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CONSULTING TEAM

URBAN systems
DILLON consulting
880 cities
modacity
1.0 INTRODUCTION

The City of Cambridge is located where the Grand River and Speed River meet. The City is a key component of a fast-growing science and technology hub located in Waterloo Region in Southwestern Ontario. Cambridge and the neighbouring cities of Kitchener and Waterloo have been coined the “Technology Triangle” due to the large number of science and technology companies located in the region. The current population of Cambridge is approximately 135,000 residents and is forecasted to grow to 173,000 residents by the year 2029.

260 KM OF BICYCLE FACILITIES & GROWING

The City already has a well developed cycling network with more than 150 km of on-street bicycle facilities and 110 km of off-street trails that form the backbone of the cycling network, including The Great Trail, Grand Trunk Trail, Mill Run Trail, and the Moffat Creek Trail.

As set out in the City’s Official Plan, Cambridge is committed to a sustainable, effective, accessible, and energy efficient transportation system and recognizes the importance of encouraging residents and visitors to enjoy the beautiful natural environment, enhancing community health and safety as well as quality of life. The City is also committed to reducing air pollution by increasing opportunities for cycling and public transportation as seen through policies in the City’s Greenhouse Gas (GHG) Reduction (Energy Management) Plan and Official Plan.

The City’s Strategic Plan and Transportation Master Plan further commits to creating new opportunities for Cambridge residents to bike, walk, and use public transit as healthy and environmentally friendly modes of transportation to travel within the city and beyond. By accomplishing this objective, the City will move towards achieving a key goal of the Strategic Plan to create and maintain a highly effective, sustainable and coordinated local infrastructure and transportation network. These objectives and goals align with the sustainable transportation vision identified in the Region of Waterloo Strategic Focus 2019-2023 and the Region of Waterloo Transportation Master Plan.

The Cycling Master Plan is intended to update the 2008 Bikeway Network Master Plan and integrate the 2010 Trails Master Plan. It is worth noting, the Cycling Master Plan replaces the 2008 Bikeway Network Plan, but does not replace the 2010 Trails Master Plan. The Cycling Master Plan aims to increase bicycle use and create a culture of cycling in Cambridge by developing an integrated network of off-street trails and on-street bicycle facilities that are comfortable for everyone along with support programs and policies to encourage cycling. This includes new infrastructure projects as well as policy and programming components that can educate and promote cycling as a practical, convenient, and attractive transportation and recreation option for residents and visitors of Cambridge.

WHAT IS ALL AGES & ABILITIES

The plan focuses on creating a city-wide network of bicycle facilities that are physically separated from traffic and on streets with low traffic volumes. This is an All Ages and Abilities approach - meaning the facilities are safe, comfortable, and equitable for a number of user groups such as older adults and children. This means focusing on bicycle facilities that are physically separated from traffic and on streets with low traffic volumes.
The Cycling Master Plan will guide Cambridge’s investments in cycling over the next 20 years and beyond. The plan establishes a vision and goals to improve cycling and outlines a series of strategies and actions based on five themes:

The strategies and actions provide holistic guidance regarding improvements to policies, standards, infrastructure and programming to ensure that cycling is a comfortable and convenient choice for everyone. By developing this Cycling Master Plan and promoting more cycling, Cambridge can work to reduce automobile dependence and greenhouse gas (GHG) emissions, increase physical activity and improve health outcomes, increase social connections, and reduce infrastructure demands.

The Cycling Master Plan is broken down into five sections:

1.0 Introduction highlights the overall purpose, process, and public engagement activities that have taken place to develop the Plan.

2.0 Cycling in Cambridge Today outlines the shaping influences that influence cycling in Cambridge, including land use and demographic characteristics, travel patterns, and opportunities and constraints for cycling.

3.0 Building a Cycling Culture outlines the plan’s vision and goals, which build on Cambridge’s overarching plans and policies. The vision and goals will guide cycling-related strategies and actions in Cambridge over the next 20 years and beyond.

4.0 Action Plan outlines the implementation and monitoring plan for the Cycling Master Plan. The Plan’s strategies and actions have been prioritized over the short-, medium- and long-term, and performance measures have been developed to monitor implementation. This section also includes a summary of the high-level cost estimates for the Plan.

5.0 Summary and Closing provides an overview of the Plan and highlights where the City goes from here.

1.1 PLAN PURPOSE AND OBJECTIVES

The Cycling Master Plan is intended to update the 2008 Bikeway Network Master Plan and integrate the 2010 Trails Master Plan. In addition to integrating these two City documents, the Cycling Master Plan is also intended to integrate with plans from the Region of Waterloo and neighbouring communities. The Plan also reflects evolving trends and best practices in bicycle planning and design and has an explicit focus on creating a cycling network that is comfortable for everyone.

The purpose of the Cycling Master Plan is to guide the development of safe and convenient cycling options for everyone over the next 20 years. The Cycling Master Plan focuses on:

→ Ensuring the City has the tools to implement projects and designs that will lead to the implementation of All Ages and Abilities bicycle routes and trails;

→ Developing an implementation strategy to fund and build high priority facilities to fill gaps in the network;

→ Ensuring maintenance and repair schedules and approaches are targeted to efficiently maintain the infrastructure and allow residents to use bicycle routes and trails year-round; and

→ Educating and promoting cycling as a great transportation and recreation option for residents and visitors of Cambridge.
1.2 CYCLING TRENDS: DEVELOPING A PLAN FOR ALL AGES AND ABILITIES

Since the 2008 Bikeways Network Master Plan was developed, there have been a number of changes in the industry that have impacted the approach to planning and designing bicycle facilities in cities across North America.

<table>
<thead>
<tr>
<th>THEME</th>
<th>THEN</th>
<th>NOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prioritizing How People Travel</td>
<td><strong>Moving Motor Vehicles</strong> – Cities focused primarily on vehicle moving capacity, and prioritized motor vehicle travel with street network improvements.</td>
<td><strong>Moving People</strong> – Many cities are now taking a broader approach and focusing on people moving capacity, including people walking, cycling, and taking transit. Streets can move more people by accommodating all of these users.</td>
</tr>
<tr>
<td>How People Travel</td>
<td><strong>By Car</strong> – In the post World War II period, vehicle ownership rates significantly increased, coinciding with growing populations, significant growth in wages, low fuel prices, access to credit, and changing land use patterns</td>
<td><strong>More Options</strong> – Recent studies have found declining vehicle ownership rates and fewer people obtaining driver’s licenses, particularly among younger generations. With declining vehicle ownership, mobility choices are required to ensure that people are able to walk, cycle, and use transit.</td>
</tr>
<tr>
<td>Bicycle Infrastructure</td>
<td><strong>Non-Separated Bicycle Facilities</strong> – For several decades, most on-street bicycle infrastructure in North America did not have physical separation between people cycling and motor vehicles. This included a focus on painted bicycle lanes and shared use lanes. However, these facilities are not comfortable for everyone and shared use lanes are no longer considered preferred infrastructure.</td>
<td><strong>Separated Bicycle Facilities</strong> – One of the most common deterrents to cycling is the fear of riding next to motor vehicle traffic. Research has shown that a significant proportion of the population would cycle more if physically separated bicycle facilities were provided.</td>
</tr>
<tr>
<td>Why People Bike</td>
<td><strong>Cycling as Recreation</strong> – It was believed that most people who were cycling were doing so as a form of recreation or exercise, but cycling was not always seen as a viable or practical form of transportation.</td>
<td><strong>Cycling as Transportation</strong> – People choose to cycle for a variety of reasons, including commuting to work or school, shopping, going to restaurants, as well as for recreation.</td>
</tr>
<tr>
<td>Bicycle Technology</td>
<td><strong>Pedal Bikes</strong> – Topography and trip distance are two barriers that often limit bicycle use. Using a pedal bicycle requires more energy and can be challenging for many people. Many communities felt their physical geography made it unsuitable for cycling.</td>
<td><strong>E-Bikes</strong> – Electric bicycles (e-bikes) are an emerging transportation mode that are gaining popularity worldwide. E-bikes have the potential for increasing the appeal of cycling to a larger group of people and extending the range of destinations that can be reached by bicycle. This is particularly important with an aging population as this helps ensure everyone can cycle.</td>
</tr>
</tbody>
</table>

Table 1 - Cycling Trends | Then and Now
Although Cambridge has an extensive bicycle network, the City’s on-street bicycle network is made up primarily of painted bicycle lanes, signed routes, and paved shoulders. Research from across North America has found that these types of bicycle facilities are only comfortable for a small segment of the population, often referred to as “Strong and Fearless” people who are comfortable riding on major roads, regardless of motor vehicle volumes and speeds (Figure 1).

Since the 2008 Bikeways Network Master Plan was developed, there has been a significant shift in the approach to bicycle network planning across North America towards “All Ages and Abilities” or “AAA” bicycle facilities. AAA facilities focus instead on people who are “Interested but Concerned”. These people often own a bicycle but do not ride frequently due to concerns about the safety of cycling. Focusing on AAA bicycle facilities is critical to building a cycling culture where people of all ages – ranging from young children to older adults – feel comfortable cycling. The ‘Interested but Concerned’ segment of the population is typically the largest segment of the population in communities of all sizes and contexts. By providing facilities that are comfortable for this group, the City can work towards building a cycling culture that ensures that cycling is comfortable for everyone.

**BUILD IT & THEY WILL COME**

Cities across North America have built networks of AAA bicycle facilities, and have seen significant results in terms of increased ridership, greater gender equity, and improved safety. Calgary’s downtown protected bike lane network resulted in:

↑ 142% increase in people cycling  
↑ 36% increase in the number of women cycling  
↓ 12% decrease in cycling collisions

---

25%–38% of the population is uninterested or unable to ride a bicycle.  
37%–60% of the population prefer complete separation from motor vehicle traffic or routes with low motor vehicle speeds and volumes.  
9%–28% of the population is comfortable riding in traffic when they need to, but prefer dedicated bicycle facilities.  
2%–6% of the population is comfortable on streets with or without dedicated bicycle facilities, and prioritize speed and directness.

![Figure 1 – Bicycle Rider Spectrum](image)
1.3 PROGRESS TO DATE

The City has made significant progress over the last decade to implement the projects identified within the 2008 Bikeways Network Master Plan and 2010 Trails Master Plan and to raise the City’s status as a Bicycle Friendly Community. The City has implemented over 60% of the infrastructure projects proposed as part of the 2008 Plan.

The City has also made progress through the implementation of several supportive programs to encourage cycling and expand educational opportunities. For example, comprehensive cycling education has been delivered, through partnerships with the Cycling into the Future program, to Grade 5 students at two schools, and the program continues to expand. Additionally, bicycle rodeos at neighbourhood associations were expanded with additional resources including additional rodeo kits to run the events and more advertising. Wayfinding signage was installed in two areas of the city to connect key destinations and to guide cyclists to safe routes using established infrastructure. The City looks to continue building on these successes and others with the development of the Cycling Master Plan. In addition to the on-street network, many of the short-term trail priorities identified in the Trails Master Plan have been implemented since the approval of the document.

Our PARTNERS

→ Cycling into the Future program delivered to over 1500 students since 2016
→ 10 schools with School Travel Plans
→ Bike Valet Parking run by partners at multiple city events
→ A growing Tour de Grand, attracting close to 3,000 cyclists in 2019.
→ CycleWR, new cycling advocacy group formed

Our CITY

→ Completed 77 infrastructure projects from the 2008 Bikeways Network Master Plan
→ 56 km of bike lanes painted
→ 80 km of Multi-Use Trails built
→ 6 mapped Neighbourhood Bike Routes
→ Bronze Bicycle Friendly Community Award
→ Continued support for the Cambridge Cycling and Trails Committee (CCTAC)
→ Over 400 bicycle parking spaces in the City
→ Several Bicycle Friendly Businesses in the City
→ Full-time dedicated staff to sustainable transportation
→ City’s first bike box facility
→ Transportation Master Plan with an emphasis on moving people not cars
→ Bike month celebrations

Our REGION

→ Piloted a bike share program in 2019
→ Stage 2 LRT alignment endorsed
→ Community-wide auto trip reduction targets
→ Bike racks on all GRT buses
→ Multi-use trails included in most Regional road reconstructions

Our PROVINCE

→ Distracted Driving Law
→ 1 m safe passing distance law
→ All MTO projects over highways to include active transportation facilities
→ $459,300 invested in Cambridge through the Ontario Municipal Commuter Cycling Program
→ $325,000 invested in Cambridge through the Ontario Municipal Cycling Infrastructure Program
1.4 PLAN PROCESS

The Cycling Master Plan was developed over five-phases through an iterative process that involved exploring options, speaking with community members and stakeholders, drafting ideas, sharing initial results, gathering and reviewing further community input, refining the content, and then creating a final plan. The goal was to create an implementable action plan to guide investments in cycling infrastructure and support programs to help make cycling a safe, convenient and attractive transportation choice for everyone.

1.5 PUBLIC ENGAGEMENT

The Cycling Master Plan was launched to the public in April 2019 and included an extensive public and key stakeholder engagement program, which included multiple participation approaches and opportunities for public input, including the use of an online engagement hub, collaborative digital mapping, pop-up events, and highly interactive joint key stakeholder and community workshops. Through this process, the City heard from hundreds of Cambridge residents.

The first round of public engagement took place over the spring and summer of 2019 to introduce the project and identify issues and opportunities. This round of engagement focused on understanding issues and opportunities for cycling in Cambridge, an understanding of how people travel within Cambridge, and where they go. This stage focused on exploring possibilities for encouraging more cycling within the city and identifying different strategies, actions, and infrastructure that can help promote cycling. Feedback from the first round of engagement helped to inform the development of the preliminary on-road and off-road cycling network as well as support programs and policies. This round included three main channels for engaging the community:

→ Bike Your City Community Workshop was held on May 14, 2019 and had over 30 participants.
→ Bike Your City Online Survey was available from April 24 to June 27, 2019 and received over 250 responses.
→ Pop-Up Events were held at the Public Works Open House on May 25, 2019 and the Tour de Grand on June 8, 2019 and received over 200 interactions.
The second round of public engagement took place in the fall of 2019 to present the draft Cycling Master Plan. The second phase of engagement focused on showcasing the draft plan and asking for input on the draft proposed network and the strategies and actions. The intent of this round was to explain the guiding principles that influenced the development of the plan and the routes and facilities identified as part of the long-term network. This round included two main channels for engaging the community:

→ Bike Your City Open House was held October 15, 2019 and had over 30 participants.

→ Cycling Master Plan Strategies Online Survey was available from September 28, 2019 to October 27, 2019 and received over 110 responses.

In addition to these events, the project included regular online updates on the project webpage along with a social media campaign to promote the project on Twitter and Facebook.

A summary of the public engagement is provided in the Engagement Summary in Appendix A.
2.0 CYCLING IN CAMBRIDGE TODAY

2.1 THE CASE FOR CYCLING

Over the past decade, communities of all sizes across North America have seen a significant interest in shifting away from a reliance on automobiles towards active forms of transportation, including cycling. This shift can help communities move towards a more balanced transportation system that encourages healthy and active living, creates a more livable community, and results in cost-effective and efficient solutions in terms of a community’s infrastructure investments. The benefits of cycling include:

**Health**

The links between active transportation and increased rates of physical activity and healthier communities are well documented. Regular physical activity reduces the risk of numerous chronic diseases and decreases the risk of injuries from falls. Physical activity also improves mental health and well-being, and contributes to healthy growth and social development of children. Any type of physical activity reduces time when people are sedentary. The commute to and from work is a period where many Canadians are inactive.

- 91% of Cambridge residents commute by automobile and are inactive during their commutes
- Only 8% of Canadian children aged 5 to 17 are getting the daily physical activity required to be healthy and ready to learn
- People who commute by car are at least 13% more likely to report being constantly under strain or unable to concentrate

**Environment**

Cycling has many environmental benefits which are realized through the reduction of the number of motorized vehicle trips and the amount of congestion, resulting in the reduction of well-established air pollution sources. Increased cycling ridership rates can reduce GHG emissions by decreasing the use of personal automobiles.

- Vehicles contribute to 49% of total GHG emission in the Waterloo Region, 68% of those emissions are from personal vehicles
- Canada would save about 3.8 million tonnes of GHG emissions each year if every Canadian left their car at home just one day a week. This is the equivalent of taking approximately 800,000 cars off the road
- A person who cycles to work has approximately one-tenth the ecological footprint of a person who commutes by car

**Safety**

Research has shown that as communities see an increase in cycling ridership, there is an increase in safety and comfort. When a large enough number of people shift from driving to cycling, there are reductions in overall road injuries and fatalities because there are fewer vehicles on the road. It has been demonstrated that as cycling rates increase, rates of collisions with motor vehicles and traffic fatalities decrease. This is known as the "safety-in-numbers" principle.

- A person who cycles to work has approximately one-tenth the ecological footprint of a person who commutes by car.
Economic
Cycling can have a multitude of economic benefits, including attracting business and tourism, boosting local business, and reducing household, healthcare, and government spending. Promoting and investing in cycling can contribute to the development of a healthy and diverse local economy by generating tourism revenue, supporting local business, and increasing property values.

Cambridge is competing with other cities within the region and throughout Ontario to attract businesses, residents, and tourists. Creating a bikeable community through cycling-supportive policy and design can create more livable, attractive, and enjoyable places to be and visit, with a stronger sense of place and freedom of mobility. This can attract businesses, residents, and visitors—as well as spending dollars. It can encourage residents to cycle to local businesses instead of driving to larger stores further away. Cycling investments can also attract visitors to the neighbourhood, who will in turn become patrons of local services and amenities.

Cost savings from transportation mode changes can result in people having larger disposable incomes. Some studies have found that people who cycle are competitive consumers who tend to spend more of their money locally than people who drive, while also shopping with greater frequency. Retailers tend to overestimate how many of their customers arrive by motor vehicle. Studies have shown that across various types of businesses, people shopping by bicycle spend more money per month than people driving. Additionally, North American studies have shown that high-quality bicycle infrastructure does not harm business districts and can have a positive impact on local shops.

Congestion
Supporting and encouraging residents to ride bicycles instead of driving can decrease congestion, which in turn makes both transit and goods movement more efficient. Cycling is a key ingredient in the efficient use of road space, as it optimizes transportation system capacity in terms of both mobility and parking infrastructure. This means that the reduced amount of space required for cyclists to use the road reduces infrastructure costs in comparison to vehicles. Cycling also has significantly less wear and tear on roads, resulting in a smaller repair budget. According to Vélo Québec, it would take 9,600 bicycles to cause the same road surface wear as a single automobile. Additionally, constructing cycling facilities is typically cheaper per kilometre than road infrastructure projects.

The cost of providing bicycle infrastructure is much less than constructing infrastructure for motor vehicles. For example, the cost of an on-street painted bicycle lane is estimated to be $5,000 per kilometre and the cost of a separated bicycle lane is $500,000 per kilometre, whereas the cost to build a kilometre of paved road could cost at least $1.3 million.

Substantially increasing the amount invested in cycling would only represent a tiny increase in overall government budgets. Research from elsewhere has found that:

- The average annual amount spent for roads and bridges: > $50 per person
- The average annual amount spent on pedestrian/bike projects: $0.87 per person

...
Equity

Research has shown that there are significant social and equity issues related to transportation\textsuperscript{16}. A lack of personal mobility or access to transportation services can hinder an individual’s social and economic development and can result in social exclusion. Certain groups tend to be more adversely affected by inequities in the transportation system, including children, youth, older adults, single parents, low income and ethnic minority populations, and people with disabilities. As an affordable and efficient mode of transportation, cycling can help to build transportation equity, provided that cycling facilities and support services are equally distributed, and the diverse needs of all community members are considered.

\textbullet\ A Vancouver study found that the likelihood of having a friendly social interaction during a trip was 35\% for active modes, compared to 24\% for transit and only 16\% for automobiles\textsuperscript{17}.

\textbullet\ The average annual cost to own and operate an automobile is $10,000 compared to $350 for a bicycle\textsuperscript{18,19}.

\textbullet\ Transportation costs are second only to housing costs as a percentage of household spending in North America. Spending on transportation is disproportionately high among low- and moderate-income families. For these families, cycling presents an affordable option\textsuperscript{20}.

2.2 SHAPING INFLUENCES

Many factors influence cycling in Cambridge, including land use, demographics, current and future potential for cycling, and overall equity need.

Land Use. Cambridge’s unique geography includes the three core communities of Galt, Preston, and Hespeler, as well as the community of Blair on the west side of the Grand River. The City has a beautiful natural setting at the convergence of the Grand and Speed Rivers, with picturesque trails that follow the rivers and connect with parks and community destinations throughout the city and region. The City is also made up of diverse neighbourhoods which provide a range of living environments, along with key destinations such as schools, parks, and community centres (Figure 2).

Existing Bicycle Network. Cambridge’s bicycle network is made of both on-street and off-street facilities. On-street facilities include painted bicycle lanes, shared lanes, signed routes, and paved shoulders. Off-street facilities include both paved and unpaved multi-use trails. There are approximately 150 km of on-street cycling facilities and approximately 120 km of trails within the City (Table 2).

<table>
<thead>
<tr>
<th>FACILITY TYPE</th>
<th>TOTAL LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ON-STREET</strong></td>
<td></td>
</tr>
<tr>
<td>Bike Lane</td>
<td>55.7 km</td>
</tr>
<tr>
<td>Paved Shoulder</td>
<td>32.9 km</td>
</tr>
<tr>
<td>Signed Route</td>
<td>42.3 km</td>
</tr>
<tr>
<td>Wide Shared Lane</td>
<td>15.7 km</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>146.7 km</td>
</tr>
<tr>
<td><strong>OFF-STREET</strong></td>
<td></td>
</tr>
<tr>
<td>Multi-Use Trails</td>
<td>80.0</td>
</tr>
<tr>
<td>Other Trails</td>
<td>37.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>117.3 km</td>
</tr>
</tbody>
</table>

Table 2 - Existing Bicycle and Trails Network
Figure 2 - Community Context
Existing Bikeway Network

- Trail
- Bike Lane
- Signed Route
- Paved Shoulder
- Wide Shared Lane

Important Places

- Arena
- City Hall
- Library
- Hospital
- Recreation Facility
- Parks
- Schools
- Commercial Zoning
- Municipal Boundary

Figure 3 - Existing Bicycle Network
2.3 TRAVEL PATTERNS & INTEREST IN CYCLING

According to the 2016 Canadian Census, less than 1% of Cambridge residents commute to work or school by bicycle. When compared with other cities in Ontario, Cambridge has an average cycling commute mode share. Although the City-wide mode share is less than 1%, most neighbourhoods in the core areas of the City have higher bicycle mode shares.

