ORANGEVILLE

CYCLING & TRAILS MASTER PLAN

SHARE THE ROAD CYCLING COALITION

Orangeville Historic Charm Dynamic Future

DILLON CONSULTING

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Glossary

Active Transportation – Any form of transportation that is "human-powered" such as cycling, walking, running, hiking, in-line skating, skateboarding, cross country skiing, etc.

Application Heuristics – Knowledge based rules developed to aid practitioners in the selection of a cycling facility type. These heuristics link specific site conditions to appropriate facility types and supplementary design features.

Bicycle – A vehicle composed of two wheels held in a frame one behind the other, propelled solely by human power, upon which typically one or two persons may travel. The Highway Traffic Act definition of a bicycle includes "a tricycle, a unicycle and a power-assisted bicycle, but does not include a motor-assisted bicycle."

Bicycle Facility – A general term used to denote facilities designed for use by cyclists. Some examples of cycling facilities are: signed only bike routes, signed bike routes with paved shoulders, bicycle lanes, separated bicycle lanes, cycle tracks, and multi-use trails.

Bicycle Lane – A portion of a roadway which has been designated, using pavement markings and signage, for the exclusive use of cyclists.

Bicycle Network – A system of bicycle facilities designated through signing by the jurisdiction having authority. This system may include shared roadways, signed bike routes, paved shoulders, bicycle lanes, cycle tracks, multi-use trails, Greenway trails, and other identifiable bicycle facilities.

Biking School Bus – An organized system of biking with school children from home to school and back. Students in the same geographic area walk to school together under the supervision of an adult volunteer. Like a regular school bus, the Biking School Bus follows a planned and safe route with scheduled stops. Parents and other volunteers receive training and support to develop and implement the program and to supervise children biking to school.

Boulevard – Located between the travelled portion of a highway and the edge of the right-of-way. It may include a hard surfaced splash pad or landscaped strip used to physically separate a cycling facility from the roadway in an urban context.

Buffer – A spatial or physical separation.

Clearance, Width / Horizontal – The width required for safe passage of a pedestrian or cyclist as measured in a horizontal lane. The width is measured from the edge of the facility (trail, bicycle lane, etc.) to any fixed object capable of injuring or destabilizing a pedestrian of cyclist using the facility. This includes a cleared area or fall zone beyond the travel surface.

Clearance, Height / Vertical – The height necessary for the safe passage of a pedestrian or cyclist as measured in a vertical plane. This would include obstructions such as trees, tree branches, or signs

Cross Section – A diagrammatic presentation of the right-of-way profile which is at right angles to the centre line at a given location.

Crossride – A part of the roadway intended as a crossing for pedestrians and cyclists where cyclists are permitted to ride within the crossing. This is indicated by signs, pavement markings and a traffic signal if the crossing is signalized.

Crosswalk – A part of the roadway specifically intended as a crossing for pedestrians. This is indicated by signs, pavement markings and a traffic signal if the crossing is signalized.

Curb – A vertical or sloping construction element along the edge of a pavement or shoulder forming part of a gutter. It strengthens and protects the edge of the pavement, and clearly defines the edge to vehicle operators. The surface of the curb facing the general direction of the pavement is called the "face".

Cyclist – A person who operates a muscular powered or motor assisted bicycle, tricycle or unicycle.

Design Speed – A speed selected for purposes of design and correlation of the geometric features of a road. It is a measure of the quality of design offered by the road.

Designated Bicycle Route – A segment of a bikeway network designated through signing or identification on a map by the jurisdiction having authority. Generally, designated bicycle routes are signed using the green Bike Route Marker M511 (OTM). However, it is still necessary to select the appropriate design treatment for the designated bicycle route given the route location and roadway conditions.

Drainage – The management of excessive water runoff through measures such as grading, ditches, swales, culverts, catch basins, etc.

Electric Assist Bike / pedelec (from pedal electric cycle) – A bicycle with an electric motor which assists the rider when they are pedalling. Electric propulsion is only available when the rider is pedalling and is automatically cut when a certain speed – usually 25 km/h – is reached.

E-Bike (Electric Bicycle) – A bicycle with an electric motor which can be operated exclusively on electric power or by pedaling. No pedaling is required for propulsion.

Greenway – A strip of undeveloped land near an urban area, set aside for recreational use or environmental protection.

Interested but Concerned – A segment of the population that would cycle more if the facilities were in place to help them to feel safe on their bikes.

Mid-block – The segment of the roadway between two intersections.

Motor Vehicle – Include automobiles, motorcycles, motor-assisted bicycles (mopeds), and any other vehicle propelled or driven other than with muscular power. It does not include streetcars, or other vehicles designed to operate on rails, power assisted bicycles, motorized snow vehicles, traction engines, farm equipment or road-building machines.

Motor Vehicle Operating Speed (85th Percentile) – The speed which no more than 15% of traffic is exceeding.

Multi-use trail – An active transportation facility that is physically separated from motor vehicle traffic by a hard surfaced splash strip or by a grass boulevard within the roadway or highway right-of-way. This facility may or may not be located within the roadway right-of-way. A multi-use trail is intended for non-motorized travel modes such as walking and cycling, and is typically located in place of, or adjacent to, a sidewalk in the boulevard of a road right-of-way.

Paved Shoulder – A form of bicycle facility on a road with a rural cross section. A paved shoulder is a portion of a roadway which is contiguous with the travelled way. It provides accommodation for stopped and emergency vehicles, pedestrians and cyclists as well as for lateral support of the pavement structure. A paved shoulder on a designated bike route may include a buffer zone to provide greater separation between motorists and cyclists.

Pavement Markings – Painted or durable lines or symbols applied on any paved bikeway or roadway surface for guiding vehicular, cyclist and pedestrian traffic.

Pedestrian – A person whose mode of transportation is by foot. It also includes a person in a non-motorized wheelchair, or person in a motorized wheelchair who cannot travel at over 10 km/h. A person pushing a bicycle or a motorized or non-motorized wheelchair is also considered a pedestrian. It does not include any person who is in or upon a vehicle, motorized or otherwise propelled.

Refuge Island – For the purpose of this document see *Median Island*

Right-of-Way – The area of land acquired for or devoted to the provision of a road.

Shared Roadway / Signed Bike Route – A road where both motorists and cyclists share the same vehicular travel lane.

"Sharrows" – The term used for shared roadway lane markings or shared lane arrows that consist of two white chevron markings and a bicycle stencil. Sharrows are intended to guide cyclists as to where they should ride within a travel lane shared by both motorists and cyclists. They are an optional treatment and are context specific.

Shoulder – The areas of gravel or hard surface placed adjacent to through or auxiliary lanes. They are intended for emergency stopping and travel by emergency vehicles. They also provide structural support for the pavement.

Sidewalk – A travelled way intended exclusively for pedestrian use, following an alignment generally parallel to that of the adjacent roadway.

Sight Distance – The length measured distance along the normal travel path of a roadway, to the roadway surface or to a specified height above the roadway, when the view for the driver of a passenger vehicle or a bicycle is unobstructed.

Sightline – A measure of the cyclist's visibility, unobstructed by traffic or objects beside a bikeway or multi-use path, to the farthest visible point of the bikeway/roadway surface. Horizontal and vertical curves along the roadway as well as roadway width should be considered when providing adequate sightlines for road users. Regular maintenance of vegetation is also important in preserving sightlines.

Signalized Intersection – An intersection where traffic approaching from all directions is regulated by a traffic control signal.

Stopping Sight Distance (SSD) – The minimum distance required to bring a bicycle to a controlled full stop.

Superelevation – The amount by which the outer edge of a curve on a road or bicycle facility is banked above the inner edge.

"Super Sharrows" – The term used for shared roadway lane markings or shared lane arrows that consist of two white chevron markings a bicycle stencil and a green background. See *"Sharrows" for more information.*

Trail Alignment – The exact route taken by a trail.

Transportation Demand Management (TDM) – consists of specialized policies, targeted programs, innovative mobility services, and products that encourage people to use sustainable modes of transportation, rather than driving alone, or make fewer trips by car.

Travel Surface – The hard-surfaced portion of the trail right-of-way or tread typically sloped or crowned to provide proper drainage**.**

Tread Width – The horizontal dimension measured across the trail travel surface or tread which provides adequate space for comfort and safe movement.

Unsignalized Intersection – An intersection where traffic approaching from all directions is regulated by any traffic control device that is not a traffic control signal.

Utilitarian Cyclist – An individual who uses a bicycle primarily for travel to and from specific destinations such as work, school, shops or recreation centres.

Utilitarian Travel – Travel for which the purpose is to reach a particular destination and are often repetitive. These include trips to places of employment, school or shopping, as well as trips that are necessary as part of an individual's daily activities.

"Walk a Block" – A drop off zone is set-up a block (or more) away from the school to encourage walking. This also helps to decrease traffic congestion at the school grounds.

Walking School Bus – An organized system of walking with school children from home to school and back. Students in the same geographic area walk to school together under the supervision of an adult volunteer. Like a regular school bus, the Walking School Bus follows a planned and safe route with scheduled stops. Parents and other volunteers receive training and support to develop and implement the program and to supervise children walking to school.

1.0 Introduction

A walkable and bikeable town is one where people walk and cycle because it is a convenient, fun, safe, and healthy choice. It is a town in which people of all ages and abilities are able to walk and cycle for any trip purpose.

In 2016, the Town of Orangeville undertook its Strategic Plan to identify priority areas for the Town's growth and development. Out of the Strategic Plan came five key priority areas to drive municipal growth. The need for this Cycling and Trails Master Plan has been reinforced by the Strategic Plan, namely in the following priority areas: Community Stewardship and Sustainable Infrastructure. Sustainable Infrastructure focuses on maintaining existing assets, planning for growth, supporting innovation, and providing systems that keep people moving, especially enhancing all forms of active transportation. The Community Stewardship priority aims to keep the community safe and protected, active and healthy, engaged and involved and aims to champion the environment. This specific priority names the need to continue to roll out master plans that will diversify active and recreational opportunities within the Town. This is why the Town of Orangeville is committed to developing and implementing a Cycling and Trails Master Plan (CTMP) which aspires to accommodate and encourage more people to be active through walking and cycling.

This Master Plan will build upon and update the 2008 Orangeville Trails Master Plan and the 2010 County of Dufferin Active Transportation Plan to create a comprehensive Master Plan for the Town that includes both trails and cycling. The CTMP will provide guidance for the creation of a connected and sustainable cycling and trails network that will improve active living and recreation opportunities for residents and visitors. It will also include strategies to grow the cycling and active transportation culture within the Town of Orangeville.

1.1 What is a Cycling and Trails Master Plan?

A Cycling and Trails Master Plan is a long-range transportation planning document intended to support and guide the planning, design and implementation of cycling and trail facilities. The plan will determine community goals and aspirations through public consultation and provide a blueprint and a set of tools to achieve these goals and aspirations. Essentially, it will make it easier to decide to walk and ride a bike in Orangeville.

1.2 Benefits and Rational of Cycling and Trails Development

The development of cycling and trails infrastructure is recognised as an increasingly relevant issue in municipalities across Canada. Intensification and urbanisation, increasing traffic congestion, the rise in obesity and health conditions associated with low physical activity levels, degrading environmental conditions associated with automobile travel, fractured habitats, and the public demand for high quality

personal mobility choices and unstructured recreation activities, are all reasons why the shift towards active transportation infrastructure is growing. These issues will become even more pertinent as our population continues to age and our communities continue to evolve.

As the Town of Orangeville continues to grow, especially within its compact urban form, it will continue to place additional pressure on all Town resources and infrastructure. The development of an updated CTMP and the associated cycling and trail system will provide Orangeville with a strategy to accommodate some of the mobility needs associated with this growth.

Having access to off-road recreational trails encourages an active lifestyle which provides health benefits to a wide range of users. Orangeville's many recreational trails and natural areas offer no or low-cost nature-based recreation opportunities, close to home and enhance the appeal and quality of life in the Town.

In 2015, the Interprovincial Sport and Recreation Council (ISRC) and the Canadian Parks and Recreation Association (CPRA) developed "A Framework for Recreation in Canada 2015 – Pathways to Wellbeing". The Framework discusses multiple ways in which recreation provides benefits to the wellbeing of individuals and communities, as well as the built and natural environment. The framework also describes a series of goals and priorities that will enable recreation's continued relevance and leadership in the journey to wellbeing.

1. Active living – foster active living through physical recreation;
2. Inclusion and Access – Increase inclusion and access to recreation for populations that face constraints to participation;
3. Connecting People and Nature – reconnection people to nature through recreation;
4. Supportive Environments – that encourage participation in recreation and build strong, caring communities; and
5. Recreation Capacity – ensure the continued growth and sustainability of the recreation field.

The framework indicates that there is evidence for a wide variety of benefits from recreation and active living as well as being outside and in nature. Some of these benefits include: Enhanced mental and physical wellbeing; Enhanced social wellbeing; Stronger families and communities; Better connections with nature; and, Economic benefits from investing in recreation.[1]

The community benefits of active transportation infrastructure investments combined with the enhancement of Orangeville's cycling and active transportation culture will purposefully benefit the Town's livability, public health, economic competitiveness, and natural environment.

[1] Canadian Parks and Recreation Association/Interprovincial Sport and Recreation Council (February 2015). *A Framework for Recreation in Canada - 2015 - Pathways to Wellbeing*. Ottawa: Canadian Recreation and Parks Association

1.2.1 Active Living / Health Benefits

The use of recreational trails and active transportation infrastructure has been widely recognized to have health benefits. According to the Canadian Fitness and lifestyle Research Institute, if Canadians reduce their reliance on cars and increase walking and cycling, they can increase their physical activity levels, lower their risk of obesity, lower the risk of hospitalizations from asthma, reduce the risk of other health conditions (cardiovascular disease, type 2 diabetes, stroke, and some cancers) and improve mental health. Engaging in physical activity through active transportation can also lead to:

- Better overall health
- Improved physical fitness
- Better posture and balance
- Better self-esteem
- Stronger muscles and bones
- Relaxation and reduced stress
- Continued independent living later in life
- Increased connection to the community[2]

The following sections provide a summary of some of these active living / health benefits.

Increase fitness and reduce obesity

As of 2017, 64% of Canadian adults (aged 18 +) were overweight or obese, and 30% of children (aged 5-17) were overweight or obese[3]. As physical activity is an essential part of any weight loss program it is not surprising that active transportation for leisure or transport contributes to lower obesity rates.

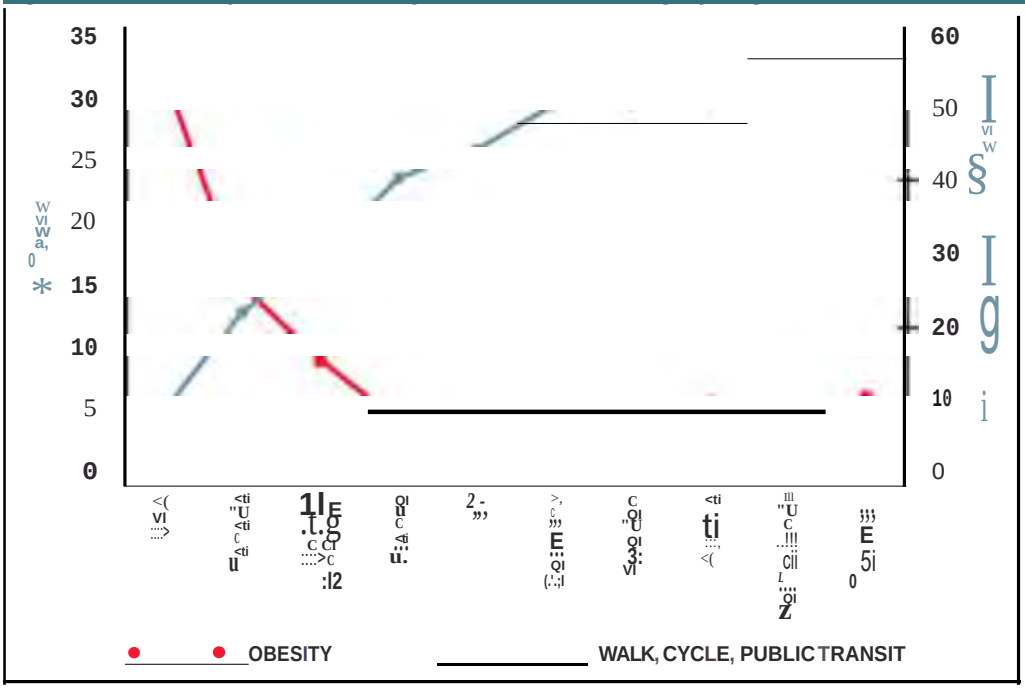
Recreational trails can provide a no-cost location to be physically active which is open to everyone. Having an equitable distribution of trails and other active transportation infrastructure can have a positive effect on nearby resident's physical activity levels. People who have trails and parks nearby to where they live are at least 25% more likely to exercise three times a week.[4] Similarly, having amenities for active living that can be used throughout the year will promote physical activity during the winter months when physically active levels tend to be lower.

Studies conducted in the United States found that men who walk or cycle to work were 50% less likely to be obese[5] and that the risk of obesity decreases by 4.8% with every additional kilometre walked per day,

[2] Bergeron, K. & Cragg, S. Making the Case for Active Transportation: Bulletin #1 – Health Benefits. Canadian Fitness and Lifestyle Research institute 2009, Ottawa, Ontario.
[3] Public Health Agency of Canada. Tackling Obesity in Canada: Obesity and Excess Weight Rates in Canadian Adults, 2018. https://www.canada.ca/en/public-health/services/publications/healthy-living/obesity-excess-weight-rates-canadian-adults.html.
[4] Active Living Resource Centre. *Active Facts: Parks, Trails and Recreation.* National Center for Bicycling & Walking. Bethesda, MD.
[5] Gordon-Larsen P, Boone-Heinonen J, Sidney S, Sternfeld B, Jacobs DR, Jr., Lewis CE. Active commuting and cardiovascular disease risk: the CARDIA study. Archives of internal medicine 2009; 169(13):1216-23.

while the risk of obesity goes up 6% with every additional hour spent in a car each day[6]. Overall, researchers have found that countries with higher rates of active transportation and transit use have lower obesity rates overall[7] • ***Figure 1*** illustrates this relationship.

Figure 1: Relationship between obesity and combined walking, cycling, and transit mode share



Source: Transport Canada (2010), data from Basset et al. (2008)

Reduced risk of cardiovascular disease, diabetes, stroke and cancer

According to Statistics Canada, cardiovascular disease, diabetes, stroke and cancer are four of the top six leading causes of death in Canada. In total, these four causes of death equated to over 56% of all deaths in Canada in 2016. Fortunately, physical activity has been shown to help reduce the risk of all of these conditions. When people are physically active, their quality of life and level of health increases and when people are healthy, they have a reduced need for medical services. A Danish study suggests that biking just 3 hours a week reduces the risk of heart disease and stroke by 50% and 30 minutes or more of biking per day lowers a women's risk of breast cancer [8].

[6] Transport Canada. Active transportation in Canada: a resource and planning guide. Government of Canada, 2010.
[7] Bassett DR, Pucher J, Buehler R, Thompson DL, Crouter SE. Walking, Cycling, and Obesity Rates in Europe, North America, and Australia . Journal of Physical Activity and Health 2008; 5(6):795-814.
[8] University of Copenhagen, Denmark . A study from the institute for exercise and sport sciences.

Research has shown that active commuting that incorporates walking and cycling is associated with an 11% reduction in cardiovascular risk[9] while high levels of walking for transportation is associated with a 31% decrease in the risk of cardiovascular disease[10]. There is also strong evidence that suggests that physical activity and active commuting lower the risk of developing Type II diabetes[11,12] and suffering a stroke[13]. Finally, there is a significant body of research that suggests that there is a causal relationship between physical activity and a reduced risk of cancer. This evidence is particularly well documented in relation to colon cancer and breast cancer[14].

Improved mental health

Mental illness affects people of all ages, education, income levels, and cultures. The Canadian Mental Health Association estimates that 1 in 5 people in Canada will experience a mental health problem or illness in any given year and that all people in Canada will be indirectly affected by mental illness at some point in their life. Fortunately, physical activity has a demonstrated positive effect on a range of mental illnesses. Research has found that physical activity can reduce the symptoms of depression, anxiety and panic disorders[15], while one study found that walking in particular can reduce anxiety and depressive symptoms in older women, and that walking was as effective as other forms of physical activity in reducing anxiety and depression[16]. Research also suggests that physical activity can improve the mental health of all people. There is evidence that increasing physical activity can improve self-esteem[17] and mood, reduce stress[18,19] and enhance perceptions of happiness and satisfaction[15]. Being directly exposed to nature, like when using the trail system, has almost immediate effects on their mood, lowers stress levels and increases happiness. These immediate benefits are felt in as little as 10 minutes in a natural

[9] Hamer M, Chida Y. Active commuting and cardiovascular risk: a meta-analytic review. Preventive Medicine 2008; 46(1):9–13.
[10] Hamer M, Chida Y. Walking and primary prevention: a meta-analysis of prospective cohort studies. British Journal of Sports Medicine 2008; 42(4):238-43.
[11] Kesaniemi YK, Danforth E Jr, Jensen MD, Kopelman PG, Lefèbvre P, Reeder BA. Dose-response issues concerning physical activity and health: an evidence-based symposium. Medicine and Science in Sports and Exercise 2001; 33:S351–8.
[12] Hu G, Qiao Q, Silventoinen K, Eriksson JG, Jousilahti P, Lindström J, et al. Occupational, commuting, and leisure-time physical activity in relation to risk for Type 2 diabetes in middle-aged Finnish men and women. Diabetologia 2003; 46(3):322–9.
[13] Cavill N, Kahlmeier S, Rutter H, Racioppi F, Oja P. Methodological guidance on the economic appraisal of health effects related to walking and cycling. Copenhagen, Denmark: World Health Organization Regional Office for Europe, 2007.
[14] Thune I, Furberg AS. Physical activity and cancer risk: dose-response and cancer, all sites and site-specific. Medicine and Science in Sports and Exercise 2001; 33:S530–50.
[15] Paluska S.A., Schwenk T.L. Physical Activity and Mental Health: Current Concepts. Sports Medicine 2000; 29(3):167–80.
[16] Heesch KC, Burton NW, Brown WJ. Concurrent and prospective associations between physical activity, walking and mental health in older women. Journal of Epidemiology and Community Health 2010.
[17] McAuley E, Blissmer B, Katula J, Duncan TE, Mihalko SL. Physical activity, self-esteem, and self-efficacy relationships in older adults: A randomized controlled trial. Annals of Behavioral Medicine 2000; 22:131–9.
[18] Fox KR. The Influence of Physical Activity on Mental Well-Being. Public Health Nutrition 1999; 2:411–8.
[19] Taylor AH. Physical activity, anxiety and stress. Physical activity and psychological well-being. Routledge 2000; 10–45.

setting.[20] Once again, providing infrastructure that can be used year around will promote outdoor recreation during the winter months. This will help maintain levels of activity in nature and exposure to fresh air and sunlight at a time of the year when sunlight is limited and many people are averse to spending time outdoors.

1.2.2 Social / Safety Benefits

Active transportation provides practical opportunities for residents to be physically active, thereby increasing mental wellness and social interactions. High rates of active transportation are a strong indicator of sustainability and livability. Active transportation facilities also provide affordable and accessible transportation choices for people of all ages and abilities. For youth, this encourages sustainable travel patterns at an early age that often continue into adulthood and provides a sense of freedom which can lead to more independent adults.

When municipalities provide infrastructure to encourage active transportation such as trails and bicycle facilities, it can facilitate people getting out of their cars and into the public realm, increasing opportunities for socialization. Communities that are walkable and bikeable will typically have "residents who are more likely to know their neighbours, to participate politically, to trust others and be involved socially, which can lead to better physical and mental health."[21]

Living near places with trails may also help residents to avoid loneliness as there are more opportunities for spontaneous interactions. Many people spend a good deal of time on social media but still report feeling lonely. Easier access to amenities, like trails, can help decrease or avoid feeling lonely which is said to be an epidemic.[22] Loneliness may be felt even more so during the winter months and providing an all season trail system can help foster those spontaneous social interactions all year round.

Active transportation provides mobility choices. This is essential for providing a transportation system that is accessible and equitable for everyone: youth; seniors; persons with disabilities; and those who may not have access to, or be able to afford a motor vehicle. In addition, recent studies have observed that millennials are purchasing new vehicles at half the rate of those aged 35 to 54, and this trend of lower vehicle ownership looks to continue.

[20] Tyrväinen, Ojala, Korpela, Lanki, Tsunetsugu, Kagawa. The Influence of urban green environments on stress relief measures: A field experiment. The Journal of Environmental Psychology 2014; 38:1-9.
[21] Bergeron, K. & Cragg, S. Making the Case for Active Transportation: Bulletin #7 – Increasing Social Capital. Canadian Fitness and Lifestyle Research institute, 2009, Ottawa, Ontario.
[22] Morris, Wanda. *Walk in a park a coping strategy for loneliness: Being near green space mattered in improving health outcomes, studies find.* National Post, 2017.

Improving streets to better accommodate cyclists enhances safety for all road users. Streets designed for slower vehicle speeds are safer for vulnerable road users, including people who are cycling. Studies have shown that slower vehicle speeds greatly increase survival rates for road users involved in a collision. When active transportation rates increase, rates of collisions between vulnerable road users and motor vehicles decrease at the same time. Studies have also shown that bicyclist safety significantly increases when there are more bikes on the road, a finding that can be attributed to the "safety in numbers" affect.

1.2.3 Economic Benefits

An increase in active transportation mode share has been said to reduce automobile collisions, lower roadway costs, reduce congestion and road maintenance costs, lower absenteeism and increase employee productivity, lower healthcare costs, lower parking infrastructure costs and increase property values. In 2002, the cost of urban congestion for Canadians was between $2.3 billion and $3.7 billion. Time contributed to the majority of the cost, at more than 90%, while 7% of the cost was attributed to increased fuel consumption and 3% was attributed to greenhouse gas emissions.[23]

Developing and maintaining bicycle and pedestrian facilities makes more efficient use of existing infrastructure and is less costly to construction and maintenance in comparison to automobile facilities. The cost of creating a bicycle lane is approximately $20,000/km if road widening in not required and $250,000/km if road widening is needed. In comparison, the Ontario Ministry of Transportation estimates that it costs approximately $1.3 million/km to widen a two lane urban arterial road to four lanes[24].

Research has indicated that proximity to trails contributes to real estate values and that properties close to or adjacent to trails are often highly marketable[25]. This is likely because trails are frequently situated in parks or natural green space and often connect to key destination and community amenities such as parks, recreation centers, and places of employment.

In addition, when residents can spend less on the cost of car ownership, maintenance, and insurance, they have more disposable income to spend on local services such as groceries, restaurants and other goods. Recent studies also demonstrate the economic cost to health services resulting from inactivity. Cycling is an opportunity to reduce health care costs by integrating physical activity into daily life.

Bicycle-supportive communities encourage residents to support local businesses, as consumers using active forms of transportation tend to shop close to where they live. Neighbourhoods and destinations

[23] Bergeron, K. & Cragg, S. Making the Case for Active Transportation: Bulletin #3 – Economic Benefits. Canadian Fitness and Lifestyle Research institute, 2009, Ottawa, Ontario.
[24] Toronto Coalition for Active Transportation, Bike Lanes: Good for Business, 2009.
[25] Ontario Ministry of Tourism and Recreation, ACTIVE2010 Ontario Trails Strategy, 2005.

that are accessible and attractive for active transportation users attract more visitors, who will in turn be patrons of local services and amenities.

1.2.4 Tourism Benefits

Cycle tourism continues to grow in Ontario. Research published by the Ontario Government in 2017 indicates that Ontario had 1.7 million cycling tourists, collectively spending $428 million. The majority of cycle tourists in Ontario are Ontario residents (87.9%), while overseas visitors accounted for only 3.4% of visitors but 20.8% of spending. Cycle tourists also tend to spend more nights and money per trip when compared to other visitors.

Walking and hiking tourism, spurred by trails and greenways, are significant contributors to the local economy. Eating and drinking establishments, retail and lodging facilities are widely recognized to be the main beneficiaries from this tourism. The Bruce Trail had an estimated 410,000 visitors in 1994 and 70% of those visitors indicated that the trail was their primary reason for being in the area. On average, these hiking tourists stayed 3.8 nights, which equated to approximately 417,000 nights spent in local accommodation. 70% of those same tourists also purchased soft goods, largely within 10 km of the trail, averaging approximately $70 per group.[26]

1.2.5 Environmental Benefits

The Town's Strategic Plan Sustainable Infrastructure priority outlines the need to support innovation through seeking opportunities to reduce energy consumption and therefore lessening its related environmental impact. One way to do that is to provide alternative modes of transportation in the Town including transit and facilities for active transportation. Active transportation, such as walking and cycling, has little to no ecological footprint. When motorized vehicle travel is reduced, as a result of a modal shift to active transportation, so too are the levels of harmful emissions, exposure to pollutants and the amount of traffic volume.[27]

According to Environment and Climate Change Canada, transportation is one of the largest single sources of greenhouse gas emissions at 24%, with urban passenger vehicles making up almost half of the transportation total. On average, one litre of gasoline emits about 2.3 kilograms of carbon dioxide (CO_2) when burned[28]. As a result, increasing rates of active transportation have been shown to reduce air pollution and Green House Gas emissions while helping to meet current climate change targets.

[26] Go for Green, The Business Case for Active Transportation: The Economic Benefits of Walking and Cycling, 2004.
[27] Bergeron, K. & Cragg, S. Making the Case for Active Transportation: Bulletin #4 – Environmental Benefits. Canadian Fitness and Lifestyle Research institute, 2009, Ottawa, Ontario.
[28] Natural Resources Canada. Emission impacts resulting from vehicle idling, 2016. https://www.nrcan.gc.ca/energy/efficiency/communities-infrastructure/transportation/cars-light-trucks/idling/4415

When compared side by side, the average passenger vehicle (production and operation) emits 271g/km of CO2, whereas the average bicycle (production, maintenance, and operation) emits 21 g/km.[29]

A congested roadway (stop-and-go traffic) produces more greenhouse gas emissions than a similar uncongested roadway (free flow conditions)[30]. This increase in emissions is caused by the additional idling and constant acceleration and deceleration of stop-and-go traffic.

Fortunately, active commuting can help to increase the overall flow of vehicle traffic by alleviating road congestion. For every additional person who bicycles to or from work, typically one less vehicle will be on the road. Also, an obvious difference is that bicycles are much smaller than cars. Twelve average bicycles can fit into one average car parking spot. Parking lots have large environmental and financial footprints. Fewer cars mean less need for car parking spot and less environmental and financial impacts.[31]

Noise pollution from traffic also interferes and imposes upon our comfort, health, and quality of life, not to mention the impacts on the natural environment. For example, some bird, bats and mammals may have difficulty finding food, hearing predators, and communicating as a result of noise pollution. An increase in active commuting typically decreases auto commuting, thereby decreasing noise pollution that is generated by traffic.

As well, active transportation trails through natural areas, if properly situated and managed, can serve to direct public access and can help maintain and protect environmentally sensitive and natural heritage areas, while advancing environmentally friendly initiatives, as outlined in the Community Stewardship priority within the Town's Strategic Plan. Additionally, trail guides and interpretive signage can further foster the understanding and appreciation of environmentally sensitive and natural heritage areas.

[29] ETA. CO2 emissions from cycling revealed. https://www.eta.co.uk/2011/12/13/co2-emissions-from-cycling-revealed/
[30] Anderson, W.P., Pavlos, S.K., Miller, E.J., Buliung, R.N. Simulating automobile emissions in an integrated urban model. Transportation Research Record 1996; 1520, 71-80.
[31] Cycling Embassy of Denmark. First Ever Priority Plan for Bicycle Parking in Copenhagen. http://www.cycling-embassy.dk/2018/03/12/first-ever-priority-plan-bicycle-parking-copenhagen/

1.2.6 Transportation Benefits

Research suggests that walking and cycling are the fastest modes of transportation for short trips in urban areas. Walking is generally the fastest mode of transportation (even compared to driving) for trips of 500m or less. This is because driving has a "start-up" that takes additional time when compared to walking. It consists of; unlocking the car, turning on the car, and leaving / finding a parking spot. Cycling is the fastest mode of transportation for urban trips of 5km or less, and is only slightly slower (2-3 minutes) than driving for trips up to 7 km[32]. Although this research was conducted in European cities, the general trends would remain true for Canadian cities although the magnitudes would likely decrease and trip distances are frequently longer in Canada.

Cycling is also seen as a more enjoyable means of transportation. Statistics Canada completed a study and found that "19% of cyclists felt that their commutes were the most pleasant activity of the day, whereas only 2% of drivers felt the same way."[33]

As was previously mentioned, commuting by active modes (specifically cycling) can help to increase the overall flow of vehicle traffic by alleviating road congestion. For every additional person who commutes by bicycle, typically one less vehicle will be on the road.

1.3 Study Area and Community Profile

In cycling and trails planning it is important to first understand the current and projected community profile, before planning for the future. This understanding will allow for more purposeful recommendations to better align with the cycling, recreation and leisure needs of Orangeville's current and future population.

1.3.1 Geography

The Town of Orangeville is a small urban centre located within Dufferin County and the outer ring of the Greater Golden Horseshoe region of Ontario. Geographically small in size, Orangeville has a land area of 15.6 km^2, and a population of 28,900 in 2016, resulting in a compact urban form and a population density of 1,851 persons per square kilometre (2016). Despite its small size, Orangeville serves as an administrative and commercial hub within Dufferin County and the northern portion of Peel Region.

1.3.2 Population

The Town of Orangeville is the largest urban area in Dufferin County and has seen population growth over the past several decades. The Town's population increased significantly by approximately 75% from

[32] Dekoster J, Schollaert U. Cycling: the way ahead for towns and cities, 1999. http://ec.europa.eu/environment/archives/cycling/cycling_en.pdf

[33] Bergeron, K. & Cragg, S. Making the Case for Active Transportation: Bulletin #1 – Health Benefits. Canadian Fitness and Lifestyle Research institute, 2009, Ottawa, Ontario.

1986 to 2001, from 14,455 to 25,248[34]. The population of Orangeville reached 28,900 residents in 2016, representing a 3.3% increase from 2011[35].

Forecasts from the 2016 Land Needs Assessment Study indicate that the Town's population will continue grow until it reaches its estimated build-out population of 36,490 residents. The build-out population is limited by the capacity of municipal services (specifically water and sewage) within the Town. Orangeville is projected to reach its build-out population by 2031. However, an earlier study[36] anticipates that the Town may reach its 'build out' population as early as 2024.

