

Establishing a Greenway Network in Hamilton: Benefits and Considerations

Prepared for the Hamilton Burlington Trails Council
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Executive Summary

This report scans the literature on greenway infrastructure and implementation from Canadian, American, and European contexts in order to describe the benefits of greenways and offer some suggestions for how Hamilton might proceed with developing a local greenway strategy. Paying attention to the documented successes of greenway implementation in other cities will allow Hamilton to develop a thoughtful, feasible, and strategic action plan for moving forward.

Greenway Benefits

Greenways offer many benefits in different domains, including:

- *Economic* (through jobs, revenue, business, and tourism; increased property values and disposable family income; and the efficient exchange of goods and services)
- *Environmental* (air and water quality)
- *Health* (physical activity; reduced environmental health impacts; safety); and
- *Social* (mobility; sense of community).

Key Considerations in Greenway Development

In order for Hamilton to successfully move forward with recognizing and developing a greenway, a number of factors must be considered and attended to:

1. *Public Engagement and Investment:*
 - Identify greenway stakeholders
 - Promote examples of individual and City-wide greenway benefits to build stakeholder support and motivation to use the greenway
 - Thoroughly involve the community in greenway planning
2. *Stakeholder Coordination:*
 - Develop a Greenway Planning Group to coordinate stakeholders
 - Develop a clear and shared short-term and long-term (20-30 year) vision for the greenway
 - Balance local (neighbourhood, ward, city) and regional (Hamilton, Burlington, Brantford, Niagara) goals
3. *Funding:*
 - Pursue provincial, municipal, non-profit, and private/business funding sources
 - Use funds efficiently and responsibly by building on and enhancing the connectivity of pre-existing cycling and trail networks
4. *Safety:*
 - Address the public's misconceptions and fears about greenway safety
 - Incorporate attention to safety concerns during greenway design and infrastructure development

5. *Ecology:*

- Ensure that the greenway's ecological benefits and impacts are fully investigated and attended to during greenway planning

6. *Equity:*

- Ensure that access to the greenway is safe and accessible for all Hamiltonians regardless of income, neighbourhood, or other factors and that the greenway contributes to greater equity in the City

Case studies of the Comox-Helmcken Greenway in Vancouver, British Columbia and Copenhagen Greenway in Denmark illustrate the importance of the above considerations. They also offer two additional recommendations for ensuring a *quality* greenway experience that attracts and retains greenway users:

- *Ease and Comfort:* Encourage the City and local businesses to continually enhance infrastructure for an easier and more 'comfortable' cycling experience, with connecting routes to schools, parks, community centres, healthcare organizations, shopping areas, and neighbourhoods.
- *Ongoing Maintenance:* Maintain greenways so that they can accommodate increasing numbers of users.

One essential goal of greenway creation in Hamilton is to increase residents' use of active transportation. To this end, the ease and comfort of greenway use, routes that allow seamless access to important city features, and the maintenance of infrastructure to keep up with demand will be key factors that influence the public's use of the greenway.

Of all these factors, collaborative coordination and adequate outreach and communication between all stakeholders to maintain a shared vision or goal is described as the most important consideration for successful greenway implementation (Rottle, 2006).

Aligning a Greenway with Provincial and Local Plans

Official recognition of a greenway is a timely consideration that responds to at least a dozen provincial and municipal strategies and plans that have goals in common with greenway development.

These plans variously respond to the following central objectives:

- *Protecting the natural environment* by growing the greenbelt, preserving natural heritage areas and landscape features, reducing greenhouse gases and air pollution, increasing air and water quality, addressing climate change, and promoting the use of non-polluting vehicles (like bicycles).

- *Enhancing the maintenance and use of trails* that conserve the environment, offer recreational opportunities, improve health and wellbeing, and build strong communities.
- *Effectively transporting goods and people* by developing City-wide and regional transportation systems that reduce congestion and the use of single occupancy vehicles and increase the use of public and active transportation.
- *Encouraging sustainability and economic development* by attracting new industries and innovative businesses, especially those related to cycling; inspiring employment opportunities so Hamilton residents can work and travel locally; and emphasizing financial responsibility and sustainability in transportation infrastructure development and design.
- *Promoting health and wellbeing* by increasing physical activity and travel by active transportation, reducing environmental health impacts caused by poor air or water quality, and improving safety for pedestrians and cyclists.
- *Enhancing mobility and accessibility* by increasing the connectivity of pathways and developing walkable cities and complete streets that enable access for all users.
- *Cooperating across City boundaries* in order to develop and implement Hamilton-Burlington-Niagara plans to address climate change and other environmental and economic concerns.
- *Collaborating with Indigenous communities* to protect and care for the land.¹

Developing a Greenway Master Plan in Hamilton would connect numerous local and provincial policies and strategies and help Hamilton move the promotion of active transportation for economic, environmental, health, and social reasons forward in a more cohesive way. Furthermore, by officially recognizing a greenway plan, Hamilton stands to keep up with innovative developments in other model cities and to demonstrate to the rest of Canada its commitments to stewardship and sustainability, health and wellbeing, and accessibility and inclusion for all.

¹ Several provincial environmental plans highlight the importance of collaborating with Indigenous communities who have been caring for the land for generations (Government of Ontario, 2016a, 2016b). As one small step towards reconciliation and Canada's recognition of its ongoing occupation of Indigenous land, in August 2016, the Government of Ontario announced that they have installed 25 trail markers along the Ontario portion of the Trans-Canada Trail to recognize the history and cultures of Indigenous people (Ministry of Indigenous Relations and Reconciliation, 2016).

Introduction

This report has been prepared at the request of the Hamilton Burlington Trails Council by Research Associates from the McMaster Research Shop. It is intended to introduce the benefits of greenways to a broader public in order to gain support and momentum for the official recognition of a greenway in Hamilton.

This report draws on academic and grey literature about greenway development from Canadian, American, and European contexts to offer suggestions for how and why a greenway might be implemented in Hamilton.

The report is organized in the following way:

- Section 1: Benefits of Greenways describes the economic, environmental, social, and health benefits of greenways in order to demonstrate the positive impacts of a possible greenway in Hamilton.
- Section 2: Developing a Greenway: Key Considerations describes best practices from greenway implementation in other cities and identifies action steps for moving forward in Hamilton.
- Section 3: Greenway Case Studies offers two examples to illustrate what greenway development and success can look like: Vancouver acts as a Canadian example of current greenway possibilities and Copenhagen as a vision for the future.
- Section 4: Aligning a Greenway with Current Provincial and Local Plans gathers together a number of significant and aligning policies pertaining to transportation, recreational trails, environmental protection, and municipal visions for the future. These policies do not specifically mention ‘greenways’, but they carry similar goals and objectives that greenway development could help address.

What is a Greenway?

While greenways as a way of planning and using land came into existence in the United States in the late 1800s, the contemporary use and spread of this term emerged in the 1960s and 70s (Flink, 1993). Greenways are linear outdoor road networks for pedestrians and cyclists. They can be developed as recreational pathways, as ecological corridors that protect wildlife and the environment, as transportation networks that offer an alternative to vehicular infrastructure, and as scenic and historic routes that connect residents to local landscape and history. Greenway trails are designed with a variety of considerations and include the following specific features: linearity, connectivity, and resource protection (Tennessee Greenways & Trails, 2008).

Section 1: Benefits of Greenways

The literature on greenways notes a number of significant benefits to cities and residents, including: economic, environmental, social, and health benefits.