Although the 2016 Canadian Census found less than 1% of Cambridge residents commute to work or school by bicycle, this underestimates the amount of cycling that is taking place in Cambridge because it does not consider all the other reasons people choose to cycle. Through the first online survey, only 11% of all cycling trips were made for commutes to work or school. The majority of cycling trips were made for other reasons such as to exercise or have fun (45%), to spend time with family or friends (25%), or to go to shops, restaurants or services (17%).

Travel patterns as well as challenges and opportunities were identified through the engagement process, and are summarized in further detail in Appendix A. Through the first online survey, we heard from many different types of cyclists, including approximately one third (32%) who are confident riding on virtually any street; one third (34%) who are comfortable riding on streets if bicycle facilities are provided; and one third (33%) who are interested in cycling, but have concerns about cycling on streets with high traffic volumes and speeds.

Figure 4 - Mode Share Comparison with other peer cities in Ontario (Source: STATISTICS CANADA, 2016 CENSUS)

Figure 5 - Types of Survey Respondents (Online Survey)

Figure 6 - Why Respondents Bike (Online Survey)
When asked how frequently Cambridge residents cycle for transportation or recreation purposes, the online survey found people cycle more frequently for recreation purposes, with 85% of survey respondents indicating that they cycle at least once per week for recreation purposes, compared to less than half (47%) for transportation purposes. In addition, over a third (35%) of survey respondents indicated that they never cycle for transportation purposes, compared to only 3% who never cycle for recreation purposes. As such, there is already a strong cycling culture in Cambridge and a significant opportunity to encourage cycling for a wide range of trip purposes.

### 2.4 CHALLENGES AND OPPORTUNITIES

Through the first online survey, several challenges and opportunities for cycling in Cambridge were identified. The survey found that the top three barriers to cycling were traffic safety, lack of bicycle facilities, and weather.

![TOP 3 BARRIERS TO CYCLING](image)

**FOR TRANSPORTATION**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than once a week</td>
<td>7%</td>
</tr>
<tr>
<td>Once a day (7 times/week)</td>
<td>2%</td>
</tr>
<tr>
<td>5-6 times/week</td>
<td>7%</td>
</tr>
<tr>
<td>1-2/week</td>
<td>10%</td>
</tr>
<tr>
<td>1 day per week</td>
<td>13%</td>
</tr>
<tr>
<td>3-4 times/week</td>
<td>16%</td>
</tr>
<tr>
<td>Never</td>
<td>35%</td>
</tr>
</tbody>
</table>

**FOR RECREATION**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than once a week</td>
<td>2%</td>
</tr>
<tr>
<td>Once a day (7 times/week)</td>
<td>4%</td>
</tr>
<tr>
<td>5-6 times/week</td>
<td>15%</td>
</tr>
<tr>
<td>1-2/week</td>
<td>32%</td>
</tr>
<tr>
<td>1 day per week</td>
<td>32%</td>
</tr>
<tr>
<td>3-4 times/week</td>
<td>11%</td>
</tr>
<tr>
<td>Never</td>
<td>3%</td>
</tr>
</tbody>
</table>

*Figure 7 - Respondent Cycling Frequency (Online Survey)*

*Figure 8 - Cycling Barriers (Online Survey)*
The online survey found that the top three reasons people use trails was to bicycle, enjoy nature or wildlife, or go for a walk or a hike.

Through the mapping exercise from the first online survey, a number of location-specific issues for cycling were identified. Some of the top cycling issues included:

- Lack of facilities
- Lack of connectivity
- Access and transitions to/from trails
- Narrow bridges over the river
- Navigating roundabouts
- Gravel shoulders
- Infrastructure maintenance
- At-grade rail crossings
- Conflicts on multi-use trails
- Driver education

Specific locations that were identified as having issues for cycling throughout the engagement process included:

- Water Street S at entrance to Churchill Park
- Water Street N at Coronation Boulevard/Dundas Street
- Blair Road
- Downtown Galt
- Hespeler Village

Figure 9 - Why Respondents Use Trails (Online Survey)
**Transportation Networks**
- Planned Bike Lane
- Planned Signed Route
- Planned Paved Shoulder
- Planned Wide Shared Lane
- Planned Trail - Main
- Planned Trail - Secondary
- Trail
- Bike Lane
- Signed Route
- Paved Shoulder
- Wide Shared Lane
- Other Trails

**Important Places**

Survey 1 Results
- Challenges along my cycling route (60)
- Cycling facilities needed (15)
- Places I like to cycle to (22)

*Figure 10 – Location and Type of Bicycle Issue Reported (Online Survey)*
3.0 BUILDING A CYCLING CULTURE

Building a culture for cycling in Cambridge will require significant investments in cycling infrastructure along with support programs and policies. To guide future investments and actions, a vision for the future of cycling in Cambridge was developed along with supporting goals. The vision and goals were developed based on the City’s existing policies and feedback received from stakeholders and residents. They build on the directions in the City’s overarching plans and policies, including the Official Plan, Strategic Plan, and Transportation Master Plan. The vision and goals form the foundation of the Cycling Master Plan and are supported by a number of strategies and actions related to the five overarching themes of the plan: Connections, Integration, Promotion, All Seasons, and Monitoring.

3.1 VISION

The vision for the Cycling Master Plan builds off the community vision outlined in the Official Plan. It highlights the key themes outlined in the community vision such as, celebrating Cambridge as a cycling city. By working towards this vision, the City can achieve a number of outcomes that are related to the goals of the Strategic Plan, such as strengthening community well-being through improved health and increased social connections, creating tourism opportunities that strengthen our economy, and finding new ways to help people move around the City.
3.2 GOALS

The City’s Strategic Plan identifies three overarching themes: people, places, and prosperity. To ensure that the Cycling Master Plan is aligned with and supports the City’s overarching goals, three goals were developed for the Cycling Master Plan that follow these three themes.

<table>
<thead>
<tr>
<th>STRATEGIC PLAN THEMES</th>
<th>CYCLING MASTER PLAN GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>More people cycling</td>
</tr>
<tr>
<td>Places</td>
<td>Develop a complete cycling network</td>
</tr>
<tr>
<td>Prosperity</td>
<td>More opportunities for cycling tourism and economic development</td>
</tr>
</tbody>
</table>

3.3 DEVELOPING THE NETWORK

Developing a complete and connected network of bicycle facilities for all users is an important component of encouraging more cycling. A well-designed cycling network needs to be visible, intuitive, and provide connections between destinations and neighbourhoods. Ideally, a cycling network serves all users, offering practical route options for those who are interested in cycling, but who may not be comfortable riding on busy streets with high traffic volumes and/or speeds.

The development of the network was informed by technical analysis and by extensive public and stakeholder consultation at key milestones through the following process:

1. Assessing Existing Conditions

An assessment of the current cycling network was conducted based on available data. This involved developing an inventory of all existing on-street bicycle facilities and off-street trails by facility type. With this inventory of the existing bicycle network, a GIS analysis was conducted to identify barriers (such as watercourse, rail, and highways) as well as gaps in the network. Input from the first round of public engagement was also used to identify barriers and gaps as well as locations where improvements to bicycle facilities were desired.

2. Establish Guiding Principles

Cambridge’s proposed bicycle network was developed based on a series of three overarching network planning principles:

→ A Comfortable Network. The proposed bicycle network focuses on developing an All Ages and Abilities (“AAA”) network. The purpose of an AAA network is to provide an interconnected system of bicycle facilities that are comfortable and attractive for all users.

Developing an AAA bicycle network was identified by Cambridge residents and stakeholders during the Cycling Master Plan engagement process as one of the most important ways to encourage more cycling trips.

The AAA bicycle network will include three types of bicycle facilities that are most effective at increasing ridership: local street bikeways, separated bicycle lanes, and multi-use trails. These facilities are the most preferred types of facilities by all users and are proven to be the safest types of facilities. While a major guiding principle of Cambridge’s proposed bicycle network is to provide AAA facilities, it is important to note that there is still a place for complementary, non-AAA facilities such as painted bicycle lanes to support the AAA network.

→ A Complete Network. The proposed bicycle network ensures all areas within Cambridge are within a close distance to a designated and complete bicycle route. This involves developing a minimum city-wide grid that ensures that most residents and areas of the City are within
400 metres of a designated bicycle route. The minimum grid network includes both the AAA network and the supporting network.

**A Connected Network.** Providing direct AAA routes to Cambridge’s community core areas, town centres, and commercial, business, employment and educational destinations is an important component of making cycling an attractive transportation option. A network of “City Spines” has been identified to provide high quality and direct north-south and east-west connections to connect each of the City’s major Community Core Areas of Galt, Hespeler, Preston, and Blair as well as major employment areas and future development areas.

### 3. Review and Assess Feasibility of Bicycle Routes

The process of selecting bicycle routes involved reviewing and assessing the feasibility of each route based on a range of factors. This started with identifying type of bicycle routes based on the following classification:

- **City Spine Network**
- **All Ages and Abilities Network**
- **Supporting Network**

At the first public event, the public was invited to identify key gaps in the cycling network as well as important destinations. At the second public event, potential candidate routes were developed and presented to the public. Attendees were asked to provide their input on the candidate routes and were also asked to identify additional routes. Input was documented on the maps presented and incorporated into the assessment.

### 4. Identify Potential Facility Types

Proposed bicycle facility types in Cambridge are described below, including All Ages and Abilities facilities and supporting facilities. Adding cycling infrastructure can help improve cyclist safety and comfort. While all types of bicycle facilities provided some safety benefits compared to streets with no infrastructure, All Ages and Abilities facilities such as multi-use trails, separated bicycle lanes, and local street bikeways have been shown to have the greatest safety benefits.

#### ALL AGES AND ABILITIES FACILITIES

**Multi-use trails** are off-street facilities that are physically separated from motor vehicles. They provide sufficient width to be used by people walking, cycling, and other forms of active transportation such as in-line skating and jogging. Multi-use trails can have paved or unpaved surfaces. Paved or firm surfaces are often preferable for people cycling and people with mobility aids or strollers. Multi-use trails are an effective facility on roads or off-street locations where right-of-way is available. They can be installed parallel to a major roadway (including City and Regional roads), within a park, or along a utility corridor or rail line. The Cycling Master Plan includes a trail classification system that outlines the key design and maintenance characteristics of various types of multi-use trails, as described in further detail in Actions 1A.4 and 1A.5.

**Separated bicycle lanes** are physically separated from motor vehicle travel lanes but are located on-street within the roadway surface. Separated bicycle lanes combine the benefits of increased comfort offered by multi-use trails due to their separation from motor vehicle traffic, with the benefits of route directness provided by on-street facilities. They also provide separation between people walking and people cycling.

There are many types of separated bicycle lanes, offering varying types of treatments to provide...
protection. Types of physical separation include concrete barriers, curbs, planters, bollards, and other types of horizontal separation. On-street parking can also be used to provide physical separation if the separated bicycle lane is located between the sidewalk and the on-street parking lane. Separated bicycle lanes can also be elevated to sidewalk level.

The increased comfort offered by separated bicycle lanes plays a significant role in increasing bicycle ridership, particularly among the ‘interested but concerned’ demographic. They are an effective way to have all types of people cycle on busier streets and have been proven to increase bicycle ridership in other cities. As noted earlier, the City of Calgary experienced a 142% increase in people cycling after the installation of their downtown separated bicycle lane network.

Separated bicycle lanes are generally appropriate on streets with higher motor vehicle volumes (greater than 4,000 vehicles per day) and high motor vehicle speeds (greater than 50 km/h).

Local street bikeways are shared bicycle routes on streets with low motor vehicle volumes (less than 1,500 vehicles per day) and low motor vehicle speeds. These streets have been optimized to varying degrees to prioritize bicycle traffic. Local street bikeways are often found on low volume streets that run parallel to major roads or within neighbourhoods on residential streets connecting existing trails. In cases where the existing streets have relatively low motor vehicle volumes and speeds, the only improvements required may be signage and pavement markings identifying the road as a bicycle route, and enhancements to crossings where the local street bikeway intersects with major roads. However, they can and should be further enhanced with traffic calming measures such as traffic circles and traffic diverters if volumes and speeds are higher.

The critical locations on local street bikeways are where these facilities intersect major roads. Crossing treatments such as traffic signals at arterial road crossings can be used to assist cyclists, pedestrians and others in crossing major roads, and to minimize potential conflicts with motor vehicles.

SUPPORTING FACILITIES

Painted bicycle lanes are designated exclusively for bicycle travel. Bicycle lanes help to define the road space for bicyclists and motorists. Bicycle lanes are generally suitable on streets with moderate traffic volumes. Bicycle lanes can also have a painted buffer, which can be located between the bicycle lane and other traffic lanes or parking lanes. Buffered bicycle lanes are more comfortable than conventional painted bicycle lanes as there is a spatial separation between people cycling and adjacent traffic lanes. Buffered bicycle lanes are distinguished from separated bicycle lanes, as the former do not provide a physical barrier, such as bollards, curbs or planters.

Paved shoulders can be used in rural areas to provide a dedicated space for people cycling on rural roads and highways, they are located on streets without a curb.

Shared streets are streets where cyclists and motor vehicles share the lane. Shared streets are marked with a ‘sharrow’ pavement marking, which should be supplemented with green coloured pavement markings to enhance visibility.
5. Select Preferred Routes and Facility Types

More detailed investigations were conducted for the proposed network to better understand the current conditions of the potential routes and assess alternative routes and facility types. A variety of considerations were factored into this assessment, including:

→ **Road Ownership**: Recommendations were developed for both City and Regional roads. However, it should be noted that roadways under the jurisdiction of the Region of Waterloo were only identified for information but are beyond the ability of the City to implement. The Region was consulted throughout the process, and the recommendations for Regional roads are generally within the Region’s plans. Where there were inconsistencies or where a facility type could not be confirmed, these corridors were classified as “Constrained Corridors”.

→ **Existing Roadway and Right-of-Way Width**: Recommendations were developed based on the ability to implement bicycle facilities within the existing road width or, for off-street multi-use trails, within the available right-of-way width. The intent was to focus on facilities that were implementable within these existing widths.

→ **Traffic Volumes and Speed**: Daily traffic volumes and speeds were reviewed. For corridors with higher traffic volumes and speeds, greater separation was recommended to ensure they are comfortable for everyone. For corridors with low traffic volumes and speeds, local street bikeways were considered.

→ **On-Street Parking**: Bike facilities directly adjacent to on-street parking without a door zone buffer are not considered comfortable for everyone (with the exception of parking protected bicycle lanes, which are located between the sidewalk and the on-street parking lane). It is generally preferable to implement bicycle facilities on street without on-street parking; however, if on-street parking was present and would need to be removed, this was identified in the feasibility assessment.

→ **Network Connectivity**: Recommendations were developed to ensure continuity of facilities to the extent possible, including providing consistent facility types along an entire corridor where possible.

→ **City and Regional Capital Projects**: The City of Cambridge and Region of Waterloo have both developed their 10-Year Capital Plans. These plans were reviewed to identify opportunities to integrate cycling facilities with projects that are already planned wherever possible.

The preferred bicycle routes and facility types were ultimately selected based on the results of each of these steps, with input provided from the public through the two rounds of public engagement to help confirm proposed bicycle routes.
3.4 STRATEGIES AND ACTIONS

The framework for the Cycling Master Plan consists of five overarching themes. This section outlines several strategies and more detailed actions to improve cycling as it relates to each of these five themes. As identified through community engagement and technical analysis, the strategies and action items under each theme address a variety of identified strengths, opportunities, challenges, and concerns with cycling infrastructure, policies, standards and support programs. The implementation of these strategies and actions will help Cambridge work towards achieving the vision and goals of the Cycling Master Plan.

1A: Develop an Integrated Cycling Network
1B: Address Barriers
1C: Provide High Quality Cycling Facilities

2A: Improve Connections
2B: Improve Integration with Transit
2C: Provide More Bicycle Parking and Other End-of-Trip Facilities
2D: Ensure Land Use Supports Active Transportation

3A: Maintain the Cycling Network Year-Round
3B: Keep the Cycling Network in a State of Good Repair

4A: Raise Awareness and Education
4B: Make It Easier to Find Your Way
4C: Promote Bicycle Tourism

5A: Monitor Cycling Trips, Investments, and Initiatives
5B: Provide Sufficient Capital, Operating, and Staff Resources
**THEME 1 | CONNECTIONS**

Establishing a complete, connected, and convenient network of cycling facilities is a fundamental part of making cycling an attractive travel option in Cambridge. The purpose of this theme is to build off the existing infrastructure that is already in place to enhance the connectivity of Cambridge’s network of on-street bicycle facilities and off-street trails. Through the implementation of new routes and enhancements to existing infrastructure, the City can work to ensure that cycling is safe and comfortable for everyone.

Cambridge already has an extensive network of off-street trails and on-street bicycle facilities throughout the community. Many Cambridge residents are already cycling, mainly for recreational purposes according to our survey results. However, there are a number of bicycle infrastructure gaps and barriers in Cambridge’s existing bicycle network.

The City can improve connectivity by providing new and improve existing infrastructure that is comfortable for everyone. A well-connected network of both on- and off-street bicycle facilities can significantly improve the ease of moving around the community, increase recreational opportunities, and make traveling by bicycle safer and a more practical transportation choice.

**WHAT WE HEARD: CONNECTIONS**

Through public engagement, there were a number of suggestions to improve Cambridge cycling connections:

- Fill in gaps in the bicycle network;
- Need for higher quality cycling facilities;
- Improve safety for cyclists; and
- Improve major intersections and locations for trails that cross roadways.

The Cycling Master Plan includes three strategies to improve connections. Each strategy is accompanied by a number of supporting actions that seek to create a cycling environment that is well-connected for everyone.

**Strategy 1A: Develop an Integrated Cycling Network**

- **Action 1A.1:** Establish a city-wide grid of bicycle facilities that is comfortable for people of all ages and abilities
- **Action 1A.2:** Coordinate new or upgraded bicycle facilities with Environmental Assessments, road improvements, and other infrastructure projects
- **Action 1A.3:** Expand the trail network
- **Action 1A.4:** Plan, design, and operate trails based on the recommended trail classification system
- **Action 1A.5:** Upgrade existing trails as required to meet the recommended trail classification system

**Strategy 1B: Address Barriers**

- **Action 1B.1:** Improve existing and develop new active transportation grade separated crossings over watercourses, rail, and major roads
- **Action 1B.2:** Improve crossings based on current best practices at locations where trails intersect with a roadway

**Strategy 1C: Provide High Quality Cycling Facilities**

- **Action 1C.1:** Ensure all bicycle facilities are designed in accordance with current Provincial bicycle facility design guidance
- **Action 1C.2:** Update the City Standards to reflect current Provincial bicycle facility design guidance and other best practices
- **Action 1C.3:** Look for opportunities for rapid implementation of cycling infrastructure through pilot projects for testing out proposed improvements
- **Action 1C.4:** Continue to maintain and install Bike Fix-it stations at key locations throughout the city
Strategy 1A: Develop an Integrated Cycling Network

Providing a complete and interconnected network of bicycle facilities throughout Cambridge is critical to supporting and encouraging more cycling. The City already has a strong network of off-street trails and on-street bicycle facilities on both municipal and regional roads, including more than 150 kilometres of on-street bicycle facilities and 110 kilometres of off-street trails. Cambridge’s existing on-street bicycle network consists of bicycle lanes, signed routes, paved shoulders, wide shared lanes, and off-street trails. However, these types of on-street facilities are generally not comfortable to the ‘Interested but Concerned’ segment of the population and are not comfortable for everyone. There are also significant gaps in the existing bicycle network as well as many areas with no bicycle or uncomfortable bicycle facilities.

Providing a complete, comfortable, and interconnected network of bicycle routes is critical to supporting and encouraging more cycling. It is important that bicycle routes are direct and provide attractive connections to key community destinations. Providing direct routes will ensure that cycling travel times are competitive with other travel modes.

The bicycle network should also be accessible for all users, with an emphasis on those with physical and cognitive impairments. Expanding and enhancing Cambridge’s bicycle network will require a combination of strategies, including upgrading existing facilities to address safety concerns, ensuring that new neighbourhoods and infill areas have adequate places for cycling, and addressing gaps in the existing bicycle network.
**ACTION 1A.1: ESTABLISH A CITY-WIDE GRID OF BICYCLE FACILITIES THAT IS COMFORTABLE FOR PEOPLE OF ALL AGES AND ABILITIES**

Developing a complete and connected network of bicycle facilities for all users is an important component of encouraging more cycling. A well-designed cycling network needs to be visible, intuitive, and provide connections between destinations and neighbourhoods. Ideally, a cycling network serves all users, offering practical route options for those who are interested in cycling, but who may not be comfortable riding on busy streets with high traffic volumes and/or speeds. Cambridge’s long-term bicycle network was developed based on the process described in Section 3.3.

As a key component of the cycling network is providing high-quality city-wide connections, the City Spine network is intended to provide a grid network of bicycle facilities that connects major destinations within the city, such as major commercial and employment areas, parks, schools, and connections to transit. **Figure 11** presents the City Spine network.

**Figure 12** presents the complete proposed bicycle network, including bicycle facility types. As noted previously, the complete proposed network includes both All Ages and Abilities facilities (including multi-use trails, separated bicycle lanes, and local street bikeways), and Supporting Facilities (including painted bicycle lanes, paved shoulders, and shared streets). The preference wherever possible is to install All Ages and Abilities facilities, even if a corridor has been identified as a supporting facility. Further review should be conducted whenever a new or upgraded bicycle route is proposed to determine if it can be built to an All Ages and Abilities standard.