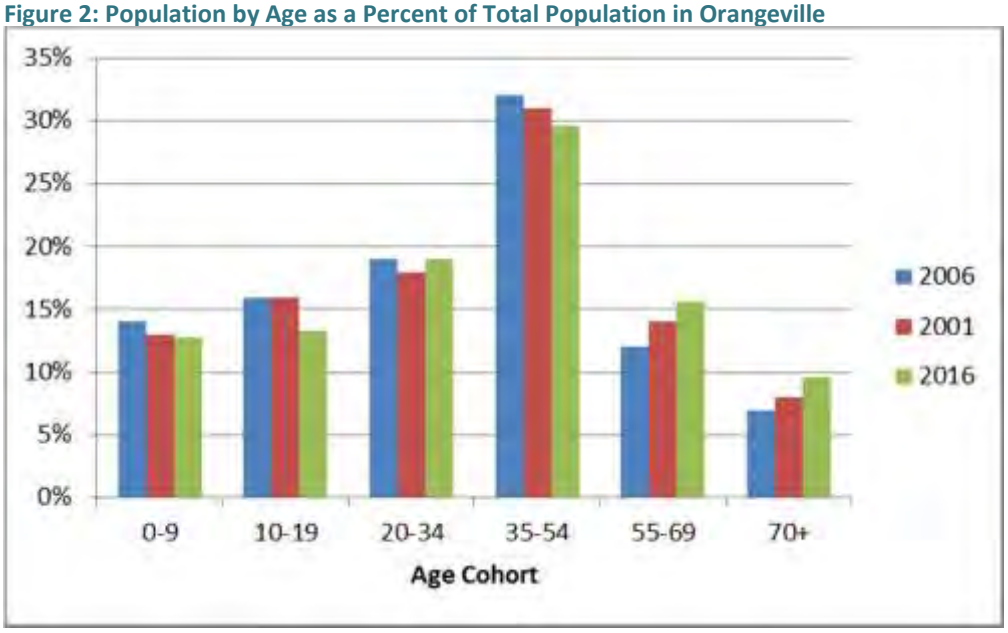
The Town Orangeville also experienced a significant increase in the number of households from 1986 to 2006, from 4,740 to 9,430. This nearly doubling in the number households over a twenty year period equated to the fastest growth rate of households in Dufferin County at 3.5%[37]. Despite a slower pace in housing development over the past 10 years (2006 to 2016), the number of households has continued to increase, reaching 10,696 in 2016[35].

1.3.3 Age Profile

Ontario's aging population has been widely observed throughout most communities across the province. In the 2016 Census, the 65 to 69 age cohort experienced the highest increase from 2011 at 30.9%. This demographic trend is also present within the Town of Orangeville, although the overall median age in Orangeville is below the provincial average. In 2016, the median age in Orangeville was 38.8 year, 2.5 years younger than the provincial median age of 41.3 years. This is likely due to the family-oriented housing that has been developed in Orangeville in recent years. Consequently, youth and families as well as older adults should be considered in cycling and trails planning. ***Figure 2*** illustrates the changing age profile of Orangeville's population from 2006 to 2016.

[34] Orangeville Parks Master Plan, 2015.
[35] Statistics Canada. Census Profile: Orangeville, Town [Census subdivision], Ontario. 2016 Census of Population, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E
[36] Orangeville Development Charges Background Study, 2014.
[37] County of Dufferin Growth Management Strategy, 2008.

Figure 2: Population by Age as a Percent of Total Population in Orangeville



Source: Statistics Canada. 2006, 2011, and 2016 Census: Community Profiles. www.statcan.gc.ca

1.3.4 Income

As reported in the 2016 Census, the median household income for the Town of Orangeville was $85,241, which was higher than the provincial average of $74,287. This trend has diverged from the previous decades, whereby the Town consistently fell below the provincial average. Although Orangeville falls below the average household income for Dufferin County as a whole, it has a comparable average household income when compared to the surrounding municipalities.

1.3.5 Employment and Commuting

Orangeville has a strong and diverse employment base and is the regional centre for commercial and service activity within Dufferin County and the northern portion of Peel Region. Although situated 35 minutes from Brampton and an hour's drive from Toronto, Orangeville is also interconnected within the Greater Toronto Area (GTA), Canada's largest metropolitan area. Although Orangeville has enough jobs for 96% of its total work force, according to the 2016 Census, 42% of Orangeville residents worked within the community, while the remaining 58% worked outside of Orangeville.

1.4 Existing Policies, Plans and Initiatives

Policies and plans that support active transportation, specifically cycling and multi-use trails, are found throughout all levels of government. At the provincial level, the Provincial Policy Statement sets the stage by providing a high level policy direction on matters of provincial interest related to land use planning and development, which includes active transportation and trails. The province also has developed a Cycling Strategy (#CycleON Action Plan) and a Sport and Physical Activity Strategy (ACTIVE2010) which includes a Trails Strategy (Ontario Trails Strategy). These strategies provide specific policy guidance and support for walking, cycling and trail development.

At the county level, Orangeville is located within Dufferin County but sits on the northern border of the Region of Peel. As such, the policies and plans of both counties will contribute to and influence the development of policy and planning within the Town of Orangeville. Dufferin County has developed an Active Transportation and Trails Master Plan (2010), while the Region of Peel has developed an Active Transportation Master Plan (2011). Both of these plans promote active transportation and active recreation through policy, programming, and networks of on and off road trails and cycling infrastructure that connect the urban municipalities and rural communities throughout both Counties'.

In Orangeville, the first comprehensive document identifying a long-term strategy to improve recreational trail uses and active transportation was the 2008 Trails Master Plan. Since then, Orangeville has supplemented this plan by producing various other plans and strategies with relevancy to cycling and trails. They are as follows:

- Parks and Recreation Strategic Plan 2010 – 2020 (2009);
- Official Plan (2013);
- Parks Master Plan Situational Analysis Report (2014);
- Parks Master Plan (2015);
- Zoning By-Law (2015);
- Orangeville Forward – A Strategic Action Plan for the Town of Orangeville (2017); and
- Orangeville BIA – Strategic Plan (2017).

At the grassroots/advocacy level, Sustainable Orangeville – formerly the Orangeville Sustainability Action Team (OSAT) – is a citizen committee that reports to council on various matters related to sustainability, including cycling and trails. Cycle Orangeville, an initiative of Sustainable Orangeville, has developed a "Biking in Orangeville – Share the Road" brochure that includes a cycling and trails route map and outlines basic bike safety, cyclist hand signals, and various other tips for cyclists and motorists. Likewise, Citizens of Headwaters for Active Transportation Team (CHATT), a supported project of Headwaters Communities in Action, is a citizen group that promotes the benefits of Active Transportation by supporting the existence and maintenance of regional trails, sitti ng on local committees as necessary and promoting initiatives via social media.

Understanding the existing policies, plans and initiatives that support cycling and trails will allow for the CTMP to update and build on past work, while developing new principles and priorities that reflect current thinking and state of knowledge.

2.0 Development of the Master Plan

The proposed cycling and trails network is the foundation of Orangeville CTMP. The plan was developed through; input and feedback from stakeholders and the members of general public, the most current Canadian and North American best practices, and project team experience. Using this process, principles were established to guide the proposed network, policies and strategies.

2.1 Developing the Guiding Principles

Based on a range of past strategic planning studies, completed by and for the Town of Orangeville, combined with input received through the CTMP consultation process, a clear direction emerged for the future of cycling and trails in Orangeville. This direction is comprised of a vision, a series of goals and objectives that were developed in order to achieve the vision, and a set of principles that will guide the implementation of the goals and objectives.

2.1.1 Vision

The CTMP Vision was created following a thorough review of the Town's key priorities as outlined in the Strategic Plan, as well as using input gathered from the initial stakeholder and community engagement sessions. The Vision, as confirmed by the CTMP Advisory Group, outlines the priorities of both the Town and residents of Orangeville and reads:

"The Town of Orangeville will provide all of its residents opportunities for active living and a high quality of life by ensuring that walking and cycling are convenient, comfortable and sustainable modes of transportation for all ages, abilities and trip purpose"

2.1.2 Goals & Objectives

The Goals & Objectives will establish the content of the CTMP. They were developed to follow and align with the Town's key priorities as outlined in the Strategic Plan and using feedback received during the initial stakeholder and community engagement sessions. They were confirmed by the CTMP Advisory Group. The Goals & Objectives of the CTMP are as follows:

- Review and assess the current state of the cycling and trails network;
- Build upon the existing and planned cycling and trails network by "filling in the gaps";
- Follow a balanced approach between the need and desire for additional infrastructure and services, the environment and fiscal priorities;
- Build capacity in the network by create additional high-quality bicycle and trail facilities that connect to places and people throughout Orangeville;

- Develop an accessible network which allows people of all ages and abilities to utilize the bicycle and trail facilities for both recreational and utilitarian travel to destinations throughout the Town;
- Address specific areas of concern that are barriers to active travel or are uncomfortable for trail users and cyclists;
- Increase the level of cycling and trail use for all trip purposes; and
- Develop policies and other initiatives to create a bicycle and trail friendly Orangeville.

2.1.3 Principles

Principles will guide the implementation of the CTMP by providing the qualitative framework for evaluating each of the Goals & Objectives. The principles were initially developed for the 2008 Trails Master Plan but have been updated and modified in order to incorporate cycling. The principles of the Orangeville CTMP are as follows:

Planned: Bicycle facilities and trails will be considered an integral component of all community planning and development.

Connected: Bicycle facilities and trails will serve to connect the neighbourhoods of Orangeville, both internally and externally, and will link key destinations.

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

Inspiring: Bicycle facilities and trails will promote and encourage use and enjoyment of the Town's natural, cultural and recreational features.

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

Navigable: Wayfinding will provide direction to major community facilities/destinations located on or adjacent to the cycling and trails network.

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

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

2.2 Cycling and Trail Facility Types for the Orangeville Context

A comprehensive cycling and trails network consists of both on and off road facilities. This variation in facility type provides a variety of travel options for multiple user groups and trip purposes. The following section describes the; On-Road Bicycle Facilities and Off-Road Trails, applicable to the Town of Orangeville.

2.2.1 On-Road Bicycle Facilities

2.2.1.1 Shared Roadway / Signed Bicycle Route

Unless cycling is explicitly restricted, all roadways are considered to be shared roadways a bicycle is defined as vehicle under the *Highway Traffic Act of Ontario (HTA)*.On a typical roadway both motorists and cyclists share the same travel lane.

A shared roadway that has been designated as a 'Signed Bicycle Route' should have some form of bicycle route signage installed. The signage provides awareness and consistency for both motorists and cyclists, while concurrently providing wayfinding for cyclists.

Signed Bicycle Route

Credit: Google Maps Street View 2018

Shared use pavement markings or "sharrows" can be added to further improve motorist awareness while indicating the appropriate lateral location where the cyclists should be located within the travel lane. Where the shared lane is narrow, less than 4 m, it is recommended that "sharrows" be placed in the centre of the lane as passing would not be advised. Where the shared lane is wide enough for a motorist to safely pass a cyclist, greater than 4 m, "sharrows" are placed adjacent to the curb.

Narrow Shared Roadway with "sharrows"

Credit: Google Maps Street View 2018

Wide Shared Roadway with "sharrows"

Credit: Cycle Toronto

2.2.1.2 Paved Shoulder (Rural Cross-Sections)

A paved shoulder is the paved portion of the roadway adjacent to a road edge. It provides additional structural support for the roadway while providing a space for stopped vehicles, emergency use and pedestrians and cyclists. A paved shoulder on a designated bicycle route should also include some form of bicycle route signage.

A buffered paved shoulder is typically recommended on high order rural roads including highways, arterials and collectors. This provides additional separation between motorists and cyclists, increasing the overall level of comfort for both road users. The buffer may include diagonal hatching or a rumble strip for additional safety.

Paved Shoulder
Credit: http://gobiking.ca

Buffered Paved Shoulder
Credit: http://www.cwats.ca

2.2.1.3 Bicycle Lanes (Urban Cross-Sections)

A bicycle lane is a portion of the roadway that is exclusively reserved of cyclists. Bicycle lanes are designated by pavement markings (a diamond followed by a bicycle symbol) and regulatory signage. Bicycle lanes are normally provided on both sides of a two-way street and are typically located on urban arterial and collector roadways.

Conventional Bicycle Lane
Credit: Google Maps Street View 2018

A buffered bicycle lane provides additional separation between motorists and cyclists, increasing the overall level of comfort for both road users. The separation can be created by providing a painted buffer (that may include diagonal hatching), or physical separation such as flexible bollards, planter boxes, a concrete curb or median, etc.

Buffered Bicycle Lane (painted buffer with diagonal hatching)
Credit: Google Maps Street View 2018

Buffered Bicycle Lane (physical buffer with flexible bollards, planter boxes)
Credit: Google Maps Street View 2018

Buffered Bicycle Lane (physical buffer with a concrete curb)
Credit: Google Maps Street View 2018

In situations where on-street parking is permitted, the bicycle lane can be placed between the parking area and the travel lane (Bicycle Lane Adjacent to On-Street Parking) or the curb and the parking area (Parking Procected Bicycle Lane). Regardless of which side of the parking area the bicycle lane is located, it should have a buffer that is wide enough to mitagate conflicts between cyclists and opening car doors.

Bicycle Lane Adjacent to On-Street Parking
Credit: Google Maps Street View 2018

Parking Protected Bicycle Lane
Credit: Google Maps Street View 2018

2.2.2 Off-Road Trails

2.2.2.1 Multi-use Trails

A paved multi-use trail is an active transportation facility that is typically designed to accommodate both recreational and utilitarian users including pedestrians, cyclists, in-line skaters, skateboarders and wheelchair users. Multi-use trails may be located within open space lands or the road right-of-way. If located within the road right-of-way, the trail should be physically separated from motor vehicle traffic by a hard surfaced splash strip or a boulevard.

Multi-use Trail (Paved)

Credit: City of Burlington

2.2.2.2 Greenway Trails

Greenway trails are low-impact trails that are primarily suited to natural open space lands such as woodlots, wooded or open creek valleys, and which are designed to primarily support walking and hiking. Off-road cycling may be supported on un-paved multi-use trails where there are no significant environmental considerations and where trail widths permit.

Multi-use Trail (Un-paved)

Credit: https://www.shutterstock.com/

Where more significant environmental considerations exist (creek valleys and floodplains) a walking/hiking trail may be appropriate. Poorly drained and permanently wet areas should generally be avoided unless a boardwalk trail can be constructed.

Walking/Hiking Trail

Credit: Ontario Trails

2.3 Existing Cycling & Trails Inventory and Context

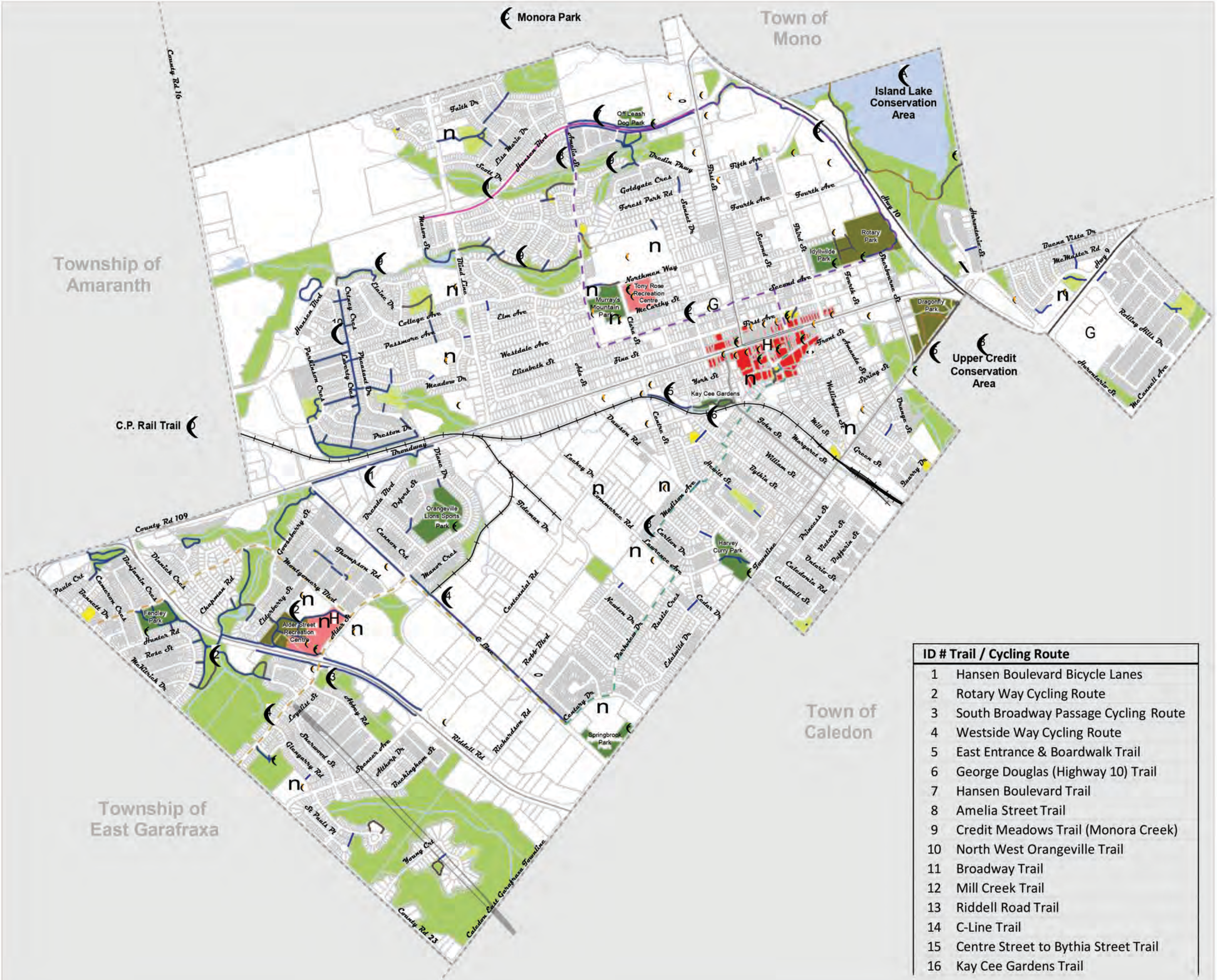
Currently there is a substantial framework of on-road bicycle facilities and off-road trails throughout the Town of Orangeville. These facilities provide a diverse range of experiences to various user types throughout most areas of the Town and provide key connections to amenities such as parks, schools, recreation / community centres, downtown Orangeville, and adjacent recreation areas located just beyond the Town's boundaries. ***Table 1*** outlines the existing cycling and trails facilities within the Town of Orangeville and their corresponding length. ***Figure 3*** illustrates the existing cycling and trails network in Orangeville.

Table 1: Existing Cycling and Trails Facilities in Orangeville

Facility Type	Existing Length (km)	Description
Shared Roadway / Signed Bicycle Route	20.2	One-way lane
Paved Shoulder (Rural Cross-Sections)	0.0	One-way lane
Bicycle Lanes (Urban Cross-Sections)	3.4	One-way lane
Multi-use Trails*	20.8	Centreline length
Greenway Trails**	3.9	Centreline length
Total	**48.3**	--

* Includes 2.0 km of concrete catwalks / connecting sidewalks

**Excludes Island Lake Conservation Area



ID #	Trail / Cycling Route
1	Hansen Boulevard Bicycle Lanes
2	Rotary Way Cycling Route
3	South Broadway Passage Cycling Route
4	Westside Way Cycling Route
5	East Entrance & Boardwalk Trail
6	George Douglas (Highway 10) Trail
7	Hansen Boulevard Trail
8	Amelia Street Trail
9	Credit Meadows Trail (Monora Creek)
10	North West Orangeville Trail
11	Broadway Trail
12	Mill Creek Trail
13	Riddell Road Trail
14	C-Line Trail
15	Centre Street to Bythia Street Trail
16	Kay Cee Gardens Trail

Town of Orangeville Cycling and Trails Master Plan

Town of Orangeville, Ontario

Existing Cycling and Trails Inventory
Figure 3

- Trail / Cycling Route - Identification Number
- Adjacent Recreation Area - Identification Letter
- Public Parking
- Bicycle Rack
- Bicycle Repair Service
- School/Education Facility
- Hospital / Medical Centre
- Library
- Visitor Information Centre
- Arterial Road
- Highway
- Railroad
- Multi-use Trail
- Greenway Trail
- Boardwalk Trail
- Conventional Bicycle Lane
- Rotary Way (5.4 km)
- South Broadway Passage Cycling Route (2.8 km)
- Westside Way Cycling Route (4.3 km)
- Watercourse
- Waterbody
- Assessment Parcel
- Major Park
- Community Park
- Neighbourhood Park
- Urban Green
- Open Space
- Recreation Facility
- Central Business District

0 150 300 450 m
1:20,000

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR/ TOWN OF ORANGEVILLE

MAP CREATED BY: SFG
MAP CHECKED BY: JA
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION:
G:\cad\GIS\187793\MXD\Figure 3 - Existing Cycling & Trails Inventory.mxd

DILLON CONSULTING

PROJECT: 187793
STATUS: DRAFT
DATE: 1/9/2019

2.3.1 Town of Orangeville Cycling and Trails Network

This section provides brief descriptions of the significant on-road bicycle facilities and off-road trails that currently exist within the Town of Orangeville. The identification numbers assigned to each of the existing on-road bicycle facilities and off-road trails corresponds to the identification numbers on ***Figure 3***.

2.3.1.1 On-Road Bicycle Facilities

(1) Hansen Boulevard Bicycle Lanes

- 1.5 m conventional bicycle lanes on the north and south side of Hansen Boulevard that extend 1.7 km from First Street to Mason Street.
- A planned extension of the bicycle lanes westward along the future extension of Hansen Boulevard to County Road 16 (Veterans Way).

Bicycle Lanes Hansen Boulevard

Credit: Google Maps Street View 2018

(2) Rotary Way Bicycle Route

- A 5.4 km signed bicycle loop that connects the neighbourhoods and schools (Princess Elizabeth Public School and Orangeville District Secondary School) of north east Orangeville to downtown Orangeville and Island Lake Conservation Area.
- The route consists of a 0.8 km section of conventional bicycle lanes (Hansen Boulevard), a 3.0 km section of on-road shared lane facilities with “Super Sharrows” and 1.6 km section of multi-use trail (Highway 10 / George Douglas Trail).

(3) South Broadway Passage Bicycle Route

- A 2.8 km signed bicycle route that connects the neighbourhoods and schools (Elementary School Des Quatre-Rivieres, Parkinson Centennial Public School and St. Peter Separate School) of south east Orangeville to downtown Orangeville.

- The route consists of on-road shared lane facilities with "Super Sharrows" and a short sidewalk connection between Dawson Road and Church Street.

(4) Westside Way Bicycle Route

- A 4.3 km signed bicycle route that connects the neighbourhoods and schools (Westside Secondary School, Spencer Avenue Elementary School, Montgomery Village Public School) of south west Orangeville to downtown Orangeville via the South Broadway Passage Cycling Route.
- The route consists of a 3.1 km section of on-road shared lane facilities with "Super Sharrows" and a 1.2 km section of multi-use trail (C-Line Trail).

"Super Sharrows" on Westside Way Bicycle Route

Credit: Dillon Consulting Limited

2.3.1.2 Off-Road Trails

(5) East Entrance & Boardwalk

- Located in Dragonfly Park, at the east entrance to the Town on open space lands south of Broadway Avenue, east of Townline.
- Comprises approximately 320m long, 2.5 m wide boardwalk through a cattail marsh, with interpretive pavilion and rest stops.
- Accessed by a gravel multi-use trail that extends along the road allowance from Townline to a parkette which marks the entrance to Orangeville, and includes the flag, commemorative plaque and a garden in the shape of a compass.
- The gravel multi-use trail also provides access to the Tranmer Trail (Upper Credit Conservation Area) at the east end of Dragonfly Park.
- Parking is provided in a gravel lot located to the south of the trail entrance, on the east side of Townline.

Boardwalk and Interpretive Pavilion in Dragonfly Park

Credit: Dillon Consulting Limited

(6) George Douglas (Highway 10) Trail

- A 1.6 km paved multi-use trail located in open space lands west of Highway 10, behind commercial businesses and plazas.
- The trail extending from Rotary Park (Second Avenue) to the court at the east end of Hansen Boulevard where it connects to the Hansen Boulevard Trail.
- The trail connects to the Vicki Barron Lakeside Trail (Island Lake Conservation Area) at the intersection of Highway 10 and 4th Avenue.
- The trailhead at Rotary Park includes ample parking, a rest stop and signage.

(7) Hansen Boulevard Trail

- An 840 m paved multi-use trail located on the south side of Hansen Boulevard.
- The trail extending from the George Douglas Trail (the court at the east end of Hansen Boulevard) to Amelia Street.
- It also has a trail connection to the Credit Meadows Multi-use Trail in the vicinity of Maywood Park (Orangeville Canada 150 Park).

(8) Amelia Street Trail

- A 230 m paved multi-use trail located on the west side of Amelia Street.
- The trail extends from the Hansen Boulevard Multi-use Trail to the Monora creek open space system crossing of Amelia Street.

(9) Credit Meadows Trail (Monora Creek)

- Comprises three segments in the north area of town, utilizing portions of the Monora Creek open space system.
- In and around Maywood Park (Orangeville Canada 150 Park): Approximately 440 m of paved multi-use trail connecting; Bredin Parkway, Woodvale Court, Victor Large Way and Hansen Boulevard to Maywood Park and to each other.
- Amelia Street to Mason Street: This multi-use trail is located north of CreditMeadows Elementary School within the Monora Creek open space lands.
    - East of Blind Line: a 700 m granular-surfaced section of multi-use trail connects Amelia Street to Blind Line. The trail has various formal sidewalkconnections to neighbourhood streets, including: Elmwood Crescent, Beechfield Crescent, Kensington Place, and Jull Court.
    - West of Blind Line: A 250 m paved section of multi-use trail connecting Blind Lineto Mason Street.
- College Avenue to Elaine Drive: This Approximately 200 m of paved multi-use trail. Parallels Monora Creek through an evergreen forest.

(10) North West Orangeville Trail

- Overall this multi-use trail is little over 2.5 km in length which includes a short loop around the storm water pond west of Hanson Boulevard, a short loop around the storm water pond south of Preston Drive and many formal sidewalk and trail connections to neighbourhood streets and parks.
- Hanson Boulevard storm water pond loop: A 250 m paved multi-use trail circling the storm water pond.
- College Avenue to Preston Drive Storm water pond: The North South spine of the North West Orangeville trail connects College Avenue to the storm water pond south of Preston Drive. The paved multi-use trail is located between the backyards of the houses on Courtney Crescent and Pheasant Drive/Court, and Drew Brown Boulevard and Laverty Crescent. This trail has connections to neighbourhood streets and parks, including: Courtney Crescent, Drew Brown Boulevard, Laverty Crescent, Pheasant Drive/Court, Ryan Meadows Park, Parkinson Crescent and Park, Wardlaw Avenue, and Preston Drive.
- Parkinson Crescent Park to Ryan Meadows Park: This paved East West multi-use trail travel is located behind the backyards of the houses on Preston Drive and includes a loop around a storm water pond.

(11) Broadway Trail

- A 700 m paved multi-use trail along the south side of Broadway, extending from Diane Drive to C Line.

(12) Mill Creek Trail

- Comprises various connected multi-use trail segments in the west area of Town, utilizing portions of the Mill Creek open space lands.
- C Line to Gooseberry Street: Approximately 400 m of paved multi-use trail. Sidewalk connection to the Mill Creek Multi-use trail section that begins at Montgomery Blvd.
- Montgomery Blvd to Hunter Road: A paved multi-use trail that follows the Mill Creek open space with a pedestrian underpass at Riddell Road. Total trail approximately 2.3 km.
    - West of Riddell Road: Multi-use trail branches with connections to Hunter Road, Fendley Park (Montgomery Boulevard), and Colbourne Crescent.
    - East of Riddell Road: Multi-use trail connects to Redfern Street and Gooseberry Street.
- Alder Street Recreation Centre: Approximately 800 m of paved multi-use trail connecting the recreation centre to Elderberry Street, Alder Street, Montgomery Boulevard.

Mill Creek Multi-use Trail behind the Alder Street Recreation Centre

Credit: Dillon Consulting Limited

(13) Riddell Road Trail

- A 1.2 km paved multi-use trail located on the east side of Riddell Road extending from the Mill Creek Multi-use Trail (in the vicinity of the Riddell Road underpass) to Centennial Road.

(14) C-Line Trail

- A 1.2 km paved multi-use trail located on along C Line, extending from the Mill Creek Multi-use Trail (in the vicinity of Broadway) to Centennial Road.
- The trail is on the west side of C Line between the Mill Creek multi-use Trail and Alder Street / Diane Drive and on the east side of C Line between Alder street / Diane Drive and Centennial Road.

(15) Centre Street to Bythia Street Trail

- A 250 m paved multi-use trail between the seniors centre building /parking lot and Mill creek, extending from Centre Street to Bythia Street and connecting to the Kay Cee Gardens.

(16) Kay Cee Gardens

- A 350 m granular-surfaced multi-use trail connects Bythia Street to John Street. The trail includes a covered bridge that crossed Mill creek.

Kay Cee Gardens Greenway Trail

Credit: Dillon Consulting Limited

2.3.2 Adjacent Recreation Areas

This section provides brief descriptions of each of the adjacent recreation areas located just beyond the Town's boundaries. The Identification letters assigned to each of adjacent recreation areas corresponds to the identification letters on ***Figure 2***.

(A) Island Lake Conservation Area

Island Lake Conservation Area is located east of Highway 10, with portions located in and to the north-east of the Town of Orangeville boundary. Owned and managed by Credit Valley Conservation, the 332 hectares of conservation lands protect the headwaters of the Credit and Nottawasaga Rivers, and include an extensive lake along with wetlands, forest and meadow habitats. The conservation area is open year -round and offers a range of outdoor recreation activities, including; picnicking, fishing, swimming, canoeing, cycling, and hiking.

- **Vicki Barron Lakeside Trail (VBLT)**
  The VBLT is an 8.2 km accessible trail that circles Island Lake (Orangeville Reservoir). The trail consists of a 2.7 m wide granular-surfaced multi-use trail, viewing platforms, and boardwalks that extend over wetland and lake features. The trail connects to the George Douglas (Highway 10) Trail at the intersection of Highway 10 and 4th Avenue. Parking is provided (12 spots) at designated trail parking spots at the north end of the Home Hardware Parking lot located at the south west corner of Highway 10 and 4th Avenue. The parking is immediately adjacent to the George Douglas (Highway 10) trail and the entrance to the VBLT.
- **Sugar Bush Trail**
  The Sugar Bush Trail is a 2.3 km rugged nature trail that travels through a Maple -Beech forest.
- **Memorial Forest Trail**
  The Memorial Forest Trail is a 1.9 km trail through a former meadowland consisting of gently rolling grass mowed hills and portions of a nut plantation including chestnut and black walnut trees.

(B) Upper Credit Conservation Area

Upper Credit Conservation Area is located south of the Town of Orangeville boundary. Owned and managed by Credit Valley Conservation, it contributes to the longest stretch of publicly owned lands along the Credit River. It acts as a green corridor allowing for movement of different species and promoting a healthy and sustainable ecosystem. The conservation area is open year -round and offers a range of outdoor recreation activities, including: fishing; bird watching; snowshoeing; cross-country skiing; and hiking.

- **Tranmer Trail**
  The Tranmer Trail is a 2.6 km mowed grass trail that winds over rolling meadows and through open fields. It provides access to the Credit River. Parking is provided in a gravel lot located south of the Dragonfly Park trail entrance, east of Townline.
- **(C) Monora Park**
  Monora Park is located north of the Orangeville urban area, west of Highway 10. The property includes approximately 20 km of trails that are used as walking/hiking trails in the summer, and are groomed as cross -country ski trails in winter for use by members of Mono Nordic Ski Club.
- **(D) C.P. Rail Trail**
  The C.P. Rail trail is a 112 km granular-surfaced multi-use rail trail that connects Orangeville to Owen Sound along the former C.P. rail line right of way. The trail is open to motorised and non -motorised activities including cycling, hiking, walking, cross country skiing, equestrian, snowshoeing, ATV use in designated areas, and snowmobiling.

2.3.3 Orangeville Brampton Railway (OBRY)

The Orangeville-Brampton Railway (OBRY) is a 55-km railway line that connects Orangeville to the Canadian Pacific Railway (CPR) in Streetsville, Mississauga. The OBRY is the southern portion of CP Rail's once-busy Toronto-Owen Sound service. The northern portion (Orangeville to Owen Sound) in no longer in operation and has been converted to a rail trail (CP Rail Trail).

The section of the OBRY within Orangeville is owned and managed by the Orangeville Railway Development Corporation (ORDC), a business incorporated by the Town. The OBRY is currently being operated by The Trillium Railway Co. Ltd. that took over from Cando Rail Services Ltd. in July 2018. Currently freight trains are being operated on the line two days per week – Tuesday and Friday – for the purposes of delivering materials to local manufacturers. Until recently, a seasonal tourist excursion train, the 'Credit Valley Explorer', toured through the scenic Credit River Valley and Headwaters countryside between Orangeville and Snelgrove (Northern Brampton), however that train ceased operation in the spring of 2018 when Cando Rail Services Ltd. ended its operation contract.

While many decommissioned rail lines in Ontario have been purchased by local municipalities and converted to trails, the presence of the Town-owned OBRY through the centre of Orangeville provides the potential for a Rail-with-Trail, where a trail co-exists parallel to an active track, within the rail corridor right of way. However, due to the infrequent and declining train usage on the section of the OBRY within Orangeville, the potential for a Rail to Trail is also a possibility in the future.

The OBRY within Orangeville could form a central off-road active transportation spine that traverses Orangeville and travels just south of the downtown area. That coupled with its connection to the existing CP Rail Trail, which travels north to Owen Sound, makes the OBRY ideally situated to facilitate local trips by residents and long distance recreational trips by residents and visitors alike. As well, trails in the neighbouring Town of Caledon include a section of the Trans Canada Trail and the Bruce Trail both of which intersect with the OBRY line in the vicinity of Forks of the Credit Provincial Park and which connect to the Caledon Trailway. Any future abandonment of the OBRY line would potentially facilitate a long-distance connection to an extensive inter-regional trail system to the south.

Local and National examples of Rail-with-Trail and Rail to Trail initiatives are provided in ***Appendix A***

2.3.4 Partnerships, Programing & Promotion

The Town of Orangeville's Community Services Department collaborated with Sustainable Orangeville to create Cycle Orangeville. Cycle Orangeville's mission is to promote and encourage safer and more connected routes and trails, cycling events, improve community health through active modes of transportation, educating better cycling and driving practices and improving Orangeville as a bicycle-friendly community.

Cycle Orangeville is involved in a continuous awareness campaign to promote respect between motorists and cyclists and for the rules of the road. Driving and cycling safely and lawfully is everyone's responsibility. In order to promote this message Cycle Orangeville developed a "Biking in Orangeville – Share the Road" brochure that includes a cycling and trails route map, important safety information for cyclists, trail users, and motorists, cyclist hand signals, and various other tips for cyclists and motorists.

Cycle Orangeville also hosted bike ride clinics, bike maintenance workshops; public bike rides to promote new cycling facilities, and operates a free bicycle valet at various community events throughout the year, including Rotary Rib Fest, to raise awareness for alternative transportation methods and bike/car safety.

The Town of Orangeville also hosts guided hikes to celebrate various events, such as Earth Week and promotes local and regional initiatives such as 'walk to school day' to encourage school aged kids to walk or cycle to school.

Overall, there are currently more than a dozen existing efforts related to bicycle and trail programming and promotion taking place in Orangeville. These programs represent a number of partnerships across the community, representing a variety of both public and private stakeholders. A summary of the existing bicycle and trails related programming and promotion can be found below in ***Table 2***.