1.1 Economic Benefits

The main ways in which greenways may stimulate the economy include:

- Job creation (mainly in the maintenance of greenway infrastructure)
- Local revenue through fees and taxes (eg. trail entrance fees)
- Increased disposable income for households to spend on the local economy
- Increase in businesses that support cycling (eg. equipment and upkeep stores)
- Increased tourism and resulting local spending (eg. bike rentals, bike tours)
- Increase in property values

1.1.1 *Jobs, Revenue, Business*

An example demonstrating economic benefit is the 2,702 mile long bicycle network called La Route Verte that was built in Quebec, Canada. As a result of this cycling network, Quebec-wide spending by cyclists totaled \$166 million in 2000. The Quebec cycling industry had sales totalling over \$181 million and sustained over 2,800 jobs. This generated revenues of \$17.2 million for the Government of Quebec and \$13.6 million for the Government of Canada (Campbell & Wittgens, 2004).

The Minnesota Department of Employment and Economic Development captured similar data. The value of all goods and services produced in the state attributed to bicycle riders' spending came to \$261 million. This spending supported more than 5,000 jobs and helped generated \$35 million in taxes (Venegas, 2009).

Vermont has also studied the economic benefits of their cycling culture, noting that in 2009, biking and walking created at least 14,000 jobs, \$41 million in wages, and \$83 million in revenue (Resource Systems Group, Inc., Economic and Policy Resources, Inc., & Local Motion, 2012).

Business districts in cities with greenways also report increases in commercial activity. A 2009 study of Bloor Street in Toronto, Ontario showed that people who biked to the area spent more money in the area per month than those who drove there, suggesting that bike traffic increases commercial activity (Sztabinski, 2009).

1.1.2 *Tourism*

Copenhagen is known as the City of Cyclists, a 'brand' that attracts tourists from all over the world and results in economic benefit. As one example, this branding effect attracts international conferences and hotel guests (Flusche, 2012).

Another celebrated example of greenway economic-tourist benefit is North Carolina's Outer Banks, which, by a conservative estimate, generates \$60 million in economic activity through

bicycle tourism. In surveying tourists, over half of survey respondents indicated that the cycling culture had a strong influence on their decision to return to the area (Flusche, 2012).

La Route Verte in Quebec was originally built to draw in tourists, attracting 190,000 bicycle tourists in 2002. These tourists spend an average of \$112 per day and stay an average of 6.5 nights compared to the \$52 per day and 3.1 nights of non-cycling tourists (Campbell & Wittgens, 2004).

1.1.3 Property Values

Properties near trails and neighbourhoods with bicycle friendly features prove to be popular among buyers. In Surrey, British Columbia, since family property values that bordered a greenway or a trail proved to be 1% to 20% greater than those that did not. According to a 1998 study, property adjacent to the Mountain Bay Trail in Brown County, Wisconsin sold faster and for an average of 9% more than comparable property not located next to the trail (Campbell & Wittgens, 2004). In Indiana, the commercial and residential land within 500 feet of the entire Indianapolis Cultural Trail increased by over 1 billion in assessed value between 2008 to 2014 (Indiana University Public Policy Institute, 2015).

1.1.4 Disposable Household Income

Greenways and cycling offer an inexpensive transportation option that makes it easier for households to go car-lite or car-free, resulting in decreased costs related to vehicle ownership, upkeep and repair, gas, and insurance. This additional household income can then be used to support the local economy (Vancouver City Council, 2012).

1.1.5 Enhanced Exchange of Goods and Services

Greenway infrastructure and increased walkability and cyclability of cities can decrease congestion on roadways, reduce travel times, and make better use of limited road capacity and transportation networks. This further enables the exchange of goods, services, and ideas throughout the city and can reduce the need for massive road reconstructions to accommodate growing populations (Vancouver City Council, 2012; The City of Copenhagen, 2015).

1.2 Environmental Benefits

Greenways enhance a city's natural environment with trees, gardens, and mini-parks while ensuring a healthy future for its people and the planet.

1.2.1 Air Quality

Motor vehicles are a major contributor to air pollution via the production and release of harmful and poisonous gases and particulates. The vehicular use of gasoline also contributes significantly to the emission of greenhouse gases that absorb and emit heat and warm the earth's atmosphere, especially through the production of carbon dioxide (Office of Transportation and Air Quality,

2014). In Hamilton, transportation contributes to 33% of the City's greenhouse gas emissions (City of Hamilton, 2015). In contrast, walking and cycling are environmentally friendly alternatives that produce virtually no air pollution or gas emissions. Per kilometre air pollution reductions as a result of increased active transportation would be large because bicycling typically replaces short, cold start vehicular trips, which have extremely high rates of gas emission (Campbell & Wittgens, 2004).

As recognized by Trees Please Hamilton (n.d.), the strategic planting of vegetation like native trees and shrubs can reduce air pollution, contribute to the health of Hamilton's urban forest, and increase our local air quality. The development of a greenway that protects and cultivates our natural vegetation would align well with existing air quality enhancement efforts in Hamilton.

1.2.2 Water Quality

Motorized vehicles and related practices to maintain roadways, such as road de-icing and the use of roadside herbicides to clear vegetation, are a major source of water pollution. Disruptions to natural bodies of water from roadway construction along shorelines and loss of wetlands due to road and parking lot expansions also contribute to the environmental impact of motor vehicles (United States Environmental Protection Agency, 1993).

Greenways can reduce pressure on roadway infrastructure and subsequently reduce our need to interfere with natural bodies of water. They can also offer an opportunity to introduce different sustainable ecosystems to mediate the environmental impacts of nearby roadways. For instance, Riparian buffers (vegetated areas alongside streams) can be incorporated into greenway design to serve as a water filtration method that traps pollutants and soil when it rains, enhancing local water quality (Craggs, 2013).

1.3 Health Benefits

Greenways encourage residents to get more active by walking and cycling, which leads to beneficial health impacts. Such benefits include increased physical activity, reduced exposure to air pollutants, and increased road safety.

1.3.1 Physical Activity

Regular physical activity plays a role in the prevention of several chronic diseases such as cardiovascular disease, diabetes, cancer, hypertension, obesity, depression, and osteoporosis. In Canada, only 15% of adults and 7% of children and youth participate in enough physical activity for optimal health and development (Colley, Garriguet, Janssen, Craig, Clarke, & Tremblay, 2011a, 2011b; Warburton, Nicol, & Bredin, 2006).

Canada's Physical Activity Guide recommends a total of 60 minutes of physical activity each day. These 60 minutes of daily movement could be easily attained by using active transportation like cycling to reach destinations such as work, school, or shopping areas (Health Canada, 2011). People living near an open space, park, trail, and/or in a walkable neighbourhood are

significantly more likely to be physically active and get recommended amounts of exercise (Bergeron & Craggs, 2009a). Developing and maintaining trails that enhance the connectivity of the city would make the use of active transportation to get around for day-to-day activities easier and more inviting.

Research on the Comox-Helmcken Greenway in Vancouver found that local residents who lived near the greenway reported a 16.1% increase in the number of days they engaged in moderate physical activity, such as bicycling at a regular pace, and an 8.0% decrease in the time spent sitting and being sedentary. They also experienced a 9.8% decrease in the number of days that they experienced poor physical and mental health that kept them from doing their usual activities (Frank & Ngo, 2016).