In addition, the proposed bicycle network includes several Constrained Corridors, which are major streets that need further review to consider how they will accommodate bicycle facilities given other competing priorities. The recommended bicycle network has identified these Constrained Corridors as shown in **Figure 14**. Along these corridors, there is a need to have an established process to consider the mobility of all modes and competing needs when implementing bicycle facilities. These streets are some of Cambridge’s main travel corridors, serving a variety of vehicle types and modes while playing an important role in the City and Regional transportation system. These Constrained Corridors will require more in-depth analysis through specific corridor studies or Environmental Assessments. Recognizing that these corridors serve desire lines within the bicycle network, these studies can determine whether bicycle facilities can be accommodated on the corridors or adjacent streets. As growth occurs within Cambridge, additional corridors, or segments of identified corridors, may be designated as Constrained Corridors requiring additional study.

**CITY SPINES** are All Ages and Abilities cycling facilities that provide high quality and direct connections to all major destinations in the city, such as major commercial areas, parks, and schools. The intent of the City Spine network is to connect to the various growth centres and nodes in the city including urban growth centres, city nodes, community nodes, and neighbourhood nodes as defined in the Official Plan.

**CONSTRAINED CORRIDORS** are major roads that serve several transportation purposes. They have been identified as desire lines as they would provide important cycling connections. However, further review is required to consider how cycling facilities will be accommodated on these corridors, given the other competing priorities for these corridors for vehicles, goods movement, and/or transit.

**MINIMUM GRID** refers to the desire to create a complete, connected network of regularly spaced cycling routes. The intent is that most Cambridge residents would be within 400 metres of a designated bicycle route when the plan is complete.
Figure 11 - City Spine Network
Please Note:

Constrained corridors have been identified as bicycle network desire lines but will require additional study and discussions before a proposed facility can be confirmed. The City will look for opportunities to upgrade supporting facilities (e.g., painted bicycle lanes) to an all ages and abilities facility wherever possible.
All Ages and Abilities Facilities

- Multi-use Trail
- Separated Bicycle Lane
- Local Street Bikeway

Supporting Facilities

- Painted Bicycle Lane
- Paved Shoulder
- Shared Street

Constrained Corridors

Constrained Corridor - Constrained Corridor - Regional

New Crossing

Crossing

Figure 13 – Types of Cycling Facilities
Figure 14 – All Ages and Abilities Bicycle Network
**ACTION 1A.2: CONTINUE TO COORDINATE NEW OR UPGRADED BICYCLE FACILITIES WITH ENVIRONMENTAL ASSESSMENTS, ROAD IMPROVEMENTS, AND OTHER INFRASTRUCTURE PROJECTS**

Considerations for bicycle facilities should be made through the design and implementation of new and upgraded roads and other infrastructure projects. This will require different internal departments and agencies, as well as external partners, to work collaboratively and share information on appropriate opportunities to incorporate different components of the Cycling Master Plan into all new infrastructure projects. The City should also continue to seek to integrate bicycling facilities into all future projects, plans and developments.

**ACTION 1A.3: EXPAND THE TRAIL NETWORK**

Trails and off-street pathways are an important component of Cambridge’s bicycle network. Existing trails form the backbone of Cambridge’s bicycle network, and include more than 50 km of designated trails. Several trails run along the Grand River and connect Cambridge regionally to Kitchener and Waterloo to the north and Paris and Brantford to the south. These trails include the Walter Bean Grand River Trail, the Living Levee Trail, and the Cambridge to Paris Rail Trail, which also combines to form The Great Trail through Cambridge. Additional trails such as the 6.5 kilometre Mill Run Trail provide important linkages between Hespeler and Preston, including an important linkage underneath Highway 401.

Recreational trail use was rated highly in the online survey and public engagement results. Trails increase an individual’s access to parks, green spaces, and other places for recreation. These trails also provide important linkages within their neighbourhoods and to the on-street network. Notable trails include the 3.2 kilometre long Bob McMullen Linear Trail in Preston, the 5.0 kilometre long Mill Pond Trail in Hespeler, and the 2.0 kilometre Northview Heights Trail in Greenway Chaplin. The proposed bicycle network in Figure 12 identifies new trails as an important component of the integrated on- and off-street network. The City should also update the 2010 Trails Master Plan.

**ACTION 1A.4: PLAN, DESIGN, AND OPERATE TRAILS BASED ON THE RECOMMENDED TRAIL CLASSIFICATION SYSTEM**

Trails are an important component of Cambridge’s existing and planned cycling network. Trails can be used for both transportation and recreational purposes and provide important connections to the bicycle network. It is important to plan, design, and operate the trails to the same standard. A Trail Classification System is shown in Table 3 that lays out the level of service and design characteristics for five classes of trail. Cambridge should work to ensure that the trails that have been identified as part of the bicycle network are designed to meet the minimums provided in the Trail Classification System. This includes surface type and width as well as maintenance practices.

**ACTION 1A.5: UPGRADE EXISTING TRAILS AS REQUIRED TO MEET THE RECOMMENDED TRAIL CLASSIFICATION SYSTEM**

Through the development of the Plan, several existing trails that are located within parks or that connect community destinations were identified as important components of the network. These connections provide off-street alternatives, can shorten travel distance, and provide important connections to parks, schools and community centres. Cambridge should work to upgrade trails through parks, trails that connect community destinations, and trails that form part of the City Spine network through the upcoming Trails Master Plan process. These upgrades can improve cycling connections while taking into consideration the local context and finding ways to integrate the facilities. Existing trails should be reviewed individually to consider current users, the role within the bicycle network, and context sensitivities to ensure they are rated to the appropriate trail class and upgraded where necessary.
<table>
<thead>
<tr>
<th>CLASS</th>
<th>CLASS DESCRIPTION</th>
<th>LEVEL OF SERVICE DESCRIPTION</th>
<th>DESIGN CHARACTERISTICS</th>
</tr>
</thead>
</table>
| TYPE 1 | Regionally Significant Multi-Use Trail | Perform Region wide function and are important transportation/commuter routes intended for year round use. Destination oriented. | Hard Surface (Asphalt/Concrete)  
4 Season Maintenance  
4.0 m wide min  
Pedestrians and cyclists may be separated  
Located both within and outside road ROW |
| TYPE 2 | Primary Multi-Use Trail | Perform City wide function and are important transportation/commuter routes intended for year round use. Destination oriented. | Hard Surface (Asphalt/Concrete)  
4 Season Maintenance  
3.0-4.0m wide min.  
Shared between pedestrians and cyclists  
Located both within and outside road ROW |
| TYPE 3 | Secondary Multi-Use Trail | Perform City wide function and are important transportation/commuter routes intended for 3 season use. Destination oriented. | Variable Surface (Granular/Gravel or Hard Surface)  
3 Season Maintenance (Spring/Summer/Fall)  
1.5 m wide min.  
Shared between pedestrians and cyclists, but may not be suitable for commuter cyclists  
Located outside road ROW |
| TYPE 4 | Internal Park Trail | Functions as main route to playgrounds/washrooms as well as isolated/solitary pathway segments. | Variable Surface (Granular/Gravel or Hard Surface)  
3 Season Maintenance (Spring/Summer/Fall)  
1.2 m wide min.  
Pedestrian use; may not be suitable for cyclists  
Located within City owned Parkland |
| TYPE 5 | Access Trail | Functions as main access route from the road to the park/trail network, as well as, maintenance access routes to parks & storm water management ponds in order to perform maintenance activities. | Variable Surface (Granular/Gravel or Hard Surface)  
3 Season Maintenance (Spring/Summer/Fall)  
3.0 m wide min.  
Shared between pedestrians and cyclists  
Located between road ROW and City owned Parkland and/or Trail Network |
| TYPE 6 | Neighbourhood Connector Trails | Functions as access route between two parallel roads. | Hard Surface (Asphalt/Concrete)  
3 or 4 Season Maintenance  
2.0 m wide min.  
Shared between pedestrians and cyclists  
Located between two parallel road ROW |

Table 3 - Trail Classification System
Strategy 1B: Address Barriers

There are a number of barriers to cycling throughout Cambridge, including major road crossings, highway crossings, rail corridors, and waterways. Improving crossings for cyclists will reduce the total distance travelled, improve safety, and make cycling a more attractive and practical transportation choice.

**ACTION 1B.1: IMPROVE EXISTING AND DEVELOP NEW ACTIVE TRANSPORTATION GRADE SEPARATED CROSSINGS OVER WATERCOURSES, RAIL, AND MAJOR ROADS**

Many existing bridges, underpasses, and overpasses have facilities for people cycling; however, they may not necessarily feel comfortable or safe, or provide the most direct route. The City should continue to work with its partners to provide safer and more convenient cycling facilities on bridges, underpasses, and overpasses. This includes ensuring facilities meet current design standards in terms of width, clearance, and appropriate railings. Overall, cycling facilities designed to overcome major barriers should be designed using AAA principles.

To enhance the connectivity and convenience of the proposed cycling network, the installation of new underpasses and overpasses may be considered as part of the implementation of the Cycling Master Plan. Several new crossings are proposed as part of the cycling network, as shown in Figure 12. These include new river crossings at Myers Road, Augusta Street, Dover Street, King Street, and Winston Boulevard as well as rail crossings at Wauchope Avenue and Elgin Street. The City should ensure that the design of these new facilities consider Crime Prevention Through Environment Design (CPTED) principles and current best practices.
ACTION 1B.2: IMPROVE CROSSINGS BASED ON CURRENT BEST PRACTICES AT LOCATIONS WHERE TRAILS INTERSECT WITH A ROADWAY OR WHERE BICYCLE FACILITIES INTERSECT STREETS

There are several locations throughout Cambridge where multi-use trails intersect roadways. Some of these locations are marked with a crosswalk, and the motor vehicle driver is required to stop for people in the crosswalk. At locations where new or upgraded facilities have recently been installed, treatments such as shared crosswalks and crossrides with elephant’s feet pavement markings can be used to facilitate safe bicycle crossings. The City should work to improve crossing treatments and visibility at locations where multi-use trails intersect with roadways. By monitoring collision data, the City can also identify high priority locations for improvement.

Special considerations are needed when designing and installing crossing treatments where bicycle routes intersect other streets, especially at major streets particularly because cyclists do not have the same crossing priority under the provincial Highway Traffic Act. These areas need treatments that make people cycling clearly visible to motorists at intersections. As an intersection is the connection point between people driving, riding transit, walking, and cycling, it is important to have treatments to highlight conflicts and minimize conflicts between road users where possible so that all users are aware of the movements of others. Treatments should serve to increase visibility, denote clear right-of-way, and facilitate eye contact and awareness with other modes. Intersection treatments can improve cyclist movements and can be coordinated with timed or specialized signals. Crossing treatments to improve safety at an intersection for people cycling can include elements such as colour, signage, medians, signal detection, and pavement markings. The type of treatment required depends on the bicycle facility, whether there are intersecting bicycle routes, street classification, and land use.

Some examples of crossing treatments include:

- **Coloured Conflict Zone Markings** include green markings to designate conflict zones and areas where cyclists are travelling. They provide a visual reminder of the presence of cyclists.

- **Dashed Bicycle Lane Markings** through intersections serve to position people cycling appropriately as they travel through the intersection. They also make other road users aware of the presence of cyclists.

- **Bicycle Boxes** provide a space for people cycling to wait to cross the intersection. They are often located in advance of the automobile stop line and provide the person cycling with a “head start” and make them more visible.

- **Reduced crossing distances** through treatments such as curb extensions or two-stage median crossings, which are positioned in the middle of the roadway allowing people cycling to cross the road in two stages instead of one providing them with a space to wait before making the second stage of their crossing.

- **Cross-rides** are pavement markings used to indicate that people cycling are permitted to use the crosswalk and do not need to dismount, although cyclists still need to yield to motor vehicle traffic before crossing at a cross-ride. These pavement markings may be combined with a pedestrian crosswalk or used on their own to indicate a separated bicycle crossing.

- **Enhanced Bicycle Signal Crossings** can include a variety of signal treatments including full signals as well as pedestrian and bicycle activated signals. These signals can be activated by people cycling using a range of technologies, such as bicycle loop detectors, bicycle pushbuttons, or other technologies such as video, infrared, or pressurized mats. Dedicated bicycle signals with bicycle symbols on the signals heads can also be
considered to provide separate signal phasing between cyclists and motorists.

- **Protected Intersections** incorporate a combination of bicycle signal phasing, design elements and space allocation that help protect cyclists from turning cars.

The City should work to review existing bicycle crossings at major streets to ensure that these crossings are appropriate for the context, and provide a safe and convenient crossing for those on bicycles, including ensuring that bicycle facilities continue to and through the intersection with treatments such as cross-rides and bicycle boxes. This will help ensure that vulnerable road users are able to cross these potential barriers to travel in an efficient manner. The City should also include a public education component for these treatments as they are introduced.

### Strategy 1C: Provide High Quality Cycling Facilities

The Cycling Master Plan focuses on building a cycling culture by developing a network of bicycle facilities that are comfortable for everyone. There are a range of provincial, national, and international design guidelines that the City should follow to ensure cycling facilities are being designed to reflect current best practices to ensure a high quality user experience is provided.

**ACTION 1C.1: CONTINUE TO ENSURE ALL BICYCLE FACILITIES ARE DESIGNED IN ACCORDANCE WITH CURRENT PROVINCIAL BICYCLE FACILITY DESIGN GUIDANCE**

The City should continue to follow guidelines such as the Ontario Traffic Manual (OTM) and Transportation Association of Canada (TAC) standards as well as national and international best practices for the design and installation of bicycle infrastructure to ensure that new cycling facilities in the City are reflective of current design standards, and congruent with cycling facilities in other parts of Ontario and elsewhere in Canada. Relevant guidelines that the City should follow include:

- **BC Ministry of Transportation & Infrastructure: BC Active Transportation Design Guide (2019)**

**ACTION 1C.2: UPDATE CITY STANDARDS TO REFLECT CURRENT PROVINCIAL BICYCLE FACILITY DESIGN GUIDANCE AND OTHER BEST PRACTICES**

The City should undertake a review of its current City Standards against the updated OTM Book 18 to ensure its current guidelines for bicycle facilities are up to date with those being used throughout the Province. These guidelines should be developed and maintained based on national and international best practices and focus on providing design standards for high quality bicycle facilities, both on-street and off-street, with an emphasis on facilities for everyone and crossing treatments. The City should install and upgrade designated cycling routes using a consistent standard that meets or exceeds local and national design guidelines as well as design options that have been successfully implemented elsewhere. These guidelines can also include recommendations for...
facility type selection based on the characteristics and context of a given street.

**ACTION 1C.3: LOOK FOR OPPORTUNITIES FOR RAPID IMPLEMENTATION OF CYCLING INFRASTRUCTURE THROUGH PILOT PROJECTS FOR TESTING OUT PROPOSED IMPROVEMENTS**

The City should consider the design and rapid installation of adjustable and temporary measures such as adjustable curbs, planters, and bollards, as a method to speed up the pace of the installation of the proposed cycling network. The temporary and movable nature of these facilities allows for both a quick and inexpensive installation, as well as easy adjustments as required.

**ACTION 1C.4: CONTINUE TO MAINTAIN AND INSTALL BIKE FIX-IT STATIONS AT KEY LOCATIONS THROUGHOUT THE CITY**

The City has already installed several bicycle repair and maintenance stations that provide tools and equipment to make quick bicycle repairs. These stations are located in public spaces throughout the city. In addition to these self-serve stations, there are opportunities for the City to partner with the private sector to provide additional bicycle repair and/or retail and rental services at different locations. These facilities work best at high demand locations. The City should continue to install bicycle repair and maintenance stations at trailheads, locations where bicycle facilities intersect, and at other high demand locations.

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**CASE STUDY**

The Region of Waterloo has identified and designed a network of separated bicycle lanes as a pilot project. The network, measuring approximately 5 km, includes linkages along University Avenue, Columbia Street, King Street, Albert Street and Erb Street with connecting links along the Laurel Trail through Waterloo Park. The linkages were selected through an identification and evaluation process. The goal of the project was to encourage more people to cycle in the Waterloo Region. The cycling network will be monitored over the next 18 months and staff will report to Regional Council in the Spring of 2021.

The City of Kitchener also recently launched a pilot project to install 5 km of separated bicycle lanes on Queen’s Boulevard, Belmont Avenue, and Water Street. The City will record data on lane use and review its findings with Council in September 2020.
THEME 2 | INTEGRATION

The theme of integration seeks to support year-round usage of the cycling network by seamlessly connecting the cycling network with the adjacent municipalities and coordinating with the Region of Waterloo and MTO on cycling improvements; providing amenities such as bicycle parking and end-of-trip facilities to support moving around the City and Region; integrating cycling with public transit and considering a public bicycle share system; and ensuring that land use supports active transportation. Investing in these areas will help to make cycling a more practical, attractive, and convenient option for day-to-day travel.

WHAT WE HEARD: INTEGRATION

Through the public engagement for the Cycling Master Plan, there were a number of opportunities and suggestions to improve integration in Cambridge:

→ Provide secure bicycle parking at key transit nodes;
→ Install more bicycle parking, including bicycle lockers and covered parking, at key locations throughout the City;
→ Plan for bicycle shops or repair stations at major transit stations;
→ Install bicycle cleaning stations, especially at off-road trails; and
→ Host educational workshops on key topics such as how to use bicycle racks on buses.

The Cycling Master Plan includes four strategies to improve integration. Each strategy is accompanied by a number of supporting actions that seek to create a cycling environment that is integrated with the communities they are located within, their regional connections, and with other forms of sustainable transportation such as transit.
Strategy 2A: Improve Connections

The City of Cambridge is one of seven municipalities within Waterloo Region. Cambridge is the second largest city in the Region, after the City of Kitchener. Together with the City of Waterloo, these three cities make up the Tri-Cities, which is the tenth largest population centre in Canada. The Region is part of a significant educational and technology hub with several post-secondary institutions, including the University of Waterloo, Wilfrid Laurier University, and Conestoga College, each of which have campuses throughout the Region, including in the City of Cambridge. Although there are some multi-use trails along the Grand River connecting these cities, there is significant room for improved connections between each of the cities in the Region.

**ACTION 2A.1: CONTINUE TO WORK CLOSELY WITH NEIGHBOURING MUNICIPALITIES TO ENSURE FUTURE CYCLING CONNECTIONS ARE WELL INTEGRATED**

As the neighbouring municipalities continue to develop and implement their own active transportation plans and networks, it is important that Cambridge continues to work closely with them. This will be important to ensure that cycling throughout the Region is well integrated. Considerations regarding the location of infrastructure as well as the type of facilities being installed will be important to ensure seamless integration of facilities between municipalities and to avoid routes that end or change upon crossing a municipal border. The proposed cycling network in Figure 12 identifies connections to adjacent municipalities.

**ACTION 2A.2: CONTINUE TO WORK CLOSELY WITH THE REGION OF WATERLOO TO CONSIDER HIGH QUALITY BICYCLE OR TRAIL INFRASTRUCTURE ON ROADWAYS UNDER THEIR JURISDICTION**

There are several major roadways in Cambridge that are under the jurisdiction of the Region of Waterloo. Some of these roadways such as Eagle Street N,

Strategy 2C: Provide More Bicycle Parking and Other End-of-Trip Facilities

**Action 2C.1: Update development requirements and the Bicycle Parking Guide to provide criteria for short-term and long-term bicycle parking and end-of-trip facilities**

**Action 2C.2: Ensure high quality bicycle parking and end-of-trip facilities are provided at all City of Cambridge owned and operated facilities.**

**Action 2C.3: Develop secure central hubs for cycling in each of the founding communities**

**Action 2C.4: Develop a program for prioritizing and implementing bicycle parking within the public right-of-way and at trail locations**

**Action 2C.5: Continue to update and publish maps of bicycle parking locations**

Strategy 2D: Ensure Land Use Support Active Transportation

**Action 2D.1: Ensure future subdivisions and employment areas are integrated with the existing cycling and trails network**

**Action 2D.2: Continue to support the provision of a region-wide Public Bike Share system**
Coronation Boulevard, Dundas Street N, and Hespeler Road travel through urban areas of the community and should have a very different look, feel and function than highways and other corridors under Regional jurisdiction. The City should continue to work with the Region to ensure that streets in urban areas under its jurisdiction have context sensitive designs that incorporate high quality active transportation facilities to the extent possible, in accordance with current best practice.

**ACTION 2A.3:** CONTINUE TO WORK CLOSELY WITH MTO TO IDENTIFY OPPORTUNITIES TO ENHANCE CYCLING AND TRAIL CROSSINGS AND CONNECTIVITY OF ROADWAYS UNDER THEIR JURISDICTION

A major barrier to cycling in the city is Highway 401, which is under provincial jurisdiction. The City should continue to work with the MTO on infrastructure projects under the Province’s jurisdiction, to ensure that new or improved infrastructure projects have high-quality cycling facilities such as overpasses and interchanges that are designed in accordance with best practices.

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**Strategy 2B: Improve Integration with Transit**

Improving cycling access and connections to transit and improving the customer experience at bus stops and exchanges can help to not only promote transit but also to encourage more cycling, thereby extending the reach and convenience of both modes. While Grand River Transit is responsible for funding, planning, operating, and maintaining transit services throughout Cambridge, the City works to ensure residents can access transit stops and that there are amenities in place to make their transit experience more comfortable. There are several infrastructure treatments and amenities that can improve the transit customer experience, including ensuring transit stops are accessible and providing amenities such as shelters, benches, lighting, and transit schedule information. All Grand River Transit buses are equipped with bicycle racks that hold two bicycles of most sizes and styles. Having the ability to bring a bicycle on the bus or park it securely allows people cycling to include transit in their journey and extend the reach of their trip. It also allows them to more quickly reach destinations that are not immediately adjacent to a transit route.