Table 2: Existing Bicycle and Trails Programming in Orangeville

Program Type	Audience	Existing Programs
Education	Youth	- Bike Safety Checks and Bike Rodeos - Active and Safe Routes to School
	Others / All	- Cycling Map with safety information widely distributed - Cycle Orangeville Website - Sustainable Orangeville Bike workshop
Encouragement	Youth	- Walk/Bike to School Day - School incentives through Active and Safe Routes to School
	All	- Guided Hikes - Earth Week Bike Maintenance workshop - Community Ride on Rotary Way - Bike Valet at Town events
Enforcement	All	- Police engage in positive ticketing for youth wearing helmets - Public awareness and enforcement campaigns annually, particularly near schools
Evaluation and Planning	All	- Counters on Vicky Barron and Dragonfly Trails - User surveys for modes of travel to Island Lake Conservation Area

In addition to Sustainable Orangeville, there are a number of additional public and private stakeholders that have shaped Orangeville's existing cycling and trails culture. The resulting partnerships have delivered the cycling and trails programming outline in ***Table 2.*** The following list summarizes the public and private stakeholders that have contributed to the promotion of cycling and trails culture in Orangeville.

- **Sustainable Orangeville**
  Sustainable Orangeville has played a pivotal role in the development of new programs and partnerships. Working with Town Staff, Sustainable Orangeville has undertaken outreach and education initiatives, has been the public face of cycling in Orangeville and has provided new connections for programming.
- **Orangeville Police Service**
  Orangeville Police Service has been a strong partner in road safety in Orangeville. They have engaged in positive ticketing campaigns, hosted Bike Rodeos and deliver education about safe road use to youth in the community.
- **Wellington-Dufferin-Guelph Public Health**
  Public Health has helped to organize and orchestrate a number of initiatives related to health promotion and injury prevention in Orangeville, including Active and Safe Routes to School programming, helmet fit seminars and educational campaigns.

- **Wellington-Dufferin-Guelph Regional School Boards**
  Both the public and Catholic School boards in Wellington-Dufferin-Guelph have been engaged in School Travel Planning initiatives throughout the region, with one school in Orangeville engaging in School Travel Planning programming.
- **Rotary Club of Orangeville**
  The Rotary Club of Orangeville provided funding and support for the establishment of the first Bicycle Route in Orangeville. The Rotary Way Bicycle Route was officially opened in 2016.
- **Credit Valley Conservation**
  With multiple conservation areas within and adjacent to Orangeville's boundary, including the exceptionally popular Island Lake Conservation Area, the CVC provides opportunities for residents to explore the outdoors on safe trails within Orangeville.

2.4 Developing the Future Network

2.4.1 Community Consultation / Engagement

When developing a cycling and trails master plan, it is critical to understand the population for which you are developing the plan for. We must appreciate the current and future socio demographic and transportation trends of the community at large (described in Section 1.3), while equally understanding the wants and needs of general public (existing and perspective users) and stakeholders.

2.4.1.1 Consultation Process

A consultation program for the CTMP was developed to engage a broad cross section of the general public and stakeholders in an open, iterative and collaborative fashion. To do so, the consultation program utilized a wide variety of traditional engagement methods, such as advisory committee meetings, a stakeholder workshop and Public Information Centres (PIC), and more progressive engagement techniques, such as a pop-up consultation and an on-line interactive project website.

Consultation Strategy

The consultation program separately targeted two specific audiences; stakeholders and the general public. The approach to consulting with each audience is discussed below.

- **Stakeholders**
  The goal of the consultation was to gain a stronger understanding of what each stakeholder group is able to contribute to the successful implementation of the CTMP. In order to achieve this goal, engagement with Stakeholders was limited to small group, intensive workshop activities designed to understand the entirety of the activities related to cycling and trails taking place in Orangeville. By identifying existing programs, stakeholders were then able to self-identify gaps in both the infrastructure in the Town and in the programming to support a stronger culture of cycling and trails use. Once gaps were identified, stakeholders considered what new programs, projects or policies could be enacted to fill those gaps, and were asked

what they could contribute to the implementation of those programs in the short and medium term. This type of in-depth consultation with Key Stakeholders allows their expertise to be respected, and provides them with a structured, meaningful way to contribute to the development of the Plan.

- **General Public**

  The goal of the consultation was to inform the public that the CTMP was being created, and to seek their feedback about what overall direction they would like to see the plan take. The outreach to the public was focused on providing residents with as many opportunities to contribute their ideas as possible to gain a sense of what their overall feelings were about the existing cycling and trails assets in town and how those assets could be developed into the future. A combination of structured, in-person events (a public open house / World Cafe session), unstructured in-person events (pop-up consultations) and structured online engagement tools (interactive project website) provided residents with multiple avenues to participate in the development of the Plan.

Stakeholders

Stakeholders were identified by the study team in partnership with the project advisory group. The identified stakeholders are as follows:

- Town of Orangeville Committees of Council (Sustainable Orangeville and Recreation & Events Committee)
- Credit Valley Conservation
- Headwaters Communities in Action (Citizens of Headwaters for Active Transportation Team (CHATT))
- Town of Orangeville staff (Public works, Planning, Recreation and Events, Facilities and Parks, Economic Development & Culture, Communications, etc.)
- Town of Orangeville members of council
- Bordering municipalities (Town of Caledon, Mono Township, Township of Amaranth, and Township of East Garafraxa)
- Dufferin County
- Wellington-Dufferin-Guelph Public Health
- Upper Grand District School Board
- Ontario Ministry of Transportation (MTO)
- Orangeville Police Service
- Local Cycling Clubs
- Local Bike Shop Owners
- Orangeville Business Improvement Area (BIA)
- Local non-profits (Rotary)

Consultation Activities

A variety of consultation activities were utilized throughout the development of the Orangeville CTMP. This section summarizes the consultation activities that were conducted.

Site Visit / Bike Tour

A member of Sustainable Orangeville led the study team on a site visit / cycling and trails tour of Orangeville on Tuesday July 3, 2018. The tour covered most of the Town's current cycling and trails facilities, identifying some of the highs and the lows of cycling and trails network in Orangeville. The tour also explored areas that have potential for future connections and provided the study team with some understanding as to the cycling and trails culture in Orangeville. ***Figure 4*** illustrates the Site Visit / Bike Tour route.

Figure 4: Site Visit / Bike Tour Route

Stakeholder Workshop

The Stakeholder Workshop took place on Wednesday, August 8, 2018 from 9:00 a.m. - 3:00 p.m. at the Lord Dufferin Centre Retirement Residence. In this full-day intensive workshop, stakeholder groups were brought together to discuss the Town's existing cycling and trails assets, identify gaps and create strategies to close those gaps and create a stronger culture of cycling and trails use in Orangeville. Attendees learned about the 5 E's approach (Engineering, Education, Encouragement, Enforcement and Evaluation and Planning) to creating a bicycle friendly community and developed a strategy to implement new programs across the 5 E's as the CTMP moves into the implementation phase. Approximately 20 representatives from key stakeholder groups were in attendance.

Stakeholder Workshop

Public Information Center (PIC) #1

The Public Information Center #1 took place on Wednesday, August 8, 2018 from 6:00-8:00 p.m. at the Lord Dufferin Centre Retirement Residence. The session was advertised in both local newspapers (The Orangeville Banner and the Orangeville Citizen) and through social Media (Facebook). Approximately 40 people attended.

The purpose of Public Information Center #1 was to provide information about the Cycling and Trails Master Plan and to invite community members to provide directed feedback on a number of issues relating to the development of a stronger culture of cycling and trails use in the Town of Orangeville. Input and feedback was received from the public. Specifically, participants had the opportunity to join three of four Discussion Groups: Cycling Education; Identifying Priority Gaps within the Existing Network, Bike Month Promotions; and Encouraging Active School Travel within the Town.

Pop-Up Consultation - Taste of Orangeville

The Pop-Up Consultation took place on Saturday, August 18, 2018 from 11:00 a.m. - 4:00 p.m. at the Taste of Orangeville. This "Pop-up" event was not advertised but was strategically located at a busy community event. In all, over 300 residents were engaged, with approximately 40 residents providing some level of specific feedback either on the map or through written comments.

Pop-Up Consultation

The purpose of Pop-Up Consultation was to maximize our engagement reach by "going to the people". This approach captures perspectives from community members who may not attend a traditional PIC. We provided community members with information about the development of a Cycling and Trails Master Plan and encouraged them to share their thoughts about all things cycling and trails within the Town of Orangeville and more specifically about the development of a new Cycling and Trails Master Plan. Community members were also asked about infrastructure gaps and encouraged to highlight any specific locations (on a map) where improvements are needed to promote cycling and trails use. Residents were also given an information card directing them to the projects engagement website where they could provide additional feedback or simply find out more information about the project.

Digital Engagement

The digital engagement (interactive project website) was available online for a period of eight weeks from Monday July 2, 2018 to Sunday August 26, 2018. The project website was advertised through social Media (Facebook), on Town of Orangeville's Website, and through the physical distribution of information cards at the Pop-Up Consultation and at a local bike shop. Social Media advertising was extremely effective, generating over 18,000 impressions and over 1,000 clicks to the project website. Based on the number of impressions, website clicks and visitors to the site (5,101), it is clear that this website helped to raise the awareness of the CTMP within the community.

The purpose of the interactive project website was to gain a stronger understanding of what specific improvements community members wanted to see. While the number of visits to the study website was high (5,101 views), the number of connections (individuals who registered to provide feedback, comments, etc.) was low (56 connections). Many of the comments suggested an overall desire to see further investment in the creation of a complete network of safe cycling and trail facilities within Orangeville, yet very few cited specific improvements that should be made.

2.4.1.2 What the Public Told Us

The consultation program for the CTMP provided a range of comments, opinions, and ideas from members of the public and stakeholders. All of the feedback that was received was reviewed and where applicable, was incorporated into the Plan. Overall, the majority of the feedback seemed to align with two broad categories: **Completing the Network** and **Improving the Understanding.** A more detailed explanation of these categories can be found below.

- **Priority # 1 - Completing the Network**
  The most consistent feedback that was received throughout consultation program was the strong desire among stakeholders and residents to see the establishment of a complete, connected network of safe cycling and trails facilities. While opinions varied widely among stakeholders and residents about how to accomplish the creation of such a network, there was little disagreement about the importance of creating a full network of trails and cycling

infrastructure that would allow for safe, continuous transportation to all corners of the Town. Residents identified the importance of travelling to schools, community centres, the downtown, commercial districts and Island Lake Conservation Area in active ways, but expressed frustration with the lack of a continuous safe route to access any of those community amenities.

- **Priority # 2 - Improving the Understanding**
  The second most common piece of feedback that was received centered around the idea that people driving and people cycling in Orangeville do not have a clear understanding of their rights and responsibilities on the roads as they relate to other road users, and that people cycling on the trails sometime behave in ways that make people walking on those trails feel unsafe. Stakeholders and residents identified the importance of a community-wide focus on educating all road users about how to responsibly share the trails and roadways in Orangeville. Suggestions for topics of potential educational programs included:

  - General cycling education how to ride a bike safely and legally;
  - Education about cycling on the road rather than on the sidewalk;
  - Education about safety equipment (lights, bells, etc.) on bikes;
  - Education about sharing the trails (especially busy trails like the ones found at Island Lake Conservation Area) with all active modes of transportation;
  - Education about the benefits of cycling for the community; and
  - Education about the 1m safe passing law and the fact that a bicycle is defined as a vehicle under the highway traffic act.

  While many of these behaviours can be altered through public awareness programs and educational campaigns, the best educational tool is infrastructure that makes the rights and responsibilities of the various road and trail users clear. Multi-use trails and cycling facilities help to reduce conflict and create a stronger culture of safe road and trail use.

A summary of the comments received during the community consultation and engagement process are contained in ***Appendix B.***

2.4.2 Identification of Link/Corridor & Crossing Location Candidates

As outlined in the previous section, the project team received a number of link/corridor and crossing location submissions from community members and stakeholders at Public Information Centres (PIC) #1, the Stakeholder Workshop, the Pop-Up consultation, and through the interactive project website. In conjunction with existing Town documents and plans (described in Section 1.4), the community and stakeholder submissions were combined to form two comprehensive lists; link/corridor candidates and crossing location candidates. Overall, the cycling and trails network that was proposed was very robust. It included most arterial and collector roads within the Town of Orangeville, as well as numerous off-road trail ideas and dozens of proposed cyclist and pedestrian crossing locations.

2.4.2.1 Evaluation Criteria

In order to develop a preferred list of both links/corridors and crossing locations, evaluation criteria were developed to assess (validate or eliminate) each of the candidates. The evaluation criteria identified were: Network Connectivity, Safety and Expected User Demand. Each of the evaluation criteria provide a high level "check" aimed at eliminating any unreasonable links/corridors or crossing locations from further analysis. The evaluation criteria are discussed further below.

1. Network Connectivity addresses "missing link" segments or crossings within the existing cycling and trails network. Each link/corridor and crossing location candidate was evaluated as having a high, low, or no degree of network connectivity within the existing and proposed cycling and trails network. Any link/corridor or crossing location candidate that displayed no degree of network connectivity was eliminated.

2. Safety, more importantly, the lack of safety was incorporated into the criteria through the use of professional judgment. However, it is recognised that such analysis is objective, thus only link/corridor and crossing location candidates that displayed obvious hazards were identified and eliminated.

3. Expected User Demand for the link/corridor and crossing location candidates were assessed based on the proximity to major origins and destinations with the community. Proximity to major origins and destinations, such as such as Downtown Orangeville, Recreation Facilities, Schools, Major Parks, Georgian College, Island Lake Conservation Area, the Centennial Road employment lands, Orangeville Hospital, etc. generate higher demands. Each of the link/corridor and crossing location candidates were evaluated as having a high, low, or no expected user demand within the existing and proposed cycling and trails network. Any link/corridor or crossing location candidate that displayed no expected user demand was eliminated.

2.4.3 Proposed Links/Corridors & Crossing Locations

The proposed links/corridors and crossing locations are illustrated in ***Figure 5***.

Town of Orangeville Cycling and Trails Master Plan

Town of Orangeville, Ontario

Proposed Links/Corridors and Crossing Locations
Figure 5

- Adjacent Recreation Area - Identification Letter
- Bicycle Repair Service
- School / Education Facility
- Hospital / Medical Centre
- Library
- Visitor Information Centre
- Proposed New Crossing Location
- Proposed Crossing Location Upgrade
- Arterial Road
- Highway
- Railroad
- Conceptual Connection
- Proposed Link/Corridor
- Multi-use Trail
- Greenway Trail
- Boardwalk Trail
- Conventional Bicycle Lanes
- Rotary Way Bicycle Route (5.4 km)
- South Broadway Passage Bicycle Route (2.8 km)
- Westside Way Bicycle Route (4.3 km)
- Watercourse
- Waterbody
- Assessment Parcel
- Major Park
- Community Park
- Neighbourhood Park
- Urban Green
- Open Space
- Recreation Facility
- Central Business District

0 150 300 450 m

1:20,000

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR & TOWN OF ORANGEVILLE

MAP CREATED BY: SFG
MAP CHECKED BY: JA
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION:
G:\cad\GIS\187793\MXD\Figure 5 - Proposed Links Corridors and Crossing Locations.mxd

DILLON CONSULTING

PROJECT: 187793
STATUS: DRAFT
DATE: 3/19/2019

2.4.4 Preliminary Design Concepts

Each of the proposed links/corridors and crossing locations was reviewed and assigned a preliminary design concept. This review was assisted by the following data:

- Length of link/corridor (m);
- Number of travel lanes;
- Existing asphalt width (m);
- Posted Speed Limit (km/h);
- Urban vs. Rural Cross-section;
- Property Limitations;
- User Demand; and
- Cost.

The preliminary design concepts for each pf the proposed links/corridors and crossing locations are illustrated in ***Table 3*** and ***Table 4***.

Table 3: Proposed Link/Corridor Preliminary Design Concepts

ID #	Street / Trail Description	From	To	Length (m)	Design Concept
1	Abbey Road Trail	Alder Street	Spencer Avenue	545	Greenway Trail
2	Ada Street & Elizabeth Street	Broadway	Rotary Way Cycling Route	360	Shared Roadway / Signed Bicycle Route
3	Alder Street (south side): Sidewalk to Multi-use Trail	Abbey Road Trail	Riddell Road	65	Multi-use Trail
4	Amelia Street (west side): Sidewalk to Multi-use Trail	Amelia Street Trail (south of Victor Large Way)	College Avenue	640	Multi-use Trail
5	B Line / Country Road 23	Broadway / County Rd 109	Townline	3150	Paved Shoulder (includes urban sections)
6	Blind Line	Hansen Boulevard	Orangeville / Mono Municipal Boundary	660	Paved Shoulder (includes urban sections)
7	Blind Line (west side): Sidewalk to Multi-use Trail	Hansen Boulevard	Broadway	1140	Multi-use Trail
8	Blind Line (west side)	Eastview Crescent	Hansen Boulevard	580	Multi-use Trail
9	Broadway & Highway 10 traffic control Island: Sidewalk to Multi-use Trail	Dragonfly Park Trail Connection	Broadway & Highway 10	25	Multi-use Trail
10	Broadway (north side): Sidewalk to Multi-use Trail	George Douglas Way extension	Broadway & Highway 10	105	Multi-use Trail
11	Broadway / County Rd 109	Orangeville / Amaranth / East Garafraxa Municipal Boundary	Dufferin County Road 16	1225	Paved Shoulder
12	Broadway / County Rd 109	Dufferin County Road 16	C Line	325	Paved Shoulder
13	Broadway (south side)	Diane Drive	Blind Line	330	Multi-use Trail
14	Buena Vista (north side): Sidewalk to Multi-use Trail	Highway 10	Hurontario Street	160	Multi-use Trail
15	Buena Vista Drive (north side)	Hurontario Street	Randy Avenue/ Clarke Avenue	275	Multi-use Trail
16	C Line (east side)	Century Drive	Townline	295	Multi-use Trail
17	Centennial Road	C Line	Dawson Road	1400	Bicycle Lanes
18	Centennial Road (north side): Sidewalk to Multi-use Trail	Riddell Road	C Line	485	Multi-use Trail
19	Credit Meadow Trail Connection (north of Jeffers Court)	Credit Meadows trail	Credit Meadows trail	320	Multi-use Trail
20	Credit Meadows Trail Extension	Former Humber Lands Trail	Hansen Boulevard	250	Multi-use Trail
21	Credit Meadows Trail: Gravel to Asphalt	Blind Line	Amelia Street	720	Multi-use Trail
22	Dawson Road	Broadway	Townline	1300	Bicycle Lanes
23	Dragonfly Park Trail Connection	Dragonfly Park	Broadway & Highway 10	75	Multi-use Trail
24	Dragonfly park trail:Gravel to Asphalt	Townline	Dragonfly Park Multi-use Trail Connection	445	Multi-use Trail
25	Dufferin County Road 16	Broadway	Orangeville / Amaranth / Mono Municipal Boundary	1830	Paved Shoulder
26	Former Humber Lands Trail	Hansen Boulevard	Credit Meadows Trail extension	650	Greenway Trail

ID #	Street / Trail Description	From	To	Length (m)	Design Concept
27	George Douglas Way Trail Extension	George Douglas Way	First Street / Orangeville Mall / Orangeville Highlands Trail	250	Multi-use Trail
28	George Douglas Way Trail Extension	George Douglas Way	Broadway	320	Multi-use Trail
29	Hansen Boulevard	Dufferin County Road 16	Mason Street	1475	Bicycle Lanes
30	Kay Cee Gardens trail: Gravel to Asphalt	Bythia Street	John Street	350	Multi-use Trail
31	Mill Creek Trail Connection	Montgomery Boulevard	Mill Creek Trail (north of Gooseberry Street)	215	Multi-use Trail
32	Mill Creek Trail Connection (north of Morrow Crescent)	Samuel Court Storm Pond Trail	Montgomery Boulevard	285	Multi-use Trail
33	Mill Creek Trail Extension	Mill Creek Trail	Alder Street & Saxon Street and Alder Street & Glengarry Road	895	Greenway Trail
34	North West Orangeville Trail Connection	North West Orangeville trail	475 Broadway (Shoppers Drug Mart Plaza)	65	Multi-use Trail
35	OBRY Corridor Trail	John Street (Kay Cee Gardens)	Townline	650	Multi-use Trail
36	OBRY Corridor Trail	Dawson Road	Centre Street	240	Multi-use Trail
37	OBRY Corridor Trail	Broadway & Blind Line	Dawson Road	650	Multi-use Trail
38	OBRY Corridor Trail	County Road 16 (C.P. Rail Trail)	Blind Line	1390	Multi-use Trail
39	OBRY Corridor Trail	Townline	Orangeville / Caledon Municipal Boundary	405	Multi-use Trail
40	OBRY Spur Line Trail	C Line	Centennial Road	615	Multi-use Trail
41	OBRY Spur Line Trail	Broadway	OBRY Spur Line Trail Junction	300	Multi-use Trail
42	OBRY Spur Line Trail	OBRY Spur Line Trail Junction	Parkinson Centennial Public School	790	Multi-use Trail
43	OBRY Spur Line Trail	OBRY Spur Line Trail Junction	C Line	855	Multi-use Trail
44	Orangeville Highlands Storm Water Pond Trail	Hanson Boulevard	Orangeville Mall	330	Multi-use Trail
45	Orangeville Highlands Trail	Orangeville Highlands Storm Water Pond Trail	Orangeville Highlands Trail	215	Multi-use Trail
46	Orangeville Highlands Trail	Hanson Boulevard & Amelia Street	Orangeville Highlands Trail	240	Multi-use Trail
47	Orangeville Highlands Trail	Lisa Marie Drive sidewalk connection	First Street / Orangeville Mall	1050	Multi-use Trail
48	Riddell Road	County Rd 109	Townline	2900	Bicycle Lanes
49	Riddell Road (west side)	Spencer Avenue/ Centennial Road	Winterton Court Trail	270	Multi-use Trail
50	Riddell Road (west side)	Winterton Court Trail	Townline	700	Multi-use Trail
51	Sherbourne Street	Broadway	Rotary Park	325	Shared Roadway / Signed Bicycle Route
52	Townline	Dawson Road	Broadway	1710	Bicycle Lanes
53	Townline	B Line	Dawson	2800	Paved Shoulder
54	Townline (north side)	Riddell Road	Dawson Road	1690	Multi-use Trail
55	Trail Connection	Young Court Trail	Buckingham Street & Winterton Court Trail	410	Greenway Trail

ID #	Street / Trail Description	From	To	Length (m)	Design Concept
56	Trail Connection	North West Orangeville trail	OBRY Trail	25	Multi-use Trail
57	Trail Connection	OBRY Trail	Broadway & Diane Drive	30	Multi-use Trail
58	Trail Connection	Orangeville Highlands Trail	Victor Heights Avenue (Mono / Monora Park)	30	Multi-use Trail
59	Trail Connection	Orangeville Highlands Trail	Brucedale Boulevard sidewalk connection (Mono / Monora Park)	100	Multi-use Trail
60	Trail Connection	Riddell Road Trail	Riddell Road & Alder Street	25	Multi-use Trail
61	Winterton Court Trail	Spencer Avenue	Riddell Road	455	Greenway Trail
62	Young Court Trail	Sandringham Circle	Young Court	1360	Greenway Trail

Table 4: Proposed Crossing Location Preliminary Design Concepts

ID #	Location	New / Upgrade	Crossing Type / Design Concept
A	Alder Street & Saxon Street	New	Intersection - Unsignalized
B	Blind Line & Credit Meadows Trail	New	Mid-Block - Uncontrolled
C	Blind Line & St Benedict Elementary School	Upgrade	Mid-Block - Uncontrolled
D	Broadway & Blind Line	Upgrade	Intersection - Signalized
E1	Broadway & Highway 10	Upgrade	Intersection - Signalized
E2		Upgrade	Ramp / Right Turn Channel - Signalized
E3		Upgrade	Ramp / Right Turn Channel - Signalized
F	Broadway west of Diane Drive	New	Mid-Block - Signalized
G	College Ave just east of Hanson Boulevard	New	Mid-Block - Uncontrolled
H	Dufferin County Road 16 & C.P. Rail Trail	New	Mid-Block - Signalized
I	First Street at the north end of Orangeville Mall	New	Mid-Block - Signalized
J	George Douglas Way at 5th Avenue	Upgrade	Intersection - Signalized
K	Hanson Boulevard just north of College Avenue	New	Mid-Block - Signalized
L	Highway 10 & 4th Avenue	Upgrade	Intersection - Signalized
M	Kay Cee Gardens Trail at Bythia Street	New	Mid-Block - Uncontrolled
N	Montgomery Boulevard & Mill Creek Trail	New	Mid-Block - Uncontrolled
O	OBRY Spur Line Trail at C Line	New	Mid-Block - Signalized
P	OBRY Spur Line Trail at Centennial Road	New	Mid-Block - Signalized
Q	OBRY Spur Line Trail at Tideman Drive	New	Mid-Block - Uncontrolled
R	OBRY Trail at Centre Street	New	Mid-Block - Signalized
S	OBRY Trail at Church Street	New	Intersection - Unsignalized
T	OBRY Trail at Dawson Road	New	Mid-Block - Signalized
U	OBRY Trail at John Street	New	Mid-Block - Uncontrolled
V	OBRY Trail at Townline	New	Mid-Block - Uncontrolled
W	Parkinson Crescent just south of Laverty Crescent (minor trail realignment also necessary)	New	Mid-Block - Uncontrolled
X	Parkinson Crescent just west of Preston Drive	New	Mid-Block - Uncontrolled
Y	Riddell Road & Spencer Avenue / Centennial Road	Upgrade	Intersection - Signalized
Z	Spencer Avenue & proposed Winterton Court Trail / Abbey Road Trail	New	Mid-Block - Uncontrolled

Design guidelines for a number of cycling and trails facilities (signed routes, bicycle lanes, paved shoulders, multi-use trails, greenway trails, intersection and mid-block crossrides, etc.) are provided in ***Appendix C***.

2.4.5 Community Outreach

The community was engaged for a second time to review the proposed cycling and trails network and to provide help prioritize the segments and crossing locations.

Public Information Center (PIC) #2

The Public Information Center #2 took was held in an open house format and took place on Tuesday, January 15, 2019 from 6:00-8:00 p.m. at the Alder Street Recreation Centre. The session was advertised in Orangeville Citizen, on MyFM 101.5, the Town's Website and through social Media on Facebook and Twitter. Notice of PIC #2 was also distributed via email to those stakeholders and community members who attended the stakeholder consultation or PIC #1. Approximately 20 people attended.

The purpose of Public Information Center #2 was to provide update as to the status of the Cycling and Trails Master Plan and to invite stakeholders and community members to provide feedback/priority on the list of proposed network segments and crossing locations. A priority setti ng exercise was undertaken using a dotmocracy (dot-voting) exercise.

A summary of the dotmocracy results and general comments received during PIC are contained in ***Appendix B.***

2.5 Preferred Cycling and Trails Network

The Preferred Cycling Network is a combination of existing and planned cycling and trails facilities, comprising of signed routes, bicycle lanes, paved shoulders, multi-use trails, greenway trails and intersection and mid-block crossrides. ***Figure 6*** illustrates the Preferred Cycling Network and preliminary design concept for each of the segments and crossing locations.

The Preferred Cycling Network represents 60.4 km of new proposed cycling and trails facilities. A breakdown by facility type is identified in ***Table 5.***

Table 5: Summary of Existing and Proposed Cycling and Trails Facilities

Facility Type	Proposed Length (km)	Existing Length (km)	Total Length (km)	Description
Shared Roadway / Signed Bicycle Route	1.4	20.2	21.6	One-way lane
Paved Shoulder (Rural Cross-Sections)	20.0	0.0	19.3	One-way lane
Bicycle Lanes (Urban Cross-Sections)	17.5	3.4	20.9	One-way lane
Multi-use Trails	17.9	20.8*	38.7*	Centreline length
Greenway Trails	4.3	3.9**	8.2**	Centreline length
Total	**61.1**	**48.3**	**108.7**	--

* Includes 2.0 km of concrete catwalks / connecting sidewalks

**Excludes Island Lake Conservation Area

Town of Orangeville Cycling and Trails Master Plan

Town of Orangeville, Ontario

Preferred Cycling and Trails Network
Figure 6

- Adjacent Recreation Area - Identification Letter
- Bicycle Repair Service
- n School / Education Facility
- G Hospital / Medical Centre
- H Library
- Visitor Information Centre
- Proposed New Crossing
- Proposed Crossing Upgrade
- Arterial Road
- Highway
- Railroad
- Conceptual Connection
- Proposed Bike Route
- Proposed Paved Shoulder
- Proposed Bicycle Lane
- Proposed Greenway Trail (unpaved)
- Proposed Multi-use Trail (paved)
- Proposed OBRY Trail (paved)
- Proposed Upgrade - Sidewalk to Multi-use Trail
- Proposed Upgrade - Pave
- Multi-use Trail
- Greenway Trail
- Boardwalk Trail
- Conventional Bicycle Lanes
- Rotary Way Bicycle Route (5.4 km)
- South Broadway Passage Bicycle Route (2.8 km)
- Westside Way Bicycle Route (4.3 km)
- Watercourse
- Waterbody
- Assessment Parcel
- Central Business District
- Major Park
- Community Park
- Neighbourhood Park
- Urban Green
- Open Space
- Recreation Facility

0 150 300 450 m

1:20,000

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR & TOWN OF ORANGEVILLE

MAP CREATED BY: SFG
MAP CHECKED BY: JA
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION:
G:\cad\GIS\187793\MXD\Figure 6 - Preferred Cycling and Trails Network.mxd

DILLON CONSULTING

PROJECT: 187793
STATUS: DRAFT
DATE: 3/13/2019

3.0 Implementation Strategy

In addition to simply identifying the cycling and trails infrastructure improvements, there are also several other essential components that are needed to create a connected and sustainable cycling and trails network that will improve active living, recreation opportunities and active transportation culture within Orangeville. The following chapter outlines these essential components and provides recommendations for consideration.

3.1 Priority Ranking of Preferred Cycling & Trails Network

The implementation order for the Preferred Cycling and Trails Network elements is based on the combined assessment of both justification and constraints criteria. This process serves to list projects in a priority ranking (high, medium, low) that incorporates the best investment for money spent. A timeline is not rigidly applied to this list. Instead, timing will be based on available funding. The schedule of implementation is therefore flexible based on how much money is available annually both directly for cycling and trails projects and for road reconstruction on links identified for cycling upgrades.

In order to rank the preferred cycling and trails network segments, five evaluation criteria were identified: Community and Stakeholder Preference, Network Connectivity, Expected User Demand, Estimated Cost and Property Limitations. The evaluation criteria are discussed further below.

1. Community and stakeholder preference was measured at PIC #2. PIC attendees were asked vote for their most preferred network segments. Stakeholder votes were assigned a higher weighting than votes by members of the general public, given that the stakeholders represent cycling and trails interests across the entire Town. Additionally, if a segment was previously identified in either the Trails Master Plan (2008) or the Parks Master Plan (2015), it was given one additional vote as these plans were developed with public input. All of the votes were tallied and a high, medium, or low degree of community and stakeholder preference was assigned to each of the preferred segments based on the number and weight of votes received.

2. Network Connectivity addresses “missing link” segments within the existing cycling and trails network. Each of the preferred cycling and trails network segments were evaluated as having a high, medium, or low degree of connectivity within the existing and proposed cycling and trails network.

3. Expected User Demand for the preferred cycling and trails network segments was assessed on the proximity to major origins and/or destinations within and adjacent to Orangeville. Each of the preferred cycling and trails network segments were assigned a high, medium, or low degree of expected user demand.

4. Cost estimates were developed for each of the proposed segment once a design concept was identified. These costs are based on unit costs per metre where appropriate and easily calculated given the approximate length of each segment. The specific cost estimates associated with each segment varied based on the proposed facility type, and the existing conditions of the specific area. The unit costs that were used to calculation the cost estimates can be found in ***Appendix D.***

5. Property Limitations were reviewed for each project. If the proposed segment crosses any property not owned by the Town (i.e. private property, Ministry of Transportation, Town of Mono, etc.) the project was flagged. Projects with property limitations have the potential for additional costs (property acquisition) and longer timelines (intergovernmental coordination, negotiation of easements, etc.).

The priority ranking of the preferred cycling and trails network is summarized in ***Table 6*** and ***Table 7*** and visualised in ***Figure 7***. The Implementation Matrices also include details for each of the segments and crossing locations including the length (where applicable), preliminary design concept and the results of the evaluation criteria.