	Before Greenway	After Greenway
Days that involved moderate physical activity	average of 2.3 days a week	average of 2.7 days a week
Time spent being sedentary	average of 7.9 hours a week	average of 7.2 hours a week

1.3.2 Environmental Health Impacts

Air pollution has the potential to cause and/or exacerbate a variety of cardiorespiratory health conditions like asthma, heart disease, pneumonia, and cancer, especially for seniors, children, those with chronic illnesses, and people who are physically active or working outdoors. Switching from motorized to active transport can reduce air pollutants and minimize their harmful effects (Campbell & Wittgens, 2004; Environment and Climate Change Canada, 2016).

In cities that are highly urbanized such as Toronto, Vancouver, New York, Chicago, and Las Vegas, people are more likely to experience stress and mental health concerns (Svatkova, 2015). Introducing greenways that promote an active lifestyle and encourage stress-relieving connection to nature will help to reduce long term medical costs for Hamilton (Campbell & Wittgens, 2004).

1.3.3 Safety

Cyclists are often forgotten in the design of road traffic systems and, as a result, become vulnerable road users. Associated safety concerns prevent 1 in 5 Canadians from walking or bicycling (Bergeron & Craggs, 2009b). The 1997 Hamilton-Wentworth Community Cycling Survey determined that approximately 60% of current cyclists would cycle more if routes were safer, with 20% of non-cyclists starting to cycle if routes were safer (City of Hamilton, 2007).

Greenway networks and intentional attention to cyclists and cycling infrastructure can enhance cyclist safety. As an example: in Copenhagen, where the city is oriented around the cyclist instead of the car, cycling has increased substantially over the last two decades and cyclist fatalities and injuries have dropped by 70% (OECD/International Transport Forum, 2013). Other studies demonstrate similar trends based on an identified principle of “safety in numbers”. Cycling safety increases as cycling increases, demonstrating a significant link between safety and the promotion of active transportation (Active Living Research, 2016).

1.4 Social Benefits

1.4.1 Mobility

Many individuals do not have access to motorized vehicles (eg. for reasons related to income, health, age), and, as a result, have reduced access to employment or social opportunities. Especially in areas where public transport is limited, a cycling network can allow such individuals access to these opportunities and resources and thus promote equity and improve quality of life.

Furthermore, Hamilton is surrounded by several unique geological features, such as the escarpment along the south and Lake Ontario on the north. A greenway would take advantage of these unique features and make it easier for residents to access them and reap their benefits. Other greenways, such as the Cranbrook Hill Greenway in British Columbia, promote their trails as a way for residents and visitors to access and appreciate the natural beauty of the area (Ciolfitto, 1997).

1.4.2 Sense of Community

Cycling stimulates more social interactions between residents compared to driving, because we are likely to cycle in groups or bump into friends while on a trail. This can foster better relationships between neighbours and lead to a stronger sense of community. Greenway trails are also an excellent way to include community members with various hobbies and ways of getting around, such as people who hike, jog, rollerblade, bike, or use strollers, scooters, or power chairs (Campbell & Wittgens, 2004).

Section 2: Greenway Development: Key Considerations

Greenways can provide overarching economic, environmental, social, and health benefits. To achieve these, we need to consider and respond to some of the common challenges that come with greenway planning. Key considerations will be described further below.

2.1 Public Engagement and Investment

An organized and inclusive greenway planning process will increase the chances of a successful project. The potential benefits of greenways to individuals and the City need to be advertised and promoted to build stakeholder support and investment.

One noted barrier to greenway development is a lack of public knowledge about what a greenway is and its benefits (Baptiste, Foley, & Smardon, 2015). This barrier affects the implementation of green infrastructure due to public unwillingness and lack of involvement in the process. To address this barrier, public participation in the planning process of greenways is essential. A significant contributor to successful greenway projects is the elicitation of opinions from local residents and businesses as well as their approval of the construction process (Brindley-Pantalone et al., 2015).

EXAMPLE

The Green Line initiative in Toronto brings together non-governmental organizations and members of the public to support the transformation of the Davenport hydro corridor into a greenway.

To spur interest and gain support, the initiative:

1. Started an ideas competition by inviting local architects, artists, planners, and the general public to submit designs for their ideal greenway; and
2. Conducted walking tours along the proposed greenway route (Takeuchi, 2015).

These two events gave the residents a way to engage with the initiative's vision and encouraged community participation and input (Goffin, 2014). Community engagement can also happen online through social media, interactive websites, and video campaigns.

STEPS FORWARD FOR HAMILTON

Hamilton needs to:

1. Identify greenway stakeholders. This may include:
 - Property owners
 - Businesses
 - Educational institutions
 - Government agencies (eg. City of Hamilton, Government of Ontario)
 - Non-profits (eg. hiking and trail organizations, neighbourhood groups, community centres)
 - Healthcare organizations (public health departments, mental health and wellness programs, aging-related services)
2. Promote examples of individual and City-wide greenway benefits to build stakeholder support and motivation to use the greenway.
3. Thoroughly involve the community in greenway planning.

2.2 Stakeholder Coordination

Greenways are meant to enhance connectivity among residential, commercial, and industrial zones, and often follow natural landscape features and pre-existing trails or paths. This means greenway development and maintenance often requires coordination across multiple jurisdictional boundaries.

Hoover and Shannon (1995) warn that when multiple authorities plan a greenway project exclusively for their own purposes, it can lead to a loss of the purpose for the regional greenway as a whole. There needs to be a balance between regional and neighbourhood needs and desires. Greenway projects that lack coordination between their multiple stakeholders can become fragmented and lack a unified vision or theme (Ryan, Fábos, & Allan, 2006). Obtaining a clear and shared vision and goals (short-term and long-term) among key stakeholders is important for a greenway project to succeed.

EXAMPLE

In New England, multi-jurisdictional greenway planning was coordinated by the creation of the New England Greenway Consortium. The Consortium acted as a forum for planners to share information about greenway planning strategies (Ryan, Fábos, & Allan, 2006).

STEPS FORWARD FOR HAMILTON

Hamilton has 15 wards and dozens of thriving neighbourhood associations. It is also uniquely positioned between Burlington and Brantford and shares our natural landscape with these adjoining cities. As a result, greenway development across the City of Hamilton will require cooperation between:

- Up to 15 ward councillors and multiple City of Hamilton offices;
- The City of Brantford and the City of Burlington in order to connect parks and trails in Hamilton with adjacent cities; and
- Local Hamilton neighbourhoods and their goals and regional-level greenway goals.

Hamilton needs to:

1. Develop and coordinate greenway stakeholders through a Greenway Planning Group;
2. Develop a clear and shared vision for the greenway; and
3. Balance local (neighbourhood, ward, city) and regional goals (Hamilton, Burlington, Brantford, Niagara) goals.

2.3 Funding

While greenways are often more affordable options for health and recreation because they require relatively small amounts of land compared to large open spaces like parks (Crawshaw, 2009), some infrastructure funding from governmental and non-governmental sources will be required.

Funding may be needed for:

- Public acquisition of land or private property (for instance, if the greenway route is obstructed by physical barriers like buildings); and
- Greenway maintenance (mowing, trimming and pruning; safety and security; garbage collection; erosion stabilization; storm cleanup).

STEPS FORWARD FOR HAMILTON

Given Hamilton's already existing trail network and cycling options, funding would be most efficiently used to enhance the connectivity of these pre-existing routes. A number of provincial, municipal, non-profit, and private/business funding sources can be pursued. Many potential examples are listed in Hamilton's Recreational Trails Master Plan (*3.2 Outreach, Promotion, and Potential Funding Sources* – p.84) (City of Hamilton, 2016b).