**ACTION 2B.1:** IMPROVE CYCLING NETWORK CONNECTIONS TO TRANSIT SERVICES PARTICULARLY iXPRESS/ION BUS ROUTES AND HIGH ACTIVITY BUS STOPS

Every transit trip begins and ends with some form of active transportation, either walking or cycling. The City should seek to increase the accessibility of bus stops for those on bicycle by ensuring that the bicycle network connects to bus routes and bus stops, particularly iXpress/ION bus routes and any other high activity bus stops. Doing so may help to increase ridership as residents feel more comfortable accessing transit by bicycle. Integrate the existing and planned cycling network with the broader transit networks as well.
**ACTION 2B.2:** AS PART OF THE PLANNING AND DESIGN PROCESS, INCLUDE SEAMLESS CYCLING AND/OR TRAIL FACILITIES ALONG THE ENTIRE ROUTE OF THE ION PHASE 2 LRT PROJECT

Phase 2 of the ION project will involve extending the existing ION LRT line from the City of Kitchener to the City of Cambridge. The City should work with regional partners, including Grand River Transit, to ensure seamless cycling facilities are provided as part of the design and construction of this project. This should include providing seamless, continuous parallel cycling facilities along the entire LRT route, ensuring bicycle facilities are integrated with ION LRT station locations, and include secure bicycle parking at ION stations and end of trip facilities.

**ACTION 2B.3:** INSTALL SECURE BICYCLE PARKING AT HIGH ACTIVITY BUS STOPS AND STATIONS

The City should work with Grand River Transit to provide both short- and long-term bicycle parking at transit exchanges, transit stops that are heavily used with high daily boardings and alightings or are located on high frequency routes, and at locations that are well integrated with the bicycle network. The City should work with Grand River Transit to conduct an audit of existing bicycle racks at transit stations and to identify short-term and long-term bicycle parking at additional locations based on frequency and boarding and alighting data. This can help provide a safe and secure place for people to lock up their bicycle if they are travelling the rest of their journey by transit, or if there is no space available on the bike racks on the bus.

**ACTION 2B.4:** WORK WITH PARTNERS TO ENSURE SUSTAINABLE TRIP PLANNING INFORMATION IS WIDELY ACCESSIBLE THROUGH AN INTEGRATED TRANSPORTATION DATA SYSTEM AND INNOVATIVE MOBILE APPLICATIONS

Providing multi-modal trip planning information in one consolidated place can make planning trips by foot, bicycle, and transit convenient and effortless. The City should work with partners to research opportunities to support the development of a consolidated transportation database that can be shared, and/or leveraging existing apps (such as Transit apps) that are currently working to provide these services to include Cambridge. This type of tool may encourage the development of an innovative third-party mobile application for promoting transportation options, and the sharing of existing data by allowing the data to be available in an open format. Examples of some of the data that could be consolidated and shared includes walking, cycling and transit routes, trip planning and trip chaining information, bike parking locations, bicycle repair stations, public washrooms, and real-time information on the availability of bicycle racks on approaching buses to name a few.

Mapping data should be reviewed on a regular basis to ensure it is current and accurate for users.

Providing accurate, accessible, functional physical mapping of routes (such as pocket maps) is also key for users that choose not to use smart phones.
Strategy 2C: Provide More Bicycle Parking and Other End-of-Trip Facilities

Bicycle parking and end-of-trip facilities are critical to encourage people to cycle as a primary mode of transportation by providing a secure place to leave their bicycle and a place to tidy up and or change upon arriving at their destinations. There are generally two types of bicycle parking:

→ **Short-term bicycle parking** typically consists of bicycle racks distributed in the public right-of-way in commercial areas and at key destinations. Since bicycle racks are generally oriented toward residents and visitors stopping in an area for shopping or other personal business, they should be located as close to destinations as possible, in convenient locations that are highly visible for users. Providing a limited number of covered bicycle racks for protection from the elements is desirable.

→ **Long-term bicycle parking** is more secure than typical bicycle racks. This may include bicycle lockers or larger secure facilities, such as bicycle rooms, bicycle cages, secure bicycle parking areas or full-service bicycle stations. Long-term parking is generally oriented toward cyclists needing to park a bicycle for an entire day or longer. Major employment areas, transit stations and areas with high cycling activity are ideally suited to long-term parking facilities. They can also be required in private developments.

Bicycle parking is provided at various locations throughout Cambridge, although there is currently no City owned long-term bicycle parking for public use available. The City publishes the locations of short-term bicycle racks online within Galt City Centre, Preston Towne Centre, and Hespeler Village. Through the engagement process, bicycle theft was identified as a significant concern. Providing secure bicycle parking such as bicycle lockers, rooms and cages to accommodate long-term bicycle parking is important to address concerns about bicycle theft.
Other end-of-trip facilities, such as changing rooms, receptacles for charging electric bicycles, showers, and storage space for equipment can also make cycling more convenient and help build a culture for active transportation within a specific development or place of employment.

The City should also consider offering incentives to business owners who want to provide public bike parking or other end-of-trip facilities for bicycle users.

**ACTION 2C.1: UPDATE DEVELOPMENT REQUIREMENTS AND THE BICYCLE PARKING GUIDE TO PROVIDE CRITERIA FOR SHORT-TERM AND LONG-TERM BICYCLE PARKING AND END-OF-TRIP FACILITIES**

Having safe and secure bicycle parking is critical, as cyclists require a place to park when they reach their destination. At its most basic, this means locking a bike to something within the street right of way. The fear of theft or vandalism is a significant barrier to biking regardless of the cost of an individual’s bicycle. There are different types of bicycle parking, which can be suitable in different situations depending on the duration of the stay. As a result, providing safe and secure bicycle parking at key locations in Cambridge is important for facilitating cycling.

Other end-of-trip facilities, such as changing rooms, showers, and storage space for equipment can also make cycling more convenient as well as to help build a culture for cycling within a specific development or place of employment. This is particularly important in cities that experience variable weather conditions including rain and snow, as more gear is required at certain times of year and having a place to store it has a significant impact on convenience.

The City has developed a Bicycle Parking Guide to provide guidance on the design and implementation of short-term bicycle parking, including single bicycle racks, multiple bicycle parking racks, and bicycle parking lots. In addition, the City’s current Zoning Bylaw does not include any requirements for short-term or long-term bicycle parking.

It is recommended that the City create a bicycle parking policy and update its Zoning Bylaw where applicable to include the following text and requirements. The City should also update the Bicycle Parking Guide to reflect evolving best practices and the needs of all types of people, including providing recommendations for long-term bicycle parking, end-of trip facilities, plug-ins for e-bicycles, and accommodations for new types of bicycles such as cargo bicycles.

**1. Number of Bicycle Parking Spaces**

- A certain number of required bicycle parking spaces must be dedicated and used as long-term and short-term bicycle parking spaces in accordance with Table 4.

- Where the application of this requirement results in a numeric fraction, a fraction of less than 0.5 must be rounded down to the nearest whole number. Fractions equal to or greater than 0.5, are to be rounded up to the nearest whole number.

- Where parking reductions are available, bicycle parking requirements will be calculated using the original parking requirements before reductions are applied.

- Cash in-lieu may be provided for short term bicycle parking within the Downtown Core Areas where it is not feasible to install on private property.

**2. Physical Specifications for Bicycle Parking**

- Required spaces may not be located within: offices, commercial or industrial work areas, dwelling units or balconies.

- The location must be easily accessible and where a bicyclist does not have to use stairs to reach it.

- Short-term bicycle parking spaces shall be located either within 15 metres of the intended public entrances of the building or facility,
or no farther than the nearest motor vehicle parking space to the intended entrance, whichever is closer.

a. All Bicycle Parking spaces shall be situated to maximize visibility so as to discourage theft and vandalism, and shall be illuminated.

b. A bicycle parking space shall be in a paved, level, drained, lighted area with access to a right-of-way without the use of stairs.

→ Long-term bicycle parking spaces shall be provided within:

a. the building or structure; or

b. a covered enclosure with secure entrance; or

c. bicycle lockers.

→ Minimum Dimensions
A bicycle parking space must comply with the following:

a. the minimum dimension of a bicycle parking space is:

i. minimum length of 1.8 metres;

ii. minimum width of 0.6 metres; and

iii. minimum vertical clearance from the ground of 1.9 metres; and

b. the minimum dimension of a bicycle parking space if placed in a vertical position on a wall, structure or mechanical device is:

i. minimum length or vertical clearance of 1.9 metres;

ii. minimum width of 0.6 metres; and

iii. minimum horizontal clearance from the wall of 1.2 metres; and

Table 4 - Minimum Bicycle Parking Requirements

* Student Transportation Services of Waterloo Region delivers School Travel Planning in Waterloo region and has created their own guidelines for board facilities and planning staff and associated contractors, called “Ride, Skate and Scoot: School Storage Facilities Guidelines.”

<table>
<thead>
<tr>
<th>USE</th>
<th>LONG-TERM</th>
<th>SHORT-TERM</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>5% of required motor vehicle parking for the first 5,000 sq/m 1.5% of required motor vehicle parking thereafter</td>
<td>5% of required motor vehicle parking for the first 5,000 sq/m 1.5% of required motor vehicle parking thereafter</td>
</tr>
<tr>
<td>Multi-Unit Residential (6 or more dwelling units)</td>
<td>0.3 per dwelling unit</td>
<td>0.05 per dwelling unit to a maximum of 12, minimum of 2</td>
</tr>
<tr>
<td>Public School* (Elementary &amp; Secondary)</td>
<td>0.2 spaces per teaching area</td>
<td>1.8 spaces per teaching area</td>
</tr>
<tr>
<td>Industrial /Other</td>
<td>5% of required motor vehicle parking for the first 15,000 sq/m 1.5% of required motor vehicle parking thereafter</td>
<td>2 spaces</td>
</tr>
</tbody>
</table>

Figure 15 - Bicycle Rack Dimensions

0.60m

0.80m (MIN.)

0.45m (MIN.)
c. if a stacked bicycle parking space is provided, the minimum vertical clearance for each bicycle parking space is 1.2 metres; and
d. shall be provided adjacent to an unobstructed access aisle that is 1.5 metres wide. The access aisle can utilize any level hard surface such as a sidewalk.

3. Bicycle Parking In Lieu of Motor Vehicle Parking

The City should look at reducing motor vehicle parking requirement by up to 10% through the provision of additional bicycle parking.

**ACTION 2C.2: ENSURE HIGH QUALITY BICYCLE PARKING AND END-OF-TRIP FACILITIES ARE PROVIDED AT ALL CITY OF CAMBRIDGE OWNED AND OPERATED FACILITIES**

Installing and improving existing bicycle parking and end-of-trip facilities at all City owned and operated buildings demonstrates leadership and reinforces to residents, developers, and private business owners that bicycle parking is important to Cambridge. The City does not currently have any long-term bicycle parking available for public use at any of its facilities, although City Hall does have long-term bicycle parking for employees. Adequate bicycle parking at libraries, recreation centres, and other civic centres will benefit employees, residents and visitors and support access to these facilities by bicycle. Providing bicycle parking and end-of-trip facilities at municipal sites would require identifying the type and quantity of facilities required for each of the buildings. This can include the provision of short-term facilities at locations and buildings that see a high amount of visitor activity. Longer-term bicycle parking and other end-of-trip facilities should be considered at locations where there are high concentrations of employees. Provision of both short- and long-term bicycle parking at civic facilities should be generally consistent with requirements for new developments.

**ACTION 2C.3: DEVELOP SECURE CENTRAL HUBS FOR CYCLING IN EACH OF THE FOUNDING COMMUNITIES**

Bicycle theft was identified as a significant concern even where bicycle racks are provided within the public right-of-way. As such, providing secure bicycle parking, such as bicycle lockers, bicycle rooms, or bicycle cages, is an important strategy to ensure bicycles are not stolen or vandalized. Each of the City’s core areas of Galt City Centre, Preston Towne Centre, and Hespeler Village have the potential to be significant hubs of activity for cycling, as they are centrally located and act as major destinations for cycling. The City should develop secure central hubs for cycling in each of these areas, which could include secure and covered bicycle parking, a bicycle repair station, maps, bike share stations, and information on the on-street and off-street cycling network as well as other destinations within the City. By developing this concept, the City can work to create an area for promoting cycling tourism, sharing information, and combining business, tourism, and transportation interests.

**ACTION 2C.4: DEVELOP A PROGRAM FOR PRIORITIZING AND IMPLEMENTING BICYCLE PARKING WITHIN THE PUBLIC RIGHT-OF-WAY AND AT TRAIL LOCATIONS**

The City should develop a program that outlines criteria for prioritizing and implementing bicycle parking in the public right-of-way, at public facilities, and at trail locations (as noted in Action 2C.2), as well as to support businesses in existing developments to retrofit existing buildings to provide bicycle parking and other amenities, such as storage and change room facilities to support employees’ cycling to work year-round. Adding these facilities would likely require a reallocation of existing motor vehicle parking to bicycle parking. There are a number of other North American cities that have implemented these bylaw regulations including San Francisco, Toronto and Minneapolis.
**ACTION 2C.5: CONTINUE TO UPDATE AND PUBLISH MAPS OF BICYCLE PARKING LOCATIONS**

The City publishes the locations of short-term bicycle racks online within the downtown core areas of Preston, Hespeler and Galt, and provides these maps on its website. The City should continue to update and publish its inventory of bicycle parking locations online to reflect new bicycle parking through the City. The City should expand this to distinguish between short-term and long-term bicycle parking, including secure bicycle parking, and should consider expanding the maps beyond the three downtown core areas to have all bicycle parking locations throughout the City shown on the City’s online bicycle network map, and on hard copy maps. This online data could also be integrated with a third party mobile application as described in Action 2B.4.

**Strategy 2D: Ensure Land Use Supports Active Transportation**

Cambridge’s location within Waterloo Region provides residents numerous amenities, including beautiful parks and trails, a scenic riverfront, and abundant recreational and tourism opportunities. The community is home to major employment and regional destinations such as the University of Waterloo, Wilfrid Laurier University, and Conestoga College.

Cambridge’s Official Plan calls for growth to occur within a complete community concept, which includes a mix of jobs, a range of housing options, convenient access to local services and community infrastructure, and access to a range of transportation options.

At a macro-scale, land use includes urban design as it relates to individual site layout and orientation, the setback and setting of buildings, and the details and materials of streetscaping elements (e.g. trees, seating, lighting, bicycle racks etc.) These elements contribute to creating attractive, comfortable and convenient places for people using active transportation.

**ACTION 2D.1: ENSURE FUTURE SUBDIVISIONS AND EMPLOYMENT AREAS ARE INTEGRATED WITH THE EXISTING CYCLING AND TRAILS NETWORK**

Ensuring that existing neighbourhoods and future development areas have cycling connections to the city-wide transportation network is key to promoting more trips by bicycle. It is important to ensure that there are adequate access points that provide direct connections to adjacent areas to support direct and short trips between neighbourhoods by bicycle. Well-designed communities make walking and biking the best way to move around for local trips.

The Cycling Master Plan identifies a proposed City-wide bicycle network. It is recognized that a key component of expanding and enhancing the cycling network is to provide access and connections to existing neighbourhoods within the City, as well as future population and employment areas, as they are often areas of high activity and are generators of transit, walking, and cycling trips. The City should prioritize infrastructure projects that provide cycling, and transit connections to these important destinations, both existing and proposed.

The City should also continue to work with developers and other stakeholders and examine existing policies and standards to ensure the development of new walkable and bikeable neighbourhoods and employment areas.

To help ensure that new developments consider the recommendations of the Cycling Master Plan and help support enhancing network connectivity. The City should develop a checklist that provides land development guidance that is specific to cycling
supportive site planning. This checklist would outline criteria that addresses several considerations such as amount, type and location of bicycle parking provided, if access is provided to the nearest bicycle facility, and if the building can be accessed directly from the street or if individuals are required to cross a parking lot to enter the building, etc. This checklist can be used to review applications and outline changes needed before approval. This checklist could also be incorporated into the update to the Bicycle Parking Guide as noted in Action 2C.4.

Access points that provide connections to adjacent streets and developments support direct and short walking and cycling trips and maximize transit route coverage and directness. It is important that new developments are integrated and well connected with the existing and proposed cycling network to ensure there is a comfortable and accessible way to access developments by bicycle to help encourage more cycling trips. The City should continue to review all development applications and consider if cycling connections have been included and work with developers to find opportunities to enhance connectivity. In addition, the City should ensure that off-road cycling and trail networks are considered early in the subdivision design process and that they are included in Environmental Impact Studies.

**ACTION 2D.2: CONTINUE TO SUPPORT THE PROVISION OF A REGION-WIDE PUBLIC BIKE SHARE SYSTEM**

Public bike share programs provide community members with temporary access to a bicycle, through payment for short-term rental periods. Public bike share programs around the world each have their own blend of unique characteristics which range from a variety of ownership and operation models, user experiences, distribution and integration with other modes and systems, among other factors. Public bike share systems can make it more convenient and enjoyable for those that walk or use transit daily and can also provide an important service for tourists.

In 2019, the City participated in a one-season pilot with the bikeshare provider Dropbike. Dropbike operated their system in Waterloo, Kitchener and Cambridge. The service ran from May 2019 - December 2019. Over 4,600 rides were taken by Dropbike users since the launch.

The Region of Waterloo and cities of Kitchener, Waterloo and Cambridge received funding to hire consultants to conduct a joint study on the available options and minimum operational requirements for a sustainable bike share program that will support transit and adequately service residents of the Waterloo Region. The final recommendations for 2020 and beyond will be presented to Regional and Municipal Councils in early 2020. Pending the results of the final recommendations, the City should work with partners to support the provision of a permanent, on-going, Region-wide Public Bike Share system.
THEME 3 | ALL SEASONS

While the installation of new infrastructure to promote and encourage cycling is often seen as a top priority, ongoing rehabilitation and maintenance of existing and new infrastructure needs to be an equally important focus. Maintenance needs to be considered at all stages of the planning and the design process. Maintenance is necessary to keep active transportation facilities functional and usable throughout all seasons, which ensures that facilities are universally accessible throughout the year. On-street bicycle routes and off-street trails are an important component of Cambridge’s transportation system and must be capable of accommodating all users in all seasons.

WHAT WE HEARD: ALL SEASONS

Through the public engagement for the Cycling Master Plan, we heard a number of opportunities and suggestions to improve maintenance of cycling and trail routes in all seasons within the City:

→ Snow removal on bicycle routes
→ Operational support and funding
→ All season bike events
→ Education programs about winter cycling
→ Weather protected bicycle parking
→ Showers and end of trip facilities
→ Clear debris out of bicycle lanes
→ Mitigation of flooding

The Cycling Master Plan includes two strategies to ensure cycling and trails are well-maintained throughout the year.
Strategy 3A: Maintain an Integrated Cycling Network Year-Round

On-going maintenance is necessary to keep infrastructure functional and usable over time. Additionally, proper maintenance is required throughout the year. In some situations, maintenance can often be overlooked or neglected due to tight operating budgets, large outstanding maintenance needs, or an insufficient inventory of bikeway maintenance issues. This strategy focuses on ensuring there is an integrated network of on-street and off-street cycling facilities that can be used in all seasons.

**ACTION 3A.1: IMPLEMENT YEAR-ROUND MAINTENANCE SERVICE STANDARDS FOR TRAILS**

The City has established year-round maintenance service standards for trails based on trail type and surface material. There are six types of trails within the City of Cambridge as described previously (Regionally Significant Multi-Use Trails, Primary Multi-Use Trails, Secondary Multi-Use Trails, Internal Park Trails, Access Trails, and Neighbourhood Connectors). Trails are maintained by Parks and Operations. Winter maintenance of trails only applies to hard surface trails, such as asphalt or concrete trails.

**Winter Trail Maintenance**

Proposed winter maintenance practices for each trail type are outlined in Table 5, including snow clearing time frame, whether the process is reactive or proactive, and the desired pavement condition.Trail service standards have been determined based on the Provincial Minimum Maintenance Standards (MMS O.Reg. 239/02) and the City’s Bylaw. The governing document is dependent on the location of the trail.

There are two primary strategies that make use of chemical freezing-point depressants in winter maintenance programs: anti-icing and de-icing.

- **Anti-icing:** A primarily preventative approach where the material is applied to the road before

**CASE STUDY:**

During the winter of 2017 – 2018, the City of Edmonton conducted an expanded anti-icing pilot program on about 3,000 kilometres of road, or about 40% of Edmonton’s arterial and collector streets. The pilot program also included treatment of about 12 kilometres of bicycle lanes, and 8 kilometres of multi-use pathways. The pilot aimed to apply calcium chloride, an anti-icing agent, to streets and bicycle facilities before or during a snowfall. The product prevents snow from sticking to the pavement, increasing the efficiency of snow removal, reducing the need for sanding and plowing, and helping the pavement stay clear of snow for a longer period. During previous trials, the City found the treatment to be effective, and is now focusing on developing their processes for anti-icing and training their staff in the procedure.
an expected winter event (approximately two hours) to prevent or delay the formation or development of bonded snow and ice to roadway and make future accumulations easy to remove. Materials typically include salt and various liquid mixtures (e.g. brine, magnesium chloride, and corn based solutions) Some agencies have also recently begun using a beet juice additive in combination with street salt and/or salt brine. Although thought of as an advanced solution, the Region of Waterloo and Cities of Cambridge, Kitchener, and Waterloo previously piloted various beet juice mixtures in varying blends for a number of years, and due to a number of issues, have since switched away.

→ De-icing: A primarily reactive approach that is characterized as applying materials to the road surface, after the winter event. For example, the snow or ice is plowed off the surface and the de-icing material is applied to the road to break the bond between the ice and the road.

The City currently follows a reactive approach on Trails and a combination of reactive/proactive approaches for on-road cycling facilities.

The proposed standards include a focus on high quality snow clearing and snow and ice control considerations for Regionally Significant and Primary Multi-Use Trails, including proactive snow and ice control strategies followed by snow clearing within 24 hours. The City should continue to pilot varying additives on these types of trails. For other types of trails, snow clearing is recommended within 36 hours along with de-icing.

The City should also consider enhanced snow clearing priority in areas with high concentrations of people at increased risk of injury such as children and older adults, including areas near schools, parks, community centres.

