
|---|--------------|------------|----------------|--------------------------|
| Proposed Trail | units per km | unit price | unit | Cost per km |
| construct stonedust trail | 1000 | \$ 25 | m | \$ 25,000 |
| construct tar & chip trail (optional) | | \$ 12 | m | |
| construct asphalt trail (optional) | | \$ 45 | m | |
| drainage features (culverts, etc.) - 20% of above | | \$ 5,000 | l.s. | \$ 5,000 |
| signs every 200 m both sides | 10 | \$ 100 | each | \$ 1,000 |
| bollards 3 every 500 m | 6 | \$ 150 | each | \$ 900 |
| gates at major road crossing every 2 km | 0.5 | \$ 3,000 | each | \$ 1,500 |
| traffic cautionary signs every 2 km | 0.5 | \$ 200 | each | \$ 100 |
| trash receptacle at rest areas, access points | 1 | \$ 150 | each | \$ 150 |
| 3 benches every 1 km | 3 | \$ 350 | each | \$ 1,050 |
| bike racks at rest areas | 0.5 | \$ 350 | each | \$ 175 |
| route map signs every 5 km | 0.2 | \$ 3,000 | each | \$ 600 |
| engineering and contingency | | | 25% | \$ 8,869 |
| GST | | | 4% | \$ 1,419 |
| total | | | | \$ 45,800 per km |
| Signed route | | | | |
| signs every 300 m both sides | 10 | \$ 100 | each | \$ 1,000 |
| engineering and contingency | | | 15% | \$ 150 |
| GST | | | 4% | \$ 6 |
| total | | | | \$ 1,200 per km |
| Paint bike lanes (4-lane road with parking) | | | | |
| remove existing lane markings | 2 | \$ 2,000 | km | \$ 4,000 |
| stripe new permanent markings | 3 | \$ 3,000 | km | \$ 9,000 |
| permanent bike symbol every 200 m both sides | 10 | \$ 200 | each | \$ 2,000 |
| signs every 200 m both sides | 10 | \$ 100 | each | \$ 1,000 |
| engineering and contingency | | | 15% | \$ 2,400 |
| GST | | | 4% | \$ 96 |
| total | | | | \$ 18,000 per km |
| Pave existing shoulders | | | | |
| 1.5 m width, 0.09 m depth HL-4 asphalt both sides | 702 | \$ 50 | t | \$ 35,100 |
| 2.25 m width, 0.04 m depth HL-3 asphalt both sides | 468 | \$ 40 | t | \$ 18,720 |
| planing | 750 | \$ 14 | m ² | \$ 10,125 |
| glasgrid | 1500 | \$ 12 | m ² | \$ 18,000 |
| strip new permanent markings | 3 | \$ 3,000 | km | \$ 9,000 |
| permanent bike symbol every 200 m both sides | 10 | \$ 200 | each | \$ 2,000 |
| signs every 200 m both sides | 10 | \$ 100 | each | \$ 1,000 |
| engineering and contingency | | | 25% | \$ 23,486 |
| GST | | | 4% | \$ 939 |
| total | | | | \$ 118,000 per km |
| Widen to provide wide shared-use lanes during road reconstruction (incremental cost) | | | | |
| 0.75 m width, 0.09 m depth HL-4 asphalt both sides | 351 | \$ 50 | t | \$ 17,550 |
| 0.75 m width, 0.04 m depth HL-3 asphalt both sides | 156 | \$ 40 | t | \$ 6,240 |
| 0.75 m width, 0.73 m depth excavation both sides | 1095 | \$ 5 | m ³ | \$ 5,475 |
| 0.75 m width, 0.45 m depth granular B both sides | 1688 | \$ 7 | t | \$ 11,816 |
| 0.75 m width, 0.15 m depth granular A both sides | 563 | \$ 9 | t | \$ 5,067 |
| catchbasin relocation every 40 m both sides | 50 | \$ 1,500 | each | \$ 75,000 |
| permanent bike symbol every 200 m both sides | 10 | \$ 200 | each | \$ 2,000 |
| signs every 200 m both sides | 10 | \$ 100 | each | \$ 1,000 |
| engineering and contingency | | | 25% | \$ 31,037 |
| GST | | | 4% | \$ 1,241 |
| total | | | | \$ 156,000 per km |

Stantec Consulting Ltd.
ESG International

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