2.4 Safety

Residents are often concerned about potential crime when in close proximity to public natural spaces. However, despite resident concerns regarding safety, the typical fears associated with proposed green spaces, such as increased crime, noise, loss of privacy, and decreased property values, are misconceptions and not supported by greenway studies and resident surveys (Love, 2005).

Luymes and Tamminga (1995) recommend that greenways strike a balance between enhancing people's sense of safety through infrastructure construction and reducing human impacts on natural ecosystems and environments. They offer a number of principles to obtain this balance, emphasizing the importance of:

1. Visibility of others (the ability to see one's surroundings and recognize and appraise strangers);
2. Visibility by others (the ability to be seen by others who may be of assistance when needed; reduced sense and fear of isolation);
3. Choice and control (ability to control one's environment and avoid/escape situations; freedom of access and action);
4. Environmental awareness and legibility (ability to navigate through the surrounding environment; ability to escape dangerous places and find routes to safe places); and
5. Solitude without isolation (being able to achieve the positive experience of solitude without the negative experience of isolation).

EXAMPLE

Following these principles, it is important for greenways to have consistent lighting and adequate signage at all trailheads and major intersections. Other safety features and design considerations may include:

- A self-policing system of residents and volunteers (similar to a neighbourhood watch system);
- A variety of entrances and exits to allow for movement options;
- Vegetation that doesn't severely hinder line of sight (Luymes & Tamminga, 1995).

STEPS FORWARD FOR HAMILTON

As Hamilton develops a greenway plan, addressing safety concerns through the design of greenway infrastructure will be essential. Responding to the public's misconceptions and fears about greenway safety will also be important.

2.5 Ecology

Greenways help promote wildlife diversity and offer protection to existing animal populations. Although greenways offer many benefits and carry little environmental and ecological cost, we need to consider challenges that may arise depending on the geography and ecology surrounding a potential greenway.

EXAMPLE

As one example, it is important to attend to a greenway's potential impact on the spread of invasive species. Hamilton is home to a vast number of animal and plant species, of which there are a number of invasive plants and pests such as the Emerald Ash Borer which kills ash trees, and the tree-attacking Asian Long-Horned Beetle (Hamilton Conservation Authority, 2016). The spread of these and other species needs to be considered during the planning of a local greenway to prevent acceleration.

STEPS FORWARD FOR HAMILTON

As Hamilton further investigates the feasibility of recognizing a local greenway network, ecological concerns will need to be taken into account.

2.6 Equity

As Bergeron and Craggs (2009c) note, "Municipalities that design for active transportation afford more equitable access to employment, education, recreation, and consumer opportunities for vulnerable populations including seniors, children, Canadians with lower incomes and people with disabilities" (p. 1). Greenways have the potential to offer many benefits across a city's population if planned in an equitable way. In order to enhance and maximize connectivity and growth among communities and neighbours, careful consideration needs to be made to how the greenway will maintain equity and accessibility for all socioeconomic classes and neighbourhoods.

EXAMPLE

As one example, the tourist users of the Outer Banks cycling infrastructure in North Carolina are predominantly affluent and earning more than \$100,000 a year (Campbell & Wittgens, 2004). Greenways do not automatically enhance access for all members of a population and carry the risk of maintaining a locale's existing inequities.

STEPS FORWARD FOR HAMILTON

Considerations should be made as to how a proposed greenway can better serve the Hamilton population by providing greenway access to all neighborhoods in need of its benefits, especially those that lack existing recreational and green spaces (Crawshaw, 2009). We need to ensure that access to the greenway is safe and accessible for all Hamiltonians regardless of income, neighbourhood, or other factors.

As some examples, attending to greenway equity concerns in Hamilton might look like:

- Paying attention to greenway route entrances and exits, which neighbourhoods these fall in, and who is able to benefit from these access points;
- Developing programs that offer free and cheap cycling supplies (bikes, helmets, lights, repairs) and cyclist education (biking safely, bike repairs) to enhance access, such as the Bike Library at McMaster University that loans out bikes, helmets, and bike lights to library patrons;
- Providing SoBi bike stations at key points along the greenway and easy access to a membership for low-income residents; designing SoBi bikes for children and recumbent and 3-wheel SoBi bikes for adults learning to cycle, seniors, and people with disabilities who cannot comfortably or safely use a standard two wheeler;
- Building charging stations for power chairs and scooters along greenway routes;
- Ensuring greenway route safety for women, people of colour, LGBTQ people, disabled people, youth and seniors, and others who are more likely to be victims of violence and assault in Hamilton;
- Aligning the design of greenway infrastructure with the technical legal requirements of the *Accessibility for Ontarians with Disabilities Act* (AODA) (City of Hamilton, 2016ab).

Summary

Attending to the above considerations and challenges associated with greenway development will help ensure the successful implementation of a greenway in Hamilton. Of all these factors, collaborative coordination and adequate outreach and communication between all stakeholders to maintain a shared vision or goal is described as the most important consideration for successful greenway implementation (Rottle, 2006).

Section 3: Case Studies

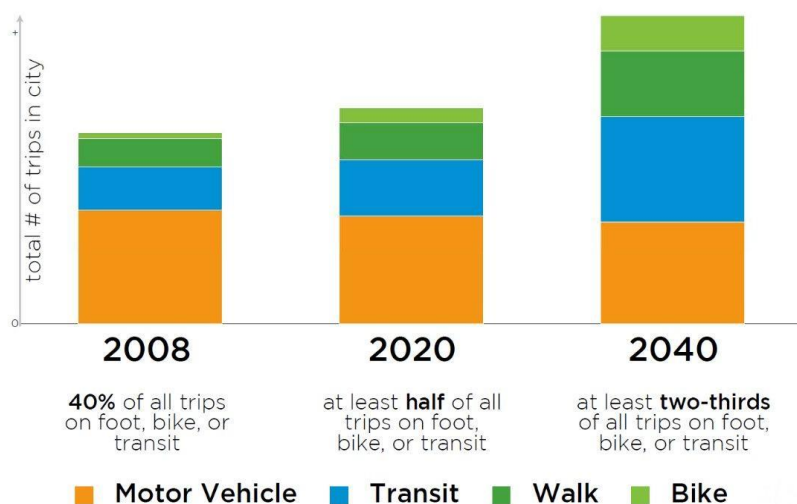
3.1 Case Study 1: What's Already Possible: Vancouver

CASE STUDY

Walking and cycling are Vancouver's top two transportation priorities. The City is committed to making walking and cycling (to work, shop, explore) a part of a daily life routine. Upon completion, the Comox-Helmcken Greenway will allow people of all ages and abilities to get where they need to go comfortably, safely and conveniently on foot and by bicycle. It is being developed in two sections, of which Section 1 is now complete.



TRANSPORTATION PLAN TARGETS



History

The Comox-Helmcken Greenway is an important east-west connection through the downtown for pedestrians and cyclists. In keeping with the project goals and objectives, the greenway will connect schools, parks, community centres, and healthcare organizations, as well as shopping areas, hotels, and residential neighborhoods. Once completed, it will be easier for children to walk or cycle to school and more comfortable for seniors to walk, shop, and be socially connected.

Transportation 2040 Plan

This plan is a long-term vision for the city that will help guide transportation and land use decisions and public investments for the years ahead. The plan sets long-term targets and includes both high-level policies and specific actions to achieve the

vision. Transportation 2040 builds upon the Greenest City 2020 Action Plan, a wide-ranging strategy to make Vancouver the greenest city in the world based on 10 goal areas that include green transportation. It plans to ensure that the majority of transportation trips are by foot, bike,

and public transit, eliminating dependence on fossil fuels and allowing people to breathe the cleanest air of any major city in the world.