<table>
<thead>
<tr>
<th>CLASS DESCRIPTION</th>
<th>SNOW CLEARING TIMEFRAME</th>
<th>REACTIVE / PROACTIVE</th>
<th>PAVEMENT CONDITION (IE. CLEAR TO PAVEMENT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regionally Significant</td>
<td>12 hours or less</td>
<td>Proactive</td>
<td>Less than or equal to 5 cm to a 1 metre clear width</td>
</tr>
<tr>
<td>Multi-Use Trail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Hard Surface Only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Multi-Use Trail</td>
<td>24 hours or less</td>
<td>Proactive</td>
<td>Less than or equal to 5 cm to a 1 metre clear width</td>
</tr>
<tr>
<td>(Hard Surface Only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary Multi-Use Trail</td>
<td>36 hours or less</td>
<td>Reactive (Treat for ice within 48 hours)</td>
<td>Less than or equal to 5 cm to a 1 metre clear width</td>
</tr>
<tr>
<td>(Hard Surface Only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Park Trail</td>
<td>36 hours or less</td>
<td>Reactive (Treat for ice within 48 hours)</td>
<td>Less than or equal to 5 cm to a 1 metre clear width</td>
</tr>
<tr>
<td>(Hard Surface Only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access Trail</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Neighbourhood Connectors</td>
<td>24 hours or less</td>
<td>Reactive (Treat for ice within 48 hours)</td>
<td>Less than or equal to 5 cm to a 1 metre clear width</td>
</tr>
<tr>
<td>(Hard Surface Only)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 - Winter Maintenance Practices by Trail Type
Winter Cycling Network

Based on the proposed year-round maintenance standards for trails and on-street bicycle facilities, the City should develop a winter cycling network as shown in Figure 16. This winter cycling network includes all existing cycling facilities that are part of the City’s primary or secondary plow priority network, all existing City spines, all existing paved trails, and all proposed short-term projects.
Year-Round Trail Maintenance

Landscaping and vegetation management can be especially important along trails and bicycle facilities, as they can become inaccessible due to overgrown vegetation. The City currently mows trails in accordance with current service targets to prevent open spaces and trails from becoming overgrown. Grass and brush that grows along recreational trails and multi-use trails should not be allowed to grow close to the edge of the trail. The width of grass and brush cleared along the trails varies with each municipality. In Cambridge, a cleared width of 1 metre from the edge of the trail is generally provided.

Recommended guidance for landscaping and vegetation management includes:

→ Ensure that all landscaping is designed and maintained to ensure compatibility with the use of bicycle facilities;

→ Monitor bicycle facilities to ensure they are clear of encroachment by vegetation, such as overgrown grass, bushes, or tree branches;

→ Ensure that signage, bicycle signal heads, and sightlines are not obstructed by vegetation;

→ After major damage incidents such as a flood or major storm, bicycle facilities should be checked, and fallen trees or other debris should be removed as quickly as possible; and

→ Install root barriers during construction as a preventative measure to mitigate surface damages and hazards caused by plant roots.

The City should consider conducting proactive patrolling of trails to identify and, ultimately, address maintenance issues as soon as possible.

**ACTION 3A.2: IMPLEMENT YEAR-ROUND MAINTENANCE SERVICE STANDARDS FOR ON-STREET BICYCLE FACILITIES BASED ON THE MINIMUM MAINTENANCE STANDARDS AND INTERNAL PRACTICES**

Maintenance practices are based on the MTO road classification. Most of the existing on-street bicycle facilities consist of conventional painted bicycle lanes or shared use lanes. The proposed cycling network has identified several kilometres of new separated bicycle lanes.

The MMS for Municipal Highways (Ontario Regulation 239/02) were updated in May 2018. The updated standards include a greater focus on maintenance standards for active transportation facilities, including bicycle lanes and sidewalks.

The MMS for addressing snow accumulation on bicycle lanes are as follows:

→ After becoming aware of the fact that the snow accumulation on a bicycle lane is greater

### Table 6 - Snow Accumulation – Bicycle Lanes (Source: MMS for Municipal Highways)

<table>
<thead>
<tr>
<th>CLASS OF HIGHWAY OR ADJACENT HIGHWAY</th>
<th>DEPTH</th>
<th>TIME FOR BICYCLE LANES</th>
<th>TIME FOR ROADWAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.5 cm</td>
<td>8 hours</td>
<td>4 hours</td>
</tr>
<tr>
<td>2</td>
<td>5 cm</td>
<td>12 hours</td>
<td>6 hours</td>
</tr>
<tr>
<td>3</td>
<td>8 cm</td>
<td>24 hours</td>
<td>12 hours</td>
</tr>
<tr>
<td>4</td>
<td>8 cm</td>
<td>24 hours</td>
<td>16 hours</td>
</tr>
<tr>
<td>5</td>
<td>10 cm</td>
<td>24 hours</td>
<td>24 hours</td>
</tr>
</tbody>
</table>
than the depth set out in the Table 6, to deploy resources as soon as practicable to address the snow accumulation; and

- After the snow accumulation has ended, to address the snow accumulation so as to reduce the snow to a depth less than or equal to the depth set out in Table 6 to provide a minimum bicycle lane width of the lesser of 1 metre or the actual bicycle lane width.

If the depth of snow accumulation on a bicycle lane is less than or equal to the depth set out in Table 6, the bicycle lane is deemed to be in a state of good repair in respect of snow accumulation.

The formation of ice and de-icing practices specific to bicycle facilities is not separated out in the MMS. However, the section which sets out the standards for ice formation on roads does include text stating “this section applies in respect of ice formation on bicycle lanes on a roadway but does not apply to other types of bicycle facilities.”

Similar to the approach adopted for the Regionally Significant and Primary Multi-Use Trails, the City should follow a proactive approach for new on-street separated bicycle lanes. As separated bicycle lanes are constructed, the City should pilot an approach to anti-icing followed by snow clearing based on MMS standards.

What will be important to consider is that through the implementation of the Bicycle Network Plan several kilometres of new on-street cycling facilities will be implemented. In order to achieve the MMS, the City will need to consider operations and maintenance budgets, resources, and equipment.

In addition to winter maintenance practices, the current service standard for street cleaning as outlined in the City’s Outside Services Review is as follows:

- Street cleaning will occur once in the spring and once in the fall, with additional passes as deemed necessary.

- Bicycle Lanes should be swept as required to maintain a safe riding surface for cyclists.

The City should consider conducting proactive patrolling of cycling facilities to identify and, ultimately, address maintenance issues as soon as possible.

**ACTION 3A.3: REVIEW AND UPDATE THE CURRENT LOOSE LEAF COLLECTION PROGRAM**

The current Loose Leaf Collection program runs for typically four weeks through the month of November. Neighbourhoods are assigned pick-up dates that span approximately one week. During this time residents and property owners rake their leaves onto the road for collection. Loader crews, leaf vacuums, and sweepers are active through this time to collect the deposited leaves. As on-street bicycle facilities are typically located adjacent to the curb lane, over the course of the week the cycling facility is obstructed by leaves and debris. The City should review and update the current Loose Leaf Collection Program and consider advising property owners that live adjacent to a bicycle lane to rake their leaves to the boulevard space adjacent to the curb (where available) as opposed to onto the street. Similar approaches have been used in cities such as Mississauga and can be used as an example for the City of Cambridge.

**ACTION 3A.4: ASSIGN AN ENHANCED WINTER MAINTENANCE STANDARD FOR LOCAL STREETS WITH DEDICATED BICYCLE FACILITIES**

There are several proposed cycling routes that are located on local streets within the City of Cambridge. These streets typically have a lower winter maintenance service standard. Many of the routes on local streets have been identified as part of the City Spine network and provide connections to key destinations within the City. As these routes on local streets are implemented, the City should consider adding them to the existing salting route, which would give them a higher priority for general winter maintenance. It may not be necessary for all
streets to be reprioritized. As these new routes are implemented, the City can review each route and determine if reprioritization is required. This review can include:

→ Monitoring bicyclist volumes on local street bikeways in the summer to determine if the route is well-used as an indicator of winter use.

→ Review route connectivity
  • Consider the roadway’s role in the network as a whole and whether it is part of the City Spine network
  • Consider whether the street connects to other bicycle facilities that are winter maintained
  • Consider whether the route provides a direct connection to a school, park, or community centre

**ACTION 3A.5: DESIGN BICYCLE ROUTES AND TRAILS TO FACILITATE DRAINAGE AND SNOW STORAGE**

One of the best ways to facilitate the clearing of snow from bicycle facilities and trails is incorporating this into roadway, bicycle facility, and trail design. Unfortunately, conventional painted bicycle lanes located at the edge of the roadway, particularly if there is no boulevard space, often become the area for snow storage, and can accumulate debris and gravel. One of the most effective ways to mitigate snow storage and clearing is through careful consideration of maintenance during the planning and design process. There are several road planning and design elements that can be considered, though it is important that City staff work together to ensure designs can address all year-round maintenance concerns.

→ Design roads and facilities with sufficient space for snow storage and to be wide enough to fit standard snow-clearing equipment: On new streets or street rehabilitation projects that include both separated or unprotected bicycle facilities (or may include them in the future), sufficient space should be provided to allow for a desired 1.8 metre bicycle facility and a metre storage space of at least 0.5 metres for snow on the side of the road or in the boulevard between the sidewalk and the bicycle facility. This will allow typical truck-mounted snowplows to plow snow into the designated storage space rather than the bicycle lane. A 1.8 metre width of the bicycle facility also allows some narrowing of the bicycle lane due to snow build up while still maintaining its functionality. Where feasible, a wide bicycle lane buffer can also be provided to increase the amount of storage space for snow (Figure 17).

→ Provide a wide buffer on sidewalks: Buffer space should be provided along the Furnishing Zone in order to allow the Furnishing Zone to be cleared without pushing the snow into any adjacent bicycle facility.

→ Remove snow from the storage locations: Snow storage can be located in the centre of the road along medians, in the boulevard and sidewalk buffer, and, in the case of protected bicycle lanes, in the road buffer. Snow removal from these temporary storage locations may be necessary as part of efforts to reduce icing over of the bicycle facility due to freeze/thaw cycles. Snow removal can be particularly important in urban and city centre environments and can be completed using a variety of equipment including loaders.

→ Consider providing walking and cycling facilities at the same vertical level: When considering facilities at a different vertical level than the road, consider using sidewalk-level separated bicycle lanes. This may allow for both facilities to be cleared at the same time and may reduce or eliminate the need for specialized equipment.
→ **Restrict on-street parking during snow events:** Where a bicycle facility is located between on-street parking and the motor vehicle lane, parking along the road can be restricted during snow events to allow this space to become temporary snow storage space. While this may not be an option for all roads, it could be utilized along priority bicycle routes in the winter. When motor vehicles are parked in the road during snow clearing the snow can accumulate in the bicycle lane but can also create a barrier making it challenging for smaller vehicles to exit their parking spot.

The City Standards should be updated to account for snow/ice removal as well as other maintenance activities in the design of bicycle infrastructure.

**Strategy 3B: Keep the Cycling Network in a State of Good Repair**

The City should aim to maintain a safe, efficient, and reliable cycling network throughout the year. Maintaining facilities in a state of good repair means the City keeps its facilities in the condition they are meant to be used for. This involves regularly monitoring and inspecting cycling facilities to ensure cycling facilities are in good condition and ensuring sufficient resources are dedicated to on-going maintenance and inspection.

**ACTION 3B.1: REVIEW AND CONSIDER UPDATING THE EXISTING INSPECTION PROGRAM TO ENSURE ADEQUATE CYCLING FACILITY AND TRAIL SURFACE CONDITIONS AND QUALITY**

In Cambridge, inspection of trails is undertaken by Community Development Department; Parks, Recreation and Culture Division (Parks) and is independent of the road patrol. The current trail inspection program focuses on identifying hazards and is less of an assessment of the current condition. On-street bicycle facilities are patrolled and inspected at the same standard as the adjacent road where road conditions are recorded and documented. Deficiencies are mitigated in...
accordance with the MMS requirements. Additionally, the City currently has an Asset Management Sidewalk Inspection Program that focuses on ensuring that sidewalk facilities are maintained and managed to ensure effective and efficient operations.

It is recommended that these different inspection programs are combined to include all active transportation facilities (sidewalks, on-street bicycle facilities, and trails including wayfinding signage). As part of consolidating the programs, there is a need to define the service standards and update the program description to ensure it is appropriate for active transportation infrastructure. Recognizing that what might be a hazard for a motor vehicle is different than what is a hazard for someone on a bicycle.

Inspections should include surface condition, drainage, culvert crossings, bridges, vegetation, graffiti, and signage. Inspections must be properly documented to adequately stand up in a claims and court proceedings. Inspection documentation should be reviewed and consolidated.

**ACTION 3B.2: CONSIDER THE DEVELOPMENT OF AN APP OR TOOL TO ALLOW USERS TO REPORT MAINTENANCE ISSUES**

The City typically receives feedback and comments on current maintenance practices including road and trail issues and hazards online or by phone call. The City also has an existing mobile app that allows people to report several issues and provide georeferenced locations. One of the components not addressed through the app or online is a specific category to identify issues that are found along on-street bicycle facilities. Current bicycle specific issues are either grouped as an on-street issue or as an off-street trail issue. The City should look for opportunities to expand the existing service to include bicycle facilities and to ensure the app is promoted. There are examples from other cities, including the City of Halifax, that focus on collecting information on maintenance issues specifically for cycling facilities.

**ACTION 3B.3: SHARE BICYCLE ROUTE AND TRAIL MAINTENANCE INFORMATION INCLUDING TIMELINES WITH THE PUBLIC**

Through the public engagement process, it was heard that there was a desire for more readily available information on the current maintenance practices for trails and on-street bicycle facilities. The City has a webpage dedicated to winter maintenance that outlines current practices and provides updates on the plow status of roadways within the City. The City should look for opportunities to provide additional information on sidewalk, bicycle lane, and trail snow clearing status as technology becomes available to accurately share this information. In the meantime, promoting the existing website and mapping tools can help ensure residents know where information on maintenance practices and snow clearing is available.

**ACTION 3B.4: ENSURE ADEQUATE BUDGET, EQUIPMENT, AND STAFF ARE AVAILABLE TO MAINTAIN BICYCLE FACILITIES AND TRAILS YEAR-ROUND**

As more on-street cycling and trail facilities are installed, it will be important to ensure the amount of funding available grows in accordance to the amount of infrastructure being added to the network. Additionally, separated bicycle lanes along existing roadways have been found to increase safety for people cycling, which can result in an increase in ridership. However, these facilities can present challenges related to maintenance, especially if appropriate funding and equipment to maintain the protected network is not available. Current maintenance funding, staffing resources, and equipment levels required to maintain all planned and existing types of active transportation infrastructure will need to be reviewed and appropriately forecasted.
THEME 4 | PROMOTION

Although engineering measures are critical, a range of support measures are equally important to build a cycling culture and encourage people to travel by bicycle in Cambridge. Together with engineering measures, these support measures such as education, encouragement, enforcement, and evaluation make up 'The Five E’s’ that are all integral parts of a comprehensive plan to encourage cycling. These support measures can help to provide education and raise awareness about cycling.

Education and encouragement initiatives can include providing information to the public on the benefits of cycling, hosting events to promote cycling, and supporting programs that teach skills and awareness of road safety and cycling. Education and awareness initiatives are important and cost-effective measures to enable residents to feel more safe and comfortable cycling throughout Cambridge.

Approaches to increase awareness can include enhanced wayfinding and signage, trip planning tools, route maps, skills-building programs, promotional campaigns, and public education campaigns. Improving awareness is typically a cost-effective approach that makes people feel safer and more comfortable using active transportation, while encouraging increased use of cycling facilities.

WHAT WE HEARD: CELEBRATE CYCLING

Through the public engagement for the Cycling Master Plan, we heard a number of opportunities and suggestions to improve promotion of cycling in Cambridge:

→ Educate motorists with campaign videos and commercials using social media
→ Reach kids at a young age on cycling in school
→ Create names and wayfinding for trails

Strategy 4A: Raise Awareness and Education

Action 4A.1: Use City and Region-wide campaigns to deliver positive messaging to promote cycling
Action 4A.2: Provide education materials explaining how to use new infrastructure types
Action 4A.3: Work with partners in the development of road safety awareness and education campaigns for all road users
Action 4A.4: Support and work with partners to expand the Bike Valet Program
Action 4A.5: Continue to support the Cycling into the Future Program
Action 4A.6: Develop a Bicycle Infrastructure Celebration Toolkit to celebrate grand openings and events throughout the year
Action 4A.7: Ensure a portion of project funding is allocated to education, awareness, and encouragement
Action 4A.8: Support School Travel Planning to reduce traffic at school sites and to encourage more active school travel among students
Action 4A.9: Support events and festivals that encourage cycling such as the Tour de Grand

Strategy 4B: Make it Easier to Find Your Way

Action 4B.1: Develop and implement a wayfinding and tourism strategy that is consistent and integrated with surrounding communities and the Region of Waterloo
Action 4B.2: Continue to implement wayfinding pilot projects for local street bikeways
Action 4B.3: Develop a map that combines information about tourist destinations, local businesses, and cycling routes
Maps that fill the gaps - show how to get between trails and on street facilities

Include time to reach destinations on wayfinding signs

Ensure wayfinding signage is readable, particularly when riding at higher speed

The Cycling Master Plan includes three strategies to promote cycling. Each strategy is accompanied by a number of supporting actions that seek to create a cycling environment that is integrated with the communities they are located within, their regional connections, and with other forms of sustainable transportation such as transit.

**Strategy 4C: Promote Bicycle Tourism**

**Action 4C.1:** Develop and implement a bicycle tourism initiative building off the Provincial Cycling Tourism Plan

**Action 4C.2:** Develop and promote cycling loops throughout the City for recreational and tourism cycling

**Action 4C.3:** Work with neighbouring communities and the Region to expand and enhance the Regional trail network

**Action 4C.4:** Continue to work with local businesses to expand the number of bicycle friendly businesses

**Action 4C.5:** Promote the unique characteristics of Cambridge that make it a desirable cycling tourism destination

**Strategy 4A: Raise Awareness and Education**

Education and awareness initiatives geared towards motorists as well as active transportation users are important components of any cycling plan. These initiatives encourage all parties to "share the road" and can contribute to increased bylaw and Highway Traffic Act compliance among all road users. While infrastructure is not built overnight, education and awareness items are often "quick wins" that can be implemented at relatively low-cost. In addition, education and awareness campaigns can actively build community interest for Cambridge’s investments in active transportation.

**ACTION 4A.1: USE CITY AND REGION-WIDE CAMPAIGNS TO DELIVER POSITIVE MESSAGING TO PROMOTE CYCLING**

Many people have a perception of cycling as being only for those who are athletic, dressed in specialized clothing, those seeking to improve their race times, or by low income groups. In order to see an increase in the number of people cycling, it is important to change this perception, and promote cycling as a safe, reliable, convenient, and accessible transportation choice for all people, not just those
seeking exercise. A campaign that features women, children, and minorities as regular users of the cycling network will help to counter this perception and normalize cycling for all. The City should also seek to highlight its favourable climate, drawing attention to the warm weather as a reason to “Get outside” in all seasons by bike. This should also include a focus on cycling throughout the winter to try to increase winter cycling participation.

Communities around the world have focused on promoting cycling positively through marketing and communications. Campaigns can help to break down myths and misconceptions regarding perceived barriers to cycling, namely perceptions about lack of time, health issues, weather, safety and security, age, and the feeling that cycling is impractical. Cambridge should work with partners to improve education and awareness of cycling, as a cost-effective approach to encouraging more people to ride in their community.

**ACTION 4A.2: PROVIDE EDUCATION MATERIALS EXPLAINING HOW TO USE NEW INFRASTRUCTURE TYPES**

A challenge with the installation and implementation of new types of cycling infrastructure can be ensuring that all road users, including cyclists and motorists, are both aware of its presence, as well as how to safely navigate it, either by bicycle or in a vehicle. Often, these new facilities may be entirely new or unfamiliar to many and can result in confusion as to how to safely interact with them. Undertaking a campaign that demonstrates the proper usage of these facilities for all road users, including cyclists and motorists, can help to increase both the safety of all road users, as well as help to encourage usage of these new facilities amongst residents. Particular attention should be given to materials which explain how to use various intersection treatments, given the high percentage of collisions that occur at intersections.

**CASE STUDY:**

PeopleForBikes, an industry coalition of bicycling suppliers and retailers in the United States, has developed a campaign called Travel With Care. The Travel With Care campaign is aimed at humanizing people on bikes and encouraging better behaviour among drivers and bicycle riders. The aim of the campaign is to inspire the general public to see every bicycle rider as a neighbour, friend or family member—just a normal person who chooses to bicycle. In addition to humanizing bicyclists, the campaign’s message is built around bettering behaviour by both people in cars and on bicycle by asking them to travel with care and to “melt icy relations on the road.”

**LOCAL EXAMPLE:**

The Waterloo Regional Police Services has a “Snap’N Save” program that encourages residents to photograph their bike’s serial numbers for proof of ownership.

- Store your bike in a well lit public location, preferably with video cameras.
- Lock the wheels to the frame and both to a secure object.
- **SNAP’N SAVE Two Photos**
  - You with your bike
  - Your bike’s serial number
- Protect your purchase and help police recover your bike if it’s stolen.
CASE STUDY:
In 2015, the City of Calgary implemented a network of protected bicycle lanes in its downtown core. The City had not previously installed protected bicycle lanes, and the treatments were unfamiliar to many road users. To help raise awareness of the new infrastructure, the City developed a brochure providing information for all road users about the new downtown bicycle network, including an overview of the new types of infrastructure along with tips and maps illustrating how to use the new infrastructure for all road users, including people driving, cycling, and walking. The brochure was made available at kiosks at multiple locations on the downtown bicycle network and online.

ACTION 4A.3: WORK WITH PARTNERS IN THE DEVELOPMENT OF ROAD SAFETY AWARENESS AND EDUCATION CAMPAIGNS FOR ALL ROAD USERS

Road safety campaigns can be critical to raising awareness of common behaviours that can cause serious injuries and potentially fatal consequences for all road users. Road safety campaigns can focus on common behaviours identified through a review of collision and safety data. The program should be targeted not only to people walking and cycling, but also to motorists. These campaigns can be developed in partnership with other agencies throughout the region and the province.