Table 6: Implementation Matrix: Cycling & Trails Network Segments

ID #	Priority Ranking	Street / Trail Description	From	To	Length (m)	Design Concept	Identified in Previous Plan	Cost Estimate	Network Connectivity	Expected User Demand	Property Limitations	Community Member / Stakeholder Support
1		Abbey Road Trail	Alder Street	Spencer Avenue	545	Greenway Trail	Y	$ 110,000				
2		Ada Street & Elizabeth Street	Broadway	Rotary Way Cycling Route	360	Shared Roadway / Signed Bicycle Route		$ 3,000				
3		Alder Street (south side): Sidewalk to Multi-use Trail	Abbey Road Trail	Riddell Road	65	Multi-use Trail		$ 25,000				
4		Amelia Street (west side): Sidewalk to Multi-use Trail	Amelia Street Trail (south of Victor Large Way)	College Avenue	640	Multi-use Trail		$ 240,000				
5		B Line / Country Road 23	Broadway / County Rd 109	Townline	3150	Paved Shoulder (includes urban sections)	Y	$ 570,000			Y	
6		Blind Line	Hansen Boulevard	Orangeville / Mono Municipal Boundary	660	Paved Shoulder (includes urban sections)		$ 115,000				
7		Blind Line (west side): Sidewalk to Multi-use Trail	Hansen Boulevard	Broadway	1140	Multi-use Trail		$ 430,000			Y	
8		Blind Line (west side)	Eastview Crescent	Hansen Boulevard	580	Multi-use Trail		$ 220,000				
9		Broadway & Highway 10 traffic control Island: Sidewalk to Multi-use Trail	Dragonfly Park Trail Connection	Broadway & Highway 10	25	Multi-use Trail		$ 10,000			Y	
10		Broadway (north side): Sidewalk to Multi-use Trail	George Douglas Way extension	Broadway & Highway 10	105	Multi-use Trail		$ 40,000			Y	
11		Broadway / County Rd 109	Orangeville / Amaranth / East Garafraxa Municipal Boundary	Dufferin County Road 16	1225	Paved Shoulder	Y	$ 70,000			Y	
12		Broadway / County Rd 109	Dufferin County Road 16	C Line	325	Paved Shoulder		$ 20,000				
13		Broadway (south side)	Diane Drive	Blind Line	330	Multi-use Trail		$ 125,000				
14		Buena Vista (north side): Sidewalk to Multi-use Trail	Highway 10	Hurontario Street	160	Multi-use Trail		$ 60,000			Y	
15		Buena Vista Drive (north side)	Hurontario Street	Randy Avenue/ Clarke Avenue	275	Multi-use Trail		$ 105,000			Y	
16		C Line (east side)	Century Drive	Townline	295	Multi-use Trail		$ 115,000				
17		Centennial Road	C Line	Dawson Road	1400	Bicycle Lanes (with Reconstruction)		$ 350,000				
18		Centennial Road (north side): Sidewalk to Multi-use Trail	Riddell Road	C Line	485	Multi-use Trail		$ 185,000				
19		Credit Meadow Trail Connection (north of Jeffers Court)	Credit Meadows trail	Credit Meadows trail	320	Multi-use Trail	Y	$ 115,000				
20		Credit Meadows Trail Extension	Former Humber Lands Trail	Hansen Boulevard	250	Multi-use Trail	Y	$ 90,000				
21		Credit Meadows Trail: Gravel to Asphalt	Blind Line	Amelia Street	720	Multi-use Trail	Y	$ 165,000				
22		Dawson Road	Broadway	Townline	1300	Bicycle Lanes (Retrofit - Road diet & widening)		$ 325,000				
23		Dragonfly Park Trail Connection	Dragonfly Park	Broadway & Highway 10	75	Multi-use Trail	Y	$ 30,000			Y	
24		Dragonfly park trail:Gravel to Asphalt	Townline	Dragonfly Park Multi-use Trail Connection	445	Multi-use Trail	Y	$ 100,000				
25		Dufferin County Road 16	Broadway	Orangeville / Amaranth / Mono Municipal Boundary	1830	Paved Shoulder (includes urban sections)	Y	$ 185,000			Y	

ID #	Priority Ranking	Street / Trail Description	From	To	Length (m)	Design Concept	Identified in Previous Plan	Cost Estimate	Network Connectivity	Expected User Demand	Property Limitations	Community Member / Stakeholder Support
26		Former Humber Lands Trail	Hansen Boulevard	Credit Meadows Trail extension	650	Greenway Trail	Y	$ 130,000				
27		George Douglas Way Trail Extension	George Douglas Way	First Street / Orangeville Mall / Orangeville Highlands Trail	250	Multi-use Trail	Y	$ 90,000			Y	
28		George Douglas Way Trail Extension	George Douglas Way	Broadway	320	Multi-use Trail	Y	$ 115,000			Y	
29		Hansen Boulevard	Dufferin County Road 16	Mason Street	1475	Bicycle Lanes (with Development)	Y	$ 370,000				
30		Kay Cee Gardens trail: Gravel to Asphalt	Bythia Street	John Street	350	Multi-use Trail		$ 80,000				
31		Mill Creek Trail Connection	Montgomery Boulevard	Mill Creek Trail (north of Gooseberry Street)	215	Multi-use Trail	Y	$ 80,000				
32		Mill Creek Trail Connection (north of Morrow Crescent)	Samuel Court Storm Pond Trail	Montgomery Boulevard	285	Multi-use Trail	Y	$ 100,000				
33		Mill Creek Trail Extension	Mill Creek Trail	Alder Street & Saxon Street and Alder Street & Glengarry Road	895	Greenway Trail	Y	$ 180,000				
34		North West Orangeville Trail Connection	North West Orangeville trail	475 Broadway (Shoppers Drug Mart Plaza)	65	Multi-use Trail		$ 23,000				
35		OBRY Corridor Trail	John Street (Kay Cee Gardens)	Townline	650	Multi-use Trail	Y	$ 245,000				
36		OBRY Corridor Trail	Dawson Road	Centre Street	240	Multi-use Trail	Y	$ 90,000				
37		OBRY Corridor Trail	Broadway & Blind Line	Dawson Road	650	Multi-use Trail	Y	$ 245,000				
38		OBRY Corridor Trail	County Road 16 (C.P. Rail Trail)	Blind Line	1390	Multi-use Trail	Y	$ 525,000				
39		OBRY Corridor Trail	Townline	Orangeville / Caledon Municipal Boundary	405	Multi-use Trail		$ 155,000				
40		OBRY Spur Line Trail	C Line	Centennial Road	615	Multi-use Trail	Y	$ 235,000				
41		OBRY Spur Line Trail	Broadway	OBRY Spur Line Trail Junction	300	Multi-use Trail	Y	$ 115,000				
42		OBRY Spur Line Trail	OBRY Spur Line Trail Junction	Parkinson Centennial Public School	790	Multi-use Trail	Y	$ 300,000				
43		OBRY Spur Line Trail	OBRY Spur Line Trail Junction	C Line	855	Multi-use Trail	Y	$ 325,000			Y	
44		Orangeville Highlands Storm Water Pond Trail	Hanson Boulevard	Orangeville Mall	330	Multi-use Trail		$ 120,000			Y	
45		Orangeville Highlands Trail	Orangeville Highlands Storm Water Pond Trail	Orangeville Highlands Trail	215	Multi-use Trail	Y	$ 80,000			Y	
46		Orangeville Highlands Trail	Hanson Boulevard & Amelia Street	Orangeville Highlands Trail	240	Multi-use Trail	Y	$ 85,000			Y	
47		Orangeville Highlands Trail	Lisa Marie Drive sidewalk connection	First Street / Orangeville Mall	1050	Multi-use Trail	Y	$ 370,000			Y	
48		Riddell Road	County Rd 109	Townline	2900	Bicycle Lanes (Retrofit - includes rural sections)	Y	$ 870,000				
49		Riddell Road (west side)	Spencer Avenue/ Centennial Road	Winterton Court Trail	270	Multi-use Trail		$ 105,000				
50		Riddell Road (west side)	Winterton Court Trail	Townline	700	Multi-use Trail		$ 265,000				
51		Sherbourne Street	Broadway	Rotary Park	325	Shared Roadway / Signed Bicycle Route		$ 3,000				
52		Townline	Dawson Road	Broadway	1710	Bicycle Lanes	Y	$ 640,000				

ID #	Priority Ranking	Street / Trail Description	From	To	Length (m)	Design Concept	Identified in Previous Plan	Cost Estimate	Network Connectivity	Expected User Demand	Property Limitations	Community Member / Stakeholder Support
						(Retrofit - Road diet & widening)						
53	🟠	Townline	B Line	Dawson	2800	Paved Shoulder (includes urban sections)	Y	$ 200,000	🟡	🟡	Y	🟠
54	🟠	Townline (north side)	Riddell Road	Dawson Road	1690	Multi-use Trail		$ 635,000	🟡	🟠		🟠
55	🟠	Trail Connection	Young Court Trail	Buckingham Street & Winterton Court Trail	410	Greenway Trail	Y	$ 85,000	🟡	🟡		🟡
56	🟢	Trail Connection	North West Orangeville trail	OBRY Trail	25	Multi-use Trail		$ 9,000	🟢	🟢		🟠
57	🟢	Trail Connection	OBRY Trail	Broadway & Diane Drive	30	Multi-use Trail		$ 11,000	🟢	🟢		🟡
58	🟡	Trail Connection	Orangeville Highlands Trail	Victor Heights Avenue (Mono / Monora Park)	30	Multi-use Trail		$ 11,000	🟡	🟡	Y	🟡
59	🟡	Trail Connection	Orangeville Highlands Trail	Brucedale Boulevard sidewalk connection (Mono / Monora Park)	100	Multi-use Trail		$ 35,000	🟡	🟡	Y	🟠
60	🟢	Trail Connection	Riddell Road Trail	Riddell Road & Alder Street	25	Multi-use Trail		$ 10,000	🟢	🟢		🟠
61	🟠	Winterton Court Trail	Spencer Avenue	Riddell Road	455	Greenway Trail	Y	$ 95,000	🟡	🟡		🟠
62	🟠	Young Court Trail	Sandringham Circle	Young Court	1360	Greenway Trail	Y	$ 275,000	🟠	🟡		🟡

Notes:

1. Identified in Previous Plan: Y = Segment was previously identified in either the Trails Master Plan (2008) or the Parks Master Plan (2015)

2. Property Limitations: Y = The proposed segment crosses property not owned by the Town (i.e. private property, Ministry of Transportation, Town of Mono, etc.)

3. Evaluation:
   - 🟢 High
   - 🟡 Medium
   - 🟠 Low

Table 7: Implementation Matrix: Crossing Locations

ID #	Priority Ranking	Location	New / Upgrade	Crossing Type / Design Concept	Identified in Previous Plan	Cost Estimate	Network Connectivity	Expected User Demand	Property Limitations	Community Member / Stakeholder Support
A	🟠	Alder Street & Saxon Street	New	Intersection - Unsignalized		$10,000 - $25,000	🟠	🟠		🟠
B	🟢	Blind Line & Credit Meadows Trail	New	Mid-Block - Uncontrolled		$10,000 - $25,000	🟢	🟡		🟠
C	🟠	Blind Line & St Benedict Elementary School	Upgrade	Mid-Block - Uncontrolled		$10,000 - $25,000	🟠	🟡		🟠
D	🟢	Broadway & Blind Line	Upgrade	Intersection - Signalized		$100,000 - $250,000	🟡	🟢		🟡
E1	🟡	Broadway & Highway 10	Upgrade	Intersection - Signalized	Y	$200,000 - $500,000	🟡	🟢	Y	🟡
E2	🟡		Upgrade	Ramp / Right Turn Channel - Signalized	Y	$100,000 - $250,000	🟡	🟢	Y	🟡
E3	🟡		Upgrade	Ramp / Right Turn Channel - Signalized	Y	$100,000 - $250,000	🟡	🟢	Y	🟡
F	🟢	Broadway west of Diane Drive	New	Mid-Block - Signalized		$100,000 - $250,000	🟢	🟢		🟠
G	🟡	College Ave just east of Hanson Boulevard	New	Mid-Block - Uncontrolled		$10,000 - $25,000	🟢	🟡		🟠
H	🟠	Dufferin County Road 16 & C.P. Rail Trail	New	Mid-Block - Signalized		$100,000 - $250,000	🟡	🟡	Y	🟠
I	🟢	First Street at the north end of Orangeville Mall	New	Mid-Block - Signalized		$100,000 - $250,000	🟢	🟡		🟡
J	🟡	George Douglas Way at 5th Avenue	Upgrade	Intersection - Signalized		$100,000 - $250,000	🟡	🟢		🟡
K	🟠	Hanson Boulevard just north of College Avenue	New	Mid-Block - Signalized		$100,000 - $250,000	🟡	🟡		🟠
L	🟢	Highway 10 & 4th Avenue	Upgrade	Intersection - Signalized		$100,000 - $250,000	🟡	🟢	Y	🟢
M	🟢	Kay Cee Gardens Trail at Bythia Street	New	Mid-Block - Uncontrolled		$10,000 - $25,000	🟢	🟢		🟠
N	🟢	Montgomery Boulevard & Mill Creek Trail	New	Mid-Block - Uncontrolled		$10,000 - $25,000	🟢	🟡		🟠
O	🟠	OBRY Spur Line Trail at C Line	New	Mid-Block - Signalized		$100,000 - $250,000	🟡	🟡		🟠
P	🟡	OBRY Spur Line Trail at Centennial Road	New	Mid-Block - Signalized		$100,000 - $250,000	🟢	🟡		🟠
Q	🟡	OBRY Spur Line Trail at Tideman Drive	New	Mid-Block - Uncontrolled		$10,000 - $25,000	🟡	🟡		🟠
R	🟢	OBRY Trail at Centre Street	New	Mid-Block - Signalized		$100,000 - $250,000	🟢	🟢		🟠
S	🟢	OBRY Trail at Church Street	New	Intersection - Unsignalized		$10,000 - $25,000	🟢	🟢		🟠
T	🟢	OBRY Trail at Dawson Road	New	Mid-Block - Signalized		$100,000 - $250,000	🟢	🟢		🟠
U	🟢	OBRY Trail at John Street	New	Mid-Block - Uncontrolled		$10,000 - $25,000	🟢	🟢		🟠
V	🟡	OBRY Trail at Townline	New	Mid-Block - Uncontrolled		$10,000 - $25,000	🟡	🟡		🟠
W	🟠	Parkinson Crescent just south of Laverty Crescent (minor trail realignment also necessary)	New	Mid-Block - Uncontrolled		$10,000 - $25,000	🟡	🟠		🟠

ID #	Priority Ranking	Location	New / Upgrade	Crossing Type / Design Concept	Identified in Previous Plan	Cost Estimate	Network Connectivity	Expected User Demand	Property Limitations	Community Member / Stakeholder Support
X	●	Parkinson Crescent just west of Preston Drive	New	Mid-Block - Uncontrolled		$10,000 - $25,000	●	●		●
Y	●	Riddell Road & Spencer Avenue / Centennial Road	Upgrade	Intersection - Signalized		$200,000 - $500,000	●	●		●
Z	●	Spencer Avenue & proposed Winterton Court Trail / Abbey Road Trail	New	Mid-Block - Uncontrolled		$10,000 - $25,000	●	●		●

Notes:

1. Identified in Previous Plan: Y = Segment was previously identified in either the Trails Master Plan (2008) or the Parks Master Plan (2015)

2. Property Limitations: Y = The proposed segment crosses property not owned by the Town (i.e. private property, Ministry of Transportation, Town of Mono, etc.)

3. Evaluation:
   - ● High
   - ● Medium
   - ● Low

Town of Orangeville Cycling and Trails Master Plan

Town of Orangeville, Ontario

Preferred Cycling and Trails Network - Ranked
Figure 7

- Adjacent Recreation Area - Identification Letter
- Bicycle Repair Service
- School / Education Facility
- Hospital / Medical Centre
- Library
- Visitor Information Centre

Proposed Trail / Cycling Route (ID Number & Priority)
High / Medium / Low

Proposed New / Upgraded Crossing (ID Letter & Priority)
High / Medium / Low

- Arterial Road
- Highway
- Railroad
- Conceptual Connection
- Bicycle Route
- Proposed Paved Shoulder
- Proposed Bicycle Lane
- Proposed Greenway Trail (unpaved)
- Proposed Multi-use Trail (paved)
- Proposed OBRY Trail (paved)
- Proposed Upgrade - Sidewalk to Multi-use Trail
- Proposed Upgrade - Pave
- Multi-use Trail
- Greenway Trail
- Boardwalk Trail
- Conventional Bicycle Lanes
- Rotary Way Bicycle Route (5.4 km)
- South Broadway Passage Bicycle Route (2.8 km)
- Westside Way Bicycle Route (4.3 km)
- Watercourse
- Waterbody
- Assessment Parcel
- Central Business District
- Major Park
- Community Park
- Neighbourhood Park
- Urban Green
- Open Space
- Recreation Facility

0 150 300 450

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR & TOWN OF ORANGEVILLE

MAP CREATED BY: SFG
MAP CHECKED BY: JA
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION:
G:\cad\GIS\187793\MXD\Figure 7 - Preferred Cycling & Trails Network - Ranked HML.mxd

DILLON CONSULTING

PROJECT: 187793
STATUS: DRAFT
DATE: 3/15/2019

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS

3.2 Operations & Maintenance

A well-maintained cycling and trail network will provide users with a safe, predictable, comfortable and reliable experience year-round. It will also help to mitigate: conflict between users and the Town's liability exposure while maximizing the lifespan of the facilities. Typical cycling and trail facility maintenance should include:

- Trash/litter pickup and disposal
- Pavement marking reapplication
- Signage replacement/repair
- Vegetation management
- Sweeping
- Surface repairs
- Snow removal / ice control
- Infrastructure Inspections

Maintaining the cycling and trails network will require a financial commitment from the Town. It will be necessary for Public Works to review its current maintenance regime and plan for the increase in maintenance and operational requirements as the number of bicycle and trail facilities expand. To ensure that all facilities are maintained in a manner that will yield the greatest benefit, the following maintenance strategies should be considered:

- **Core Network:** more maintenance and operations resources should be invested into the areas of the network with the highest ridership. Facilities not within the core network still require maintenance; however a higher standard and frequency for repairs, sweeping and pavement marking reapplication may be applied to the core network.

- **Winter Network:** in order for walking and cycling to be viable and competitive modes of transportation in winter, the core network of cycling and trails facilities should be maintain during the winter.

- **Facility Design:** maintenance and operations staff should be included in the design process for any new cycling or trails facility. This will allow for any maintenance and operations specific design modifications to be made, ultimately reducing maintenance costs.

- **Maintenance Standards:** Town staff should review the Province's Minimum Maintenance Standards (*https://www.ontario.ca/laws/regulation/020239*) to ensure town practices are consistent with them.

3.2.1 Future Considerations

As Orangeville's cycling and trails network continues to grow it will also require an increase in the budget allocation for maintenance. The overall annual cost to maintain the cycling and trails network will depend on how much of the proposed network has been implemented and what standards are being applied.

Research into cycling and trails maintenance costs in Ontario suggests that annual maintenance costs for different cycling and trails facilities varies significantly between facility types and season. ***Table 8*** estimates the annual maintenance costs for various facility types.

Table 8: Estimated Annual Maintenance Costs

Facility Type	Maintenance Costs Per km (per year)	
	Annual Maintenance	Snow Removal / Ice Control
Signed Bicycle Route	$260	N/A
Signed Route with Sharrows	$1,750 – $4,400	N/A
Bike Lane	$5,450 – $6,050	$1,000
Buffered Bike Lane	$6,850 – $7,650	$1,000
Paved Shoulder	$4,850 – $6,050	N/A
Buffered Paved Shoulder	$6,250 – $7,650	N/A
Multi-use trail (paved)	$1,700 – $2,300	$6,750 – $12,500

Source: Based on City of Kingston Active Transportation Master Plan, 2018

There is frequently discussion over whether un-paved granular-surfaced trails require higher or lower maintenance efforts than paved asphalt trails. Investigations by other trail-builders indicate that the routine maintenance costs are comparable for both types of surfaces. However in areas where trails may be particularly vulnerable to flooding or washouts from nearby creeks, the cost of repairing un-paved granular-surfaced trails may be more costly than installing asphalt when averaged over the long-term.

The Town should consider monitoring and reporting costs associated with maintaining and operating cycling and trails facilities to Council annually to ensure adequate funds are budgeted for.

3.3 Supporting Actions

In order to create a community where trail use and cycling are commonplace, the Town cannot merely focus on building new infrastructure – there must also be concerted effort to encourage behaviour change and educate residents about how to use that infrastructure in a safe, legal manner. Orangeville has been effective at creating new programs and partnerships to promote cycling, but there are opportunities to build on the existing successes by strengthening the existing programs in the community and adding new complementary programs to help to build a more diverse cycling community in Orangeville.

This section provides recommendations for new programs and policies that could be implemented in Orangeville to help to foster the creation of a strong culture of cycling in the Town. Recognizing the limited resources available to the municipality, this section will recommend a relatively small number of new programs but will instead focusing on growing and strengthening programs and partnerships that

already exist within the Town. The new and expanded programs that are presented here are based on examples from around North America where communities have made great strides towards being among the most bicycle friendly jurisdictions in North America.

3.3.1 Program Recommendations

The following recommendations are based on feedback from stakeholders and members of the public, and also reflect similar programs undertaken by communities from around North America that have achieved strong success in promoting and developing a culture of cycling and trail use. These communities have a similar climate to Orangeville, and the recommendations made are of programs that stakeholders and members of the public felt were important for the community and, most importantly, realistic for Orangeville to achieve. In each of the sub sections below, there are suggestions for programs that can be expanded within Orangeville (Program Enhancements) and suggestions for new programs to undertake (New Programs).

3.3.1.1 Education

Program Enhancements

1. **Active School Travel**

   The Town of Orangeville has already been working on Active and Safe Routes to School programming with partners at the Health Unit and the School Boards, but there is an opportunity to bring in a larger number of partners and to offer programming at more schools. Since Orangeville already has access to School Travel Planning resources, expanding programs to more schools in Orangeville should be a priority – ensuring that all students within the Town have access to safe routes to walk, bike or wheel to school and expanding access to cycling education. Many organizations in Orangeville, including the Orangeville Police Service and WDG Public Health, have existing relationships within schools, and are in frequent contact with staff and administration at most schools in Orangeville for a variety of programs and events. Those connections could be expanded to include more emphasis on cycling education in schools to help to ensure that all students know the rules of the road, and how to operate a bicycle safely. Other suggestions for encouraging more active school travel in Orangeville include:

   - Installing Bike Repair stations at all high schools in Orangeville;
   - Organising mountain biking field trips to local recreation areas (Monora Park, Island Lake Conservation Area);
   - Providing support for after-school bike clubs; and
   - Supporting and leading biking and walking school buses.

   Recommended Partners:
   Sustainable Orangeville, WDG School Boards, WDG Public Health, Orangeville Police Service, Rotary Club of Orangeville

Inspiration:

Cycling Into The Future – Waterloo Region, Ontario

Cycling Into The Future is a cycling education program that has been delivered in Waterloo Region for the past several years. Through a funding partnership with the Cities of Kitchener, Cambridge and Waterloo, Cycling Into The Future has resulted in hundreds of Grade 5 students learning how to safely operate a bicycle. The goal is to ensure that each student in Waterloo Region learns basic bike handling skills and the rules of the road, resulting in a population that is more aware of the rights and responsibilities of people on bikes in the future.

2. **Comprehensive Public Awareness and Education Plan**

Orangeville has some experience in delivering education about trail use and cycling – the Cycle Orangeville map, outreach programs at schools and community rides serve as an excellent foundation for a more comprehensive public awareness and education plan. The plan, as outlined by stakeholders and community members, would focus on delivering key messages about cycling across a wide variety of channels. The Town has a strong foundation of communications; staff are well versed in advertising in local newspapers, on social media, on radio, using print assets like maps and on mobile assets like buses. The public awareness campaign should make use of this existing expertise, spreading the message to as many residents and visitors as possible.

In order to deliver a comprehensive education and public awareness campaign in Orangeville, the first step that should be taken is to create a Task Force to help to coordinate and deliver the various educational messages within the Town. This Task Force should have representatives from a variety of groups and stakeholders who play a role in promoting trails use and cycling, and should consider including:

- Orangeville Police Service
- Credit Valley Conservation
- Town Staff (Facilities and Parks, Recreation and Events, Communications, etc.)
- Sustainable Orangeville
- Commute Ontario
- Rotary Club of Orangeville
- Downtown Orangeville BIA
- Town Council representative
- Local Bike Shops
- WDG Public Health
- School Boards and School representatives

As a group, this Task Force can identify potential topics of public awareness and opportunities to expand education within the community. By including a large number of stakeholders, the Town increases the opportunities to leverage the various networks that already exist within the Town to spread the message that the Task Force identify as priorities. Educational and awareness topics that emerged from the Stakeholder and Public Consultations included:

- Community benefits of promoting trails and cycling
  - Reduced infrastructure costs, increased quality of living, age-friendly and accessible communities, improved local economies and increased property values
- Trail etiquette
  - Signage designs indicating trail etiquette expectations
- General Road Safety and sharing the road with people on bikes
  - Information about the 1 m Safe Passing Law, requirements for bikes to have front and rear lights and reflectors, general riding tips including hand signals and proper lane positioning
- Bike Maintenance
  - Information and workshops about the ABCs of bike maintenance – Air (checking tires, how to fix a flat), Brakes (testing brake cable tension, making basic adjustments as necessary) Chain (how to put a fallen chain back on, what to check for with regards to your gearing and drivetrain) – to ensure that people feel confident making small, on-the-fly fixes to keep their bikes in good working order.
- Stronger promotion of existing assets
  - Especially as more aspects of this Plan are completed and the community begins to have a more complete network, stronger promotion of the various ways to get around Orangeville by trail or by bike safely could include bus shelter ads with route maps highlighting safe cycling and walking routes, improved wayfinding signage around the community and a social media campaign to explore the various safe trails and bike routes in the community, including the popular destinations that they connect to.
- Parents and kids
  - Parents are often the decision-makers when it comes to how their children travel to and from school. When parents are driving their children to school, there is an opportunity to convert those trips into active trips through education and providing encouragement campaigns like walking school buses or “Walk a Block” designated drop off zones away from the entrance of the school. Drop-off times can be a good opportunity to engage with parents and share information about active school travel, and encourage them to think differently about how their kids are getting to and from school.

Recommended Partners:

See above for list of partners to be a part of the Public Awareness and Education Task Force.

Inspiration:

Bike Carmel – Carmel, Indiana

The City of Carmel, has been working on establishing itself as a great place to use trails and to ride a bike. Centred on the popular Monon Greenway, Carmel is working to promote its existing trails and to create a stronger culture of active transportation. One of the ways that they are doing that is by engaging in a community wide campaign designed to get more people walking

and cycling in the City. The City engages in public outreach, attending and hosting numerous events around the community, hosts bike valet where they distribute bike safety information and information about the City's trails and also produces videos showcasing the City's trails and cycling infrastructure. Carmel is home to a rapidly growing cycling culture, and provides excellent inspiration for Orangeville moving forward.

New Programs

1. Seniors' Cycling and Trail Use Education Programs

One of the fastest growing demographics when it comes to new riders and residents interested in physical activity is the population of older adults. Seniors have different desires and also face unique challenges, including reduced mobility, which can be difficult for younger or more mobile individuals to understand. Providing Seniors with a comfortable space to learn about cycling and trail use basics, including trail etiquette, basic bike handling skills and basic bike maintenance, can go a long way towards making new riders or trail users feel confident. Consider hosting sessions at the public library and organising group rides to start, and then consider offering a 55+ cycling education course in future years. A suggested curriculum for a 55+ cycling course can be found in ***Appendix E***.

Recommended Partners:

Town Staff (Recreation and Events and Public Library), Sustainable Orangeville, Rotary Club of Orangeville

3.3.1.2 Encouragement

Program Enhancements

1. Car Free Days and Open Streets Events

Orangeville has several road closure events in the Downtown each year – consider creating a new Open Streets event to provide more residents with the opportunity to explore their community at a human scale without being concerned about interacting with motor vehicles. Open Streets Events are excellent tools to promote and introduce active transportation to the "interested but concerned" population. Consider expanding the length of the routes available to ensure that there is space for residents to move and explore, particularly if the Rail Trail is constructed, using an Open Streets event to promote and celebrate that infrastructure would be a great way to build community support for the project. For a good resource about how to deliver an effective Open Streets event, see 8 80 Cities Healthiest Practice Open Streets Guide.

Recommended Partners:

Sustainable Orangeville, Orangeville Police Service, Downtown BIA

Inspiration:

Pulse Open Streets Event – Peterborough, Ontario

Celebrating its 3rd year in 2019, Peterborough's Open Streets events have proven incredibly successful. With a route that utilizes roads and trails, the event draws thousands of people each year to explore the City. There are activity hubs at local parks and BIAs, leaving the space between open for people to walk, run, ride, wheel and more.

2. **Bike Month**

Orangeville has been running events – like the Rotary Way Community Ride – that could be incorporated into a formal Bike Month for several years, but has never hosted an actual Bike Month. Expanding the number of events and programs offered during one single month can help to create a conversation about cycling in the community and can provide the push for people to get back on their bikes and give cycling a try. Maximizing the number of events during Bike Month can help to target the "interested but concerned" population of potential riders in Orangeville, and can build a strong sense of community focused on cycling. Consider partnering with Sustainable Orangeville, the Rotary Club of Orangeville and local bike shops to offer weekly guided bike tours around Orangeville during Bike Month, and expand the offerings of events to ensure that June is a month-long celebration of cycling in Orangeville.

Recommended Partners:

Sustainable Orangeville, WDG Public Health, Local Bike Shops, Rotary Club of Orangeville

Inspiration:

Bike to Work Month – Ottawa, Ontario

The City of Ottawa has hosted arguably the most successful Bike Month in Ontario for the past several years, in part because the community has focused on building effective partnerships to deliver the event. Rather than keep the organization and delivery of the month-long campaign in-house, The City of Ottawa provides funding to EnviroCentre, a local non-profit, to bring Bike to Work Month to life. As a result, the Bike to Work Month offerings in Ottawa have grown rapidly - with new partners coming on board, new initiatives spearheaded by EnviroCentre being made available each year, and new interest in the promotion growing each year. This is an excellent example of a community providing resources to a local non-profit to help to make an event stronger, to build capacity and to develop a stronger culture of cycling.

3. **Enhanced Bike Valet**

Orangeville's Bike Valet offerings have been a benefit to the community – providing people on bikes with a safe place to lock their bike while at community events and also providing an opportunity for Sustainable Orangeville representatives to talk with riders about cycling in town. One of the suggestions from the stakeholder consultation was to integrate bike valet into the special events permitti ng process to ensure that all special events in Orangeville include provisions for Bike Valet. This could be accompanied by a small fee for event organizers to pay

for staffing at the bike valet, and could help the community make bike valet a more reliable element of special events in town.

Another suggestion for enhancing bike valet it to provide a "Ride a bike, Borrow a chair" service, where riders can access a limited number of folding camp-style chairs at community events where seating might be of benefit (concerts, movies, etc.). A similar program can be found in Carmel, Indiana, and has proven to be highly successful there.

Recommended Partners:
Sustainable Orangeville, Recreation and Events Staff (to update special events permitti ng procedures), Local Bike Shops

New Programs

1. **Cycling and walking distance maps**
   With Orangeville's compact geography, most trips made within town are easily doable in less than 15 minutes by bike, and many destinations lie within a 30 minute walk of most areas of town. One of the challenges with promoting active transportation is that residents often assume that walking or cycling to a destination will take much longer than it actually does. That knowledge gap can be fixed, by promoting the large areas of town that lie within a 5, 10 and 15 minute bike ride of popular destinations like the Alder Recreational Centre, Downtown Orangeville and Island Lake Conservation Area. An excellent example of these types of visual displays can be found in ***Figure 8***, from the City of Peterborough. Consider creating similar maps and posting them in prominent locations to show residents that riding their bikes or walking to their destinations would be a healthy, quick option to get around the community.

   Recommended Partners:
   Sustainable Orangeville, Downtown BIA, Credit Valley Conservation, Town Staff (Facilities and Parks and Recreation and Events)

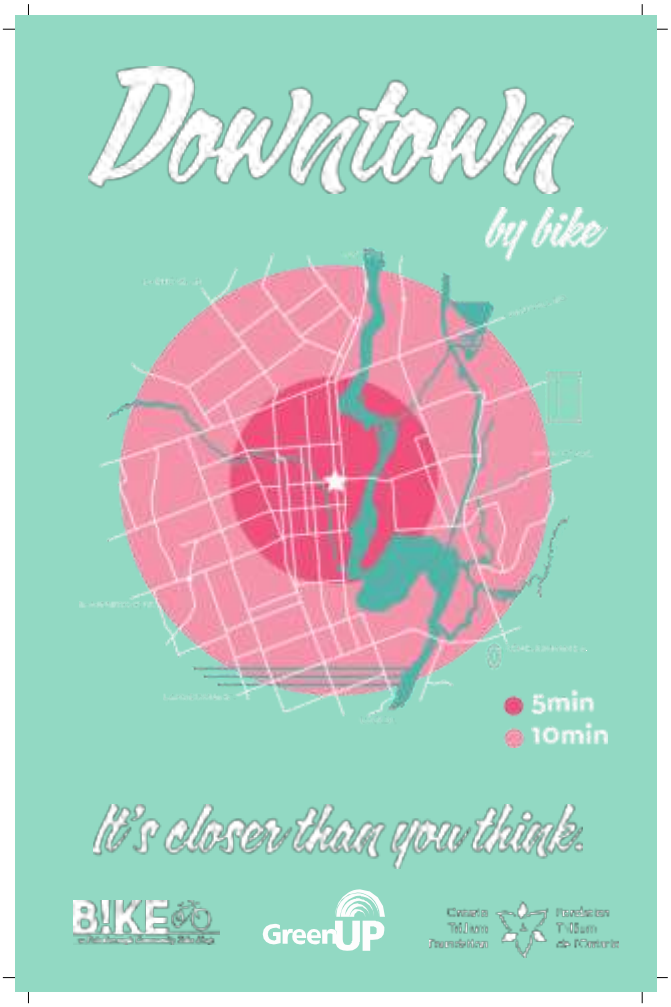


Figure 8: "It's Closer Than You Think" Map from the City of Peterborough

2. **Women Cycling**

When it comes to cycling in Orangeville, the gender divide is particularly stark. According to the 2016 Statistics Canada Census, only 22% of bike commuters in Orangeville are women, representing a significant untapped market for cycling in the Town. Creating programs designed specifically to make more women feel comfortable on bikes can significantly expand the cycling community in Orangeville. Base projects on well-established programs like the League of American Bicyclists' Women Bike Program which focuses on developing bike programs that focus on "The 5 Cs" - Comfort, Convenience, Confidence, Community and Consumer Products. Support the development of Women-only rides, women-only nights at local bike shops and consider hosting more family-focused rides in town to encourage women and families to come out and ride. For inspiration, look to some of the programming that has been offered in Fort Collins, Colorado, where weekly women's only rides, an annual Women's Bike Expo and an annual CycloFemme ride form the basis of a broad ranging program to encourage women to ride more often.

Recommended Partners:
Sustainable Orangeville, Local Bike Shops, Local Cycling Clubs, Town Staff (Facilities and Parks and Recreation and Events)

3.3.1.3 Enforcement

New Programs

1. **Bylaw review**
   One of the gaps identified at both the stakeholder and public consultation sessions was a lack of understanding about what the bylaws relating to cycling and trail use are in Orangeville. It is suggested that the community evaluate their existing bylaw structures to identify gaps in the bylaws as they relate to active transportation, and that there be a process to introduce a suite of bylaws that make active transportation and trail use safer and more clearly understood for all road users. These bylaws could include clarifications around what types of vehicles are permitted on municipal trails (e-bikes, electric assist bikes, etc.), clarification around when people on bikes are permitted on the sidewalk and stronger enforcement of parking restrictions for bike lanes. The City of Belleville recently completed their own Active Transportation Bylaw review, and the suite of new bylaws can be found here.

2. **Bike Registration and theft control**
   One of the most significant barriers to cycling is the fear of bike theft. While bike theft can be limited with adequate bike parking and good quality bike locks, there is no lock that will stop a truly determined thief with the right tools. In order to curb bike theft, some communities are turning to online bike registry tools like Project 529. Encouraging residents to register their bikes on Project 529 and distributing stickers indicating that a bike has been registered at community events could help to deter bike theft in Orangeville, and local bike shops could help customers to register their bike at the time of purchase as well to ensure that more bikes in Orangeville can be tracked and returned in the event that they are stolen.

   Recommended Partners:
   Sustainable Orangeville, Orangeville Police Service, Local Bike Shops

   Inspiration:
   Project 529 Bike Theft Reduction – Vancouver, British Colombia
   In Vancouver, bike theft was hitti ng epidemic levels, with over 2,000 bikes being stolen in the area each year. The stolen bikes almost never made their way back to their rightful owner, since most bikes are not registered. The City of Vancouver partnered with the Vancouver Police Department and Project 529 to register as many bikes in the City as possible, offering free decals at local police departments and hosting free registration events throughout the City. As a result of their efforts, Vancouver has seen a 30% reduction in Bike Theft since launching their partnership with Project 529.

3. **Bike and Trail Safety Equipment Giveaways**
   A common concern among all road and trail users is the lack of visibility of people walking and cycling in the dark. Lights and bells on bikes are required under the Highway Traffic Act, but many riders still do not have a working light or bell on their bike. Consider having volunteers and Orangeville Police Service officers engage in an educational campaign to both promote the fact that lights and bells are required on bikes and to hand out lights, bells and reflectors to people walking and cycling who don't have those items to keep them safer on the roads and trails.

   Recommended Partners:
   Sustainable Orangeville, Orangeville Police Service, Local Bike Shops

   Inspiration:
   Lights on Bikes – Ottawa, Ontario
   Each year the City of Ottawa engages in light giveaways in partnership with Safer Roads Ottawa and Bike Ottawa. They distribute thousands of bike light sets by setti ng up check stops at popular destinations and outfitti ng riders on the spot with an inexpensive set of bike lights. It can go a long way towards ensuring that all road users are safe and visible!