Transportation 2040 also supports numerous other City, regional, and provincial policies.

Public Consultation

In 2011, City staff consulted with businesses, seniors, children and youth, and other residents by holding open houses, walking tours, workshops, surveys and community meetings. About 619 people participated in the consultation.

The public raised several topics, of which the top five were given highest priority. These included:

1. The need for on-street parking;
2. Access to residences and businesses (many residents want to maintain vehicle access to their front doors while some would like to see streets closed);
3. Decreasing traffic;
4. Change to neighborhoods and streets (some residents want to leave their streets the way they are, others would like a greenway to be implemented); and
5. Separating bikes from traffic and pedestrians.

When the public was asked to imagine using the Comox-Helmcken Greenway, people ranked the following as potential concerns:

1. Increased pedestrian/cyclist traffic
2. Reduced emergency access
3. Temporary construction impacts
4. Project costs
5. Landscape maintenance
6. Reduced number of vehicle lanes

The City took this public feedback into consideration in order to develop a successful greenway that would serve the community's needs.

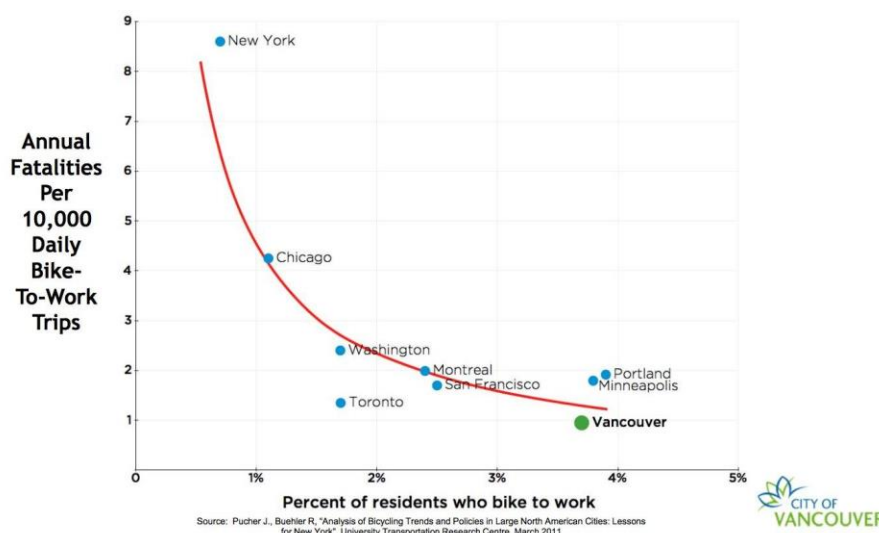
Pedestrian Safety

The West End of the city is a walking neighborhood where 40% of residents walk to work. People on foot are the most vulnerable as they are more likely to be injured or killed when tragic accidents occur. In early 2012, a Pedestrian Safety Study was completed, with results showing that pedestrian safety in Vancouver has been improving over time and performs very well compared to peer cities in North America and Europe. Many of the pedestrian safety treatments from the study are being implemented as part of the Greenway including corner bulges, pedestrian countdown timers, audible signals, raised crosswalks, and upgraded intersection and street lighting.

Cyclist Safety

For cycling to become a prominent mode of transportation, routes should feel safe and comfortable for people of all ages and abilities. The Comox-Helmcken greenway design supports the policies and actions of the Transportation 2040 plan in various ways:

- Lowering the traffic volumes on Comox Street so cyclists feel more comfortable sharing streets and are less likely to cycle on sidewalks;
- Providing separated bike lanes where appropriate;
- Improving lighting along the street and at intersections; and
- Restricting vehicle turning movements at particular intersections to make it safer for novice cyclists to cross.



Bicycle-Friendly Initiatives

Vancouver wants cycling to be safe, convenient, comfortable, and fun for their residents. The City has implemented a number of initiatives to further these goals. As some examples, Vancouver:

- Accommodates unconventional bikes and other forms of active transportation, such as cargo bikes, delivery tricycles, in-line skates, and skateboards;
- Highlighted potential conflict zones (multiple people/vehicles turning) with pavement markings;
- Worked with adjacent municipalities and other partners to improve cycling connections across municipal boundaries; and
- Supported the development of a mobile application that makes it easier to make maintenance requests.

APPLICATION TO HAMILTON

A case study of the Comox-Helmcken Greenway suggests a couple of key best practices for Hamilton to consider. These include paying attention to the importance of:

- Thorough community consultation and involvement in greenway planning;
- Creating a long-term transportation vision to guide planning and actions over 20-30 years, including policies to increase cycling infrastructure;

- Developing a greenway with connectivity in mind so that it is easier to cycle and walk between schools, parks, community centres, healthcare organizations, shopping areas, and neighbourhoods; and
- Encouraging the public to cycle and walk, and providing the infrastructure needed to do so easily, comfortably, and safely.

3.2 Case Study 2: Vision for the Future: Copenhagen, the City of Cyclists

Copenhagen is one of the most bicycle-friendly cities in the world. The 2014 Bicycle Account, where the city documents yearly developments in cycling, remarkably showed that 45% of all work or education related journeys in the city were made by bicycle. This represents a 25% increase as compared to what was documented in 2012, suggesting that the popularity of the greenway is continually increasing over time. Such high cycling rates contribute to the greater overall efficiency of moving goods and people (The City of Copenhagen, 2015).

History

Bicycles became common in Copenhagen at the beginning of the twentieth century. The first cycling path in the city was established on the Esplanaden roadway in 1892, and by 1907, Copenhagen was considered the top cycling city in Europe with 80,000 bicycles. Numbers continued to rise in the 1940s as the first recreational bicycle routes were built through green spaces on the outskirts of the city. World War II led to the rationing of petrol, making cycling the dominant form of transportation in Copenhagen (City of Copenhagen, 2009).

With the increasing wealth and affordability of motor vehicles, Copenhagen experienced a decline in cycling in the 1950s (Goodyear, 2012). However, popularity quickly rose during the energy crisis and growing environmental movement of the 1970s, when the government was forced to introduce initiatives like car-free Sundays to conserve oil reserves (Greenfield, 2012). With this came a clear demand for segregated cycling paths.

Although many city planners suggested using a ‘back streets strategy’ by developing cycling paths on quiet residential streets, uptake was low because the majority of cyclists refused to deviate from more direct routes. In response to protests, politicians gradually took up building cycling paths on main roads and developed the first coordinated strategies for increasing cycling in the city (Jensen, 1998).

Travel Time

Although cost effectiveness and health benefits are among the top motivators, the most compelling reason to travel by bike in Copenhagen rather than other modes of transportation is reduced commute times. In recent years, Copenhagen has increased the capacity of their greenway networks: Cycle tracks have been widened, two-way traffic has been introduced in several areas, and bicycle/pedestrian bridges have been opened. This has resulted in the shortening of travel times by an average of 7% since 2012. All the while, the number of kilometres cycled per day in Copenhagen continues to rise.