ACTION 4A.4: SUPPORT AND WORK WITH PARTNERS TO EXPAND THE BIKE VALET PROGRAM

Large community events can create traffic congestion and overwhelm motor vehicle parking capacity. Depending on their location, they can also generate a significant amount of cycling trips and a temporary spike in bicycle parking demand. One way to mitigate such challenges is to work with event organizers to provide and promote the use of temporary secure bicycle parking and/or bicycle valet programs. The City already offers a free bicycle valet at events including the Hespeler Music Festival and the Cambridge Ribfest. The City should continue to work with event coordinators to ensure that temporary bicycle parking is provided at all community events, such as Concerts in the Park, Canada Day, and the Cambridge Fall Fair. The City should consider hiring a co-op student to help run the Bike Valet Program during peak periods.

ACTION 4A.5: CONTINUE TO SUPPORT THE CYCLING INTO THE FUTURE PROGRAM

Cycling Into The Future’s mission is to educate every student in the Waterloo Region in their comprehensive cycling education program. Cycling Into The Future promotes the love of biking among Grade 5 students in the Waterloo Region. Built around modules that develop skills in such areas as tire repair, riding,
and on-road safety awareness, Cycling Into the Future has trained over 4,000 students in schools in Cambridge, Kitchener, Waterloo, and Woolwich Township, including over 1,000 students in Cambridge. Through a series of challenges, Cycling Into the Future seeks to build knowledge, skill, and confidence in students, so they can become safe and enthusiastic cyclists. The program invites all students to participate in this training. Special learn-to-ride instruction is provided to students who do not know how to ride a bicycle. The program provides refurbished bicycles and new helmets to students who cannot afford them. The Cycling Into the Future Program includes a comprehensive six module training program designed to teach children how to safely and confidently own and operate a bicycle. Through their covenant of inclusion Cycling Into The Future ensures that every student can participate in the program by further subsidizing student fees for schools in low-income neighborhoods and having schools pay the fee for families who are not able to as well as providing bikes and helmets for students who don't have them, teaching kids to ride for the first time, and adapting their instruction and equipment for students with special needs.

The City has supported this program financially and should continue to subsidize this program to schools throughout Cambridge.

**ACTION 4A.6: DEVELOP A BICYCLE INFRASTRUCTURE CELEBRATION TOOLKIT FOR GRAND OPENINGS AND EVENTS THROUGHOUT THE YEAR**

The City should continue to find ways to celebrate the installation of new cycling projects through website material, videos, posts on social media, and events that raise awareness and get people excited about the ongoing implementation of the Cycling Master Plan. The City should develop a Bike Infrastructure Celebration Toolkit that would offer a checklist of items that need to be completed every time the City completes a project. This could include items such as templates for newspaper advertisements, surveys, social media posts, and press releases to help build the profile of cycling and the impacts of projects. When new major cycling projects are completed, celebration events should be held and Cambridge should use the resources in the toolkit to continue to promote new projects through social media, press releases and other forums to raise awareness and to provide people with an opportunity to try the new facility.

**ACTION 4A.7: ENSURE A PORTION OF PROJECT FUNDING IS ALLOCATED TO EDUCATION, AWARENESS, AND ENCOURAGEMENT**

An important component of installing new infrastructure projects is ensuring that residents are aware of new investments and are familiar with how to use the facilities. Promotion of new infrastructure projects helps to build education and share safety information specific to new facilities that may be unfamiliar. To ensure appropriate funds are available for education, awareness and encouragement, a portion of every active transportation project’s capital budget should be allocated to education, awareness and encouragement. The City should develop a budgeting checklist for all new projects to ensure project funding includes education, awareness, and encouragement as part of the capital budget.

**SINCE 2016, CYCLING INTO THE FUTURE IN CAMBRIDGE HAS INCLUDED:**

→ 17 schools have participated
→ Over 1,000 students have gone through the training
→ Over 50 helmets given out
→ 50 bicycles given out
ACTION 4A.8: SUPPORT SCHOOL TRAVEL PLANNING TO REDUCE TRAFFIC AT SCHOOL SITES AND TO ENCOURAGE MORE ACTIVE SCHOOL TRAVEL AMONG STUDENTS.

School Travel Planning in the Waterloo Region is directed through a partnership of municipalities and school boards and it has two mandates: to promote the use of active school travel, and to reduce school traffic. School Travel Planning typically focuses on 6 E’s: engineering, education, encouragement, enforcement, evaluation, and equity. Solutions are customized for each school site and often involve a group of interventions that might include Sidewalk Smarts education, Trailblazer patrollers, active transportation celebration days, tactical urbanism, walking clinics, the CAA Foot Patrol program, Drive to Five campaigns, Cycling into the Future education, bike rodeos, Walking School Buses and creative interventions customized to unique school scenarios. The City should continue to partner with school boards and other municipalities to fund, support, and actively direct the coordinated region-wide School Travel Planning initiative. This action would result in greater social attention and understanding of the impacts of mode choice; greater safety for those who are using active school transportation; and a gradual shift in mode choice away from family vehicle use.

ACTION 4A.9: SUPPORT EVENTS AND FESTIVALS THAT ENCOURAGE CYCLING SUCH AS THE TOUR DE GRAND

Since the first Tour de Grand in 1998, the recreational cycling event has grown in popularity and size. The City should continue to support events (both financially and with a visible presence) such as the Tour de Grand, that promote cycling as a fun, healthy activity. Events that celebrate cycling help to build a culture for it, increasing momentum for further investments in cycling and more cycling use. Cambridge should also work with community associations and other groups to support and encourage cycling programs such as neighbourhood cycling clubs. Annual events may be included in event calendars produced internally and by external organizations where feasible.

Strategy 4B: Make it Easier to Find Your Way

A seamless, consistent, and easy-to-understand system of trip planning tools, signage and wayfinding for cycling is important. It can make the transportation network easier to navigate, identify the location of important destinations, and provide information about route type. Most importantly, wayfinding helps people make decisions about how to navigate a neighbourhood or area.

Current wayfinding, signage and trip planning measures in Cambridge are primarily focused on bicycles and vehicles and situated along designated bicycle routes. Cambridge’s website includes a Bikeway Network map, individual trail maps, and information on bicycle parking and the free valet bike parking at events. The website also provides several suggested Neighbourhood Bike Routes with maps, surface types, and route descriptions provided. Building on and expanding existing wayfinding, signage and trip planning tools enables people cycling to identify facilities and destinations throughout Cambridge.

ACTION 4B.1: DEVELOP AND IMPLEMENT A WAYFINDING AND TOURISM STRATEGY THAT IS CONSISTENT AND INTEGRATED WITH SURROUNDING COMMUNITIES AND THE REGION OF WATERLOO

The City has implemented wayfinding plans for two routes in Galt and Hespeler using custom blue signs. Two types of signs have been developed, including Roadway Confirmation Signs identifying the corridor as a Bike Route along with identification of a key destination and travel time and distances, and Roadway Turn Signs. Throughout the development of the Cycling Master Plan, wayfinding has emerged
as an important topic, with a desire for regional consistency throughout the Waterloo Region to ensure that users have a seamless experience to travel to and from their destinations, regardless of which municipality they are travelling through. This requires a consistent approach to wayfinding, including the types of signs, destinations, and information provided.

This action includes the development of a wayfinding strategy that builds upon the City’s current wayfinding practices as well as other practices within the Waterloo Region to ensure regional consistency. Wayfinding is a decision-making process related to navigation and is important to provide simple, clear, and intuitive information to help people navigate spaces effectively and intuitively. This helps people identify how they can navigate a city, neighbourhood, or active transportation network effectively from their present location to their destination.

A seamless, consistent, and easy-to-understand system of wayfinding for cycling is important. It can make a community’s active transportation network easier to navigate, identify the location of important destinations, and provide information about facility type. Wayfinding typically refers to signage and pavement markings which help to guide users to designated facilities and key destinations, along preferred routes, without the assistance of a smartphone or other mapping tools.

It is important to consider that many residents and visitors may not be familiar with the location of existing cycling facilities or community destinations. A wayfinding system helps provide information about routes, but also helps to identify destinations that can be accessed via a given route or within a short walking or cycling distance. Wayfinding can also help raise awareness of the distance and time that is required to travel to destinations within a community by walking or cycling.

Design Principles
The wayfinding strategy is based on six overarching Design Principles:

→ **Layout.** The layout of information should be duplicated for each sign type and the signage should clearly identify that the information is intended for people cycling. Layout features such as size, style, colours, and font choice, should be the same across the wayfinding network, even if it crosses multiple jurisdictions. This will help to make it clear which user the wayfinding is targeted to.

→ **Simple.** The information that is being conveyed should be structured and presented to the intended audience in a clear and logical form. The information provided needs to be read quickly at the desired travel speeds. While people walking may have more flexibility and willingness to stop, people cycling need to be able to maintain an even pace as they take in the information and identify their desired route. Simple and easily read wayfinding signage should be provided over complex messaging, such as listing too many destinations or providing unnecessary additional text.
→ Predictable and Consistent. When the information that is being shared is predictable, it can be quickly recognized, understood, and used. Predictability can relate to a number of aspects of wayfinding information, from the placement of a sign to the design of its contents. Predictability also means that understanding can be recalled for use in new situations and unfamiliar areas. In addition to predictable placement and content, the consistent use of an agreed list of road and destination names and references allows for users to confidently use wayfinding signage to reach destinations and follow routes across different jurisdictions. A consistent set of references also helps users trust and learn the system and apply their knowledge to new journeys.

→ Branding. A consistent brand along a corridor or network that is easily tied to local context is helpful to ensure that users know they are continuing along the same network. In some communities, the municipality’s logo is often used to provide local community branding. Trail-specific branding could be considered for regional, provincial, and even national facilities that serve multiple jurisdictions, such as ‘The Great Trail’ (formerly known as the Trans Canada Trail).

→ Progression. It is important to provide a manageable amount of information to people at one time, as too much information can be difficult to understand and be unnecessary. Too much information can make decision-making challenging and leave people second guessing themselves. In particular, wayfinding for cycling is similar to guide signing for drivers: information provided to riders who are moving must be provided in advance of where major changes in direction are required, repeated as necessary, and confirmed when the turning movement is complete.

→ Context. The frequency and type of information that is provided on wayfinding materials will vary depending on the context in which the materials are being used. For example, there will be a difference between wayfinding that is being used along on-street facilities when compared to a multi-use trail. On-street signage, for example, will typically be required at higher frequency due to the prevalence of intersections and opportunities for decision-making. Off-road facilities may require less frequent spacing serving to remind people walking and cycling of the pathway they are on and to communicate choices at intersections or where the pathway branches.

Sign Types
A comprehensive wayfinding system should consist of several types of signage and/or pavement markings to ensure a bicycle user is on the best route to their destination. The primary categories of bicycle wayfinding signage are described below. These should be applied consistently for both on-street bicycle facilities and off-street trails to ensure a consistent user experience.

→ Turn Signage: On the approach of a decision point (typically an intersection), turn signage provides direction to select destinations through the use of directional arrows, including straight arrows and turn arrows. Turn signage should not repeat information provided on signs for motorists to avoid information overload. Turn signage is particularly important when people cycling require different information than motorists, such as different destinations that may be of more interest to non-motorists or bicycle route decision. Turn signage should be located at a safe stopping distance before the turn. To manage the amount of information provided on one sign, turn signs will typically contain up to three destinations.
→ **Confirmation Signage:** The confirmation signage is placed after decision points. These signs provide confirmation, reassure people cycling of their direction, and confirm additional destinations reached along the route. Confirmation signs will also provide information about other destinations that may be reached on the route. Confirmation signs should be located at 20–30 metres after turns and should be repeated for reassurance every 400 metres in urban areas and every 800 metres in rural areas. Because confirmation signs are located after turns where the information load is less distracting, it is possible to include more information about destination names and distances. Typically, three to four destinations would be shown in ascending order.

→ **Special Situation Signage**

- **Turn Fingerboard** – Optional turn fingerboard signs can be placed after the decision sign, at the point of the turn, to highlight unusual or easily missed turns. Fingerboards are useful for complex turns as the shape of the sign is advantageous because it clearly shows direction.

- **Off-Network Waymarker** – Waymarkers can be used on non-designated routes to guide people cycling to the designated cycling network. They are specifically intended to indicate short linkages to designated bicycle routes from other roads or paths. They are not intended to be used to mark the route of a designated bicycle facility.

**Sign Placement and Siting**

The frequency of signs and the provision of destination information will depend on the land use context. It is important to ensure that signage is only provided when helpful, without creating sign overload.
Destination Hierarchy

Connecting people to destinations is one of the key principles of providing wayfinding. A hierarchy of destinations allows transportation professionals to prioritize what information to include when all destinations will not fit on a sign. A destination hierarchy should be based on distance, the importance of a destination for riders in an area, and the provincial, regional, or local significance of a location. If a wayfinding program is being developed at a regional scale or intended to be consistent across neighbouring municipalities, then all municipalities should agree to the hierarchy.

1. Level 1 – Centres

These can be regional, municipal, town, or urban centres depending on the context. They are characterized as being major centres of activity that offer a range of attractions and services and provide primary geographic orientation points. In Cambridge, these should include the Core Communities of Galt, Preston, and Hespeler as well as Blair Village. Level 1 destinations can be included on signs up to 8 kilometres away.

2. Level 2 – Major Attractions

These trip attractors include rapid transit stations and exchanges, major tourist venues, regional parks, and post-secondary education institutions. Level 2 destinations are included on signs up to 4 kilometres away.

3. Level 3 – Local Neighbourhoods

These represent centres of a community with sub-regional/municipal/town importance. Local neighbourhoods provide a mixture of services used by local residents and visitors and should be determined in alignment with local Community Plans. They should be suitable reference points as they are well-known and unambiguous. Level 3 destinations are included on signs up to 2 kilometres away.

4. Level 4 – Local Destinations

In some contexts, the City may also wish to extend the wayfinding system to include local destinations. This may be useful to reflect the nature of lower density areas or to integrate bicycle wayfinding with walking wayfinding on multi-use trails. They may also be useful to provide wayfinding signage on a route that does not connect Level 1–3 destinations. It is, however, important to consider the principles and in particular, the need to keep information simple and consistent. Overloading signs with information often has the unintended effect of making them harder to understand and use. It is not practical to list all the possible local destinations across a community, but the following represents some classifications that may be useful:

- Recreational bicycle facilities;
- Shopping centres;
- Business parks;
- Parks, open spaces and sports facilities;
- High schools;
- Landmarks;
- Healthcare facilities;
- Public washrooms;
- Bicycle repair shops;
- Civic facilities such as community centres, or libraries.

Level 4 destinations are included on signs up to 2 kilometres away.

Pavement Markings

Some communities use pavement markings to supplement the wayfinding network. Such treatments include coloured striping along the edge of pathways, or symbols that show distances and remind people where the route goes. Shared lane markings (sharrow) can be used on local street bikeways to provide confirmation information. Wayfinding pavement markings can be used at decision points. Wayfinding pavement markings should only be used as a supplement to signage, and not in place of it, and regular inspection and maintenance should be
conducted to ensure that the pavement markings have maintained their functionality with age.

**ACTION 4B.2: CONTINUE TO IMPLEMENT WAYFINDING PILOT PROJECTS FOR LOCAL STREET BIKEWAYS**

Based on the principles and guidance in the wayfinding strategy, the City should continue to implement wayfinding pilot projects, particularly on local street bikeways. As noted previously, local street bikeways are located on streets with low vehicle speeds and volumes. In many cases, particularly where vehicle volumes and speeds are already low (less than 1,500 vehicles per day), the only required treatments on local street bikeways are signage and wayfinding. Wayfinding signs along a local street bikeway should be used to provide information regarding direction, distance, and/or estimated travel time to key destinations. If traffic volumes are greater than 1,500 vehicles per day, additional traffic calming or traffic diversion measures may be necessary.

The Implementation plan identifies a number of ‘quick win’ wayfinding pilot projects on local street bikeways with less than 1,500 vehicles per day.

**ACTION 4B.3: DEVELOP A MAP THAT COMBINES INFORMATION ABOUT TOURIST DESTINATIONS, LOCAL BUSINESSES, AND CYCLING ROUTES**

The City already publishes a map of the existing bicycle network online, along with an interactive online map. This map identifies existing and planned on-street bicycle facilities, off-street trails, walkways, and key destinations such as points of interest, schools, and parks. The City should continue to support on-going updates to this map on an annual basis, and should publish this in both print and digital formats. The Cambridge Cycling and Trails Advisory Committee has identified developing a map as part of its work plan for 2020. The map should add additional elements to promote bicycle tourism such as key tourist destinations, bike retail outlets, and other key destinations.

**Strategy 4C: Promote Bicycle Tourism**

Cycling can contribute to the development of a healthy and diverse economy. Bicycle-supportive neighbourhoods, employers, and other destinations throughout Cambridge can encourage residents to support local businesses. Neighbourhoods and destinations that are accessible and attractive for active transportation users can attract more visitors, who will in turn be patrons of local services and amenities. For employment areas, cycling infrastructure provides more choice for people travelling to work, which is essential for individuals who may not have access to a vehicle. Furthermore, having options that support residents who use active forms of transportation in their neighbourhoods and to other destinations can decrease traffic congestion and increase the attractiveness and vibrancy of the area for both locals and visitors. Cycling can also support and encourage tourism, as cycling tourism is the fastest growing tourism sector in Ontario and is recognized by the tourism industry as a powerful economic driver to the province. Cambridge’s unique natural, historic, and cultural setting along with its geographic location positions the City strongly to leverage this growing sector to be a premier cycling tourism destination.

**ACTION 4C.1: DEVELOP AND IMPLEMENT A BICYCLE TOURISM INITIATIVE BUILDING OFF THE PROVINCIAL CYCLING TOURISM PLAN.**

Promoting cycling from a tourism perspective can provide a variety of benefits to the local economy. The City should leverage provincial efforts to promote cycling tourism, including working to implement the Ontario’s Cycling Tourism Plan at a local level by working with the Ontario Tourism Marketing Partnership Corporation (OTMPC) to support cycling tourism marketing efforts and support Regional Tourism Organizations (RTOs) in developing partnerships to advance cycling tourism projects.
The City should also partner local organizations to promote cycling options and activities for visitors. For example, bicycle friendly businesses can increase awareness about cycling by establishing initiatives that encourage visitors, as well as residents and employees, to cycle to shops and restaurants. Promoting cycling tours in Cambridge can help to increase bicycling and grow local businesses such as restaurants, breweries, farmers markets and other arts and cultural attractions. The City should also work with neighbouring municipalities to encourage hotels and bed and breakfasts to invest in bicycles to lend to their patrons to support bicycle tourism. For example, Langdon Hall Country House Hotel and Spa provides bicycles, including fat tire bicycles in the winter. The City should reference and promote these tourism initiatives on existing City of Cambridge websites and applications.

**ACTION 4C.2: DEVELOP AND PROMOTE CYCLING LOOPS THROUGHOUT THE CITY FOR RECREATIONAL CYCLING AND CYCLING TOURISM**

To help promote recreation and economic development for residents and visitors, the City should develop and promote a series of cycling ‘loops’ that provide continuous connections to key destinations throughout the community. Figure 19 identifies a conceptual network of Primary and Secondary Loops throughout the City. Much of the infrastructure for already exists (92%). The table below shows the percentage of the Primary loop that is physical separated from motor vehicles, a dedicated on street facility, and the percent where no facility exists. Completing the Primary Loop would involve upgrades to existing infrastructure, crossings improvements, and signage and wayfinding along with marketing and promotion. These loops could connect with important regional connections such as the Cambridge to Paris Rail Trail and are important to promote recreational cycling as well as cycling tourism.

<table>
<thead>
<tr>
<th>Existing Facility is Separated from Motor Vehicle Traffic</th>
<th>75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Facility is a Dedicated On-Street Cycling Route</td>
<td>18%</td>
</tr>
<tr>
<td>No Existing Facility</td>
<td>8%</td>
</tr>
</tbody>
</table>

The plan recognizes the importance of government and industry working together to take advantage of the potential growth of cycling visitors to the province through 12 actions in four key priority areas:

1. Products and Experience Development
2. Strategic Marketing
3. Advancing the Tourism Sector
4. Making Evidence Based Decision

**CASE STUDY:**

Cycling is an important economic driver in Ontario. The Ontario Ministry of Heritage, Sport, Tourism and Culture Industries developed Ontario’s Cycling Tourism Plan. This plan builds on Ontario’s Cycling Strategy and Trails Action Plan and documents the significant economic benefits to the Province. Cycling is a growing sector in Ontario with 1.7 million cycling visits, accounting for 1.2% of total visits to Ontario. Cycling visitors spent $428 million, or 1.8% of total visitor spending in Ontario. Cycling visitors generally spend more on average per trip than other visitors, $255/trip for cycling tourists compared to $171/trip for total visitors. Cycling tourists to Ontario stay longer than regular visitors and the majority of Ontario visits by cyclists were overnight visits.

The plan recognizes the importance of government and industry working together to take advantage of the potential growth of cycling visitors to the province through 12 actions in four key priority areas:

1. Products and Experience Development
2. Strategic Marketing
3. Advancing the Tourism Sector
4. Making Evidence Based Decision
Figure 19 – Potential Cycling ‘Loops’
CASE STUDY:
As businesses are certified, they can work with the Ontario by Bike Network to ensure their businesses are added to their online interactive map. This map highlights all businesses across Ontario that have been certified as bicycle-friendly, which means cyclists can count on secure bike parking, local cycling information on-hand, local food options, rest areas, and repair information. This can be used for trip planning, with icons on the interactive online map highlighting different types of businesses, such as accommodations, attractions, bicycle shops, bicycle tours, breweries, business areas, restaurants, and others.

ACTION 4C.3: WORK WITH NEIGHBOURING COMMUNITIES AND THE REGION TO EXPAND AND ENHANCE THE REGIONAL TRAIL NETWORK

The City should work closely with neighbouring cities and townships in the Waterloo Region, in particular Kitchener and Waterloo, in an effort to improve and expand the cycling connections between these communities. Creating a network of connected communities will help to not only support usage within Cambridge, but also expand the broader network through improved connections to existing networks in other communities. Lastly, a system of connected communities will help to promote cycling tourism in all of these communities and introduce people to the ease and benefits of cycling as a means of transportation.