3.3.1.4 Evaluation and Planning

New Programs

1. **Cycling and Trail Use Evaluation Plan**
   Throughout the consultations, it became clear that Orangeville does not yet have a strategy to evaluate trail and cycling use in the community, but that there was strong interest in gaining a better understanding of how residents were getti ng around and how the trails are being used. It is suggested that the Town take steps to begin collecting data by:

   - Investing in automated counters to be placed on Town-owned trails and on-road cycling facilities;
   - Tracking bike rack use at schools and popular destinations;
   - Undertaking hands-up surveys to understand how students are getti ng to school; and
   - Delivering Community-wide surveys to better understand how residents are getti ng around, and what their thoughts are about active transportation and trails in the Town.

   All of these initiatives would start to paint a clearer picture of the true state of active transportation and trail use in Orangeville in a way that Statistics Canada commute data cannot. In order to show the impact that the Town's cycling and trails programs are having, creating an annual document that tells the story of how cycling is changing in Orangeville would be a useful investment of time and resources. The document should be one that is highly visual, features stories about particular projects, testimonials from residents who use the new infrastructure, and highlights the overall progress of the cycling program in Orangeville. This type of document

can help to communicate the long-term impacts of the investments that are being made in a way that is hard to capture with raw numbers.

Recommended Partners:
Sustainable Orangeville, Town Staff (Facilities and Parks, Recreation and Events and Communications)

Inspiration:
Active Waterloo Cycling Report **– Waterloo, Ontario**
Waterloo has a strong program of counting people riding bikes and using trails, with a number of permanent and mobile counters around the community. The City has taken that data and turned it into a highly informative document called the Active Waterloo Cycling Report, a bi-annual document that is meant to highlight the successes of the cycling program in Waterloo. By focusing the report on identifying overall ridership increases, highlighting key investments and their place within the broader active transportation network and identifying new opportunities to attract more of the "interested but concerned" population. The Active Waterloo Cycling Report not only serves to keep the City accountable to its active transportation targets, but also to provide decision-makers with the data necessary to support their decisions to invest more resources into cycling in Waterloo.

3.3.2 Staffing Capacity

As Orangeville moves forward with the implementation of this plan, many elements can be achieved through existing capacity and partnerships, but experience from across Ontario and North America has shown that communities where there is a specific staffing resource to help move both infrastructure and programming related to active transportation, trails and transportation demand management (TDM) are able to accomplish much more than communities without those resources, or where the responsibility for implementation lies scattered across various departments and staff members. A key recommendation in this plan is for the Town to establish an Active Transportation and Transportation Demand Management Coordinator position to help facilitate stronger partnerships, ensure the development of new trails and cycling infrastructure, and deliver programs that will help Orangeville residents choose to walk, bike, and use the trails in town more often.

3.3.3 Transit and Cycling Coordination

The Orangeville Transit System provides service on three routes throughout Town. Transit service is offered Monday to Friday between 7:15 a.m. and 8:45p.m. and on Saturday's between 7:15 a.m. and 6:15 p.m. There is no service on Sundays and holidays.

It is widely recognized that connecting / integrating the two modes of travel, in this case transit and cycling, will improve overall connectivity. The Town could leverage this by providing amenities at key transit stops that support cycling such as bicycle parking. Installing bike rack on buses is another way to

improve connectivity; however it may provide limited value in a town the size of Orangeville as it would likely take longer to wait for the bus and load/unload than to simply bike to the destination. Alternatively, Orangeville Transit could allow bikes on the bus, subject to capacity and the bus operator's discretion.

3.4 Funding and Partnership Opportunities

The primary sources of funding for municipal cycling and trails development are typically:

- Capital Budgets;
- Development contributions, e.g. development charges, site plan requirements;
- Community fund -raising / corporate sponsorship / public donation programs;
- Partnerships with other agencies; and
- External funding/grant programs.

It is expected that cycling and trails development in Orangeville will need to draw on any, and all, of these possibilities. They are discussed in the following sections.

3.4.1 Capital Budgets

There is a range of cycling and trail initiatives that have been identified for the Town of Orangeville which are of interest to the community, and which will compete for the available cycling and trails development monies. Potential municipal sources of funds are:

- Municipal capital budget, e.g. for new trails development, including signs, trailheads, rest areas and other amenities along the trail;
- Maintenance & operations budgets, e.g., for pavement marking reapplication, signage replacement / repair, snow removal / ice control;
- Economic development / marketing funds, e.g. for cycling and trail brochure / map; and
- Road improvements programs, e.g. for on-road cycling facilities and related infrastructure.

3.4.2 Development Contributions

In recent years, Orangeville has been pro-active in planning and acquiring new trails within open space lands in association with new development. The success of this can be seen in the southwest and northwest areas of Orangeville, in particular. There are a currently a number of proposed residential development projects, which are pending approval or for which funds have been secured, that will comprise new segments of trail. All other current and future opportunities to acquire new cycling and trails infrastructure in association with new development should continue with a view to completing preferred cycling and trails network and providing all residential areas with access to cycling and trails infrastructure.

3.4.3 Community Fundraising / Corporate Sponsorship

Sponsors may include service groups, corporate donations or public donation programs such the Town's Buy-a-Metre Trail Campaign, which was initiated in 2000, and used in 2006 to support the development of the George Douglas Way.

Fundraising programs or events are potential sources of revenue for trails development; however, at any given time there may be competing interests for donations from the general public, including other recreational facilities, hospital needs, etc. As well fundraising takes a significant amount of work and depending on the cost of the event may not be as profitable as hoped for. A more consistent source of funding may be local service organizations that are conversant in fund-raising. In Orangeville, several service clubs organizations have already generously contributed to the development of cycling, trails and park-related amenities. As a long-term prospect, it should be noted that many service organizations across Ontario are suffering from an aging membership and a corresponding decline in volunteerism.

The potential for corporate sponsors should also be investigated. The Chrysler Greenway in Essex County, The Dofasco 2000 Trail in Hamilton and the Second Marsh interpretive area in Oshawa are good Ontario examples of corporate involvement in trails projects. While Orangeville does not have such major employers, there may be willingness by local businesses and corporations to contribute to fund-raising efforts in support of a high quality of living in the Town. Given its unique character and opportunity to attract publicity and visitation, the OBRY trail would be an excellent project to market to corporate sponsors.

The involvement of service organizations and community clubs should also be solicited. In particular smaller projects such as trailheads, route and interpretive signs, and the development of short, soft-surface nature trail loops lend themselves to community fund-raising or sponsorship. The Town of Orangeville's cycling and trail system has already benefited from the generosity of local service organizations.

3.4.4 Partnerships with Other Agencies

There are multiple opportunities for external cycling and trails connections as there is interest and momentum in cycling and trails development in the surrounding regions. Orangeville is well positioned to assist with and benefit from this momentum. External groups and agencies that may be interested in partnerships and collaborative ventures are:

- Credit Valley Conservation
- Friends of Island Lake
- Headwaters Communities in Action
- Headwaters Tourism
- Central Counties Tourism (RTO 6)
- Town of Caledon
- Town of Mono
- Township of East Garafraxa
- Ontario Ministry of Transportation (MTO)

3.4.5 External Funding / Grant Programs

At the time of writing there are a limited number of funding opportunities that are available to municipalities at the provincial and federal level. Strong partnerships with community organizations can provide access to other grant programs that fund community-based initiatives. The following external funding sources are currently available for trails and active transportation related projects and programs. These and other programs that may arise through federal and provincial budgets should be explored at the time of implementation. Most have application deadlines which should be monitored annually as projects and program enhancements are contemplated.

Direct Funding Programs (Municipalities and Community Organizations)

- Federal / provincial Gas Tax Fund;
- Federation of Canadian Municipalities Green Municipal Fund; and
- Ontario Sport and Recreation Communities Fund.

Indirect Funding Programs (Community-based Grants)

- Ontario Trillium Foundation.

Programs may change or additional programs may become available when the Provincial Government releases the 2019 Ontario Budget.

3.5 Conclusion

The content of this master plan was created to guide Orangeville's cycling and trails development into the future. Its contents are unique to the Town of Orangeville but are based on best practices, lessons learned and engineering / planning / design judgement. The plan was shaped by input received from Town staff, residents, and stakeholders while being guided by the Vision that was created following a thorough review of the Town's key priorities as outlined in the Strategic Plan, as well as using input gathered from stakeholders and community members.

The Orangeville Cycling and Trails Master Plan is a flexible and adaptive blueprint meant to guide Town staff and its partners on future cycling and trails decision making, while informing the Town's budgeting process to guide the implementation of Town-wide cycling and trails infrastructure and initiatives identified in the plan. The infrastructure and initiatives outlined in this plan build on past successes and identify a new and improved vision for growth to make the Town of Orangeville a more walkable and bikeable town for people of all ages and abilities.

Appendix A

Rail-with-Trail and Rail to Trail initiatives

1.0 Rail-with-Trail

Montreal, Quebec: A 3 km path which runs alongside a four-track main line of CP Rail. The corridor is owned by the City with a portion leased back to CP. The trail was initiated in the early 1990s by the former City of Montreal, Parks Service Department as an off-road cycleway. The trail is separated from the rail line by a 2m (7 foot) chain-link fence.

Waterloo, Ontario: The Laurel Trail, a 5 km section of the Trans Canada Trail through the downtown core and the University of Waterloo campus. Formerly a CN Rail Line, the corridor is now owned by the Region of Waterloo. In 2004, the track operated slow freight trains, two or three times daily. A trail count on a weekend day found 458 users during a 6-hour period. At some locations the track and trail are as close as 1m, with no barrier fencing. In 2004, the City reported that since establishment as a trail route, there has never been an incident. This corridor has been identified as a major transportation line for future light rail transit.

St. Thomas, Ontario: A 4.8 km long, 3m (10 foot) wide asphalt trail, which runs east/west through downtown St. Thomas, population 35,000. The corridor is owned by CN/CP with a portion leased to the St. Thomas Trans Canada Trail Committee and the City of St. Thomas. Although not heavily used, the line is considered active. A 1.8m (6 foot) chain-link fence separates the rail from the trail. The 3m (10 foot) asphalt path is maintained by committee members, trail users, and the City, and is reported to be well used by commuters, families, youth and seniors.

Victoria, British Columbia: The E&N is a short-line railway, over 160 km (100 miles) in length, and only one of two remaining railways on Vancouver Island. In 2006, the railway and its historic assets, which include 6 stations and several trestle bridges, were donated to a newly formed not-for-profit organization, the Island Corridor Foundation, comprised of local governments and the First Nations. A rail-with-trail was proposed by the local community. The ICF was receptive to the rail trail plan and discussions have led to the development of a master plan, which is currently in its first phase of implementation. The width of the railway corridor ranges from 15-to 30-metres, and the trail will range from 3m- to 4m in width. Where the corridor is wide enough, there will be a natural separation between the trail and rail operations. Where the corridor is narrower, physical barriers will separate the two uses. The 17-kilometre trail is expected to be completed prior to the Winter Olympics in 20103. Freight and VIA Rail passenger service continues, and commuter rail between the southern communities of Victoria and Duncan will be studied in the future.

Halifax, Nova Scotia: An accessible multi-use trail which closely follows an active CN rail line along the western shore of the Halifax peninsula in Nova Scotia. There is a 1km existing section of multi-use trail, there is a proposed project called the Halifax Urban Greenway which will connect to the Chain of Lakes Trail on the west side to Point Pleasant Park on the east. The project has been identified as a priority for the 2014-2019 Active Transportation Priorities Plan and the project is coming into the early stages of detailed design. Along the current section, the trail is separated from the rail line by natural vegetation.

2.0 Rail to Trail

Caledon, Ontario: The Caledon Trailway is a 39km multi-use trail extending from Terra Cotta to Palgrave, constructed along the abandoned historic Hamilton & Northwest Railway, and later CN rail line. It is a primarily rural trail passing through, or close to, several conservation areas, parks and the urban centres of Caledon East and Palgrave. Allowable uses are walking, cycling and horseback riding. Motorized vehicles are not permitted. The Town of Caledon purchased the rail right of way for trail purposes in the 1980s and the Caledon Trailway became the first designated part of the Trans Canada Trail (now The Great Trail). The Caledon Trailway comprises 90% rail trail and 10% road detours with several trail bridges. Surfacing is compacted limestone screenings. Parking is provided at several community facilities and at most major roadways. Other amenities include seasonal portolets, stone benches, wayfinding and interpretive signs.

Hamilton, Ontario: The Escarpment Rail Trail is a 32km multi use trail developed along an abandoned CN rail line. The railway came into the control of CN in 1923 and was active for a number of years. After several years of abandonment, CN sold the line to the Region of Hamilton Wentworth. The former rail right-of-way was developed by the Region into a pedestrian and cycling trail in 1993. It is jointly operated by the Hamilton Conservation Authority and the Grand River Conservation Authority The corridor stretches from above the escarpment from Albion Falls northwest to the lower city and is part of the country wide The Great Trail network.

Guelph, Ontario: The Radial Line Trail in the City of Guelph is a 37km trail that runs from Guelph to Limehouse Conservation Area where it connects to the Bruce Trail. Most of the trail corridor follows the alignment of the abandoned Guelph Radial Line a former electric rail corridor through the Eramosa River Valley as well as along Blue Springs Creek. It is largely natural and stone dust and is used for hiking and cycling.

Toronto, Ontario: The Beltline Rail Trail is a 9km trail in the City of Toronto. The Belt Line Railway was built in the 1890's for commuter purposes. There were 2 commuter rail loops in total. Neither was successful and only ran for a total of 2 years. One of the trail loops was transformed into the Beltline Trail which follows the right of way of the former 'Don Loop.' It ranges in materials from crushed stone, gravel, asphalt and compacted dirt, but the whole trail corridor is characterized as a very wide path.

Also in Toronto is the West Toronto Railpath. It is a 2km multi-modal trail and park space which runs north / south connecting Toronto's West End. The corridor follows a portion of an abandoned rail line that serviced many industries in the west end such as those dealing primarily in coal, oil, iron and aluminum. It also backed onto worker housing and small shops. The Railpath is maintained by the City of Toronto Parks, Forestry and Recreation division.

Lynn Valley, Haldimand-Norfolk, Ontario: The Lynn Valley Trail is a 10km trail located in Lynn Valley and follows the former Lake Huron and Port Dover Railway, a former CNR rail corridor. The rail corridor was active up until 1988 when it was abandoned. In 1991 the Regional Municipality of Haldimand-Norfolk purchased the corridor to potentially use it for a utilities corridor. However, the Lynn Valley Trail Association (LVTA), which was formed in 1988, looked to transform the corridor into a trail for hiking and cycling. The Lynn Valley Trail was officially opened in 1993. The trail is maintained by volunteers

through LVTA and is funded through donations and trail memberships. The trail connects the business districts of Simcoe and Port Dover. Also in this area is the LE & N Trail which runs along the former LE & N Electric Car Route which extends from Port Dover all the way to Galt Ontario. This trail links to the Lynn Valley Trail.

Appendix B

Community Consultation & Engagement Summary

In July and August of 2018, the Study Team conducted a series of consultation events and activities. They included a site visit / bike tour, stakeholder workshop, Public Information Centre (PIC), a pop-up consultation, and an on-line interactive project website. In January 2019, a second PIC was held. The comments received from each of the consultation events are reported below:

1.0 Site Visit / Bike Tour

2.0 Stakeholder Workshop

The attendees worked to identify an inventory of existing activities and assets within the Town, to identify priority gaps and to define a path forward for the Town through this plan.

2.1 Identified Inventory and Gaps from Stakeholder Consultations

Engineering

Inventory	Gaps
- Bike routes with signage - 32 km of trails - Hanson Bike Lanes - Some Bike Parking	- Bike Share System - Maintenance and development standards - Connectivity - End of trip facilities – washrooms, change rooms etc. along routes - Trail heads and informational signage - Trails crossing major roads like Broadway - Bike Racks on buses

Education

Inventory	Gaps
- Cycling map with safety information on the back - Police engage in bike safety checks and bike rodeos at schools - Cycle Orangeville website - OSAT Bike workshop - Active and Safe Routes To School (ASRTS) Programming in schools	- Community doesn't know what the sharrows mean - Residents not hearing about town initiatives - Not enough information is put out - No adult education programs to learn to ride - Bike Rodeos are limited - Parents are the decision makers for the trip to school and they largely are afraid of letting their kids walk or bike

Encouragement

Inventory	Gaps
- Earth Week Bike maintenance workshop - Parks trucks have share the road stickers - Community Ride on Rotary Way - Bike to School Day - Fat bike rentals at Island Lake - Bike Valet at Town events - School incentives as part of ASRTS	- Businesses aren't engaged in promotion of cycling - Downtown lacks bike racks - Marketing of cycling is lacking - Bike Share - Family bike rides and events - "Rediscover your bike / Dust off your bike" safety check / maintenance workshops - Ongoing bike valet at Farmer's Market

Enforcement

Inventory	Gaps
- Police engage in positive ticketing for youth wearing their helmets - Police do public awareness and enforcement campaigns near schools and at intersections	- Volunteer trail patrol - Bylaws may need to be reviewed and updated - No bylaw restricting parking in bike lanes - Police need resources to enforce 1m safe passing law and lights on bikes requirements

Evaluation and Planning

Inventory	Gaps
- Counters on Vicky Barron and Dragonfly trails - User surveys for mode of travel to Island Lake - Trails Master Plan - Dufferin County AT Plan - Trails budget - Orangeville sustainable Action Team has a dedicated budget	- Counters and Surveys on town-owned facilities - Official Plan Policies that require complete and connected neighbourhoods - Plans for connectivity beyond Orangeville - Systematic evaluation plan for the Trails and Cycling Master Plan

2.2 Suggested actions for future programs

Engineering

- A Connected Trails and on-road network, including the Rail Trail, and also focusing on connecting to neighbouring municipalities and the larger provincial network of cycling and trails facilities.
- A Bike Share System
- Identifying and establishing standards for a winter maintenance network
- A Wayfinding Strategy to help residents and visitors navigate the trails and cycling infrastructure in the Town
- Crossrides and Pedestrian Crossovers at major crossings
- Road Diets on Broadway and First Street
- Bike Parking partnership fund to help increase bike parking availability at community destinations
- Annual cycling budget for on-road infrastructure in addition to the existing annual trails budget
- Traffic calming on residential streets
- Broadway and Highway 10 are being reconstructed – ensure that the project includes a new Trail and Pedestrian crossovers to make crossing Highway 10 safer for all users
- Bike Racks on Town Buses
- Undertake a Bike Parking Inventory and deliver increased levels of bike parking in Town

Education

- The creation of a comprehensive public awareness and education campaign was a priority for all attendees.
- In School Education through increased participation in School Travel Planning, more Bike rodeos and more on-road skills training for middle and high school students
- Trail etiquette promoted through signage and Social Media
- General cycling safety and Share the Road messaging shared on Social Media and on screens available to the Town (i.e. in Recreation Centres or Public Health offices)
- Stronger promotion of existing trails assets through Social Media and map production and distribution
- Bike Maintenance skills through partnerships with bike shops and OSAT
- Educating the community about the community benefits of cycling and trails development
- Interacting with parents and students to change school travel behaviours
- Seniors' and Women specific rides and events

Encouragement

- Update the Special Events Policy to incorporate Bike Valet into all events as a default
- Host an Open Streets event downtown, particularly as a way to celebrate the Rail Trail
- Bike to GO Promotions
- Ride a Bike Borrow a Chair enhancements to Bike Valet
- Family and Women's only rides
- Promotion of the short distances that can be easily walked or bikes within Orangeville.

Enforcement

- Bike lane bylaws need to be implemented
- Update all Active Transportation bylaws
- Introduce trail patrol programs
- Undertake collision and near-miss reporting for people walking and cycling
- Light and Bell giveaway and education campaign

Evaluation and Planning

- Develop a comprehensive Trails and Cycling Evaluation Strategy
- Counters installed at key on and off-road locations
- Annual reporting on plan progress and evaluation of next steps
- Introduce a user feedback system
- Evaluate and track bike rack use at schools and popular community destinations
- Undertake hands-up surveys at schools to identify trends in school travel patterns
- Deliver community surveys
- Include Active Transportation policies in the Official Plan Update
- Update Development Charges Bylaw to include Cycling and Trails infrastructure funding
- Include funding for an Active Transportation / Transportation Demand Management Coordinator

2.3 Short-term priority actions

From the long list of suggestions, attendees refined their lists to a short list of high-impact, short term actions.

Action	Corresponding "E"
Bylaw review and updating	Enforcement
Construct the Rail Trail	Engineering
Staff for cycling, trails and TDM	Evaluation and Planning
Develop an Active Transportation Committee	Evaluation and Planning
Have Bike Valet at all community events	Encouragement
Undertake a cycling and trails communications strategy	Education / Encouragement
Undertake a needs assessment and gap analysis	Evaluation and Planning
Install counters to establish baseline usage data on trails and cycling infrastructure	Evaluation and Planning

3.0 Public Information Centre (PIC) #1

PIC #1 was a structured opportunity for residents to provide their feedback about how Orangeville can become a better place to walk, bike or use the trails. Below is a table of the topics discussed and the key points that emerged from the conversations around the tables.

Topic	Key Points
Bike Month	- June or July is a good month for Bike Month in Orangeville - A focus on events that both encourage people to ride and educate them about safe cycling skills was desired. - Examples of events to be run included Bike Rodeos, Family cycling days, Bike in Movies, Bike to Restaurant days and a Bike Swap event - Parks, Recreation and Facilities Staff and local School Boards were identified as the stakeholders best situated to lead this promotion
Public Awareness and education	- More bike valet and bike parking all around town - Bike shops have a role to play – at the point of purchase they can be providing information about safe riding and good routes in the community. - Media and social media campaigns to promote cycling and trail use are key to changing minds and attitudes around Town. - Wayfinding signage all around the community could help people think about how they could get around differently. - Engaging residents at popular destinations like the farmers market to talk about trails and cycling
Engaging new riders and trail users	- More points of contact – more bike valet, more events - Regularity of events – biweekly rides to get more people out. Host community rides to a specific destination in town i.e. – coffee ride, ice cream ride etc. - Stronger communication about existing events and infrastructure – Social Media, traditional media
Youth and Cycling	- More bike parking is needed at schools - Biking school buses / Bike pooling would help improve perceptions of safety - Ensuring safety for the last 200m of the trip to school is key – creating designated drop off sites away from school to reduce traffic around the entrance would help - Create “School Streets” that can be closed at drop off and pick up times to cars to make walking and cycling safer - Create a rewards program / competition to get more kids interested in riding or walking - More cycling skills training in school

4.0 Pop-up Consultation

The Pop-Up Consultation was an unstructured opportunity for residents to provide their feedback about how Orangeville can become a better place to walk, bike or use the trails. The feedback that was received, either on the map or through written comments, is listed below.

- Orangeville's trail system should connect to the Upper Grand trail way
- Island lake (VBT) need more garbage and recycling cans
- Who owns the quarry? Lots of informal trails there
- Orangeville needs to add: Benches, Garbage & Recycling Cans, Water fountains, Washrooms, etc. to trail network
    - Add above to town mapping
    - Include change tables on mapping
- Increase / improve signage
    - Add trail categories to signage
- Update zoning by-law to require multi-residential units to have bicycle parking
- Install lighting in Key routs
- I would love to see: more bike racks around town in Orangeville
- I would love to see: separated bike lanes, Bike Share, Bicycle repair stations, more bike racks, and scenic bike trails in Orangeville
- I would love to see: rail trails and bike rec. trails that connect to CVC in Orangeville
- I would love to see: a safe crossing at Riddle and Spence in Orangeville

5.0 Project Website

Residents of Orangeville were invited to share their thoughts regarding anything related to trails and cycling in Orangeville

5.1 General Comments

- There is no good way to cross Hwy 10 when headed to or from the residential area on the east side, not to mention the hospital, clinics, and Island Lake Public School. There is a good crossing for Island Lake CA to the north, but that's a big detour for anyone headed to Rolling Hills Drive.
- Cars get very upset when bikes use the full lane on Broadway - but using the sidewalks is not good practice, and the lane is too thin to be passed safely.
- The Hanson bike lane is not well maintained, so is discouraging to bikes. More sweeping is required.
- Getting from the West end to the downtown is tricky - Broadway is perilous to say the least, especially at the train tracks.
- Centennial is a natural route for crossing town, but the road is not in great shape, and cars typically speed along this stretch, making it even more difficult for bikes.
- no curb cut to get from the bike route on Amelia to the trail that runs between Amelia and Blind Line just north of College
- difficult to cross Broadway at Diane Drive, I feel unsafe making a left from the road (no turning lane and busy traffic) to get to the trail system on the south side of Broadway
- I would feel safer for both myself and my children to have a path along the railway tracks than biking on the roads
- not sure if this counts, as it takes us out of the Orangeville boundary but there is a trail from Starview into Monora Park (both of which are Mono), the difficulty is getting to Starview from First St (which is in Orangeville). I will ride on the road and make a left onto Starview, But it is just before the intersection at First St and Hwy 10 and it is very busy with a lot of cars turning on to First St, I would not let my kids make the turn there.
- increased awareness for drivers, currently not a very friendly place to bike
- Definitely need a continuous bike path. I came from meadowvale, they have awesome continuous bike paths....not shared with cars, they were very well thought out. They were incorporated in the design of the town. Where the paths were basically in the backs of homes with a park like atmosphere, little lakes and ponds, etc.....for miles!!! These were throughout the town of meadowvale, I believe Mississauga has them as well. It was great to get to from point A to B, or just for exercise alone. This way you don't really have to deal with the cars on the road.
- I ride every day on all Orangeville bike routes and all other roads in town. I use my bike for all commuting, errands, and shopping in town. I also use the routes when transiting out of town to nearby locations.
  - Feedback: #1: Bike Adoption will not improve or increase until such time as the Town commits to maintaining designated bike routes and roads so they do not bend rims when ridden at normal speeds. In particular, all of Parkview Drive, and Church Street, and 2nd Avenue are all

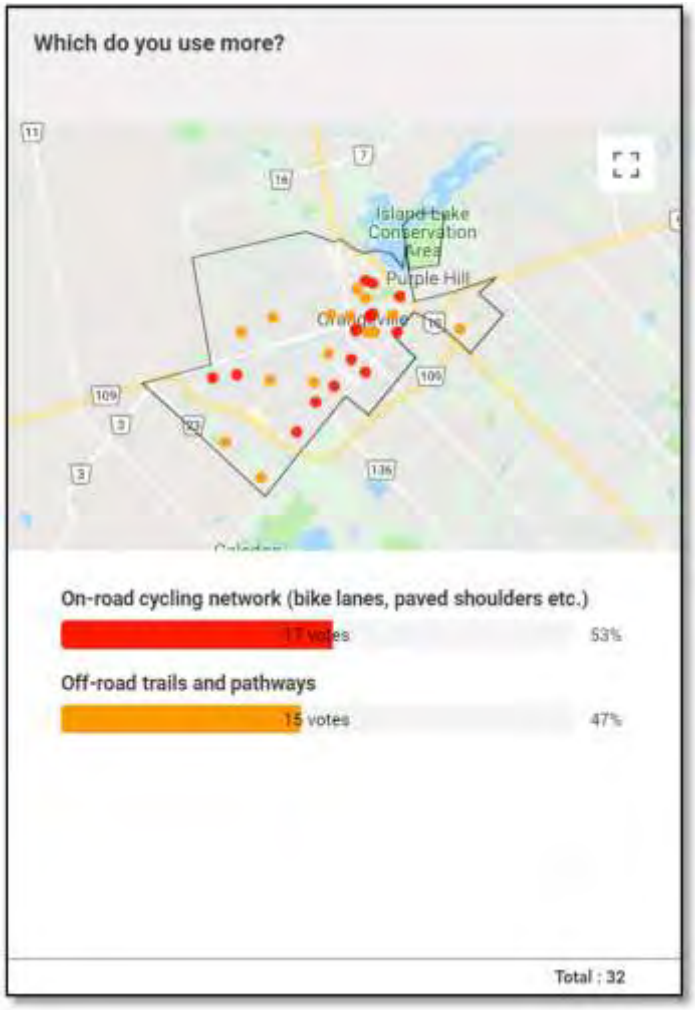
unrideable. They need total resurfacing along their entire length. The cold patch and crack filling is not adequate, the patches subside after application, or fall out, or are ripped out by the bus, and by cars, and the winter plow. I take alternate routes for each (Centennial Rd for Parkview, Broadway for Church St).

- Feedback #2: The Town must fill the missing route gaps to allow east / west travel from each end of town. Main missing gaps are 1) east / west from Broadway/Dawson to Broadway/Diane Drive (the asphalt strip just beside the south side sidewalk could be lowered, expanded and separated by a curb from the sidewalk and road) and 2) east / west from Centennial and Centre Street west to Centennial and C-Line and up the hill to Sobey's and 3) east / west from Broadway and Townline to Broadway and Hwy 10 on the north side (to just past the McDonalds where the path starts again).For a 'downtown' east / west bike route, Banting Dr and Zina St east / west between Blind Line and First St and could be considered an alternate to placing a bike route directly on Broadway. Reason, is there is no elevation change so users are more likely to use it. Most folks in their middle ages do not want to try to ride south up the 1st Street Hill from 2nd Avenue. Have the bike path connect sensibly from Broadway and Blind Line, with an eastern-side bike lane north to Banting, then as you turn right and travel east on Banting, the bike route forks into 2 routes - the existing one down Elizabeth 2ndAve for 'north-east' travel to the Home Depot / Walmart / RioCan as it currently does - and a new 2nd route parallel, one street south (Zina) for travel to the downtown at Broadway and First.
- Feedback #3: The Town must blow debris and broken glass off all off-street bicycle paths as soon as the snow melts in the spring, for example the designated north/south bike path on C-Line or the path on the south side of Broadway from C-Line and Broadway east to C-Line and Diane Drive. It should be swept, and blown once a month spring/summer/fall with the leaf blowers along paths where broken bottles have been smashed.
- Feedback #4: Maintain off street paths. The bicycle / pedestrian path for example east of the Home Hardware lumber yard has had large tree roots erupting through the pavement which will cause accidents for cyclists travelling in low light conditions, or simply if they aren't paying full attention. These dangerous lumps in the pavement have been there for years and the town just keeps spray painting circles around them, rather than what they should do which is resurfacing that section and grinding out the stumps.
- Feedback #5: Think about selecting future bike routes based on lack of elevation change, or lack of abrupt elevation change. For example, 2nd Avenue has a very steep climb on it, which pretty much renders it useless to all but fit cyclists. Nobody is going to use a bike path when an average recreational cyclist has to get off their bike and push it up a steep hill like that. Hansen and Amelia are a much better example of choosing a bike lane/route based on a gradual elevation change.
- Feedback #6: Engage active cyclists who use the Orangeville roads every day when planning new routes, or prioritizing road maintenance schedules. Not just occasional riders who use routes several times a month or less.
- Feedback #7: Determine criteria for ranking roads for resurfacing in Orangeville, and enshrine the presence of a bike route along that road in Town planning rules, as one which elevates that road in priority for resurfacing.

- Feedback #8: Establish a new marked route like Hansen, along Townline to allow users to get their bikes safely to the GO Transit park and ride, and build a sizeable glass enclosed, roofed lock up, for a reasonable number of bikes with security cameras on the GO Premises. If you want more GO ridership, give people who aren't that close to a walkable GO pickup stop, a reason to use GO.

- Orangeville and the residents would benefit from at least 20-25 km of continuous paved bike trail to encourage a healthy lifestyle.
- drivers should be made aware and reminded of road regulations around cyclists - town should repair pot holes in cycling paths to prevent severe injury to cyclist
- I'd like to see a growing network of dedicated bike paths. Not a supporter of the Sharrow program. Would like to see family biking events organized. Would like to see collection, repair and donation of bicycles and helmets to young people from needy families
- We appreciate the hard work that has gone into the creation of bike routes in Orangeville however it should be noted that the surfaces must be maintained to cycling requirements not motorized vehicles. Bumps are noticed far more on a bike and have the potential to alter the course of a bicycle. Also and even more important is that the bike lane receive regular street sweeping. My wife and I travel regularly on Hanson to our rides north of town but cannot use the bike lanes as all the road debris is kicked into the lane and stays there since the cars do not travel in the bike lane. We can't take a chance riding on the glass and pebbles that collect there so we have to ride on the yellow line or in the live lane.
- Lastly as motor vehicle drivers we need to recognize that a bicycle is a vehicle that has the right of way as a motorized vehicle and same slow moving rights as say a tractor so when occupying a lane it's the responsibility of the motorized vehicle driver to find an opportunity to safely pass- not to find a way to squeeze a car/truck and a bicycle through the same lane.
- The route network is growing, but education is a key deliverable. There is confusion about the routes and how they should be used and shared. I encourage the network to grow, so that people can get between all major landmarks in town (shopping, recreation, businesses, downtown, etc.) easily.
- We have beautiful nature trails for biking. There are so many routes to amenities that could be improved and made more bike friendly. As our town gets bigger we need to think about reducing traffic through our main routes that were not designed for major rush hour traffic!
- Would like to have safe bike routes without motorized vehicles. So I can bring my daughter and feel that she is safe and can enjoy the bike ride. We want the youth to be more active, so this would be a great opportunity to spent quality fun time with the little ones
- Would like to increase visibility of these routes to make motorists more aware that more people are using this mode of transportation.
- I'm delighted to see bike routes being established. That said, some of the streets, like Parkview and Church are in bad shape and are extremely hard on my bike. I often avoid these routes because I feel there is potential of damaging my e-bike.
- Please get the bike racks that have been purchased and are sitting in a workshop somewhere up already I would like to have somewhere to lock my bike when I go downtown to the grocery store etc. and currently bike lock spots are pretty limited!

- Not that the fountain and clock down the middle of Broadway aren't quaint but really if we were a bike friendly municipality why wouldn't that extra space have been used for proper bike lanes, biking downtown is one of the worst places because the lanes are no longer wide enough to accommodate a vehicle and most drivers seem less than impressed when I am in front of them.
- My personal dream is to see the Orangeville to Streetsville single rail track become a Rail trail artery. This would bring cycle tourism to Orangeville and also give access to the existing Caledon rail trail that passes through Inglewood.
- Should be more emphasis on outdoor activities. The town is doing a great job in making Orangeville more bike friendly. Keep it going!!!



6.0 Public Information Centre (PIC) #2

PIC #2 was an unstructured drop-in for residents and stakeholders to provide feedback/priority on the list of preferred network segments and crossing locations. A priority setting exercise was undertaken using a dotmocracy (dot-voting) exercise.