Security and Safety

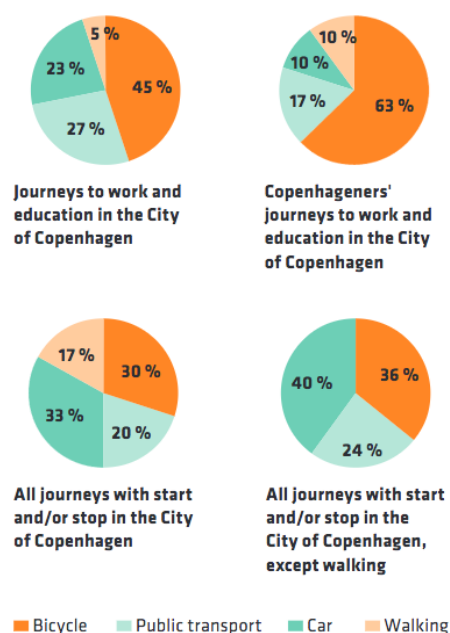
There is a strong sense of safety felt among those who bike in Copenhagen. In the 2014 Bicycle Account, 74% of residents stated that they felt safe cycling with the current state of the greenway as a result of:

- Increased overall width of cycle paths;
- Greater number of cycle paths;
- Increased distance between cycle paths and motor traffic (normally wider than 2 metres across); and the
- Overall behavior and courtesy of other cyclists.

While cycling steadily increases, the number of cyclist fatalities and casualties has been declining over time as infrastructure is improved.

Adapting to Increasing Demand

The fact that so many people choose to cycle has a significant positive impact on Copenhagen road congestion. However, with more than double the amount of bikes entering and leaving the city since 1990, the city anticipates that the growth of cycling is likely to strain the capacity of the greenway, particularly in sections where bicycle traffic is heaviest. This could result in increased travel times and dissatisfaction among users, and may even discourage use of the greenway. Thus, it is crucial to continue to expand the cycling infrastructure so it can handle the growth of bicycle traffic and avoid any impediments in cycling.



Bicycle-Friendly Initiatives

Copenhagen has introduced a number of initiatives to enhance the cycling experience, such as:

- Cycle Friend is a subscription-based mobile bicycle repair shop that provides bicycle repair services to subscribers while they are at work;
- The City of Copenhagen's health aid centre keeps tricycles on hand for the 500+ citizens, such as the elderly or injured, who wish to keep on cycling even though they lack the balance and strength for a two wheeler;
- Bicycle maintenance facilities exist at most service stations, where cyclists can clean and repair their bicycle;
- Shops cater to cycling customers by offering excellent bicycle parking facilities, special stands for cargo bicycles, and pump stations;
- Several Copenhagen libraries, in collaboration with local committees and environmental centres, lend out cargo bikes so citizens can transport their children, shopping and library loans home for free.

A case study of the Copenhagen Greenway suggests a couple of key best practices for Hamilton to consider. These include paying attention to the importance of:

- Paying attention to safety concerns and implementing initiatives and infrastructure to address them so that residents feel a strong sense of safety when using the greenway;
- Continually promoting greenway benefits to cyclists, such as reduced commuter times, so that residents will be motivated to use the greenway;
- Continually encouraging businesses and the City to cater to a ‘comfortable’ cycling experience; and
- Maintaining infrastructure in order to accommodate increasing numbers of greenway users.

Section 4: Aligning a Greenway with Current Provincial and Local Plans

A number of provincial, regional, and local plans and priorities align with the development of a greenway network in Hamilton and Burlington. These policies and plans promote the economic, environmental, and health benefits of active transportation (cycling and walking); recommend enhancing cycling infrastructure to increase active transportation; and encourage stewardship of the environment.

Relevant report recommendations will be highlighted and summarized below.

4.1 Provincial Plans

4.1.1 Land Use Planning Review: The Greenbelt Plan and Niagara Escarpment Plan

Over 2015-2016, the Government of Ontario has been reviewing their Growth Plan for the Greater Golden Horseshoe, the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, and the Niagara Escarpment Plan. Over the next several years, municipalities will need to conform to these Growth Plans.

The Ontario Government’s proposed changes include an emphasis on:

- Complete communities (that encourage active transportation like walking or biking)
- Protecting natural heritage and water (such as the green areas around Hamilton and Burlington)
- Growing the greenbelt (adding 4 parcels of land identified by the City of Hamilton and the Region of Niagara to “Protected Countryside” designation)
- Addressing climate change (through creating walkable communities with more green space)

Further info at: <http://www.mah.gov.on.ca/Page10882.aspx>

4.1.2 Climate Change Action Plan

The Government of Ontario recently released their 5 year plan for fighting climate change. This includes an intended \$150-225 million from the Greenhouse Gas Reduction Account to support cycling and walking.

The plan includes the following relevant action areas:

- Become a North American leader in low-carbon and zero-emission transportation
 - By taking actions to promote the use of non-polluting vehicles such as bicycles
- Support cycling and walking
 - By improving a commuter cycling network, cycling facilities, bike parking, and revising the provincial road and highway standards to require commuter cycling infrastructure be considered for all road and highway construction projects
- Strengthen municipal climate change strategies
 - Such as encouraging cities like Hamilton in the implementation of its Climate Change Action Plan
- Reduce congestion and improve economic productivity
 - By reducing single-occupancy vehicle trips and increasing walking and cycling
- Collaborate with Indigenous communities
 - An important recommendation that a Hamilton greenway network should also attend to

Further info at: <https://www.ontario.ca/page/climate-change-action-plan#section-4>

4.1.3 Ontario's Cycling Strategy

This comprehensive report articulates a provincial commitment to enhancing cycling infrastructure and participation. As one example, Action 2.2 states the importance of “Identifying a province-wide network of cycling routes that will help locate areas of provincial infrastructure that should accommodate cycling” (p. 2).

In Hamilton-Burlington, developing a greenway network would be a thorough way of identifying our local cycling routes and areas where enhanced cycling infrastructure is needed.

Further info at: <http://www.mto.gov.on.ca/english/publications/ontario-cycling-strategy.shtml>

4.1.4 Greater Golden Horseshoe Transportation Plan

The Ministry of Transportation is developing a regional transportation plan for the Golden Horseshoe that is expected to be completed in 2018. This plan will consider all types of transportation including cycling and walking.

Further info at:

<http://www.mto.gov.on.ca/english/transit/greater-golden-horseshoe-transportation-plan.shtml>

4.1.5 *Ontario Trails Strategy and Supporting Ontario's Trails Act, 2016*

Ontario has developed a provincial strategy to support and enhance Ontario's trails and has recently passed related legislation. The Trails Strategy contains 52 deliverables to support the vision of "A world class system of diversified trails, planned and used in an environmentally responsible manner, that enhances the health and prosperity of all Ontarians" (p. 11).

Further info at:

- http://www.mtc.gov.on.ca/en/sport/recreation/trail_strategy.shtml
- https://news.ontario.ca/mtc/en/2016/06/province-passes-act-to-support-ontarios-trails.html?utm_source=ondemand&utm_medium=email&utm_campaign=p

4.2 Local/Regional Plans

4.2.1 *The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area (Metrolinx, 2008)*

This report, prepared by Metrolinx, an agency of the Government of Ontario, specifically identifies the following two strategies that align with a greenway network.

- Strategy 2: Enhance and expand active transportation
 - Priority 2.1: Plan and implement complete, integrated walking and cycling networks for the GTHA that address key barriers such as bridges over 400-series highways, rail corridors and major rivers, and missing sidewalks on major roads. The cycling networks will bring every GTHA urban resident to within a maximum of one kilometre of a dedicated bicycling facility. This will be supported by a provincial funding commitment increased over time to at least \$20 million per year for municipalities to complete the walking and cycling networks. (p. 31)
- Strategy 7: Build communities that are pedestrian, cycling and transit-supportive

Further info at:

http://www.metrolinx.com/thebigmove/Docs/big_move/TheBigMove_020109.pdf

4.2.2 Hamilton's Transportation Master Plan

Hamilton's Transportation Master Plan (TMP) is currently under review. Draft documents identify the growth of Hamilton's population and a trend towards an aging population that will require alternative travel modes that support independence and promote accessibility. In light of population growth and increased use of vehicles on Hamilton roads, the TMP recognizes the need to shift from a car-centric City to one that promotes alternative modes of walking, biking, and public transportation that cater to a growing and aging population.