ACTION 4C.4: CONTINUE TO WORK WITH LOCAL BUSINESSES TO EXPAND THE NUMBER OF BICYCLE FRIENDLY BUSINESSES

Bicycle Friendly Businesses can increase awareness about cycling by establishing initiatives that encourage visitors, as well as residents and employees, to cycle to shops and restaurants. Bicycle Friendly Businesses can vary in their focus, but all allow a business to “brand” itself as welcoming to customers who arrive by bicycle. Long Beach, California pioneered the Bicycle Friendly Business and this has spread to a number of other communities, including Los Angeles, California, Winnipeg, Manitoba, and Canmore, Alberta.

The City has approximately a dozen businesses with a Bicycle Friendly Business designation, the majority of which are in Hespeler, including hotels, restaurants, breweries, bicycle retailers and art galleries. The City should build on the success of these bicycle friendly businesses to establish a Bicycle Friendly Business District in each of its founding communities.

The Ontario Share the Road Cycling Coalition has a well established and respected Bicycle Friendly Business program that Cambridge should encourage.
local businesses to consider. With four different levels of certification, the program is designed to be both accessible for those businesses making initial movement towards becoming more bike friendly as well as encourage existing certified members to take further steps towards increased recognition. Cambridge should work with its three local Business Improvement Areas to not only encourage them to seek individual business recognition, but also the creation of Bicycle Friendly Business Districts within Cambridge that support customers on bike, and advertise these zones accordingly as a way to increase their customer base.

**ACTION 4C.5: PROMOTE THE UNIQUE CHARACTERISTICS OF CAMBRIDGE THAT MAKE IT A DESIRABLE CYCLING TOURISM DESTINATION**

The City has a unique natural and physical setting that positions it well for bicycle tourism. With its beautiful natural setting on the Grand and Speed Rivers, a well developed recreational trail network, and with historic buildings in each of its Core Communities, the City has a significant opportunity to position itself as a unique destination for bicycle tourism as a way to provide a variety of benefits to the local economy. The City should continue to partner with local organizations, including government and industry partners, to market and promote the unique characteristics of Cambridge that make it a desirable tourist destination and to promote bicycle tourism options.

The City should work also closely with neighbouring cities and townships, in an effort to increase cycling tourism. The Great Trail runs through Cambridge with connections to Kitchener and Waterloo to the north west, and Paris and Brantford to the south. The City should leverage cycling tourism opportunities for this connection and other inter-municipal routes, such as Cambridge to Guelph, and highlight Cambridge as a great starting/end point for long-distance cycling.
Evaluation is one of the ‘Five Es’ that makes up a comprehensive approach to bicycle planning and design, along with engineering, education, encouragement, and enforcement. Monitoring bicycle usage, patterns, and trends allows for evaluation to take place. This is critical to improve a community’s understanding of the use of its bicycle facilities and can allow municipalities to plan for necessary improvements to their bicycle networks.

Monitoring and reporting is essential to ensure that the Cycling Master Plan is implemented as intended, and to determine whether the Plan is achieving its goals. Monitoring will also enable the City to appropriately allocate monetary and staff resources to implement prioritized initiatives. Monitoring also provides a means of identifying changing conditions which would require changes to the Cycling Master Plan. The monitoring needs to be:

- Meaningful. Monitoring should yield meaningful results and point to the success in achieving the vision and goals of the Cycling Master Plan.
- Measurable. Monitoring needs to establish criteria that are measurable and for which data or information can be readily obtained.
- Manageable. Monitoring implementation needs to consider resource limitations and identify measures where information is accessible, or data is simple to collect.

The Cycling Master Plan includes two strategies to monitor cycling. The strategy is accompanied by a number of supporting actions that seek to provide a framework for monitoring success of the implementation of the Cycling Master Plan.
Strategy 5A: Monitor Cycling Trips, Investments, and Initiatives

Monitoring cycling trips, investments, and initiatives can help to tell the story of cycling within a community. It can help promote cycling and justify future investments. Monitoring is also a tool to track progress towards achieving the vision and goals of the Cycling Master Plan and ensure that Cambridge is implementing the strategies, actions and infrastructure identified in the Plan.

**ACTION 5A.1: DEVELOP A CYCLING DATA COLLECTION AND MONITORING PROGRAM, INCLUDING A NETWORK OF COUNTERS ON BICYCLE ROUTES AND TRAILS TO MONITOR ACTIVITY**

To assist in monitoring the implementation of the Cycling Master Plan, a comprehensive cycling monitoring program should be developed. This program will help identify baselines for each of the goals of the plan as well as the various success measures that will be developed as part of the implementation plan. The monitoring program focuses on identifying ‘measures of success’ for two components: first, the degree of progress in implementing the plan, and secondly, the outcomes of the plan. Potential measures of success are described in the tables below, including general measures of success for the overall plan, as well as specific measures of success related to each of the first four themes of the plan.

<table>
<thead>
<tr>
<th>MEASURE OF SUCCESS</th>
<th>INDICATOR</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycling Mode Share (commute)</td>
<td>%</td>
<td>Statistics Canada Census</td>
</tr>
<tr>
<td>Cycling Mode Share (all trips)</td>
<td>%</td>
<td>Transportation Tomorrow Survey</td>
</tr>
<tr>
<td>Proportion of each of women, children, and older adults cycling (commute)</td>
<td>%</td>
<td>Statistics Canada Census</td>
</tr>
<tr>
<td>Proportion of each of women, children, and older adults cycling (all trips)</td>
<td>%</td>
<td>Transportation Tomorrow Survey</td>
</tr>
<tr>
<td>Cycling volumes on key corridors</td>
<td>#</td>
<td>Bicycle counts (see below)</td>
</tr>
<tr>
<td>Cycling funding levels (% of total budget)</td>
<td>%</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Transportation GHG emissions/capital</td>
<td>Tonnes CO2/capital</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Collisions involving cyclists</td>
<td>%</td>
<td>City of Cambridge / Police data</td>
</tr>
</tbody>
</table>

Table 7 - Measures of Success *(OVERALL PLAN)*
<table>
<thead>
<tr>
<th>MEASURE OF SUCCESS</th>
<th>INDICATOR</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>**THEME 1</td>
<td>CONNECTIONS**</td>
<td></td>
</tr>
<tr>
<td>Total length of bicycle network (by facility type)</td>
<td>Total km</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Total length of AAA bicycle network</td>
<td>Total km</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Proportion of total jobs and population within 400 metres of the existing bicycle network</td>
<td>% of City</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Proportion of total land area within 400 metres of the existing bicycle network</td>
<td>% of City</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Length of completed bicycle network projects</td>
<td>km</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>**THEME 2</td>
<td>INTEGRATION**</td>
<td></td>
</tr>
<tr>
<td>Total km of bicycle network within rapid transit bikeshed (800m of rapid transit station)</td>
<td>km</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Bicycle network coverage within each of Galt, Preston, and Hespeler Core Communities</td>
<td>% of area</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Number of bicycle racks within each of Galt, Preston, and Hespeler Core Communities</td>
<td>#</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Percentage of new developments with short-term and long-term bicycle parking and end-of-trip facilities</td>
<td>%</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Percentage of City owned and operated facilities with short-term and long-term bicycle parking and end-of-trip facilities</td>
<td>%</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Number of secure bicycle parking spaces at transit stops</td>
<td>#</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Number of non-secure bicycle parking spaces at transit stops</td>
<td>#</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Number of bicycle repair stations</td>
<td>#</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Number of Public Bike Share bicycles</td>
<td>#</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>**THEME 3</td>
<td>ALL SEASONS**</td>
<td></td>
</tr>
<tr>
<td>Total km of pathways cleared</td>
<td>km</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Total km of bicycle routes cleared</td>
<td>km</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Total operating budget for year-round maintenance of trails and bicycle routes</td>
<td>#</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Winter cycling volumes on key corridors</td>
<td>#</td>
<td>Bicycle counts (see below)</td>
</tr>
</tbody>
</table>

Table 8 - Measures of Success (THEMES)
As part of its monitoring program, the City should also develop a dedicated bicycle count program. The City already has an established vehicle count program and it has installed bicycle counters at several off-street trail locations, including the Grand Trunk Trail, Mill Run Trail, and the pedestrian and cycling bridge. These counters provide information such as the hourly, daily, weekly, and monthly usage of these facilities. For on-road bicycle facilities, the City collects bicycle counts as part of its regularly scheduled Turning Movement Count (TMC) program. However, bicycle data from TMC counts provides limited information, as these counts are only collected for a limited time period and only once every several years.

The City should expand on its existing off-street trail count locations and temporary count locations, as well as looking to obtain City-wide travel pattern information through the Transportation Tomorrow Survey which is scheduled to occur every five years.

The City should consider the following elements when developing a data collection and monitoring program:

- Selecting count locations (these may vary depending on the mode that is being counted);
- Selecting a consistent count time period;
- Selecting appropriate data collection materials, technology, and equipment;
- Developing a clear data collection methodology;
- Supporting opportunities for volunteer counts by developing consistent materials;
- Developing data archival formats;
- Establishing data analysis techniques;

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- Developing a clear data collection methodology;
- Supporting opportunities for volunteer counts by developing consistent materials;
- Developing data archival formats;
- Establishing data analysis techniques;
CASE STUDY:
The City of Hamilton has an Active Transportation Benchmarking Program that collects pedestrian and cycling activity throughout the City along sidewalks, trails, and on-street bicycle routes. The data is used to help build long-term support for walking and cycling, improve conditions for pedestrians and cyclists, and contribute to City processes including designating levels, maintenance programs, planning and design studies. Since the program was initiated in 2011, data has been collected for over 250 multi-use trails, footpaths, stairs, over/underpass locations, and over 60 on-street bicycle route locations across the City. In addition, 110 locations include consecutive seasonal (fall, winter, spring, summer) count information. The program has also expanded to include 20 permanent count locations. The City publishes the count data online to allow members of the public to view the results.

› Providing training for both counting (where applicable) and analysis; and

› Developing a data reporting methodology (see Action 5A.2).

As a first step, the City should install additional permanent counters at 5 – 10 additional locations across the City to provide information about geographic variation in bicycle use. The City can supplement these permanent count locations with temporary counts, which can be either manual counts or short-duration automatic counts, that can be supplemented with trends from the permanent count data. In addition to collecting this data, the City should ensure that the data collection program includes a process to regularly review and analyze the data.

**ACTION 5A.2: DEVELOP A REPORTING PROGRAM TO COMMUNICATE RESULTS OF THE MONITORING PROGRAM ON AN ANNUAL BASIS**

A clear reporting methodology is required to ensure that the cycling data collected is analyzed, presented, and reported to staff, decision-makers, and the public in a systematic and consistent fashion over time. This will allow for the clear monitoring of cycling trends as well as progress towards achieving transportation related goals.

An important part of collecting data is ensuring that it is analyzed and that the findings are communicated to the general public in a format that is transparent, visible, and easy to understand. This can involve installing visual bicycle count displays at prominent locations along the bicycle network, so the numbers are easily viewed by both people walking, cycling, and people driving. In addition, some cities publish their bicycle network traffic count data online, which allows members of the public to view the results. Both of these tools help dispel myths that people might have about whether the bicycle network is well-used.
**ACTION 5A.3: UPDATE AND REASSESS THE FIVE-YEAR ACTION PLAN ANNUALLY**

A five-year standalone Cycling Action Plan has been developed as part of the Cycling Master Plan that aligns with Cambridge’s priorities. The initial five-year Cycling Action Plan is based on the recommendations of the Implementation section of this document. This Cycling Action Plan should be updated as part of the annual budgeting process to identify upcoming projects, initiatives, funding sources and implementation partners as part of its efforts to prioritize the implementation of the Cycling Master Plan actions, to monitor and communicate successes, and to keep the Cycling Master Plan a living document. The five-year Cycling Action Plan should be reported back to the public to ensure awareness for current planned projects and investments in cycling.

**ACTION 5A.4: CONTINUE TO WORK TOWARDS A HIGHER BICYCLE FRIENDLY COMMUNITY STATUS**

The Share the Road Cycling Coalition has a Bicycle Friendly Community (BFC) Program that provides incentives, hands-on assistance, and award recognition for communities that actively support bicycling. Communities complete a thorough application and are judged in five categories referred to above as the Five “Es”: Engineering, Education, Encouragement, Enforcement, and Evaluation & Planning. A community must demonstrate achievements in each of the five categories in order to be considered for an award on the Bronze, Silver, Gold or Platinum or Diamond level. Applications are judged by a volunteer panel of expert judges and communities with more significant achievements in these areas receive higher awards. The BFC application is a great self-assessment tool, as communities see where they can improve in each of these categories.

44 communities throughout Ontario are currently recognized as either Gold, Silver, or Bronze level Bicycle Friendly Communities, including three Gold level communities, and eight Silver level communities. No communities in Ontario have yet reached the Platinum or Diamond level. Cambridge has currently received a Bronze level recognition as a Bicycle Friendly Community and would like to work towards a higher status. Cambridge received the Bronze level designation as a recognition that, while there are still many opportunities for improvements to the cycling network, the evaluators felt that the City’s commitment to making cycling safer, the strong partnerships that have been created within the community, and the rapid pace at which Cambridge has become more bicycle friendly are worthy of recognition. The judging panel was impressed by the strong progress being made across all 5 Es in Cambridge, but emphasized that in order for cycling to become more accessible to a larger percentage of the population, infrastructure for cycling must be created to get people on bikes to their destinations efficiently and comfortably. By completing this Cycling Master Plan and following through with the implementation of quick wins identified in the Implementation section of this report, the City can make significant strides to building a cycling culture and making cycling more comfortable, convenient, and attractive for everyone, which should position the City well to work towards a higher Bicycle Friendly Status in the future.
Strategy 5B: Provide Sufficient Capital, Operating and Staff Resources

Implementation of the Cycling Master Plan will require ongoing capital and operating costs along with increased resources for staff and equipment. To ensure the successful implementation of the plan and that the City achieves the vision and goals of the plan, the City will require dedicated, on-going funding to implement the Cycling Master Plan.

**ACTION 5B.1: CONTINUE TO SUPPORT THE CAMBRIDGE CYCLING AND TRAILS ADVISORY COMMITTEE**

The Cambridge Cycling and Trails Advisory Committee (CCTAC) advises Council on policy, planning, development and implementation of public trails and related off-road and on-road cycling and active transportation facilities. The City should continue to work with the CCTAC and ensure that this Committee continues to provide City staff with input and direction regarding the implementation of the Cycling Master Plan and implementation of the future update of the Trails Master Plan.

**ACTION 5B.2: ENSURE ADEQUATE STAFF RESOURCES ARE AVAILABLE TO IMPLEMENT THE CYCLING MASTER PLAN**

Implementation of the Cycling Master Plan includes not only additional financial resources, but also additional staff resources to implement the various strategies. Dedicated bicycle and pedestrian program managers are common in North American cities and, along with other transportation planners and active transportation advocates, are a critical part of creating a walkable and bicycle-friendly community.

The City hired a dedicated full-time Sustainable Transportation Coordinator in late 2019, who will look after the active transportation portfolio and help to implement the Cycling Master Plan. This should be supplemented within two years by a full-time Active Transportation Engineer to help the City move forward with implementation of the short-term priority projects identified in the Cycling Master Plan.
4.0 IMPLEMENTATION PLAN

The strategies and actions developed as part of the Cycling Master Plan are intended to guide the City’s policy, planning, programming, and capital investment decisions as well as ongoing public engagement, operations, and maintenance activities in support of building a cycling culture over the next 20 years. While the Cycling Master Plan has been developed as a long-term plan, it will require financial investment, staff resources, and an implementation strategy to prioritize improvements over the short-, medium- and long-term. This section presents an implementation plan, including prioritization of the actions and network improvements identified over the short-term (within 5 years), medium-term (5-10 years) and long-term (10-20 years). In addition to the short-term initiatives, the implementation and phasing strategy also identifies a number of ‘quick win’ initiatives that the City should begin within the next two years.

The Cycling Master Plan is intended to be a flexible and living document. For the proposed cycling network, there is some level of flexibility regarding the specific locations, corridors, and facility types that are recommended. The Plan presents recommendations and suggestions based on feedback received as part of the public engagement process, technical analysis, and current best practices in cycling facility design. However, the City will need to review the feasibility and desirability of each recommended infrastructure project, and the implementation of the identified projects within the Cycling Master Plan will require ongoing public engagement as these new projects are considered.

4.1 PRIORITIZING ACTIONS

This section groups and prioritizes each action identified under each of the five themes. Strategies for implementing each of the actions identified in the Cycling Master Plan are outlined in the table below. This table provides guidance with respect to:

- **Timeframe.** Each action is identified as either a short-term (0-5 years), medium-term (5-10 years) or long-term (10-20 years) initiative. Many actions will be implemented on an ongoing basis, in which case they are shown under each timeframe. It should also be noted that these priorities may change over time. If an opportunity arises to immediately implement an action identified as a medium or long-term priority, such as an infrastructure redevelopment opportunity or other capital project, the City should seek to maximize the opportunity.

- **Method of Implementation.** This column identifies how each action will be implemented: as a capital project, through ongoing operations and maintenance, as a policy or programming initiative, or some combination.

- **Responsibility.** This column suggests the primary and secondary responsibility for each action. Many actions are the primary responsibility of the City of Cambridge (including Engineering, Public Works, Planning, Parks & Recreation, Communications, or Finance), while other actions should be led by external agencies, such as other government agencies (including the Region of Waterloo, surrounding municipalities, Grand River Transit, School Boards), community groups or the private sector.
Table 9 - Cycling Master Plan Themes and Actions

Note: Policy & Programming items may have further costs related to implementation
### THEME 2: INTEGRATION

- **Parks & Recreation, Region of Waterloo,** are well integrated

### Strategy 2B: Improve Integration with Transit

- **Action Ongoing**
  - High activity bus stops
  - Transit, Parks, Recreation, Region of Waterloo

### Strategy 2C: Expand Bike Sharing Services

- **Action Ongoing**
  - Requirements criteria

### Strategy 2D: Ensure Land Use Support Active Transportation

- **Action Ongoing**
  - Waterloo Tourism Planning

### Strategy 3A: Provide Year-Round Maintenance Services

- **Action Ongoing**
  - Year-round maintenance service standards for trails

### Strategy 3B: Provide Year-Round Employee Training and Development

- **Action Ongoing**
  - Employee training and development programs

### Strategy 3C: Expand Public Bike Sharing Services

- **Action Ongoing**
  - Update and reassess the five-year action plan annually

### Strategy 4A: Raise Awareness and Education

- **Action Ongoing**
  - Support and work with partners to expand the Bike Valet Program

### Strategy 4B: Build a Culture of Cycling

- **Action Ongoing**
  - Develop and promote cycling loops throughout the City for recreational cycling and cycling tourism

### Strategy 4C: Support Businesses and Employers

- **Action Ongoing**
  - Continue to work with local businesses to expand the number of bicycle friendly businesses

### Strategy 5A: Monitor Cycling Trips, Investments, and Initiatives

- **Action Ongoing**
  - Update and reassess the five-year action plan annually

### Strategy 5B: Provide Sufficient Capital, Operating, and Staff Resources

- **Action Ongoing**
  - Ensure adequate staff resources are available to implement the Cycling Master Plan

### Table 9 - Cycling Master Plan Themes and Actions (Continued)
4.2 NETWORK PRIORITIZATION

Priorities were identified for the cycling network based on a range of factors, including:

→ Integrating with the City’s Capital Plan and the Region of Waterloo’s Capital Plan;

→ Investing in areas with high existing bicycle use and high cycling potential

→ Focusing on a network-based approach, focused on building initial connections in each of the three founding communities;

→ Building out the City Spine network;

→ Identifying lower-cost ‘quick wins’ for rapid implementation; and

→ Input received from the public.

Priorities have been identified for implementation over the short-term (0 to 5 years), medium-term (6 to 10 years), and long-term (10 years and beyond).

The cycling network priorities are shown in Figure 20. It should be noted that these priorities only apply to bicycle facilities on City owned roadway, and do not apply to roadways under the jurisdiction of the Region of Waterloo.
Transportation Networks

Proposed Bikeway Network Prioritization
- Short-Term
- Medium-Term
- Long-Term
- Future Road

Existing Bikeway Network

Important Places
- Parks
- Schools
- Commercial Zoning
- Municipal Boundary

Figure 20 – Cycling Network Priorities
4.3 FIVE-YEAR ACTION PLAN

The Implementation Plan in the previous sections identifies a number of high priority actions and network improvements to be undertaken over the short-term. In addition to these short-term actions identified in the implementation tables and bicycle network priorities that are identified over the next five years, the City should focus on a number of “quick wins” to move forward with implementing the Cycling Master Plan immediately and to build momentum. This section summarizes the recommended Five-Year Action Plan for the City of Cambridge, focusing on these “quick wins.”