6.1 Dotmocracy Results

Proposed Cycling & Trails Segments

6.2 General Comments

- Add a short section of bike lane / paved shoulder to connect from Country Rd 16 to C-Line via Country Road 109
- Add a crossing upgrade to the intersection of Hwy 10 and Fifth Avenue
- I'd appreciate being able to see these (& other) materials online
- This evening has been great but I'd like more time to think things over
- How can we get a sense of how many walkers/cyclists/ages use these trail segments? That might help give a sense of when & where people need loop completions/crossings/links
- What sense is there about the benefits/values/gains that come from trail use? (I did a CVC survey of the early years after the Island Lake circle loop was finished. The health benefit to residents was remarkable!
- A few ideas related to the functional trail system for the property located on the north side of Hansen Boulevard, just west of the Orangeville Mall:
    - Limiting any formal trail system to the areas outside of the identified Natural Heritage System (i.e. watercourse, wetland, woodland and associated buffer);
    - Formalization of the existing trail from Brucedale Boulevard into the Orangeville Highlands/Brucedale Investments property, hence, allowing potential access to Monora Park in the Township of Mono to the north;
    - Utilizing the proposed sidewalk network within the proposed development to connect the proposed park areas and to the existing trail network to the south of Hansen Boulevard;
    - Potentially utilizing the area in the vicinity of the storm water management pond as a part of the trail system. This may include a trail along the periphery of the storm water block or within the block itself; and
    - Provide a connection to a safe access point to the adjacent to the Orangeville Mall

Appendix C

Cycling & Trails Design Guidelines

1.0 Off-road Trail Development Guidelines

1.1 Overview

To facilitate a bicycle network, multi-use trails (either paved or unpaved) are anticipated to be the primary off-road trail type in Orangeville. However walking/hiking only trails may be more appropriate in areas with environmental concerns or constraints. Therefore, walking/hiking only trails are included as part of a Greenway Trails classification.

The following table summarizes the design standards for the existing and proposed inventory of off-road, recreational trails in Orangeville. Detailed guidelines for each trail type are provided in the sections following. For best practices related to cycling, the design guidelines for multi-use trails should be read in conjunction with Section 2.0 On-road Bicycle Facility Design Guidelines.

Table C-1: Off-road Trail Classifications & Design Standards

FACILITY TYPE / LOCATION		DESIGN STANDARDS				
OFF-ROAD TRAILS		Width (m)		Clearing Height (m)	Surface	Grades
		Clearing	Tread			
Multi-use Trails (Paved)		4.2 – 7.5 (0.6 beyond tread; 1.5 if adjacent to a slope > 3:1)	3.0 - 4.5 (add width in high traffic areas or at curves)	3.0	Asphalt	- 0-5% with less than 3% optimal. - 6% < 150m - 7% < 120m - 8% < 90M - 9% < 60m - 10% < 30m
Greenway Trails	Multi-use Trails (Un-Paved)	4.0 (0.5 beyond tread)	3.0	3.0	Compacted limestone fines	- 0-5% with a max. grade of 10%
	Walking and Hiking Trails	1.0 - 2.0 (no additional clearing width)	1.0 – 2.0	2.5	Compacted natural dirt or woodchips	- 0-20% with a max. grade of 25% (match natural terrain)

1.2 Multi-use Trails (Paved)

I. **Description:** A paved multi-use trail is typically designed to accommodate moderate to high levels of use and a wide range of both recreational and utilitarian users including pedestrians, cyclists, in-line skaters and skateboarders.

II. **Design Speed:** The design speed of a trail is typically 20 km/h to 30 km/h. Where site conditions will allow, trails should be designed using a 30 km/h design speed but where site conditions are constrained, a 20 km/h design speed is appropriate. Facilities with higher design speeds must account for slower-moving users by providing elements that facilitate safe passing, such as additional facility width, pullout refuges, and separation of travelers by mode and/or direction of travel.

III. **Location:** Suitable locations for multi-use trails include roadway boulevards, urban parks and open space corridors, and natural open space lands without significant environmental constraints.

IV. **Clearing Width:** 4.2 – 7.5 m (minimum 0.6m cleared and graded area beyond tread; 1.5m adjacent to slopes greater than 3:1) and depending on environmental conditions). A greater clearing width will be needed to maintain sightlines on curved sections.

V. **Tread Width:** 3.0 – 4.5 m; 3.0 m (typical). Additional width may be required in high traffic areas or at curves.

VI. **Clearing Height:** 3.0 m (typical). A minimum vertical clearance of 3.0m should be used with a minimum of 3.5m for tunnels and underpasses. Overhanging foliage should also be trimmed to this height.

VII. **Tread Surface:** Asphalt is the standard surface to accommodate wheeled modes, and to promote accessibility. Compacted granular surfaces may be used in natural areas or as an interim surfacing. In high-usage, or urban locations the multi-use trail may include elements such as unit pavers or concrete banding as design elements or to delineate a separate pedestrian zone.

VIII. **Stopping Sight Distance:** Stopping Sight Distance (SSD) is the distance required by a cyclist to come to a complete and controlled stop upon spotting an obstacle. It is a function of perception and reaction time, tire/surface friction coefficient, grade, cyclist speed and the braking capabilities of the bicycle. The minimum SSD for a bicycle traveling at 20 km/h (on a flat, paved surface in wet conditions) is 20 metres and a bicycle traveling at 30 km/h (on a flat, paved surface in wet conditions) is 35 metres.

IX. **Grades:** Grades of 0-5%, with less than 3% being optimal, to accommodate all wheeled modes. Grades greater than 5% for paved surfaces and 3% for unpaved surfaces (e.g. crushed stone), are undesirable because the ascents are physically difficult for many cyclists to climb and the descents cause some cyclists to exceed the speeds at which they are comfortable. However, as terrain dictates, grades over 5% and less than 150m long are acceptable when a higher design

speeds is used and additional width is provided. Where steep grade changes occur on an approach to a roadway, a switchback shall be provided.

X. **Cross Slope:** Multi-use trails should be designed with a minimum 2% cross-slope for storm water runoff. This slope should be lower on the inside of any curve for greater cornering safety. Swales will be required on the uphill side of paths to reduce hazards on the path and maintain its structural integrity.

Horizontal Curves: The preferred turning radius for a multi-use trail is 20 metres (30 km/h design speed). Where space is restricted, a lower turning radius may be used, to a minimum of 10 metres (20 km/h design speed). In lower turning radius situations, warning signage and trail widening (0.3 – 0.5 m) is required. In all situations where grades on or near the curve are more than 3%, warning signage and trail widening are required.

XI. **Lateral Clearance on Horizontal Curves**: Trails that are intended to accommodate faster modes of active transportation, such as cycling and in-line skating, shall avoid blind corners, sudden grade changes or steep slopes terminating at trail to trail or road to trail intersections. The inside portion of a curve, including at intersections, should be kept free of significant obstructions within the approximate eye-level range of a trail user (0.6m - 2.0m). Appropriate obstruction removals for sightlines are determined by the minimum SSD and the radius of the curve. It should allow a trail user to see obstacles or other users in the path ahead and stop completely before reaching them.

XII. **Setbacks to Hazards:** A minimum setback of 0.6m is recommended from stationary obstacles such as poles, trees, fences, site furnishing and trees with a preferable setback of 1.0m. A curb with a height greater than 150mm is considered a lateral obstruction as measured from the bikeway edge. Fences/ barriers should have a lateral clearance of 1.0m from the edge of the path. If this is not possible, the edges should curve back so that they are at least 1.0m away. This distance will prevent the cyclist's handlebars from clipping the edge of the barrier and falling. A cleared, graded area of not more than a 6:1 gradient is recommended for a distance of 0.6m adjacent to the trail, with a 1.5m separation to adjacent slopes that are steeper than 3:1.

XIII. Signage:

Warning Signs: Shall be provided indicating changes from one trail type to another (e.g. multi- use to pedestrian only trails), and at uncontrolled road crossings. *Directional* signs should be provided at all trail junctions.

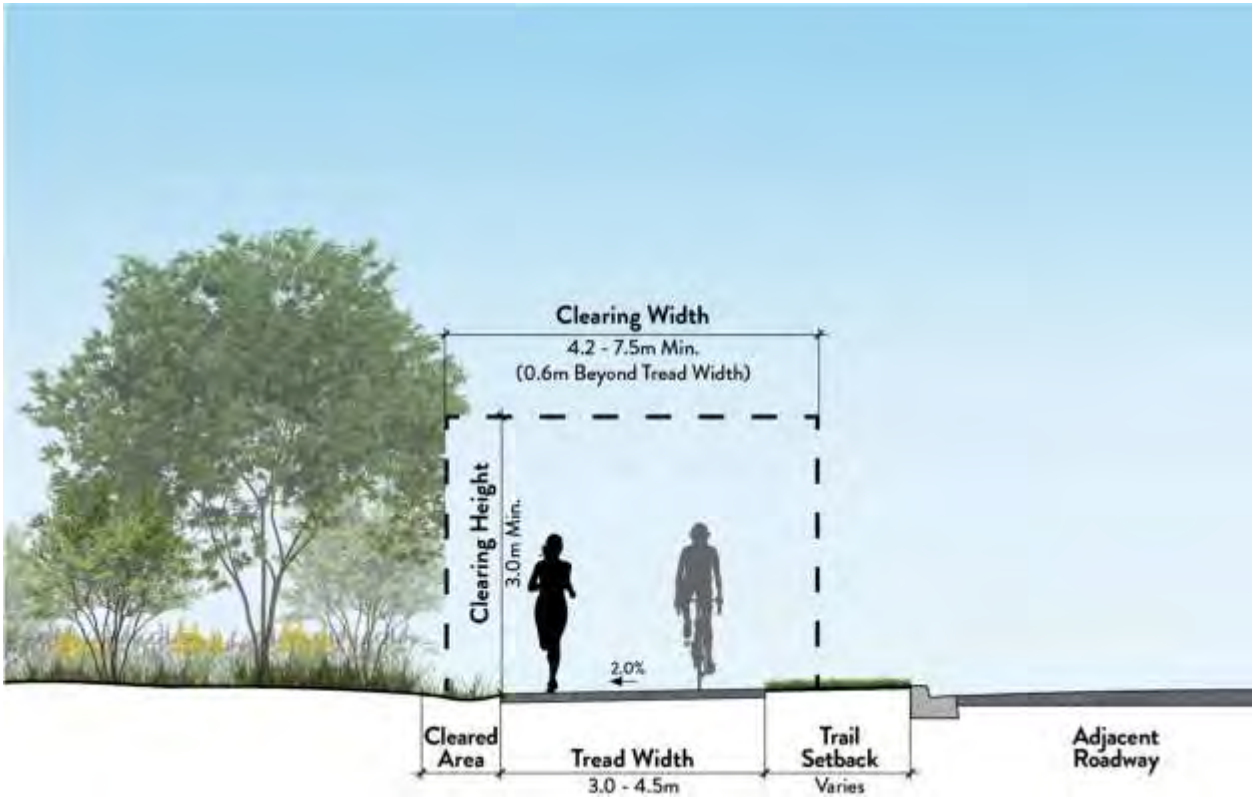
Distance Markers: Should be provided at intervals of not less than one per every 2 km for trails with extended lengths between trailheads and junctions.

Interpretive Signs: May be located at points of interest. See Section 1.5 Trail System Signage for additional design guidelines.

XIV. **Landscaping:** Planting buffers or fencing screens should be considered in areas where trails run close to adjacent residential areas. Crime Prevention Through Environmental Design (CPTED)

principles should be used in the location of vegetation and other design aspects of the trail. See Section 1.7 CPTED Principles.

Figure C-1: Multi-use Trail (Paved)



Credit: Dillon Consulting Limited

1.2 Greenway Trails

Greenway trails are low-impact trails that are primarily suited to natural open space lands such as woodlots, wooded or open creek valleys and which are designed to primarily support walking and hiking. Some off-road cycling may be supported where there are no significant environmental considerations and trail widths permit.

An assessment of local environmental conditions is required as part of determining an appropriate trail design standard. An Environmental Impact Study and approval from Credit Valley Conservation is required for the development of trails through areas identified as Open Space – Conservation in the Town's Official Plan.

1.2.1 Multi-use Trails (Un-Paved)

I. **Design Speed:** The Design speed for an unpaved trail is typically 20 km/h. Unpaved trails have lower coefficients of friction that influence curvature design.

II. **Location:** Broad, open valleys and floodplains; dry woodland areas; buffer and setback zones adjacent to residential areas.

III. **Tread Width:** 3.0 m (typical) to accommodate low speed, off-road cycling. Low use walking/hiking trails and trails through sensitive natural environment areas (where approved) shall be based on minimum widths to minimize environmental impacts. A wider minimum tread width is recommended in areas of lower environmental sensitivity and where higher usage is anticipated, or where trail may eventually be paved.

IV. **Clearing Width:** 4.0 m (minimum 0.5 m cleared area on either side of finished tread)

V. **Clearing Height:** 3.0 m (typical). Overhanging foliage should be trimmed to this height.

VI. **Tread Surface:** Compacted limestone fines with underlayment of filter cloth (typical) is recommended for casual walking trails with low gradients, in areas of lesser environmental sensitivity, parks, or where higher usage is anticipated. These trails may be upgraded to asphalt should the volume of users increase or if improved accessibility is a consideration.

VII. **Grades:** To minimize environmental impacts the trail should match the natural terrain with regard for erosive slopes and sensitive embankments. For casual walking trails 0-5% is recommended, with maximum sustained grades not exceeding 10%. Switchbacks may be needed in order to maintain maximum grades.

VIII. Signage:

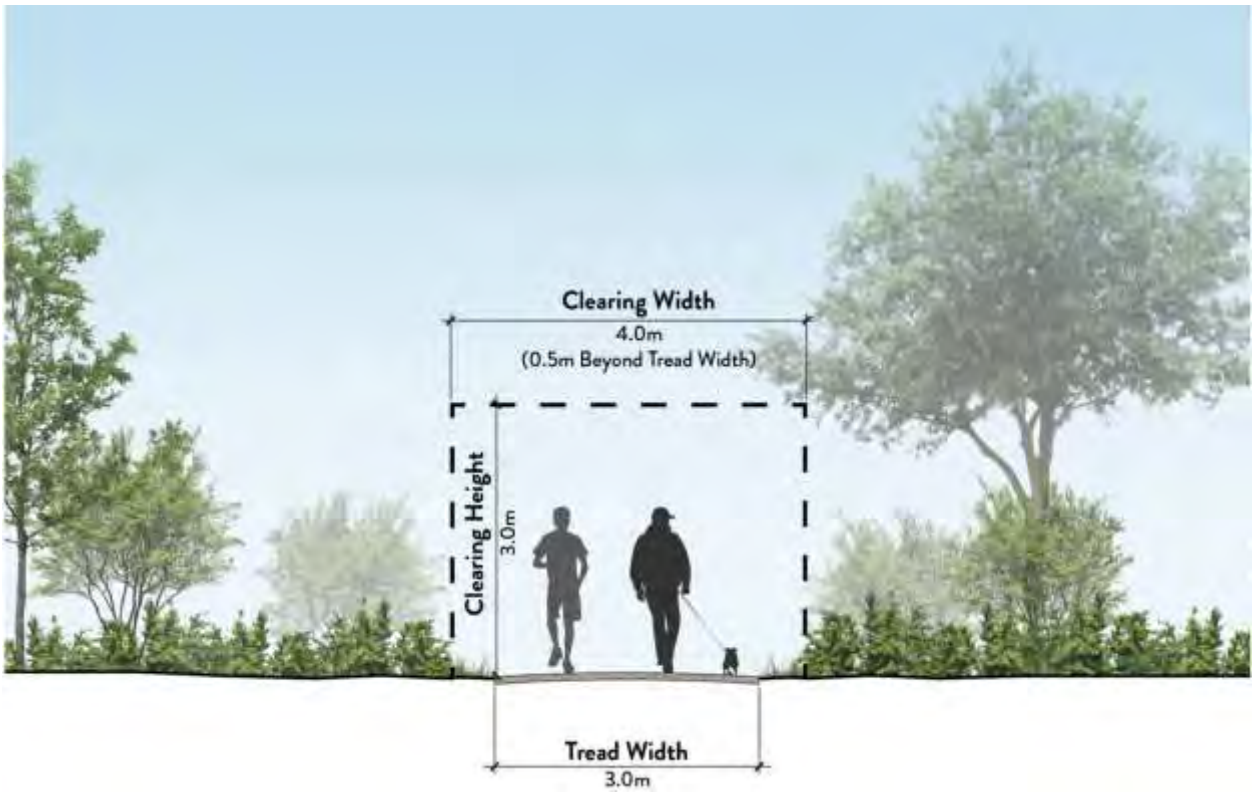
Warning Signs: Shall be provided indicating changes from one trail type to another (e.g. multi-use to pedestrian only trails), and at uncontrolled road crossings. Directional signs should be provided at all trail junctions.

Distance Markers: Should be provided at intervals of not less than one per every 2 km for trails with extended lengths between trailheads and junctions.

Interpretive Signs: May be located at points of interest. See Section 1.5 Trail System Signage for additional design guidelines.

IX. **Landscaping:** Planting buffers or fencing screens should be considered in areas where trails run close to adjacent residential areas. Crime Prevention Through Environmental Design (CPTED) principles should be used in the location of vegetation and other design aspects of the trail. See Section 1.7 CPTED Principles.

Figure C-2: Multi-Use Trail (Unpaved)



Credit: Dillon Consulting Limited

1.2.2 Walking / Hiking Trails

I. **Location:** Creek valleys and floodplains, dry woodland areas, subject to assessment of local environmental conditions. Poorly drained and permanently wet soils should generally be avoided unless mitigated through appropriately constructed boardwalks.

II. **Tread Width:** 1.0 m to 2.0m. Low use walking/hiking trails and trails through sensitive natural environment areas (where approved) shall be based on minimum widths to minimize environmental impacts. Trail routing should be located to protect sensitive vegetation and preserve existing trees to the extent possible.

III. **Clearing Width:** No additional clearing width beyond the tread is needed, with the objective to minimize the footprint of the trail. However, overhanging or hazard vegetation may be cleared, as needed, for safety reasons.

IV. **Clearing Height:** 2.5 m (typical) respecting sensitive vegetation.

V. **Tread Surface:** Based on site specific conditions and trail purpose. Compacted limestone fines may be used in areas of lesser environmental sensitivity. Natural earth (compacted), woodchips, or wooden logs ("corduroy trail") trail surfacing is recommended for narrow width trails in more sensitive areas.

VI. **Grades:** The trail is to match the natural terrain as much as possible with regard for erosive

slopes and sensitive embankments to minimize environmental impacts. Grades ranging from 0-20% with maximum sustained grades of 25% for short distances are appropriate. Switchbacks or stairs may be needed to traverse steeper slopes or avoid areas of sensitive vegetation.

VII. **Cross Slope:** Minimum 2% cross-slope for storm water runoff. Swales will be required on the uphill side to reduce hazards on the trail and maintain its structural integrity.

VIII. Signage:

Warning Signs: Shall be provided indicating changes from one trail type to another (e.g. multi-use to walking/hiking only trails.

Directional Signs: Should be provided at all trail junctions. Distance markers should be provided at intervals of not less than one per every 2 km for trails with extended lengths between trailheads and junctions.

Interpretive Signs: May be located at points of interest. See Section 1.5 Trail System Signage for additional design guidelines.

Figure C-3: Walking / Hiking Trail

Credit: Dillon Consulting Limited

1.3 Accessible Trails

1.3.1 Overview

The *Accessibility for Ontarians with Disabilities Act (AODA)* was enacted in 2005, and was followed by the development of the *Integrated Accessibility Standards Regulation (Ontario Regulation 191/11)*. A component of this is the *Accessibility Standard for the Design of Public Spaces* which strives to ensure that new and redeveloped public spaces appropriately serve the needs of all users, including those with a wide range of disabilities. The Accessibility Standards for the Design of Public Spaces addresses the design of public spaces not covered by Ontario's Building Code. These include sidewalks and pedestrian walkways, parking lots, outdoor public use eating areas, play spaces, recreational trails and beach access areas.

For the purposes of interpreting and supplementing the Standards, the Global Alliance on Accessible Technologies and Environments (GAATE) has prepared a publication entitled *The Illustrated Technical Guide to the Accessibility Standard for the Design of Public Spaces.* It was prepared in consultation with the Accessibility Directorate of Ontario and various Ontario professional organizations (OAA, OALA, etc.).[1] The *Illustrated Technical Guide* includes reference to the minimum accessibility requirements for recreational trails under the AODA but also recommends additional best practices to elevate the level of accessibility or to address gaps in the Standards.

The foregoing guidelines for Multi-use Trails (refer to Section 1.1), if applied, would typically result in an accessible trail. However local conditions and design standards may vary within a trail corridor, therefore, AODA standards should be referenced during the design of a recreational trail that will be identified as accessible. These requirements are summarized in the following sections together with better practices recommended by GAATE. It should be noted that different or additional accessible standards apply to sidewalks and pathways which have a functional purpose other than for a recreational experience.

1.3.2 Accessibility Requirements for the Design of Recreational Trails

I. **Trail Entrances:** Trail entrances must have a clear width of 850 mm to 1000 mm through any gate, bollard or entry element.

   Better practice: Entrances to trails should also be maintained so they remain clear of obstructions such as trees or rocks.

II. **Travel Width:** Minimum 1000 mm

   Better Practice: Consider a minimum width of 1800 mm to allow wheelchairs or scooters to pass comfortably. If the trail is less than 1800mm wide consider providing 1800 mm x 1800 mm passing or turn-around spaces, located not more than 30 metres apart.

[1] The Illustrated Technical Guide to the Accessibility Standard for the Design of Public Spaces. Global Alliance on Accessible Technologies and Environments. Retrieved from https://gaates.org/DOPS/loc.php

III. **Clearing Height:** Minimum 2100 mm head room above trail surface.

Better practice: Minimum of 2300 mm head room clearance above trail surfaces.

IV. **Travel Surface:** Firm and stable.

Better Practice: Harder surfaces such as asphalt or compacted fine gravel screenings are most appropriate. Consider using colour, tone and textures within ground surfaces to define primary trail routes and assist with wayfinding.

V. **Gradients:** Gentle running slopes are recommended, to minimize the amount of strength and stamina required to use the trail.

Better Practice: A gradient of 0-5%, with less than 3% being optimal, to accommodate all wheeled modes. (Note: Gradients no steeper than 1:20 (5%) are required for sidewalks and pathways; Gradients no steeper than 10% are required for ramps on accessible trails). Consider providing landings along sloped walkways longer than 30 metres.

VI. **Cross Slope:** No minimum requirements.

Better Practice: Gentle cross slopes are recommended to provide an even surface for people who use strollers, wheelchairs, walkers and other mobility aids and for those with poor balance.

VII. **Edge Protection:** Provide edge protection where trails do not have protective barriers (e.g. fencing); run adjacent to water; or are adjacent to a drop-off in grade. The edge protection must consist of an elevate barrier that runs along the edge of the recreational trail; must be at least a minimum of 50 mm above the trail surface; and not impede the drainage of the trail surface.

VIII. **Ramps:** Properly designed ramps may provide improved access for people using wheelchairs, strollers, walkers, or other mobility aids. It is not a requirement that recreational trails include ramps, however where used within an accessible trail the following standards should apply:

- minimum width of 900 mm;
- firm and stable surface;
- not steeper than 1:10 (10%) gradient;
- landings, minimum 1670mm x 1670 mm in size, to be provided, at the top and bottom of ramp; at abrupt changes in the direction of the ramp; at horizontal intervals not greater than 9 metres apart.

IX. **Surface Openings:** Openings on the trail, ramps or its landings must not allow the passage of an object more than 20 mm in diameter.

Better Practice: Consider a maximum of 12 mm to reduce tripping hazards.

X. **Signage:** The following should be included at each trailhead, together with other trail information:

- trail(s) length / distance;
- surface type / construction;
- average and minimum trail width and gradient;
- location of / distance to amenities.

XI. **Landscaping:** No minimum requirements.

Better Practice: Consider including plantings that could enhance the experience of all users including people with disabilities, e.g., plants with strong contrasts in colour, texture or fragrance. Avoid plants that drop fruit or large seed pods that may be a tripping hazard.

Example of Unpaved Accessible Trail and Boardwalk

Credit: US Forest Service

1.4 OBRY Trail

As the premier open space connector within the trail system it is anticipated that any trail developed within the OBRY corridor will be a Multi-Use Trail. While located within a generous right of way, the corridor is complicated by watercourses through much of the route. Consequently, no uniform standards can be applied along its length. **A detailed study is required to confirm the most feasible routing and the final design of the OBRY trail.**

If the trail is developed while the OBRY is still functional the following additional best practices should be considered in order to provide a safe rail-with-trail environment.

I. **Distance Separation:** Minimum 1.0m to 1.5m between track and trail. More where feasible. In Barriers may be considered to improve user comfort, e.g. decorative fencing, bollards.

II. **Signage:** The following signs are recommended:
- Crossings: Signs warning of the ORDC trail crossing should be located along roads, on approach to the trail intersection. Consideration should be given to a formalized pedestrian crossing on Town Line, at the Train Station, as use / traffic warrants;
- STOP Signs: Located at road crossings (both directions);
- Caution Signs: Signs about active rail line use and train schedule should be located at road

crossings or trail entrances;

- Trail Entrance Signs: Name and trail identity to mark trail entrances and at road crossings.

III. **Trailhead:** A rest area and trail entrance with trail and interpretive information is recommended to be located in the open space lands adjacent to the train station and parking lot, or at Railway Parkette on the west side of Town Line across, which is recommended for upgrading in the 2015 Orangeville Parks Master Plan.

IV. **Design Aesthetics:** Given the urban context and quality of streetscape design in the downtown core, aesthetics should be considered in all design details for the trail. A unique theme to portray the history of the rail industry should be considered.

Example of Rail-With-Trail - Waterloo Spur Line Trail

Credit: Region of Waterloo

Although Canadian examples exist of trails along active rail corridors including, locally, the Waterloo Spur Line, the United States has many more examples. According to the Rails to Trails Conservancy, as of 2018, there are more than 350 rails-with-trails in the US with the length of trail totaling more than 580 km. These include trails along high speed rail lines, as well as spur lines and periodic use lines such as the OBRY. Accordingly, the best studies of rails-with-trails originate in the US. The studies include safety statistics, address common concerns, cite case studies and include design guidelines and best practices. The following resources are recommended by the Rails to Trails Conservancy.[2]

America's Rails-with-Trails: A Resource for Planners, Agencies and Advocates on Trails Along Active Railroad Corridors. Rails-to-Trails Conservancy, 2013.

Rails-with-Trails: Lessons Learned. Alta Planning + Design and the U.S. Department of Transportation, 2002.

Rails-with-Trails: Design, Management, and Operating Characteristics of 61 Trails Along Active Rail Lines. Rails-to-Trails Conservancy, 2000.

[2] https://www.railstotrails.org/build-trails/trail-building-toolbox/basics/rail-with-trail/

1.5 Trail Signage

1.5.1 Signage Design and Branding

Signage systems must be designed to accommodate a wide range of potential users from adults to children who depend on signs for orientation and guidance. These include individuals who use mobility aids as well as people with vision, hearing, or cognitive difficulties. A complete trail signage system should be designed to address general information about the trails and their attributes, wayfinding and directional information, regulatory information (where there are restrictions) and provide interpretation and educational opportunities.

Signage for the trail system should be designed as a comprehensive family of signs with a consistent identifying graphic style, image or trail logo.

The *Orangeville Directional Wayfinding Master Plan*[3] provides guidance on a range of sign types which could be adapted to the trail system. The recommendations of this study, if implemented, will contribute to a cohesive signage system for Orangeville, of which trail signage would be a component part.

The proposed Directional and Wayfinding signage system capitalizes on the three Orangeville icons found in the Town's logo. Use of the green 'Trees' icon in a customized logo is for Parks and Trails in the Directional Wayfinding Master Plan.

To achieve a cohesive look, ***a sign fabrication company should be retained to develop the final sign content, graphic appearance, sign templates and a simplified trail map for the Town.*** The signs should be designed and fabricated in accordance with the guidelines and specifications in the *Orangeville Directional Wayfinding Master Plan.*

The following sections describe the hierarchy of trail signs proposed for the Town of Orangeville. Where appropriate, examples of applicable signs and specifications from the Directional Wayfinding Master Plan are provided to guide the sign design and fabrication. A compatible design has been proposed for proposed trail sign types, such as trail markers on Greenway Trails, which are not specifically included in the Directional Wayfinding Master Plan.

Note: Graphics illustrate the design intent for each sign type, detailed shop drawings are required to be submitted.

1.5.2 Trailhead Identity and Information Sign

I. These integrated signs serve as trail identity, wayfinding and information signs, take the form of information panels or kiosks and would be provided at key Trailheads.

II. Trailhead Identity and Information Signs should include the following information:

[3] Orangeville Directional Wayfinding Master Plan.
https://www.orangeville.ca/documents/2014/09/23/orangeville-directional-way-finding-master-plan

- Trail route map, both broader network and trail specific information, e.g., showing trail loops and distances, degree of difficulty, and any notable hazards such as steep slopes;
- Trail name, if applicable.
- Town of Orangeville Logo or Wordmark, and Parks & Trails Logo (per the Orangeville Directional Wayfinding Master Plan);
- Location information in case the user needs emergency assistance;
- Trail etiquette (e.g. share the trail), and information on applicable policies or by-laws (hours of operation, permitted trail uses);
- Space for promotion of trail related events or activities;
- Areas for patron recognition or sponsors;
- Contact information to report trail management and maintenance concerns;
- Link to web-based information for more details.

III. The Trail Identity and Information Sign should be one or two-sided and designed and fabricated in accordance with the specifications of the Community Orientation Map sign in the *Orangeville Directional Wayfinding Master Plan,* or as approved by the Town.

Figure C-4: Example of Trail Identity and Information Sign

- Sign Dimensions: 1.8 m w x 2.0 m high (to top sign face edge)
- Sign Face: 1.6 m w x 1.0 m high, aluminum blind fastened to frame attached and supported by 2 black powder coated aluminum posts (round with decorative top and bottom, to be sourced at detailed design) with poured concrete footing, decorative black metal bracket (powder coated) attach to frame bottom and post edge.
- Typographic Standards: Primary: Baskerville and Baskerville Bold. Secondary: Helvetica and Helvetica Bold.
- Colours: In accordance with the Town's branding and logo. Town of Orangeville Graphics Standards Manual provides the colour palette.

Source: Orangeville Directional Wayfinding Master Plan

1.5.3 Wayfinding Signs

Wayfinding signs should be located throughout the trail and cycling system, directing users along routes or to nearby facilities or attractions. For the purposes of the trail system different wayfinding signage is proposed for Bicycle Lanes / Bicycle Routes and for Greenway Trails to reflect the urban and natural contexts.

Bicycle Lane / Bicycle Route / Multi-use Trail Directional Signs

I. For named Bicycle Routes and Bicycle Lanes and prominent Multi-use Trails, the recommended route marker is the Directional Community Sign as specified in the *Orangeville Directional Wayfinding Master Plan.*

II. Bicycle Lane / Bicycle Route Markers may include:

- Decorative signpost with graphic, colour coded signboard; or,
- Signboard mounted to streetlights with the specified decorative support.

III. Directional signs should be located:

- At key parks and facilities to mark the start of a trail / route;
- Every 500 to 700 metres for continuous sections of the trail
- At key road intersections in the cycling system to mark directional changes in a route (3 to 5 metres in advance of a turn).

IV. Information on the signboards should include:

- Town of Orangeville Logo or Wordmark, and Parks & Trails custom icon (per the Orangeville Directional Wayfinding Master Plan);
- Route name, corresponding to an overall route map with styling and colours compatible with the family of trail signage;
- Directional arrows marking the route.

The Bicycle Lane / Bicycle Route Markers should be one or two-sided (for bi-directional signs), and designed and fabricated in accordance with the specifications of the Directional Community – Parks & Trails sign in the *Orangeville Directional Wayfinding Master Plan,* or as approved by the Town.

Note: For traffic awareness purposes bicycle lanes and bicycle routes may also be marked along their length with signs or pavement markings in accordance with the Ontario Traffic Manual – Book 18 - Cycling Facilities.

Figure C-5: Example of Directional Parks & Trails Signboard (typ.)

Source: Orangeville Directional Wayfinding Master Plan

Figure C-6: Directional Community – Parks & Trails Signpost Specifications (typ.)

- Sign Dimensions: 1.15 m w x 3.5 m high (to top sign face edge)
- Sign Face: 1.0 m w x 0.7 m high, aluminum blind fastened to frame attached and supported by 1 black powder coated aluminum post (round with decorative top and bottom, to be sourced at detailed design) with poured concrete footing, decorative black metal bracket (powder coated) attach to frame bottom and post edge.
- Typographic Standards: Primary: Baskerville and Baskerville Bold. Secondary: Helvetica and Helvetica Bold.
- Colours: White signboard with blue border and typeface, in accordance Town of Orangeville colour palette.

Source: Orangeville Directional Wayfinding Master Plan

Greenway Trail Directional Markers

In more natural settings, directional markers along the trail system should be of a simpler form and design while still reflecting the overall family of wayfinding signage.

I. The suggested styling for Greenway Trail Directional Markers is:
   - Post or bollard, with mounted aluminum signs / symbols; or
   - Pedestal style square extruded aluminum signboard, with removable / interchangeable graphics panels (e.g. Trail Key)
   - Simple text, bold graphics, or international symbols as applicable.

II. Directional trail markers should be located:
   - At key parks and facilities to mark the start of a greenway trail;
   - Every 500 to 700 metres for continuous sections of the trail;
   - At key intersections or junctions in the trail to mark directional changes or a trail loop.

III. Information on the markers should include:
   - Parks & Trails custom icon (per the Orangeville Directional Wayfinding Master Plan);
   - Trail name(s) or colour coding, as applicable, corresponding to an overall route map with styling and colours compatible with the family of trail signage;
   - Directional arrows;
   - Reminder of regulatory information (additional to or replacing regulatory signs).

Example of Bollard Trail Marker

Credit: Conservation Halton

Example of Extruded Aluminum Trail Marker

Credit: 'TrailKey' Fontasy Sign and Display Inc.[4]

1.5.6 Interpretive/Educational Signs

I. These signs may be used in conjunction with a themed trail, or special feature areas along the trail. Trails may be developed on themes of wildlife and natural ecosystems, landscape or heritage as part of naming, commemoration or sponsorship activities.

II. In natural areas interpretive information should be oriented to building stewardship and responsibility for environmental management as well as education on the special features.

III. Interpretive/educational signs should be located:

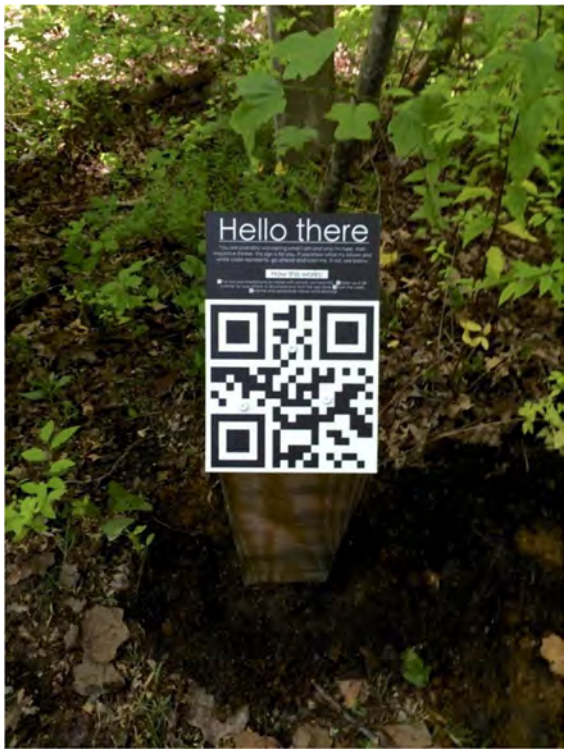
- Within a widened trail node or viewing area to allow for unimpeded use of the trail;
- At trailheads or rest areas.