Key directions of the TMP that relate to Greenway infrastructure include:

- Healthy city
 - Hamilton can support their commitment to health (of people and the environment) and safety by promoting active transportation and improving pedestrian, bicycle, trails and transit networks
 - Other relevant policies identified by the TMP include:
 - Complete Livable Better Streets: http://mitl.mcmaster.ca/reports/MITL_Complete_Streets_Report.pdf
http://www.sprc.hamilton.on.ca/wp-content/uploads/2013/11/Complete_Streets_Policy_for_Hamilton_Final_November_2013.pdf
 - Hamilton's Plan for an Age-Friendly City: <https://www.hamilton.ca/city-initiatives/strategies-actions/hamiltons-plan-age-friendly-city>
 - Hamilton Active and Sustainable School Transportation Charter that promotes active transportation to schools
<http://smartcommute.ca/hamilton/wp-content/uploads/sites/12/2014/07/Charter-Public.pdf>
- Integration of pedestrian and bicycle networks
 - Creating an accessible and age-friendly non-auto network that will further integrate pedestrian and bicycle networks with the large transportation network. The TMP recommends Council "assign a high priority to resolving missing links and gaps within the pedestrian and cycling networks" (Hamilton Transportation Master Plan Review and Update, 2016, p. 18).
 - One key priority is enhancing alternative transportation connectivity between Upper and Lower Hamilton, while protecting the natural landscape of the Niagara Escarpment (protected by the Niagara Escarpment Planning and Development Act)
 - Other relevant policies identified by the TMP include:

- Shifting Gears: Hamilton’s Cycling Master Plan: <https://www.hamilton.ca/city-planning/master-plans-class-eas/hamiltons-cycling-master-plan>
- Pedestrian Mobility Plan: <https://www.hamilton.ca/city-planning/master-plans-class-eas/hamilton-pedestrian-mobility-plan>
- Recreational Trails Master Plan, which aims to connect parks, recreational centres, schools, commercial sites, cultural and institutional centres, transit facilities, and residential neighbourhoods: <https://www.hamilton.ca/city-planning/master-plans-class-eas/recreational-trails-master-plan>

Further info at: <https://d3fpllf1m7bbt3.cloudfront.net/sites/default/files/media/browser/2016-04-27/tmp-review-pic4-handout.pdf>

4.2.3 *Hamilton’s Recreational Trails Master Plan*

The updated 2016 Recreational Trails Master Plan lists 7 key objectives:

- Planned: Trails will be considered an integral component of all community planning and development.
- Connected: Trails will serve to connect the urban and rural communities of Hamilton, both internally and externally, and will link key destinations. Improved wayfinding will be incorporated into the trails network.
- Diverse: The trail system will be designed to appeal to a wide range of users, abilities and interests.
- Inspiring: Trails will promote and encourage use and enjoyment of the City’s natural, cultural and recreational features.
- Accessible: Where possible, the trail system will provide opportunities for four-season use, and will include a core network of trails that are accessible to people of all ages and abilities.
- Safe: Safety, security and user comfort will be considered in the design and management of the trail system.
- Sustainable: The trail system will be developed and managed in a manner that preserves the environment, is financially responsible, and encourages opportunities for partnership and stewardship.

It makes the following recommendations to guide the future development of Hamilton trails in a manner consistent with federal, provincial, and municipal policies:

1. Integrate components of and alleviate gaps in the overall existing recreational trail system
2. Integrate new trail accesses, routes, and crossings with existing conditions and planned City infrastructure projects (e.g. Highway 403, Lincoln Alexander Parkway, Red Hill Valley Parkway, waterfront, Niagara Escarpment, GO transit stations)
3. Complement the City's transportation system to support multi-modal mobility
4. Encourage inter-regional trail connections
5. Strengthen partnerships with other trail organizations and groups
6. Continue to build upon physical, economic, sustainable, and environmental design standards
7. Further develop maintenance and management standards
8. Identify new trail amenities to provide a better user experience
9. Integrate off-road trails with the planned on-road cycling networks to better address broader community land use and transportation goals and objectives.

Other relevant policies identified by the Recreational Trails Master Plan include:

- 2005 Transportation Canada study entitled "Strategies for Sustainable Transportation Planning": http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/briefing-sustain-trans-prac_0.pdf
- 2008 Federation of Canadian Municipalities report "Communities in Motion: Bringing Active Transportation to Life": https://www.fcm.ca/Documents/tools/GMF/Communities_in_motion_en.pdf
- For a list of other policies and related organizations, see the Trails Master Plan Appendix at <https://d3fpllf1m7bbt3.cloudfront.net/sites/default/files/media/browser/2016-06-27/hamilton-recreational-trails-master-plan-2016-appendixb.pdf>.

Further info at: <https://d3fpllf1m7bbt3.cloudfront.net/sites/default/files/media/browser/2016-06-27/hamilton-recreational-trails-master-plan-2016.pdf>

4.2.4 *Our Future Hamilton*

Over the last year, Hamilton has been preparing their Vision for the next 25 years. This vision includes a number of themes relevant to a greenway network.

- Theme 2: Economic prosperity and growth
 - Attract and retain new industries and innovative businesses (such as innovative businesses related to cycling and recreational trail use)
 - Inspire diverse employment opportunities in Hamilton so people can work locally rather than commute to a job in another city (where working locally would reduce automobile transport and increase the use of active transportation)
- Theme 3: Healthy and safe communities

- Create an environment that promotes active and healthy living to support a high quality of life for residents
- Make it easy for people to be physically active by providing safe routes for walking and biking around the city
- Theme 4: Clean and green
 - Foster pride in and protect Hamilton's unique natural environment including its waterfront, waterfalls, escarpment and other natural areas; protect wildlife and plant habitats
 - Enhance and maintain trails so people can enjoy Hamilton's greenspaces and natural amenities
 - Improve public transportation and active transportation options to reduce our impact on the environment (*Sign of Success: We use cars less and make more trips using active and public transportation; We consume less energy; We reduce greenhouse gas emissions; Air quality has improved; Environmentally Significant Areas are protected and rehabilitated; Hamilton plants more trees; Water in the harbour and streams is clean*)
- Theme 5: Built environment and infrastructure
 - Develop complete streets that meet the needs of pedestrians, cyclists, transit users, motorists and movement of good
 - Create a well-connected transportation network that allows people to get around conveniently without a car
 - Build and maintain parks, trails and beaches for all residents to enjoy (*Sign of success: Hamilton has more green spaces including parks, trails and beaches*)

Further info at: <https://www.hamilton.ca/city-initiatives/priority-projects/hamilton-community-vision>.

4.2.5 Hamilton's Climate Change Action Plan

Hamilton's Climate Change Action Plan commits to reducing greenhouse gas emissions by 20% by 2020 and by 50% by 2030. One way to help us reach these targets is to reduce our use of single-occupancy vehicular transportation and increase our use of public transportation, cycling, and walking. The Climate Change Action Plan's recommended education and awareness campaigns will no doubt include information about how Hamiltonians can reduce their negative impact on the environment, such as by biking and walking.