Theme 1 | Connections

1. Undertake network improvements:
   
   → **2019-2023 Capital Projects**
     - Wellington Street (Beverly Street to Park Hill Road) and Park Hill Road (Ainslie Street to Wellington Street)
     - Bruce Street (Water Street to Wellington Street)
     - Salisbury Avenue (Byng Avenue to Victoria Park)
     - Forrest Road and Tait Street (Churchill Drive to 1st Avenue)
     - Elgin Street (Cylde Road to Avenue Road)

   → **New Bicycle Routes**
     - Beverly Street (Dundas Street to Elgin Street)
     - Park Hill Road (Ainslie Street to Water Street)
     - Wellington Street (Beverly Street to end of cul-de-sac to the south)
     - Cambridge to Paris Rail Trail parallel to Water Street (Entrance to Churchill Park to Ainslie Street)
     - Christopher Drive (connection from Churchill Park to multi-use trail)
     - Rail corridor east of Duke Street (Bishop Street to Dunbar Road)
     - Dunbar Road (Concession Road to Conestoga Boulevard)
     - Groh Avenue (Hespeler Road to Goebel Avenue / Holiday Inn Drive)
     - Hamilton Street/Queenston Road and Bishop Street (Eagle Street to rail corridor east of Duke Street)

   → **Local Street Bikeway Wayfinding Projects**
     - Henry Street and Elliot Street (Churchill Park to Ainslie Street)
     - Ballantyne Avenue (Henry Street to Chalmers Street)
     - Forrest Road (Salisbury Avenue to Churchill Drive)
     - Dover Street, Sherring Street Eagle Street (from Speed River to Hamilton Street)
     - Shepherd Avenue, Edward Street, Stratchona Street, Adam Street, Rife Avenue, Kribs Street, Lewis Street, and Avondale Road (Bechtel Street to Renwicke Avenue) and Hungerford Road (Lewis Street to Queen Street)

   → **New Crossings**
     - Feasibility study for new pedestrian and cycling crossing between Fountain Street and Dover Street
     - Work with partners to provide a new crossing at Water Street and Myers Road
     - Work with partners to provide a new crossing at Water Street north of Churchill Park

2. Ensure cycling facilities are considered as part of all capital projects designated as part of the Cycling Network currently included in the City’s Capital Plan

3. Update the City Standards to reflect current Provincial bicycle facility design guidance and other best practices
Theme 2 | Integration

1. Install secure bicycle parking at high activity bus stops and stations
2. Update development requirements to provide criteria for short-term and long-term bicycle parking and end-of-trip facilities
3. Install high quality bicycle parking and end-of-trip facilities at select City-owned facilities
4. Update the Bicycle Parking Guide
5. Continue to support the provision of a region-wide Public Bike Share system

Theme 3 | All Seasons

1. Develop a pilot program for proactive de-icing and snow clearing on Regionally Significant and Primary Multi-Use Trails and on all new separated bicycle lanes
2. Review and update the Loose Leaf Collection Program
3. Assign an enhanced winter maintenance standard for local streets with dedicated bicycle facilities
4. Review and updated the existing inspection program to ensure adequate cycling facility and trail surface conditions and quality

Theme 4 | Promotion

1. Develop a campaign to deliver positive messaging to promote cycling
2. As new infrastructure is constructed, provide education materials explaining how to use these new infrastructure types
3. Develop a Bicycle Infrastructure Celebration Toolkit to celebrate grand openings and events throughout the year
4. Develop and implement a wayfinding and tourism strategy that is consistent and integrated with surrounding communities and the Region of Waterloo
5. Implement wayfinding pilot projects for local street bikeways
6. Develop an online and printable map that combines information about tourist destinations, local businesses, and cycling routes
7. Develop and implement a bicycle tourism initiative building off the Provincial Cycling Tourism Plan
8. Develop and promote cycling loops throughout the City for recreational cycling and cycling tourism

Theme 5 | Monitor

1. Develop a cycling data collection and monitoring program, including a network of counters on bicycle routes and trails to monitor activity
2. Develop a reporting program to communicate results of the monitoring program on an annual basis
4.4 COST ESTIMATES

The Cycling Master Plan includes order-of-magnitude capital cost estimates and ongoing operating and maintenance cost estimates for the implementation and ongoing maintenance of bicycle facilities. The cost estimates presented are based on typical unit costs and recent construction and maintenance pricing in the City of Cambridge and elsewhere in the Region and Canada (Table 10). The cost estimates have been provided to identify the relative cost for planning purposes and should not be used for budgeting purposes. Wherever possible, the City should continue to seek out new opportunities to work with developers, other agencies and levels of governments to establish cost-sharing agreements, or to seek grant opportunities in order to offset total project costs.

Cost estimates have been developed for bicycle facilities on City-owned roadways. Cost estimates do not include any bicycle facilities under the jurisdiction of the Region of Waterloo. The capital cost to implement the Cycling Master Plan is approximately $83 million over the long-term (Table 11). This includes approximately $11 million for on-street facilities, $28 million for off-street trails, and $44 million for new grade separated crossings. Excluding the cost of new grade-separated crossings, the capital cost to implement on-street bicycle facilities and off-street trails is approximately $39.2 million.

However, by prioritizing projects as short-term priorities and identifying longer term priority projects, it is estimated that the highest priority projects for implementation over the short-term would cost approximately $4 million over the next 5 years, excluding projects that are already included as part of the City’s 2019 – 2023 Capital Plan.

The timeframe of the Cycling Master Plan depends on annual funding levels. Excluding the cost of grade-separated crossings, which will likely require external funding sources and partnerships to complete.

Various funding scenarios were reviewed. To achieve a 20-year horizon, the City would need to invest $1.958 million in new funding annually to implement the plan, as shown in Table 12.

To the extent possible, the City and Region should aim to invest in as many infrastructure improvements in the short-term as possible, because building a cycling culture in the City typically follows the implementation of high quality cycling infrastructure and, thus, to begin the building of that culture as soon as possible, near-term investments should be maximized.

4.5 FUNDING AND LEVERAGE STRATEGIES

Although the Cycling Master Plan is estimated to cost approximately $84 million over the next 20 years and beyond, these costs can be shared by pursuing external funding from other levels of governments, partnerships with other organizations and the development industry, and integration of cycling projects with other plans and projects. This section describes several strategies that the City may consider to help leverage its investments and to maximize its ability to implement cycling improvements.

CAPITAL PLANNING

The City should incorporate the Cycling Master Plan recommendations into its Operating and Capital Budgets to ensure that projects are accounted for in the City’s capital planning process. In this regard, the City should seek changes to its Operating and Capital Budget for 2021 and beyond to fund implementation of the Cycling Master Plan. Based on the existing capital budget allocation and the recommendations of the Cycling Master Plan, the City will need to significantly increase its annual investment to ensure the Cycling Master Plan is implemented within the proposed timelines.
Note: The cost estimates have been provided to identify the relative cost for planning purposes and should not be used for budgeting purposes.

<table>
<thead>
<tr>
<th>BICYCLE FACILITY TYPE</th>
<th>CAPITAL COST (per km)</th>
<th>ANNUAL OPERATING COST (per km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-Use Pathway 2-Sides</td>
<td>$624,000</td>
<td>$5,000</td>
</tr>
<tr>
<td>Multi-Use Pathway 1-Side</td>
<td>$312,000</td>
<td>$2,500</td>
</tr>
<tr>
<td>Separated Bicycle Lane</td>
<td>$500,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Local Street Bikeway</td>
<td>$5,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>Painted Bicycle Lane</td>
<td>$5,000</td>
<td>$2,500</td>
</tr>
<tr>
<td>Paved Shoulder</td>
<td>$5,000</td>
<td>$2,500</td>
</tr>
<tr>
<td>Shared Street</td>
<td>$5,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>Grade Separated Crossing</td>
<td>$19,000,000</td>
<td>$1,000</td>
</tr>
</tbody>
</table>

Table 10 - Bicycle Facility Capital Costs and Operating Costs

<table>
<thead>
<tr>
<th>Timeline</th>
<th>PROPOSED ON-STREET BICYCLE FACILITIES</th>
<th>PROPOSED TRAILS (INL. BOULEVARD TRAILS)</th>
<th>TOTAL COMBINED CAPITAL COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term*</td>
<td>Distance (km)</td>
<td>Capital Cost</td>
<td>Distance (km)</td>
</tr>
<tr>
<td>13</td>
<td>$3,110,000</td>
<td>2</td>
<td>$890,000</td>
</tr>
<tr>
<td>Medium-term</td>
<td></td>
<td>22</td>
<td>$1,112,000</td>
</tr>
<tr>
<td>Long-term*</td>
<td></td>
<td>89</td>
<td>$6,753,000</td>
</tr>
<tr>
<td>New grade separated crossings</td>
<td>-</td>
<td>2.2</td>
<td>$44,000,000</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>$10,975,000</td>
<td>59</td>
</tr>
</tbody>
</table>

* Does not include infrastructure included as part of capital projects
Does not include projects identified on Regional Roads

Table 11 - Summary of Capital Costs and Priorities

<table>
<thead>
<tr>
<th>SCENARIO</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yearly funding allotment</td>
<td>$1,000,000</td>
<td>$1,305,500</td>
<td>$1,958,250</td>
<td>$3,916,500</td>
</tr>
<tr>
<td>Years to complete network</td>
<td>39.2</td>
<td>30</td>
<td>20</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 12 - Funding Scenarios
INTEGRATION
The City should integrate cycling improvements with other plans and capital projects, where possible. There are cycling components associated with many upcoming and planned road renewal programs, development projects and major capital projects which have been identified as a part of the City’s cycling network. The best opportunities to provide safe and convenient cycling facilities is during the initial planning and design of these projects. Wherever possible, the City should seek out opportunities to integrate cycling facilities with new infrastructure or renewal and rehabilitation projects, such as major road resurfacing and servicing upgrades. The City needs to also make necessary amendments to existing policies and standards to ensure opportunities to integrate proposed cycling projects are required as new developments occur.

EXTERNAL FUNDING SOURCES
The costs of implementing the improvements identified in the Cycling Master Plan can be significantly reduced by pursuing external funding sources and partnership opportunities for many of the identified projects. This section describes funding strategies and potential funding sources that the City may want to consider to assist in leveraging its investments, and maximize its ability to implement cycling improvements. The City regularly checks grant funding opportunities. The City should also pursue all available sources of funding for transportation infrastructure and programs, including the programs identified below (Note: as funding opportunities change regularly, the information in this section is subject to change):

→ Provincial Programs and Initiatives. The Provincial Government administers the CycleON Action Plan 2.0 program, which promotes new, safe and high-quality cycling infrastructure through cost sharing with local governments. Some possible projects include new bicycle trails and bicycle lanes, improvements to existing cycling infrastructure, and providing bicycle lockers and other equipment that makes cycling a safer and more convenient option for travellers. The CycleON program provides funding for infrastructure which forms part of a bicycle network plan adopted by an Ontario local government.

→ Federal Funding. There are several programs that provide funding for environmental and local transportation infrastructure projects in municipalities across Canada. Typically, the federal government contributes one-third of the cost of municipal infrastructure projects. Provincial and municipal governments contribute the remaining funds, and in some instances, there may be private sector investment as well.

→ Green Municipal Funds. The Federation of Canadian Municipalities manages the Green Municipal Fund, with a total allocation of $550 million. This fund supports municipal efforts to reduce pollution, reduce greenhouse gas emissions and improve quality of life. The expectation is that knowledge and experience gained in best practices and innovative environmental projects will be applied to national infrastructure projects.

→ Developers. The City should explore opportunities for cycling infrastructure to be constructed as development occurs within Cambridge. This process could be formalized through an update to the City of Cambridge Official Plan or through individual negotiations.
Private Sector. Many corporations wish to be good corporate neighbours — to be active in the community and to promote environmentally-beneficial causes. Bicycle routes and multi-use trails are well-suited to corporate sponsorship and have attracted significant sponsorship both at the local level and throughout North America.

Service Clubs. In many communities, service clubs (such as the Rotary Club) have been involved in funding and building bicycle infrastructure and facilities including pathways and bicycle parking.

Advertising. In regards to a bicycle route map, the City should continue to work with local business who are interested in providing advertising and therefore revenue to cover some or all of the cost of advertising.

5.0 SUMMARY & CLOSING

The Cycling Master Plan provides a comprehensive approach to guide Cambridge’s progress and investments in cycling over the next 20 years. The Master Plan includes recommendations for improving cycling-related policies, standards, infrastructure, and programs over the long-term, along with priorities over the short and medium-term.

The Cycling Master Plan is one step towards implementing the vision for cycling in Cambridge, it is not the last. The actions identified in the Plan are intended to lay the groundwork for implementation over the long-term. However, it is important to recognize that implementation will require investment and resources. This includes investments in new infrastructure, upgrades to existing infrastructure, ongoing maintenance of existing and new facilities, resources for development of new standards and policies, funding for new programming and public education, and staff resources.

The Cycling Master Plan has been developed based on extensive technical work and engagement with the Cambridge community over a 9-month period. Through this public engagement process, hundreds of community members provided input into the development plan at various phases.

The City of Cambridge would like to thank all community members for their participation in the process and valuable input developing the Cycling Master Plan.
REFERENCES

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APPENDIX A
ENGAGEMENT SUMMARY
FINAL REPORT | FEBRUARY 2020
Engagement Summary

Overview of the Project

The Cycling Master Plan (CMP) for the City of Cambridge builds off the direction from the City’s 2008 Bikeway Network Plan and 2010 Trails Master Plan. This project was initiated by the City and looks for opportunities to work from the existing infrastructure to reflect current best practices in bicycling and design, to expand the cycling network, and to continue to grow cycling mode share and expand the world of cycling for all ages and abilities. Dillon Consulting worked in close collaboration with Urban Systems, who is leading the development of the Cycling Master Plan, with support from 8 80 Cities and Modacity. The objective of this project was to help position the Cycle Master Plan to create plans and designs that will lead to safe and accessible cycling infrastructure, develop an implementation strategy to fund and build high priority facilities, and fill gaps in the network. The Master Plan aims to ensure maintenance and repair schedules and allow cycling facilities year-round; promote cycling as both a great transportation and recreation option for residents and visitors of Cambridge.

The project included an extensive public and key stakeholder engagement program, which included multiple participation approaches and opportunities for public input, including the use of an online engagement hub, collaborative digital mapping, pop-up events, and highly interactive joint key stakeholder and community workshops.

STUDY PROCESS

1. **SPRING 2019**
   - **PROJECT LAUNCH**
   - **BIKE YOUR CITY COMMUNITY WORKSHOP MAY 14, 2019**

2. **SPRING 2019**
   - **CELEBRATE AND SUPPORT CYCLING**
   - **POP-UP EVENTS ACROSS CAMBRIDGE SUMMER 2019**

3. **SUMMER 2019**
   - **DEVELOPING THE NETWORK**
   - **BIKE YOUR CITY OPEN HOUSE EVENT OCTOBER 15, 2019**

4. **FALL 2019**
   - **BUILDING A CYCLING CULTURE**

5. **WINTER 2019**
   - **MASTER PLAN**
Feedback Summary
Round 1: Spring - Summer 2019

Over the spring and summer of 2019, the City hosted three main channels for engaging the community:
1. Bike Your City Community Workshop (May 2019)
2. Bike Your City Online Survey
3. Pop-ups at cycling-related events

Bike Your City Community Workshop
A community-wide Workshop on May 14th, 2019 from 5:30pm-8pm at Cambridge City Hall was the first in-person engagement touchpoint for the CMP, bringing together a range of voices to provide their input on the existing conditions with respect to cycling infrastructure and supports, and helping to identify opportunities for improvements and completion of a ‘minimum grid’ for the City. The main event was preceded by a pop-up in the outdoor courtyard to talk with passers-by about the key elements of a future network.

The event objectives were to:
- Provide information on the CMP project process and opportunities to get involved through the process
- Collect information on current cycling/active transportation activities and preferences
- Collect feedback on the existing issues and opportunities for cycling in Cambridge
- Collect feedback on the key corridors for a minimum grid, and perspectives on safety for different ages and abilities

There were over 30 participants who showed during this workshop and for their first activity, they were invited to browse precedent images of dedicated infrastructure from municipalities with a similar climate/community context to Cambridge.

Safety and barrier-free access for all ages and abilities was a key concern for many participants. With over 100 dots on the images, the images that got the most attention were protected cycling lanes with curb barriers, bike boulevards with field barriers, bike parking with a series of parking spots or one large rack and bike storage with multiple levels with stair access.
In addition to this there were a number of workshop activities:

**The Current and Future Network**
Participants provided input on the current best-used routes for pedestrians and cyclists, with key amenities and destinations also indicated to collect information on trip purpose/distances.

The findings from this session were integrated into future sessions and materials as a starting point in understanding the local context from the point of view of the participants.

Building on the current network, this activity collected feedback on the future network and the type of infrastructure participants would like to see.

**Envisioning the System**
Four topic stations were set up with table facilitators to help guide the conversation as participants made their way to each of the stations.

**Topic 1: Finding Your Way Around the Network**
This activity included materials that showed examples of signage for different types of routes, and creating a common language for understanding the network. Participants were asked what the key principles would be in developing cycling signage that would encourage and/or improve safety for all road users. The discussion covered the issue of where wayfinding is needed, for example at major intersections or trail entrances. Some samples of what was heard:

- Consistent signage and education
- Better wayfinding
- Bigger font sizes for signs as small fonts make it hard to read when traveling at fast speeds with a bike

**Topic 2: Going Multi-Modal**
This table hosted a discussion about opportunities for transit integration, based on the LRT and GRT Bus Transit corridors, as well as supporting infrastructure at station locations e.g. bicycle parking, storage. The major themes discussed during this session included:

- Convenience, particularly with lack of bike cleaning and repair stations
- Bike parking
- Concerns over theft and security
- Service frequency and
- Educational programs on how to use bike racks on buses.
Above: Images of Topic Station Materials and Activities
Below: Participants providing input to the Current and Future Network
Topic 3: A System for All Seasons
This station was designed to discuss key maintenance requirements to support the use of cycling and active transportation routes year-round, including regular maintenance and snow removal.

Participants were asked what barriers they experience cycling year-round and what the city should consider in selecting routes to be cleared in the winter. Popular responses were:
- Lack of snow removal
- Lack of secure bicycle parking, and businesses or office spaces without secure parking
- Lack of shower facilities.

Suggestions for what the city should consider included:
- Separated bike lanes
- Using sand instead of salt
- Education program ideas such as ‘How to dress for winter biking?’.

Topic 4: A Culture of Cycling – Other Support Programs and Policies
At this table, there was a discussion of key intersections between cycling infrastructure and other services/sectors, including economic development and tourism, school access, and health.

Participants were asked to suggest ways that a culture of cycling can be fostered, through education/awareness or other means.

There were almost 40 ideas collected, including:
- Educational programs such as implementing bike days at school, kid-friendly wayfinding, and engaging youth advisory committees.
- Participants highlighted the need for media outreach and political support
- Building a sense of community through cycling for cultural change to happen within the city.
Bike Your City Online Survey
From April 24, 2019, to June 17, 2019, over 250 respondents participated in the Bike Your City Survey hosted on the Engage Cambridge site. Most of the respondents accessed the survey through Facebook or through Instagram.

The survey asked a variety of questions regarding cycling including what the respondents want to see for the future of cycling facilities, and infrastructure, when the respondents use trails in Cambridge, what would encourage the respondents to cycle more often, and more. In addition, a ‘drop-a-pin’ style survey map was launched to collect feedback on key destinations and currently most used routes in the city.

Many of the themes captured within this survey echoed those that came through the Community Workshop in May, including concerns over security, whether in the form of safety with a protected bike lane or in the form of theft and having a safe place to park and store one’s bike; incomplete cycling networks; and cold weather and time restrictions.

An limited desire to ride in cold weather (which can be mitigated with proper gear and clothing) and an unwillingness to spend too much time biking are two factors where perceptions can change and a cultural shift can help increase cycling in colder conditions and encourage a more positive perception and open-mindedness to cycling longer distances.

Overall, without being prompted with questions on what could change on a cultural level respondents rarely spoke of educational and cultural programs to increase cycling rates. The most popular answers to what would encourage respondents to ride their bikes more often included safer separated bike lanes, debris and snow-free biking lanes, and connected grids.

Pop-Up Events
The City also has pop-up booths at two events over the spring and early summer of 2019, as summarized below:

Public Works Open House – Saturday May 25th, 2019
A recurring annual event, the Public Works Open House attracted over 870 attendees, particularly families with young children (generally not current cyclists). Survey participation was promoted

• Lack of facilities on Coronation Boulevard
• Connections across the river from the Blair area to Preston.
• Addressing bike theft in the core areas (mainly Galt).

Tour de Grand – Sunday June 9th, 2019
With over 2500 attendees, the Tour de Grand was a significant opportunity to reach out to the cycling community in Cambridge and encourage participation in the survey and the overall project process. Visitors to the project booth were excited about the opportunity to engage, and were particularly interested in the infrastructure related elements of the project. Other comments received were:

• Need for improved connections between Blair and Preston
• Encourage more people to bike to work/school
• Need for addition of a multi-use trail along the riverside (west side) of Water St between the Paris-Cambridge Trail head and Ainslie Street
• Need to address bike theft in Galt, by providing lockers or other more secure parking options.
• Cycling infrastructure badly needed on Maple Grove Road.
Round 2: Fall 2019

There were two main channels for engagement open for the second round of engagement in fall 2019, to present the draft cycling network and key strategies for the Cycling Master Plan:

1. Bike Your City Open House
2. Cycling Master Plan Strategies Online Survey

Bike Your City Open House

At this key milestone in the project, a drop-in style event was hosted to provide community members and interested stakeholders with an opportunity to view the key elements of the Draft Cycling Master Plan, including the proposed network, key strategies and actions, and the overall vision and goals. As with the Community Workshop in May, a pop-up booth was set up in the outdoor courtyard at City Hall to support more casual conversations prior to the Open House.

Some of the key highlights of the event included in-depth discussions on the proposed network and potential modifications, the prioritization of strategies, and the ways to leverage existing infrastructure. A 360 degree video tour of a number of key routes in the proposed network was on display, to create a visual connection to the existing conditions and compare that to the envisioned improvements.

Participants voted on the comparative level of priority for each of the five key strategy themes for the CMP, namely:

- Connections
- Integration
- Promotion
- All Seasons
- Monitoring
Cycling Master Plan Strategies
Online Survey

From September 28, 2019, to October 27, 2019, over 110 respondents participated in a survey on the proposed network and strategies for the CMP.

Most of the respondents accessed the survey through Facebook or through Instagram and 96% of all respondents identified as residents of the City of Cambridge.

Overall, the majority of the survey participants were Cambridge residents between the ages of 35 and 64. When evaluating different types of connections, the survey also found that providing connections to trails was the most critical. The majority of participants thought that the proposed network achieves the objectives of creating a more connected cycling and trail network within Cambridge as ‘Well’ or ‘Very well’.

Which destinations do you think are most critical to provide connection to? (Select up to three)

- Major commercial areas
- Schools
- Parks
- Community centres
- Connections to trails

Overall, the majority of respondents chose 'Connections to trails' as the most critical destination.
Feedback on the Proposed Network

How well do you think the proposed network achieves the objective of creating a more connected cycling and trail network in Cambridge?

Question options
- N/A
- Not well at all
- Somewhat well
- Well
- Very well

How well do you think the proposed network achieves the objective of creating a more complete cycling and trail network in Cambridge?

How well do you think the proposed network achieves the objective of creating a more comfortable cycling and trail network in Cambridge?