IV. The presentation of information should be both interesting and informative and suited to a wide range of users, including adults and children, using simple text and info graphics. Information contained on the signs may be complemented with, or replaced by a digital link, i.e. to web-based information via a QR code. This allows for supplemental or updating or information

[4] https://fontasy.ca/products/trailkey-trailmarkers/

however requires additional web-page management to avoid broken links.

V. Sign design and construction may vary according to the trail setting or storyline. A consistent design should be used within each trail loop, and each sign series should be compatible with the overall Town trail system identity.



Example of Sign with QR Code

Credit: Mountain Goat Trail, TN, USA

Example of Interpretive Sign

Credit: Fontasy Sign and Display Inc.[5]

1.5.4 Regulatory Signs

I. Regulatory signs display prohibitive information, warnings, and cautions about the trail system or its context.

II. Areas where these signs may be needed include: natural areas where access is discouraged; potential hazard areas (e.g. steep slopes, or bridges) and changes in trail type (e.g. multi-use to walking trails); temporary trail closures due to conditions, wildlife considerations or environmental restoration.

III. Regulatory signs should be designed as part of the overall signage system, using compatible styling however the message should be easily recognized from a distance (e.g. simple shapes, bold graphics, concise text or international symbols where applicable).

[5] https://fontasy.ca/products/trailkey-trailmarkers/

Regulatory signs on the Latah Trail, Idaho

Credit: Alex Gamble Designs

Examples of the 'friendly' and informative signs

Credit: Alex Gamble Designs

IV. Prohibitive information should include brief, informative explanation with reason for the restriction, encouraging co-operation, and noting whether the situation is temporary or permanent.

V. Unless part of an interpretive / educational sign, regulatory signs along trails are typical of roadway signs, constructed using a post mounted aluminum plate with a painted or reflective sheeting surface. Dimensions of a regulatory sign will vary depending to the information displayed.

Example of Educational Sign in Mississauga

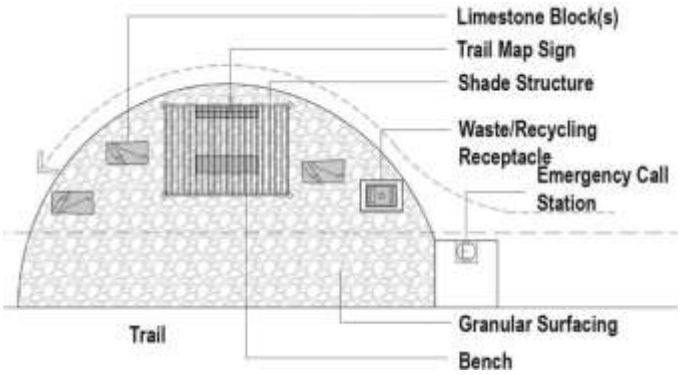
Credit: City of Mississauga

1.6 Trailheads and Rest Areas

1.6.1 Trailheads

I. Trailheads demarcate an entrance to a major trail and can additionally function as gathering areas or as rest areas. They may be designed differently depending on the anticipated number of users and the setting of the trail (e.g. an urban park vs. a natural area).

II. Typical amenities at a trailhead typically include seating, waste receptacle, and trail map or wayfinding sign. Depending on municipal standards and preferences a trailhead may also include a shade shelter or an emergency call station (for remote areas).



Example of Trailhead Layout

Credit: Dillon Consulting Limited

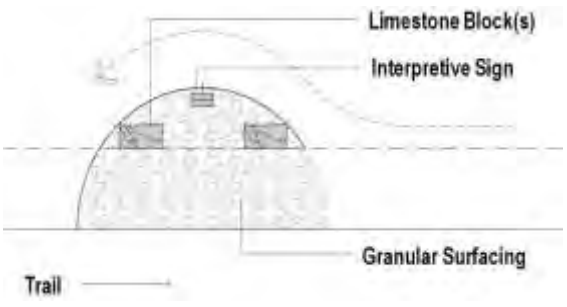
Trailhead on the Herb Gray Parkway

Credit: Industryous Photography

1.6.2 Rest Areas

I. Rest Areas provide respite areas to break up trail distances, may be combined with trailheads at key junctions on longer trail systems, or located in association with unique or scenic features along the trail that offer viewing or interpretive opportunities.

II. Typical amenities include some form of seating. A naturally shaded location or a shade shelter should be provided. Other amenities may include interpretive signs or waste receptacles.



Example of Rest Area Layout

Credit: Dillon Consulting Limited

Rest Area on the Herb Gray Parkway

Credit: Industryous Photography

Table C-2: Trailhead and Rest Area Design Guidelines

DESIGN ELEMENT		TRAILHEAD		REST AREAS	
		Type 1: Multi-Use Trails	**Type 2: Greenway Trails**	**Type 1: Multi-Use Trails**	**Type 2: Greenway Trails**
SITE	Size	50-60 sq. m.	15-20sq. m		
	Location	At parks, entrances to major trails, or junctions within the trail system	At parks, entrances to major trails, or junctions within the trail system	At trailheads and approximately every 2km and/or at trail junctions	At trailheads and approximately every 2km and/or at trail junctions
	Surfacing	Match or complement trails surfacing, e.g. asphalt or unit paver surface	Compacted granular surface	Match or complement trail surfacing	Compacted granular surface
	Trail Barriers	Removable bollard / lockable gate to allow maintenance and emergency vehicles	Bicycle and vehicular barrier gate	N/A	N/A
	Shade	Shade trees, or shade shelter (urban areas)	Shade Trees	Locate where shade is available.	Locate where shade is available.
	Landscaping	Buffer plantings or privacy fencing adjacent to residences; May include decorative planting (e.g. at parks, urban locations)	Natural vegetation with barrier planting or rail fence to protect natural areas (where needed)	Existing natural vegetation or park landscape; Buffer plantings or privacy fencing adjacent to residences (where needed)	Existing natural vegetation
SIGNAGE * May be combined	Trail Identity and Information*	Trail / park name, potentially with unique trail identity branding for special trails	Trail / park name, potentially with trail identity branding	N/A	N/A
	Wayfinding *	Trail map / information board, and link to web-based information, noting distance / difficulty of trail(s)	Distance / Difficulty of Trail(s).	Distance / Wayfinding Marker e.g., X distance to Y destination	Distance / Wayfinding Marker e.g., X distance to Y destination
	Educational / Interpretive Sign(s) *	Trail conduct / etiquette (specific to the type of trail); May include interpretive information at locations with unique features	Trail conduct / etiquette (specific to the type of trail); May include interpretive information at locations with unique features	Interpretive panel and/or marker with link to web-based information at locations with unique features or history	Interpretive panel and/or marker with link to web-based information at locations with unique features or history
SITE FURNISHINGS	Waste Receptacles	Yes. May include dog waste stations	Yes. May include dog waste stations	Yes, where waste pick-up is feasible	Yes, where waste pick-up is feasible
	Benches	2 benches	2 benches or 2-3 armour stone pieces (natural settings)	1 bench	1-2 armour stone pieces
	Bicycle Facilities	Bike rack; Bike repair station	Bicycle rack (at junction of multi-use trails and walking trails)	Bike rack	N/A
	Other	Potential for shade shelter, public art, or emergency call station	Potential for shade shelter, public art, or emergency call station	N/A	N/A

1.7 Crime Prevention Through Environmental Design (CPTED) Principles

Crime Prevention through Environmental Design (CPTED) is a suite of design strategies that can reduce the threat of crime to pedestrians. The following CPTED strategies are most relevant to the design and operation of transportation facilities:

I. Natural surveillance reduces opportunities for crime by maximizing visibility and fostering positive social interaction. Design strategies include:

- Encouraging slower passing motor vehicle traffic so that it can act as a surveillance asset;
- Avoiding poorly placed lights that create blind spots for potential observers;
- Placinglightingatproperheightssoitilluminatesthefacesofpeopleusingthespace;
- Configuring landscaping and other physical elements to maintain sight lines and avoid blind spots.

II. Natural access control provides connectivity so that pedestrians have options to maintain movement and avoid areas that are isolated.

III. Territorial reinforcement promotes a sense of ownership by inviting use of public space. Design strategies include:

- Placing amenities (e.g., seating and shade trees) in common areas to attract larger numbers of desired users;
- Maintaining sidewalks, street furniture, and landscaping such that they communicate an alert and active presence occupying the space.

For additional information regarding CPTED, refer to guidelines or practices documented by the relevant local jurisdiction, or the Royal Canadian Mounted Police's overview of the Canadian perspective on CPTED strategies[6].

[6] Royal Canadian Mounted Police. 1998. Creating Safer Communities: An Introduction to Crime Prevention through Environmental Design (CPTED) for Architects, Planners and Builders [online]. Catalogue Number JS62-97/1998. Ottawa, ON: Royal Canadian Mounted Police (RCMP)/Canada Mortgage and Housing Corporation (CMHC). [Viewed November 28, 2018] http://publications.gc.ca/collections/Collection/JS62-97-1998E.pdf

1.8 Trails in Environmental Areas

The following are considerations for the development of trails within creek valleys and other natural areas. These are general guidelines and do not preclude the need for investigation of site specific conditions and an Environmental Impact Study and approval by Credit Valley Conservation for lands designated Open Space - Conservation in the Official Plan (Schedule A).

"Where proposed parks, trails or public works would be located within lands designated Open Space Conservation, an Environmental Impact Study will be undertaken to the satisfaction of the Town and Credit Valley Conservation to ensure that potential impacts on the natural environment are identified. If it is determined that the project will have an acceptable impact, appropriate mitigating measures will be identified and implemented" (Official Plan - Section E.5.3.8)

1.8.1 Trail Development Best Practices

I. Wherever possible trails should be located above the regional storm flood line or (through narrow valley conditions or constrained areas), outside the 5-yr. flood line to reduce maintenance and reparation costs. This criteria may not be met through underpasses. Temporary closure of trails during spring runoff or extended wet periods may be required.

II. Development of trails, bridges, boardwalks, etc. should be undertaken with minimal disturbance to existing vegetation and without loss of stream corridor function or aquatic habitat, (e.g. use longer span bridges and natural stone rather than gabions within the stream channel).

III. Planted riparian buffer strips shall be established adjacent to all stream courses that will assist in sedimentation control, erosion protection and filtration of runoff from adjacent paths. All work within these zones shall be in accordance with Conservation Authority requirements.

IV. Perimeter fencing, log barriers or a buffer planting of thorny or prickly native plant species may be required to deter access through sensitive areas or to block random trail routes.

V. Periodic/seasonal closures or re-routing of trails may be necessary to prevent permanent damage or to allow regeneration of the woodlot understory.

VI. Construction within stream corridors shall be undertaken during the season when the stream is least sensitive (generally summer), and with the least impact on fish or wildlife habitat.

VII. Restoration in riparian areas should include native species that have a high tolerance to flood conditions with deep or wide-spreading root systems to bind soil and reduce erosion. Aquatic habitat enhancement should be considered through the planting of species that overhang and shade the stream bed.

VIII. Landscaping within, and adjacent to, all natural environment areas should avoid invasive species. Native species should be used with an emphasis on species that are indigenous to the local conditions, as determined through field assessment and use of available data, (e.g. Ecological Land Classifications for Southern Ontario, Ministry of Natural Resources).

1.8.2 Trail Advocacy and Education

Public awareness and education are of paramount importance in responsible trails use, reduction in user conflicts and the prevention of environmental damage, and should be part of the marketing and promotion of recreational uses in natural areas.

I. Partnerships with trail associations, school environmental groups and community organizations should be encouraged for re-vegetation and planting programs, trails development (e.g. walking trails), and garbage clean-up, through such programs as Adopt-a-Park or Adopt-a-Trail.

II. Education on environmental sensitivities of an area and the impacts from off-trail or non-permitted uses should be made through friendly and informative regulatory and educational signage.

III. Reduced mowing strategies and naturalization in urban valley systems can be perceived by the public as neglect, and the use of these areas through recreational trails may draw additional attention to these issues. Informative signage will increase public acceptance of such measures. Natural areas that lie immediately adjacent to housing may require a higher level of maintenance to alleviate public concerns, such as mowing strips adjacent to fences.

1.8.3 Monitoring of Impacts

The recreational benefits derived from the use of the natural corridors for trails and other passive uses must be carefully balanced with the potential increase in impact on the natural environment. Monitoring of these developed natural areas will be important in ascertaining the successful integration of recreation with ecological objectives.

I. Routine trail maintenance should include monitoring for environmental damage, (e.g. twice yearly when mowing is done). Input from trail users and local residents should also be solicited.

II. Specific issues to be monitored include:

- Destruction of understory vegetation and slopes as a result of trail breaking, “hang-out” areas, mountain biking, etc.;
- Destruction of trail surfacing by prohibited uses such as motorized vehicles;
- Creek bank erosion and destruction of riparian vegetation as a result of public access to the water’s edge;
- Encroachment into natural areas from adjacent land-uses.

III. The presence of public trails within buffer zones and natural areas, which are accessible to maintenance staff, may reduce the occurrence of environmentally detrimental activities such as dumping, expansion of gardens, etc.

IV. The development of a designated trail system together with an effective signage system to direct and educate users can help to limit the establishment of informal paths in natural areas. Monitoring of off-trail uses will, however, be an ongoing part of trail management. Where the health and sustainability of environmental areas is threatened by high usage or off-trail

encroachment, mitigation may be needed.

V. Mitigation measures may include:

- Trail system expansion;
- Improving the trail surface, or installing stairs, boardwalks, bridges or viewing areas to better support usage and to discourage trail diversions;
- Posting regulatory and educational signs, noting reasons why areas are sensitive and off-limits;
- Enforcing a dogs on-leash policy;
- Erecting fencing or planting barricades to preclude off-trail hiking. This may be accomplished in association with other structures such as boardwalks, bridges or viewing areas to keep people on the trail.

Markham Naturalization Sign

Credit: City of Markham

2.0 On-Road Bicycle Facility Guidelines

2.1 Overview

These guidelines and planning principles represent the most current North American industry practice and experience in comprehensive planning for cycling uses. This includes the National Association of City Transportation Officials' (NACTO) Urban Bikeway Design Guide, the American Association of Transportation Highway Officials (AASHTO) Guide for the Development of Bicycle facilities, Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads, and Ontario Traffic Council (OTC) Ontario Traffic Manual (OTM) Book 18: Cycling Facilities.

The term "On-road" refers to accommodating bicycles between the road curbs on urban cross-section designs and on the pavement in rural cross-section designs. Cyclists are permitted on-road under the Highway Traffic Act, and may elect to use roads even where a parallel off-road route is provided.

The following table summarizes the design standards for the existing and proposed inventory of on-road cycling facilities in Orangeville. Detailed guidelines for each trail type are provided in the sections following.

Table C-3: On-road Cycling Facilities Design Standards

FACILITY TYPE / LOCATION		DESIGN STANDARDS			
ON-ROAD CYCLING FACILITIES		**Width (m)**	**Vertical Clearance (m)**	**Horizontal Clearance (m)**	**Grades**
Shared Roadway / Signed Bicycle Route	Wide curbside lane	4.0 – 4.5	2.7 - 3.6	- 0.2 – obstruction between 100mm and 750mm high - 0.5 – obstruction > 750 mm high	- No absolute Maximum - <4% is ideal - 8% is practical upper limit
	Narrow curbside lane	< 3.0 – 4.0			
Paved Shoulders (Rural Cross-Sections)	Conventional	1.2 – 1.5	2.7 - 3.6	- 0.2 – obstruction between 100mm and 750mm high - 0.5 – obstruction > 750 mm high	- No absolute Maximum - <4% is ideal - 8% is practical upper limit
	Buffered	1.2 – 1.5 lane + 0.5 – 1.0 buffer			
Bicycle Lanes (Urban Cross-Sections)	Conventional	1.5 – 1.8 bicycle lane	2.7 - 3.6	- 0.2 – obstruction between 100mm and 750mm high - 0.5 – obstruction > 750 mm high	- No absolute Maximum - <4% is ideal - 8% is practical upper limit
	Conventional Splitting two travel lanes	1.8 – 2.0 bicycle lane			
	Adjacent to On-Street Parking	1.5 bicycle lane + 0.5 – 1.0 buffer			
	Buffered	1.5 – 1.8 bicycle lane + 0.5 – 1.2 buffer			
	Parking Protected	1.5 – 1.8 bicycle lane + 0.8 – 1.2 buffer			

2.2 Operating Space / Dimensions

Most bicycles are approximately 0.9 - 1.1m tall (handlebar height) and 1.8m long. With rider included, most bicycles occupy approximately 0.75m of horizontal space but have an operating envelope of 1.2 m to 1.5 m. The operating envelope dimensions are greater than the actual width occupied by the bicycle and rider since they take into account variations in tracking (reflecting that not all riders can steer a very straight line, especially when riding uphill or when traveling at full speed). To accommodate bicycle and rider a vertical clearance envelope of 2.5m should be used to allow the cyclist to feel safe and comfortable. ***Figure C-7*** illustrates the physical design dimensions, operating envelopes, and minimum clearances for a cyclist. These dimensions provide the basis for the design of bicycle facilities described in later sections of this chapter.

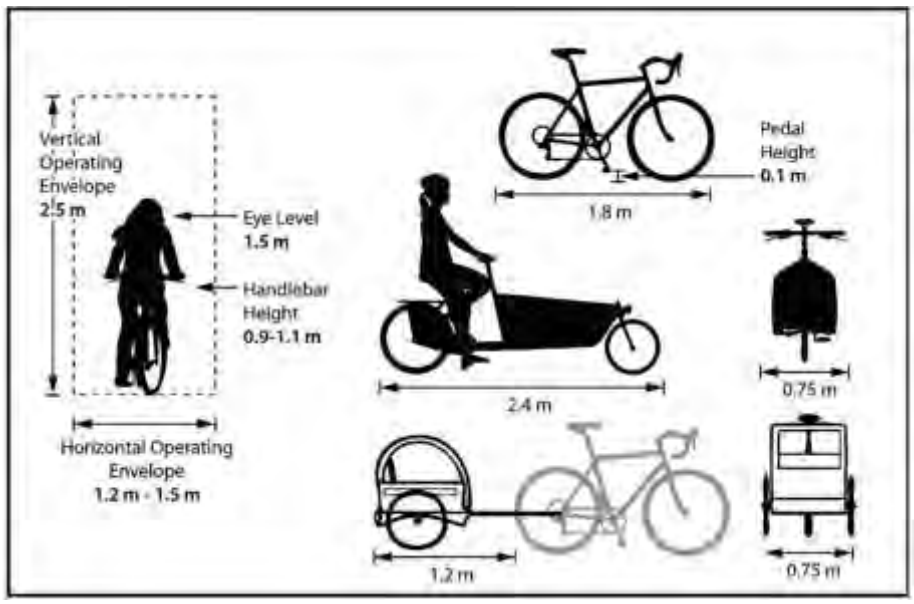


Figure C-7: Bicycle Operating Space

Source: TAC Geometric Design Guide for Canadian Roads, chapter 5 – Bicycle Integrated Design, 2017 (Figure 5.2.1, p.7)

2.3 On-Road Bicycle Design: Geometric

2.3.1 Design Speed

The design speed of an on-road bicycle facility is typically 20 km/h to 30 km/h, but depending on site conditions a design speed of 40 km/h to 50 km/h may be suitable. These conditions would include: downgrades that are greater than 5%, strong and regularly occurring tailwinds, and facilities designed with passing areas. Facilities with higher design speeds must account for slower-moving users by providing elements that facilitate safe passing, such as additional facility width and/or pullout refuges.

2.3.2 Stopping Sight Distance

Stopping Sight Distance is the distance required by a cyclist to come to a complete and controlled stop upon spotting an obstacle. It is a function of perception and reaction time, tire/surface friction coefficient, grade, cyclist speed and the braking capabilities of the bicycle. The following formula can be used to calculate the estimated stopping distance:

$$SSD = 0.694V + \frac{V^2}{255(f + \frac{G}{100})}$$

Where: SSD = stopping sight distance (m)

V = design speed or velocity (km/h)

f = coefficient of friction

G = grade (%) - upgrade is positive and downgrade is negative

Table C-4 illustrates minimum stopping sight distance for a range of speeds from 10 km/h to 50 km/h and grades up to 12% on a paved surface under wet conditions. For two-way facilities, the values for the descending direction control the design. The recommended coefficient of friction (f) is 0.25 for paved surfaces, which accounts for the poor wet weather braking characteristics of many bicycles.

Minimum Stopping Sight Distance (m) with Coefficient of Friction, f=0.25									
	Design Speed (km/h)								
Grade (%)	10	15	20	25	30	35	40	45	50
12	8	13	18						
10	8	13	18	24					
8	8	13	19	25	32				
6	8	13	19	25	32	40			
4	8	13	19	26	33	41	49		
2	8	14	20	26	34	42	51	61	
0	9	14	20	27	35	44	53	63	74
-2	9	14	21	28	36	45	55	66	77
-4	9	15	21	29	38	47	58	69	81
-6	9	15	22	30	39	50	61	73	86
-8	9	16	23	32	42	53	65	78	92
-10	10	16	24	34	44	56	70	84	100
-12	10	17	26	36	48	61	76	92	110

Table C-4: Minimum Stopping Sight Distance (m) for Bicycles (Paved Surface, Wet Conditions)

Source: TAC Geometric Design Guide for Canadian Roads, chapter 5 – Bicycle Integrated Design, 2017 (Table 5.5.1, p.37)

2.3.3 Horizontal Curves

The minimum radius of a curve for a bicycle facility is a function of bicycle design speed, super elevation, and coefficient of lateral friction. The following formula can be used to calculate the minimum radius:

$$R = \frac{V^2}{127\,(e + f_L)}$$

Where: R = radius (m)

V = design speed or velocity (km/h)

e = superelevation (m/m)

f_L = Coefficient of lateral friction

Table C-5 provides the minimum radius for a range of design speeds based on the coefficient of lateral friction and superelevation rates of 0.02 m/m and 0.05 m/m.

Design Speed (km/h)	Coefficient of Lateral Friction	Minimum Radius for Design (m)	
		e = 0.02 m/m	e = 0.05 m/m
20	0.30	10	9
25	0.30	15	14
30	0.28	24	21
35	0.27	33	30
40	0.25	47	42
45	0.23	64	57
50	0.22	82	73

Table C-5: Minimum Radii for Paved Bikeways

Source: TAC Geometric Design Guide for Canadian Roads, chapter 5 – Bicycle Integrated Design, 2017 (Table 5.5.2, p.38)

2.3.4 Lateral Clearance on Horizontal Curves

The inside portion of a curve—including at intersections—should be kept free of significant obstructions within the approximate eye-level range of a trail user (0.6m - 2.0m). Appropriate obstruction removals for sightlines are determined by the minimum SSD and the radius of the curve. It should allow a cyclist to see obstacles or other users in the bicycle facility ahead and stop completely before reaching them. For information on Lateral Clearance on Horizontal Curves, see section 5.5.3.2 in *Geometric Design Guide for Canadian Roads (2017).*

2.3.5 Grades

Grades of 0-4% are optimal for cyclists. There is no absolute maximum grade for a bicycle facility. However, long steep grades are undesirable because the ascents are physically difficult for many cyclists to climb and the descents cause some cyclists to exceed the speeds at which they are comfortable. The practical upper limit for an on-road bicycle facility is 8%. Where steep grades cannot be avoided, higher design speeds (e.g., 50 km/h to 60 km/h) should be used.

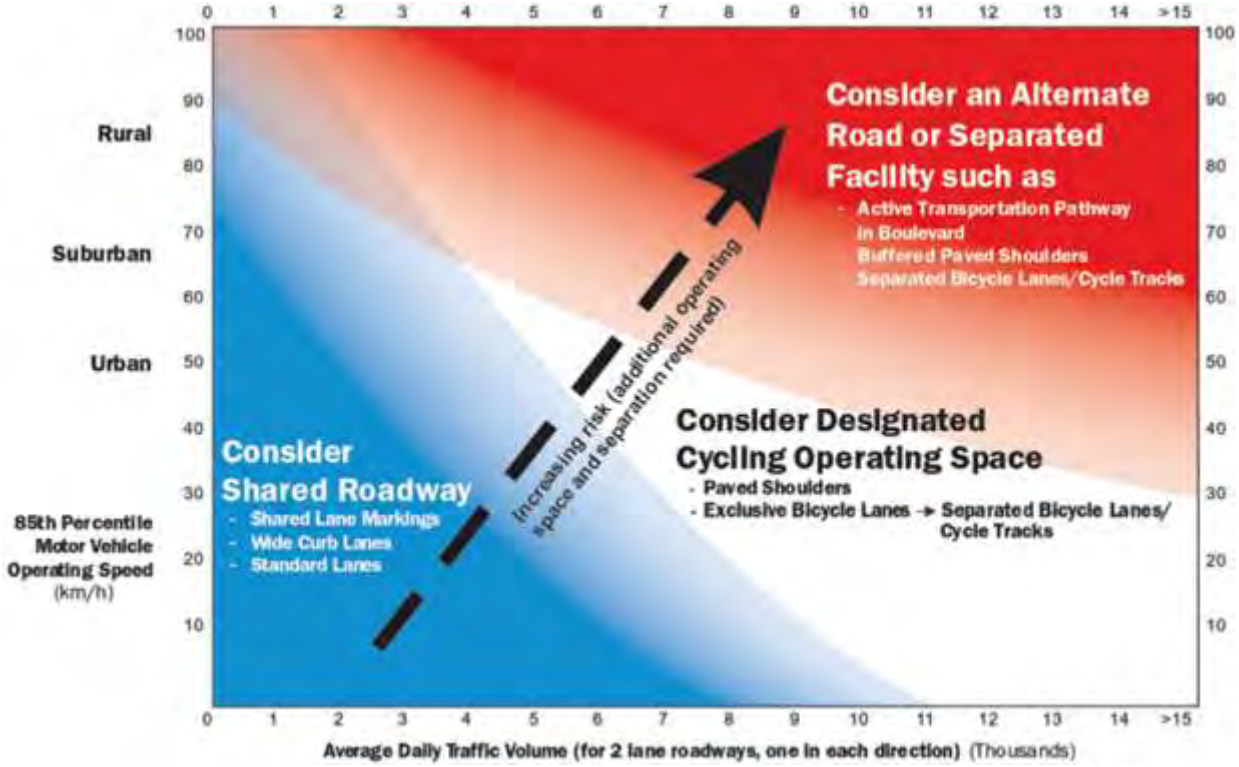
2.3.6 Crest & Sag Curves

Crest curves control the distance that a cyclist can see ahead. The longer the curve, the farther a cyclist can see. The minimum length required is a function of the sight distance and algebraic difference between grades on either side of the crest. For information on crest and sag vertical curves, see sections 5.5.4.2 and 5.5.4.3 in *Geometric Design Guide for Canadian Roads (2017).*

2.4 Bicycle Facility Selection

When selecting a bicycle facility type, the 'Desirable Bicycle Facility Pre-Selection Nomograph', illustrated in ***Figure C-8***, aids practitioners towards a bicycle facility type.

Figure C-8: Desirable Bicycle Facility Pre-Selection Nomograph



Source: OTM Book 18 – Bicycle Facilities, 2013 (Figure 3.3, p. 30)

The pre-selected bicycle facility type must then be vetted through a combination of application heuristics or knowledge-based rules that have been developed to aid in the selection process. The heuristics link specific site conditions to appropriate bicycle facility types and supplementary design features. The following outlines, in no particular order, the primary application heuristics:

1. 85th percentile motor vehicle operating speeds;
2. Motor vehicle volumes;
3. Function of street, road or highway;
4. Vehicle mix;
5. Collision history; and
6. Available space.

Secondary application heuristics:

7. Costs;
8. Anticipated users in terms of skill and trip purpose;
9. Function of route within the bicycle network;
10. Level of bicycle use;
11. Type of roadway improvement project;
12. On-street parking; and
13. Frequency of intersections.

For the site characteristics and corresponding design considerations for each of the 13 application heuristics, see sections 3.2.2.2 in *OTM Book 18 - Cycling Facilities (2013)*.

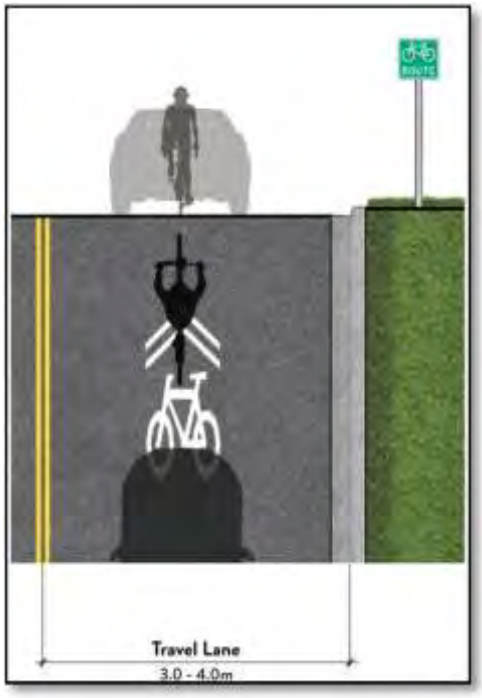
2.5 Cross-Section Elements & Dimensions

The necessary cross-section elements and their corresponding dimensions are dependent on the bicycle facility type and the specific characteristics of the roadway where the bicycle facility will be located. ***Table C-6*** presents a summary of the cross-section elements and dimensions for the various on-road bicycle facilities. ***Figure C-9*** to ***Figure C-11*** illustrates the cross-sections and plan views for the various on-road bicycle facilities.

Table C-6: On-Road Bicycle Facility Elements and Dimensions

ON-ROAD BICYCLE FACILITIES		Cross-Section Elements & Dimensions		
		Width (m)	**Vertical Clearance (m)**	**Horizontal Clearance (m)**
Shared Roadway / Signed Bicycle Route	Wide curbside lane	4.0 - 4.5 shared travel lane	2.7 - 3.6	0.2 - obstruction 100mm to 750mm high 0.5 – obstruction greater than 750 mm high
	Narrow curbside lane	< 3.0 – 4.0 shared travel lane		
Paved Shoulders (Rural Cross-Sections)	Conventional	1.2 – 1.5 paved shoulder	2.7 - 3.6	0.2 - obstruction 100mm to 750mm high 0.5 – obstruction greater than 750 mm high
	Buffered	1.5 – 2.0 paved shoulder + 0.5 – 1.0 buffer		
Bicycle Lanes (Urban Cross-Sections)	Conventional	1.5 – 1.8 bicycle lane	2.7 - 3.6	0.2 - obstruction 100mm to 750mm high 0.5 – obstruction greater than 750 mm high
	Conventional Splitting two travel lanes	1.8 – 2.0 bicycle lane		
	Adjacent to On-Street Parking	1.5 bicycle lane + 0.5 – 1.0 buffer		
	Buffered	1.5 – 1.8 bicycle lane + 0.5 – 1.2 buffer		
	Parking Protected	1.5 – 1.8 bicycle lane + 0.8 – 1.2 buffer		

Figure C-9: Cross Sections and Plan Views of Shared Roadways and Signed Bicycle Routes

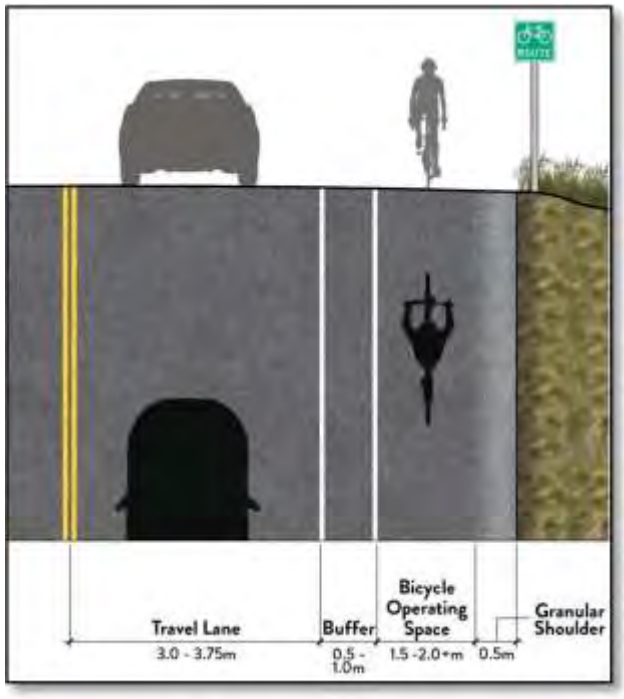


Narrow Signed Bicycle Route
with Optional "sharrow"

Wide Signed Bicycle Route
with Optional "sharrow"

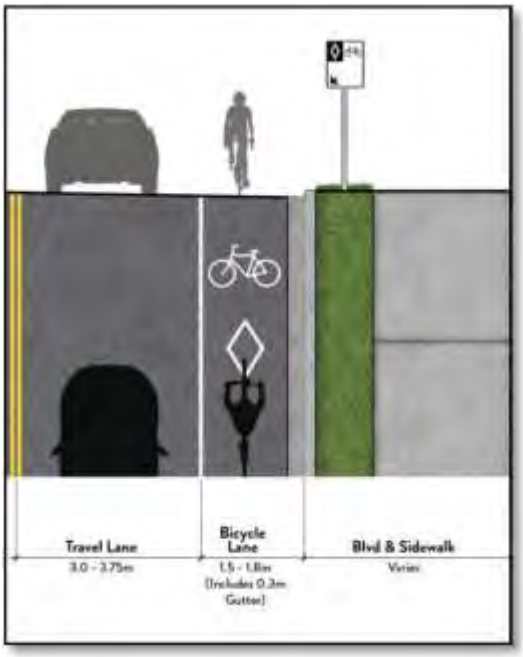
Figure C-10: Cross Sections and Plan Views of Paved Shoulders (Rural Cross-Sections)

Signed Bicycle Route
with Paved Shoulder

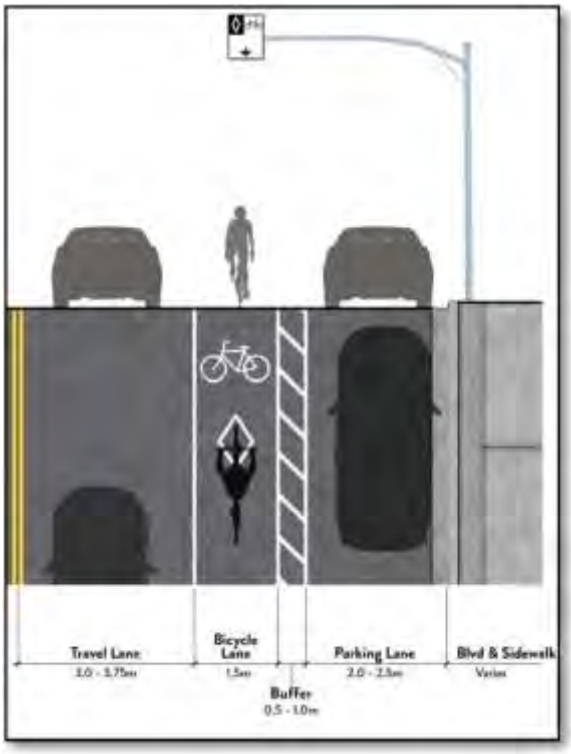


Signed Bicycle Route
with Buffered Paved Shoulder

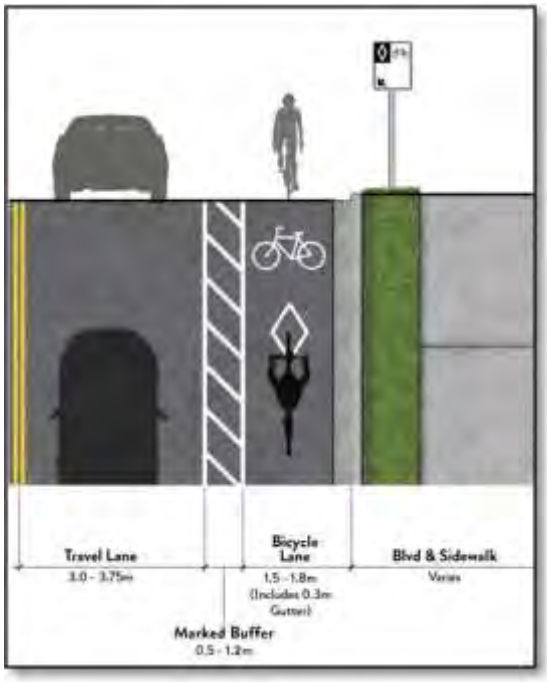
Figure C-11: Cross Sections and Plan Views of Bicycle Lanes (Urban Cross-Sections)



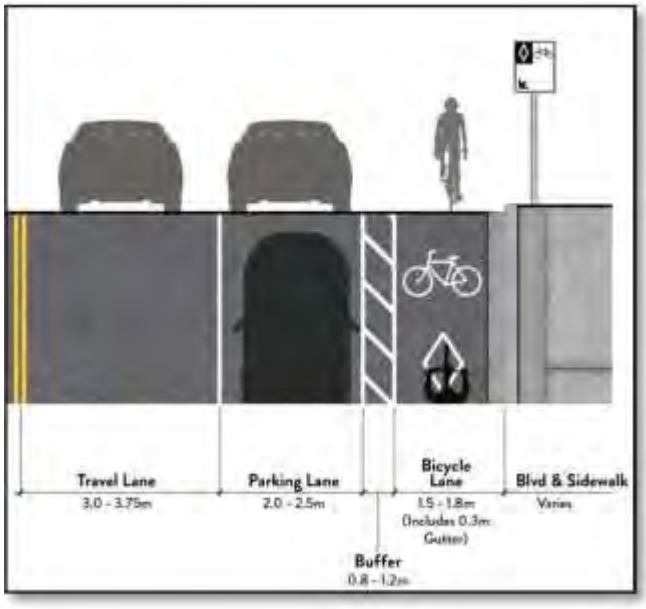
Conventional Bicycle Lane



Bicycle Lane Adjacent to On-Street Parking



Buffered Bicycle Lane
(Physical separation can be provided by including: flexible bollards, planters, or a concrete curb/median in the buffered area)



Parking Protected Bicycle Lane
(Physical separation can be provided by including: flexible bollards, planters, or a concrete curb/median in the buffered area)

For additional details regarding cross-section elements and dimensions, see tables 4.1-4.4 in OTM Book 18 - Cycling Facilities (2013).