The Climate Change Action Plan also endeavors to mitigate the factors that lead to health impacts of climate change, such as health concerns resulting from or aggravated by poor air quality, and to preserve wildlife corridors and water resources. As explored above, greenways can have a positive impact on air and water quality and assist with preserving our natural areas.

The Plan advocates for the establishment of an oversight and coordination body to guide the implementation of Hamilton's Climate Change Action Plan. A similar coordination body will be

essential to the successful development of a greenway. Opportunities for a group to work collaboratively on both Action Plans could be perused.

Further info at: <http://greenventure.ca/climatechange/HamiltonCCAPFINAL2015.pdf>

Further info about how Hamilton and Burlington are working together to develop a response to Climate Change:

<https://climatechangehamilton.ca/events/>

4.2.6 Burlington's Strategic Plan

The City of Burlington's 2015-2040 Strategic Plan includes a number of relevant directions. Burlington has also developed a city-specific Transportation Master Plan and Parks Master Plan.

- Strategic Direction 2: A city that moves
 - 2.1.c.: A Complete Streets vision is put in place through a co-ordinated plan, which will include on and off-road bike lanes, sidewalks, multi-use paths and trails and a public transit system that are all well-connected throughout the city (*Connectivity measures: The ability to go from one end of the city to the other on a multi-use trail.*)
- Strategic Direction 3: A Healthy and Greener City
 - 3.1.d.: The trail system is being linked to the city's park network, to neighborhoods and to other regional systems, ensuring that the city's rural area and waterfront are easily accessible.

Further info at: https://www.burlington.ca/en/services-for-you/resources/Ongoing_City_Projects/Strategic_Plan/Burlingtons-Strategic-Plan-Draft-for-Consultation-Web.pdf

4.2.7 Other Relevant Plans (Hamilton)

- Rapid Ready: Expanding Mobility Choices in Hamilton (2013): <https://www.hamilton.ca/city-initiatives/priority-projects/rapid-ready>
- Pipeline Trail Master Plan: <https://www.hamilton.ca/city-planning/master-plans-class-eas/pipeline-trail-master-plan>
- Gage Park Master Plan (and other individual plans for other parks): <http://www2.hamilton.ca/NR/rdonlyres/56FC002C-1471-427C-9291-3165301FA5D4/0/GageParkMasterPlanandStormwaterManagementPlanMarch2010.pdf>
- Light Rail Transit (LRT) developments and plans: <https://www.hamilton.ca/city-initiatives/priority-projects/light-rail-transit-lrt>
- West Harbour Waterfront Master Plan: <https://www.hamilton.ca/city-planning/planning-community/west-harbour>
- Hamilton Pedestrian Mobility Plan: <https://www.hamilton.ca/city-planning/master-plans-class-eas/hamilton-pedestrian-mobility-plan>

- Street Master Plans: <https://www.hamilton.ca/city-planning/master-plans-class-eas/street-master-plans>

4.2.8 Other Relevant Plans (Burlington)

- Community Trails Strategy (2015): <https://www.burlington.ca/en/services-for-you/Community-Trails-Strategy.asp>
- Cycling Master Plan: https://www.burlington.ca/en/services-for-you/resources/Transportation/Cycling/Cycling_Master_Plan_FINAL.pdf
- Transportation Master Plan: https://www.burlington.ca/en/services-for-you/transportation-master-plan.asp?_mid_=606
- Cootes to Escarpment EcoPark System: <https://www.burlington.ca/en/services-for-you/Cootes-to-Escarpment-EcoPark-System.asp>
- Think Outside the Car (promotion campaign, September 2015): <https://www.burlington.ca/en/services-for-you/Think-Outside-the-Car.asp>
- Active Aging Plan: <https://www.burlington.ca/en/services-for-you/Active-Aging-Plan.asp>

Conclusion

It is clear from the literature that greenways offer many potential benefits and that these benefits align with *Our Future Hamilton*'s key priorities for the next 25 years. In order for Hamilton to realize its new vision, the City will need to develop concrete work plans and success indicators. Officially recognizing and developing a greenway would create more cohesion across multiple City plans and significantly address a number of essential objectives identified in the City's vision.

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Appendix A: Example Canadian, American, and European Cycling Guides

While this list is not exhaustive, we include it here to offer a sense of the scope and reach of cycling infrastructure and promotion.

Canada		
City	Document Date	URL to best source of further info
All major cycle cities	2015	https://www.pembina.org/reports/cycle-cities-full-report.pdf
Halifax, Nova Scotia	2012	https://www.dal.ca/content/dam/dalhousie/pdf/sustainability/BikewaysPlan_20July2012.pdf
St. John's, Newfoundland	2010	http://www.bikestjohns.ca/assets/Uploads/adult-handbook-feb21.pdf
Toronto, Ontario	2013	http://www.torontocycling.org/uploads/1/3/1/3/13138411/daniel_arancibia_ce_report_bike_lanes_december_10.pdf
Burlington, Ontario	2015	https://www.burlington.ca/en/services-for-you/resources/Ongoing_City_Projects/Strategic_Plan/Burlingtons-Strategic-Plan-Draft-for-Consultation-Web.pdf
Brantford, Ontario	2000	http://www.brantford.ca/Parks%20and%20Trails%20%20Documents/Bikeway%20Implementation%20and%20Design%20Plan%20-%20complete%20for%20internet.pdf
Victoria, British Columbia	2003	http://www.victoria.ca/assets/Departments/Sustainability/Documents/greenways-plan.pdf http://gvcc.bc.ca/wp-content/uploads/2014/03/03-03-14-Workshop-report-final-draft.pdf
Vancouver, British Columbia	2012	http://council.vancouver.ca/20121212/documents/ptec3.pdf
USA		
City	Document Date	URL to best source of further info
Boston,	2013	https://www.cityofboston.gov/images_documents/Boston%20

Massachusetts		0Bike%20Network%20Plan,%20Fall%202013_FINAL_tcm3-40525.pdf
Philadelphia, Pennsylvania	2012	http://www.pedbikeinfo.org/pdf/PlanDesign_SamplePlans_Local_Philadelphia2012.pdf
Cincinnati, Ohio	2015	http://static1.squarespace.com/static/55b12903e4b0ee2de4897649/t/5671d982b204d5dd9d54007d/1450301826421/Cincinnati+Connects+Report+Part+1.pdf
Florida	2016	http://www.dot.state.fl.us/research-center/Completed_Proj/Summary_PTO/FDOT-BDV26-977-03-rpt.pdf
Minneapolis, Minnesota	2011	http://www.minneapolismn.gov/www/groups/public/@publicworks/documents/webcontent/convert_275983.pdf
Portland, Oregon	2010	http://nacto.org/wp-content/uploads/2012/06/City-of-Portland-2010-2030-Plan.pdf
Seattle, Washington	2013 2014	http://www.seattle.gov/transportation/docs/SDOT_BikeBooklet_08_04_2014.pdf http://www.seattle.gov/transportation/docs/ump/08%20SEATTLE%20Bicycle%20and%20Pedestrian%20Travel.pdf
Europe		
City	Document Date	URL to best source of further info
Amsterdam, The Netherlands	2009	http://www.fietsberaad.nl/library/repository/bestanden/CyclingintheNetherlands2009.pdf
Copenhagen, Denmark	2011	http://www.eltis.org/sites/eltis/files/case-studies/documents/copenhagens_cycling_strategy.pdf
London, England	2011	http://content.tfl.gov.uk/london-greenways-report-2011.pdf