2.6 Signage Types and Requirements

On-road bicycle signs are categorized into one of three groups:

1. Regulatory Signs
2. Warning Signs
3. Guide and information Signs

2.6.1 Regulatory Signs

Regulatory Signs form the basis for traffic regulations regarding priority and other diver behavior. Cyclists using shared use lanes or paved shoulders are governed by the roadway signage as they are defined as vehicles under the Highway Traffic Act of Ontario (HTA). The Provincial and National sign standards manuals apply to both motorists and cyclists. Designation of Bicycle Lanes requires specific by-laws to be accompanied by signage and pavement markings.

Shared Roadway / Signed Bicycle Routes

The 'Motor Vehicle Passing Prohibited' sign (Rb-66), illustrated in ***Figure C-12***, should be used when conditions are not safe for a motorist to pass a cyclist. Consideration should be given to the supplementary tabs (Rb-66t and M204) that can be added to the sign to provide additional clarity.

Figure C -12: Motor Vehicle Passing Prohibited Signs

Source: OTM Book 18 – Bicycle Facilities, 2013 (Figure 4.5, p. 46)

Bicycle Lanes (Urban Cross-Sections)

A reserved bicycle lane sign must be used to designate an on-road lane for the exclusive use of cyclists. The Reserved Bicycle Lane signs, found in the TAC Bikeway Traffic Control Guidelines for Canada, are illustrated in ***Figure C-13***. The ground-mounted version of the 'Reserved Bicycle Lane' sign (RB-91) should be installed when the bicycle lane is immediately adjacent to the curb. Otherwise, the overhead mounted version of the 'Reserved Bicycle Lane' sign (RB-90) should be installed on a cantilever and centred above the designated lane. The 'Reserved Bicycle Lane Ends' sign (RB-92) should be installed where the bicycle lane ends.

Figure C-13: Reserved Bicycle Lane Signs

Source: OTM Book 18 – Bicycle Facilities, 2013 (Figure 4.21, p. 63)

The 'Turning Vehicles Yield to Bicycles' sign (RB-37), illustrated in ***Figure C-14***, may be used when motorists cross a bicycle facility and are required to yield.to cyclists The sign should incorporate any pavement markings or treatments that are present in reality.

Figure C-14: Turning Vehicles Yield to Bicycles Sign

Source: OTM Book 18 – Bicycle Facilities, 2013 (Figure 4.23, p. 64)

2.6.2 Warning Signs

Shared Roadway / Signed Bicycle Route

The installation of share the road warning signs, illustrated in ***Figure C-15***, are optional but remind motorists to share the road since a bicycle is defined as a vehicle in the *Highway Traffic Act of Ontario*

(HTA). The 'Share the Road' sign (Wc-19) is appropriate on wide (4 m or greater) shared use lanes where passing is possible. Where shared lane widths are narrow (less than 4 m) or steep, the 'Shared Use Lane Single File' sign (Wc-24) is appropriate as it discourages motorists from passing cyclists as side by side travel is not recommended. Consideration should be given to the supplementary tabs (Wc-19t and Wc-24t) that can be added to both signs.

Figure C-15: Share the Road and Shared Use Lane Single File Signs

Source: OTM Book 18 – Bicycle Facilities, 2013 (Figure 4.4, p. 46)

The 'Reserved Bicycle Lane Ahead' Sign (WB-10), illustrated in *Figure C-16*, may be used when motorists are required to modify their travel path to avoid an upcoming bicycle lane. This sign should be placed in advance of the bicycle lane and can be placed above or adjacent to the curb lane.

Figure C-16: Reserved Bicycle Lane Ahead Sign

Source: OTM Book 18 – Bicycle Facilities, 2013 (Figure 4.22, p. 64)

2.6.3 Guide and Information Signs

Guide and Information Signs are essential to; direct road users along roadways, identify intersecting routes, provide direction to centres of population and other destinations, etc.

Shared Roadway / Signed Bicycle Route & Paved Shoulders (Rural Cross-Sections)

The 'Bicycle Route Marker' sign (M511), illustrated in *Figure C-17*, designates a shared roadway, signed bicycle route, or paved shoulder as part of the bicycle network, however, alternative designs and colours can be implemented by a municipality such as Orangeville's custom cycling route signage. Examples are illustrated in *Figure C-18*.

Figure C-17: Bicycle Route Marker Sign

Source: OTM Book 18 – Bicycle Facilities, 2013 (Figure 4.3, p. 45)

Figure C-18: Town of Orangeville Cycling Route Signs

Source: Dillon Consulting Limited

The previous section provided a high-level overview of the required and optional bicycle related signage for various on-road bicycle facilities. A summary of this information can be in *Table C 7*, following. For additional details, including sign spacing, etc. see chapter 4 in OTM Book 18 - Cycling Facilities (2013).

Table C-7: On-Road Bicycle Facility Signage

ON-ROAD BICYCLE FACILITIES		Sign Category		
		Regulatory	Warning	Guide and Information
Shared Roadway / Signed Bicycle Route	Wide curbside lane			
	Narrow curbside lane			
Paved Shoulders (Rural Cross-Sections)	Conventional	--	--	
	Buffered			
Bicycle Lanes (Urban Cross-Sections)	Conventional			--
	Splitting two travel lanes			
	Adjacent to On-Street Parking			
	Buffered			
	Parking Protected			

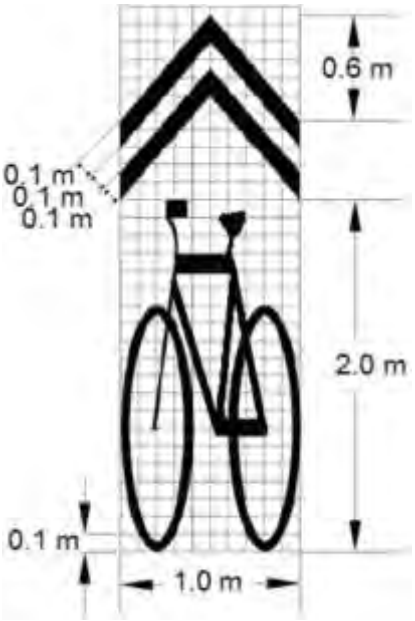
2.7 Pavement Markings

Pavement Markings are used on paved roadways to provide guidance and information to vehicles and pedestrians about the direction of traffic and where you may and may not travel.

2.7.1 Shared Roadway / Signed Bicycle Route

Shared Roadway / Signed Bicycle Routes can be marked with an optional shared lane symbol know as a 'Sharrow', as illustrated in ***Figure C-19***. A 'Sharrow' provides guidance to both cyclist and motorists as to where a cyclist should be riding (laterally) within the lane.

Figure C-19: 'Sharrow' Pavement Marking



Source: OTM Book 18 – Bicycle Facilities, 2013 (Figure 4.6, p. 47)

In addition to the standard 'Sharrow' some practitioners apply a 'Super Sharrow' for additional visibility. A 'Super Sharrow' has an additional green surface treatment behind the 'Sharrow' as illustrated in ***Figure C-20***. To date, the Town of Orangeville has utilized the 'Super Sharrow' pavement marking on their existing Shared Roadways / Signed Bicycle Routes.

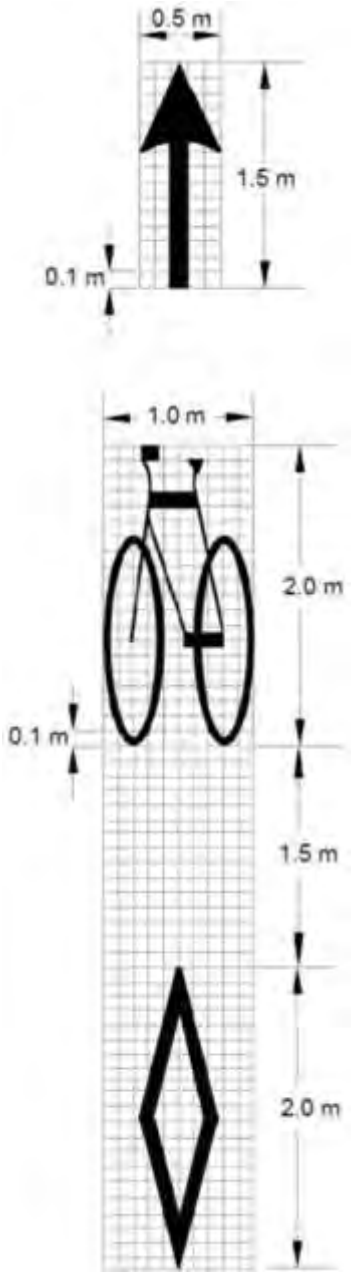
Figure C-20: 'Super Sharrow' Pavement Marking

Credit: City of Vancouver

2.7.2 Bicycle Lanes (Urban Cross-Sections)

Bicycle lanes are marked by a diamond and a bicycle, and an optional directional arrow may also be used where directional guidance is necessary. ***Figure C-21*** illustrates the typical bicycle lane pavement making along with the optional directional arrow.

Figure C-21: Bicycle Lane Pavement Markings



Source: OTM Book 18 – Bicycle Facilities, 2013 (Figure 4.26, p. 65)

For additional details, including bicycle lane line dimensions and pavement marking spacing, see chapter 4 in OTM Book 18 - Cycling Facilities (2013).

2.8 Sewer Grates and Utility Covers

Sewer grates and utility covers increase the risk to cyclist and they are often located within a cyclist path. When sewer grates are located within a cyclist's path, only bicycle safe gates (openings perpendicular or diagonal to direction of travel) should be used. When constructing new roadways it is desirable to locate all grates and utility covers outside of the roadway and thus out of a cyclists expected path, as illustrated in the following photos.

Example of Offset Catch Basin

Credit: Google 2018

Example of Curb Inlet Catch Basin

Credit: Google 2018

3.0 Trail Crossing Guidelines

Where trails cross roads, road operations must continue to function as planned and in accordance with the Highway Traffic Act (HTA). Preferably, trail alignments are directed towards existing intersections where the crossing can be integrated into the existing operations. This is not always possible, and situations will occur where trails cross roads at mid-block locations. Both of these scenarios are included in this section.

3.1 Crossing Roads at Intersections

Trail crossings at roadway intersections are defined by whether the intersection is signalized or stop controlled, and further by the position of the trail and sidewalk (if present) relative to the edge of the roadway. The volume and speed of the roadway and the user volume of the trail may also influence the choice of configuration.

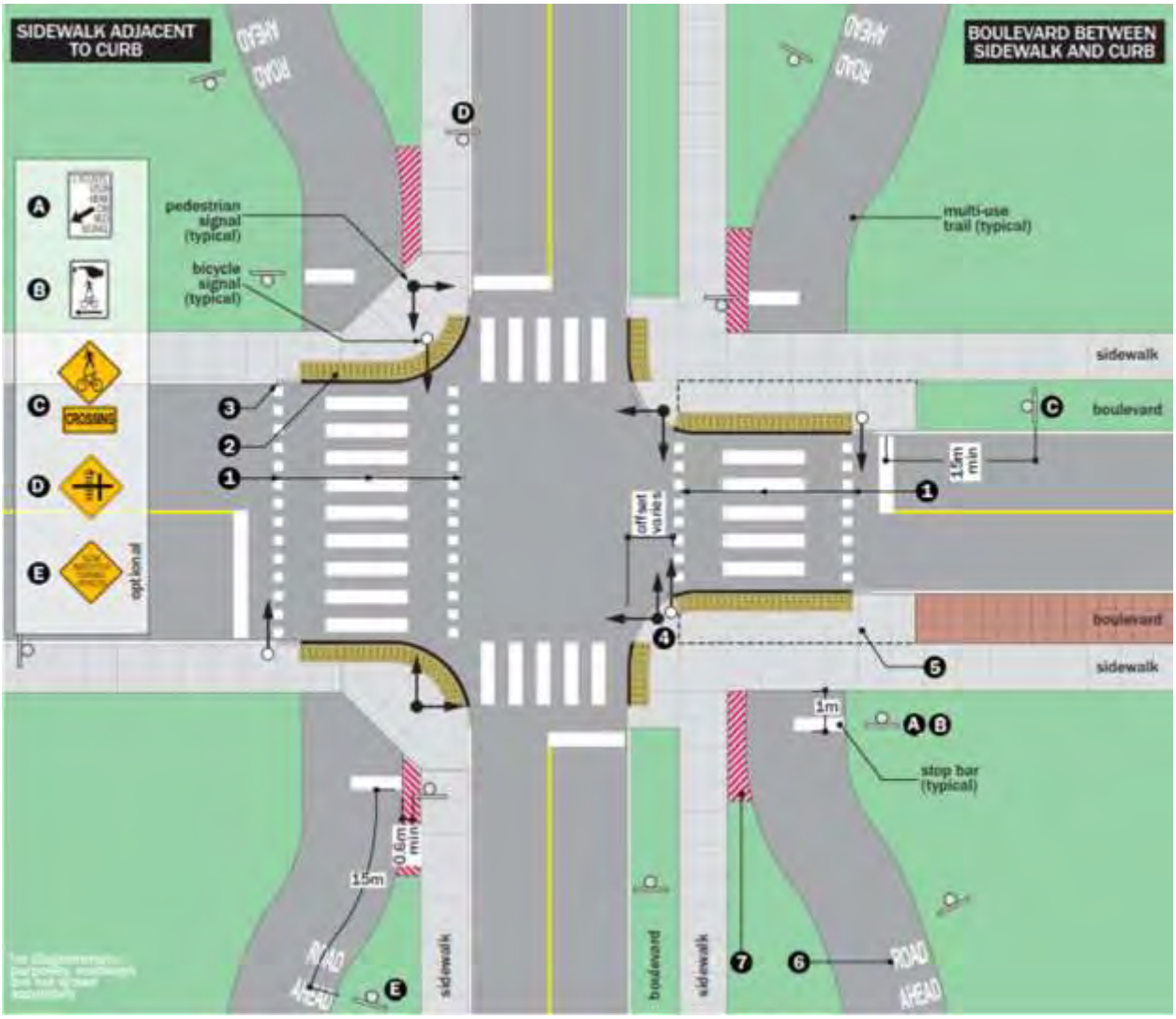
3.1.1 Crossing Roads at Signalized Intersections

There are two primary types of signalized intersection crossing configurations:

1. Separated crossride, which can be designed in either a symmetrical or asymmetrical fashion;
2. Combined crossride.

All configurations are appropriate for any signalized crossing where both trail and sidewalk are present. ***Figure C-22***, following, illustrates the design of a combined crossride at a signalized intersection.

Figure C-22: Signalized Intersection Combined Crossride



Key

1. Combined crossride
2. Tactile walking surface indicator and flush curb, match width of crosswalk/crossride (typical)
3. Curb transition (typically 1.2 metres)
4. Where bicycle and road signals are positioned close together, they can be mounted on a single pole
5. Boulevard area forming part of trail crossing may be concrete, asphalt, or any other hard surface conforming to accessibility requirements; where sufficient space exists in the boulevard for a bicycle to stop, a waiting area should be provided, with the stop bar located near the curb
6. Optional warning text painted on trail
7. Visually contrasting cane-detectable surface (such as tactile walking surface) where separation is less than 1.0 metre

Source: Based on Toronto Multi-use Trail Design Guidelines, 2014 (Figure 5.13, p. 47)

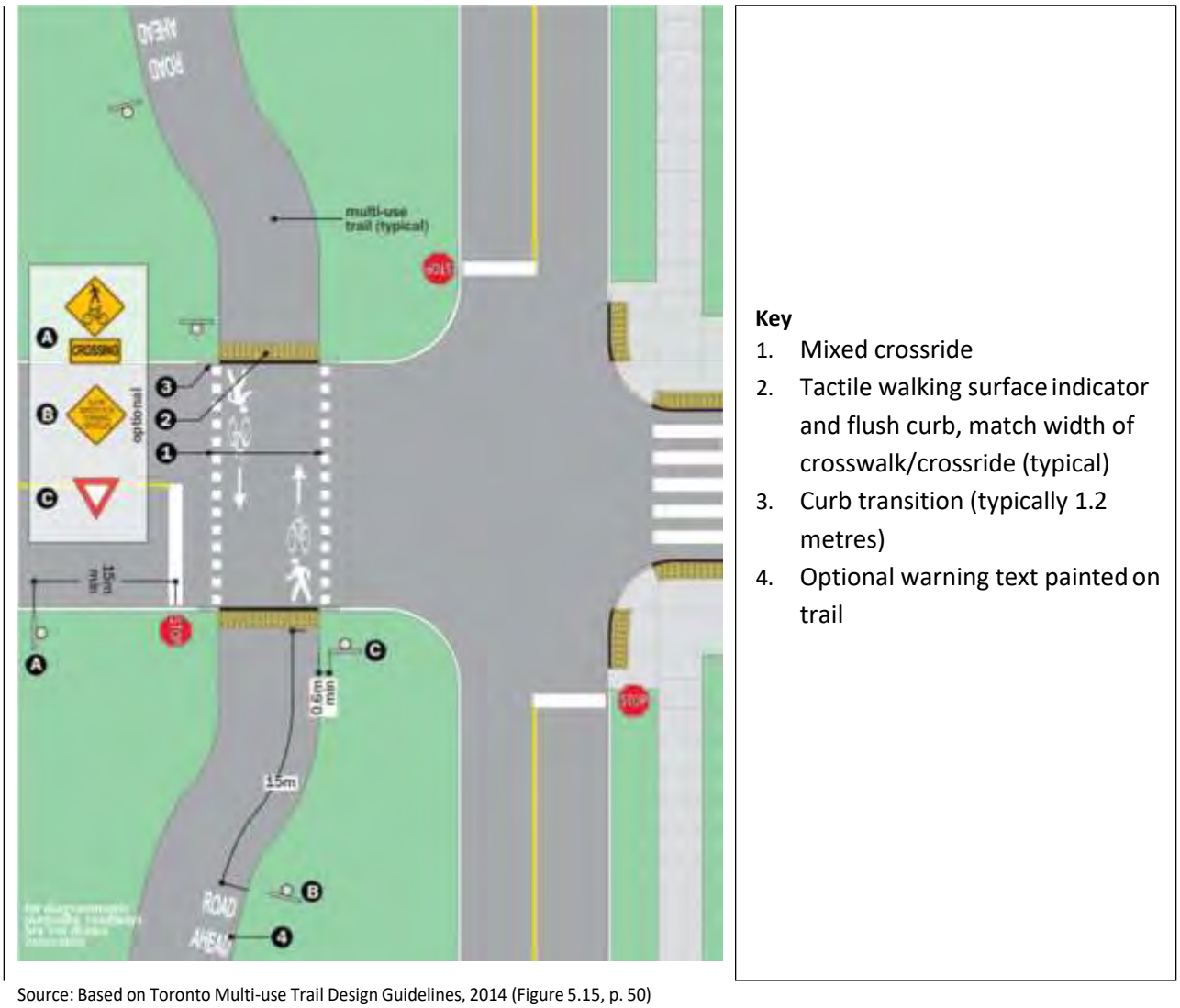
3.1.2 Crossing Roads at Unsignalized Intersections

There are two types of unsignalized intersection crossing configurations;

1. Separated crossride, which is appropriate for any stop-controlled crossing where both trail and sidewalk are present;
2. Combined crossride, which is appropriate for any stop-controlled crossing where a trail is present and a sidewalk is not.

As multi-use trails often take the place of sidewalks within Orangeville the combined crossride at an unsignalized intersection is illustrated in ***Figure C-23***.

Figure C-23: Unsignalized Intersection Combined Crossride



Key

1. Mixed crossride
2. Tactile walking surface indicator and flush curb, match width of crosswalk/crossride (typical)
3. Curb transition (typically 1.2 metres)
4. Optional warning text painted on trail

Source: Based on Toronto Multi-use Trail Design Guidelines, 2014 (Figure 5.15, p. 50)

3.2 Mid-block Road Crossings

Mid-block crossings may be uncontrolled or signalized. The Highway Traffic Act does not permit a stop-controlled mid-block crossing. When determining whether a mid-block crossing should be signalized or unsignalized the following criteria should be considered:

- Daily Traffic Volume;
- Posted Speed Limit; and
- Road Width (# of lanes).

An unsignalized mid-block crossing is suitable for roadways where these are less than 5,500 vehicles per day, 40km/h or less, and less than 4 lanes. Anything exceeding these limits should be signalized. Roads exceeding 35,000 vehicles per day, 60 km/h and four lanes are typically not appropriate for an at-grade crossing. In rare cases however, a signalized crossing may be appropriate.

In additional to the design criteria below, all mid-block crossings will require a no-stopping zone adjacent the crossing to prevent physical or sightline obstructions.

3.2.1 Signalized Mid-block Road Crossing

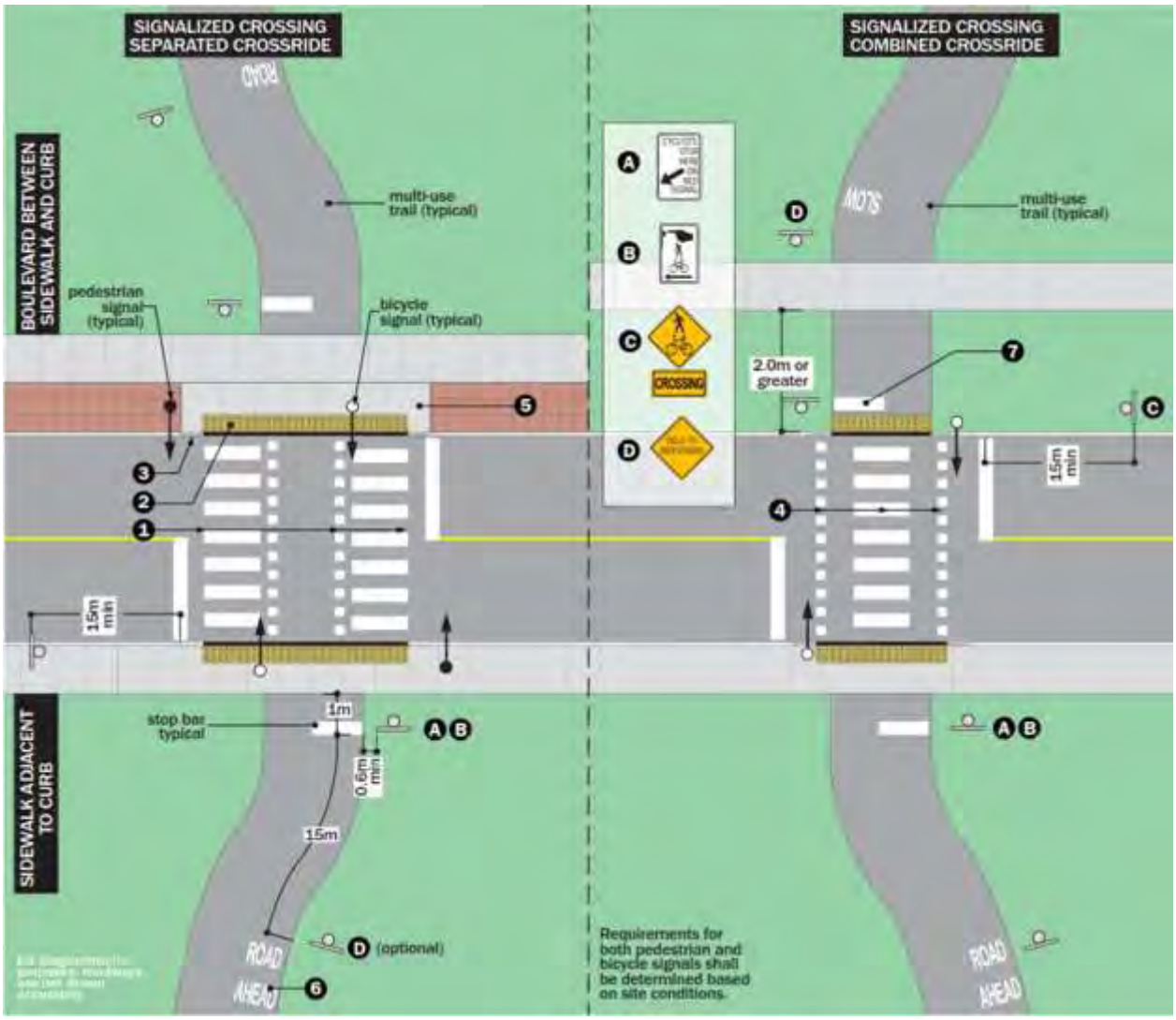
There are two primary types of signalized mid-block crossing configurations:

1. Separated crossride, which can be designed in either a symmetrical or asymmetrical fashion,
2. Combined crossride.

Both configurations are appropriate for any signalized crossing where both trail and sidewalk are present. The combined crossride configuration should be the default approach for a signalized mid-block crossing; however, the separated crossride is preferable for roadways with higher speeds and volumes, or for trails with higher volumes and/or a broad mix of user-types.

Figure C-24 illustrates the design of both primary signalized mid-block road crossing configurations.

Figure C-24: Mid-Block Road Crossing Configurations (signalized)



Key

1. Symmetrical separated crossride. Note that an asymmetrical crossing is possible, where the pedestrian crossing is deleted from one side.
2. Tactile walking surface indicator and flush curb, match width of crosswalk/crossride (typical)
3. Curb transition (typically 1.2 metres)
4. Combined crossride
5. Boulevard area forming part of trail crossing may be concrete, asphalt, or any other hard surface conforming to accessibility requirements
6. Optional warning text painted on trail
7. Where sufficient space exists in the boulevard for a bicycle to stop, a waiting area should be provided, as shown, with the stop bar located near the curb

Source: Based on Toronto Multi-use Trail Design Guidelines, 2014 (Figure 5.16, p. 53)

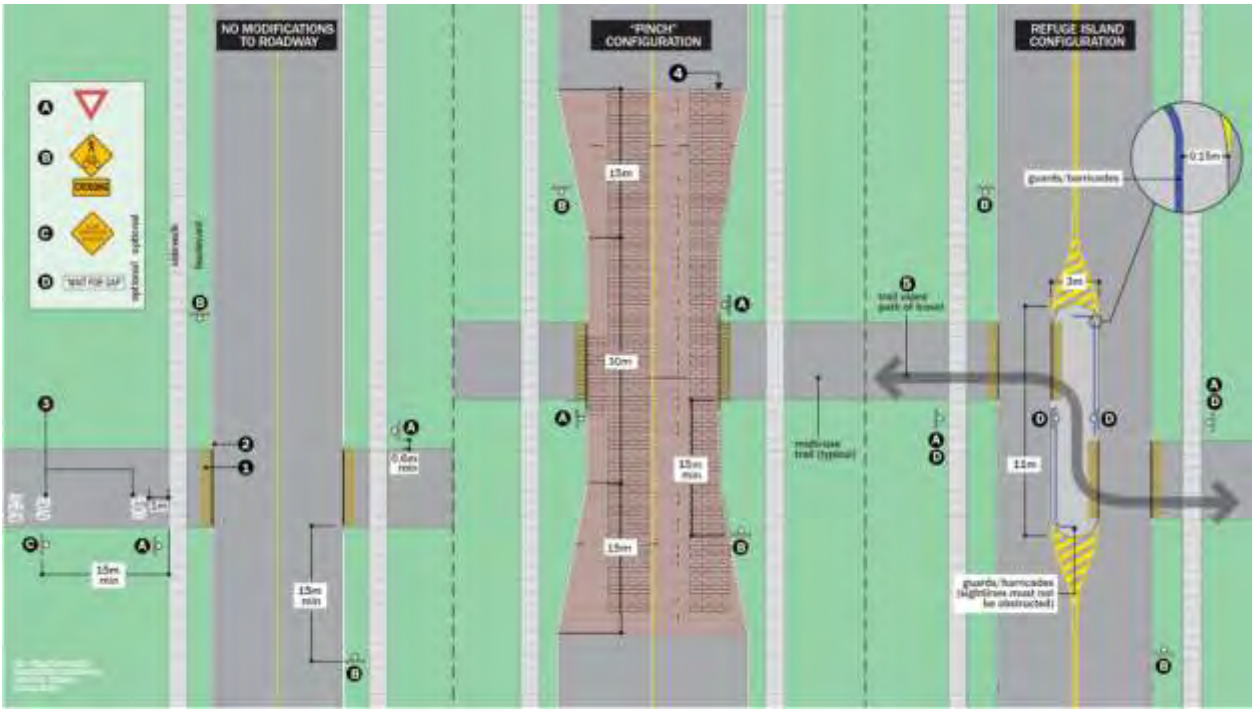
3.2.2 Unsignalized Mid-Block Road Crossing

Uncontrolled mid-block crossings are typically appropriate on local roads where volumes, speeds and especially the crossing distances are low. However, depending on the specific conditions of the road, one or more crossing configuration may be appropriate.

Figure C-25 illustrates the design of three unsignalized mid-block road crossing configurations. The "no modification" configuration is sufficient in many instances, however, the "pinch" and refuge island configurations can help mitigate situations where distance is greater and speeds or volumes are elevated. Both of these configurations also provide a level of traffic calming by narrowing the roadway in the vicinity of the crossing.

The enhanced surfacing on the "pinch" configuration is optional, but greatly improves the visibility of the crossing. The refuge island design necessitates that trail user's face oncoming traffic before exiting. As such, the configuration shown here must be used, and a mirror reflection of it should be avoided.

Figure C-25: Mid-Block Road Crossing Configurations (unsignalized)



Key

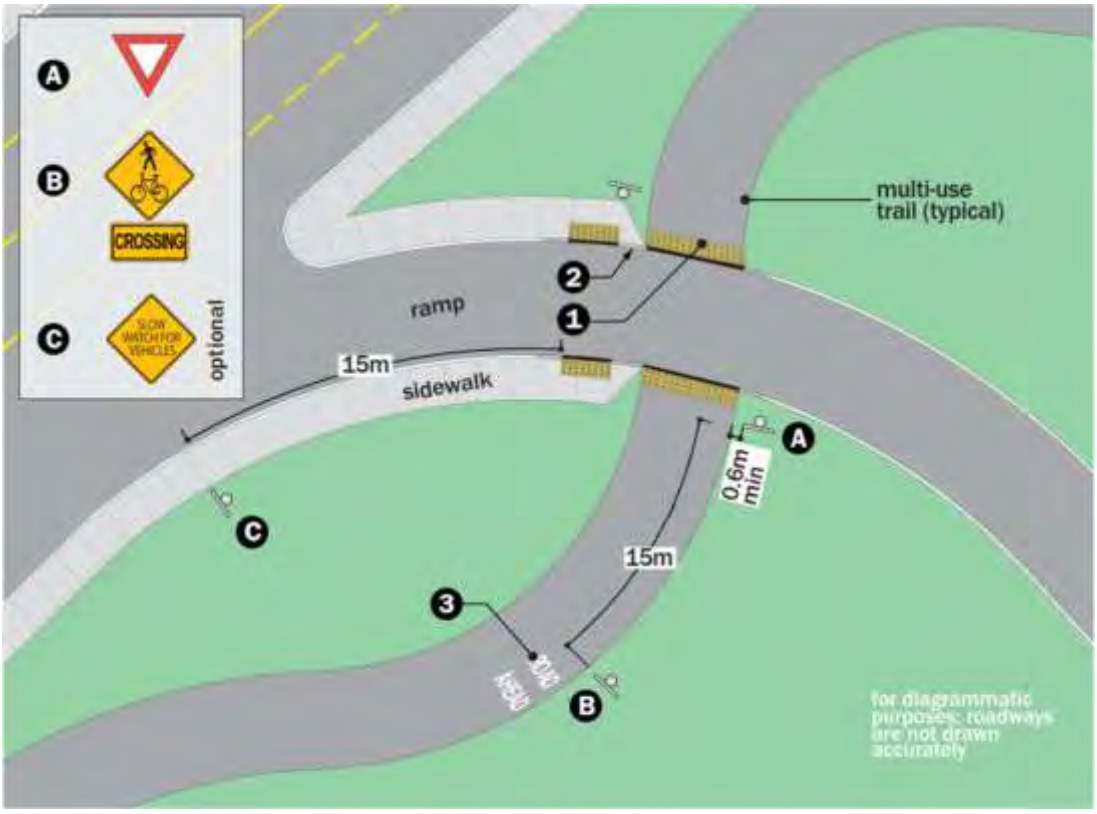
1. Tactile walking surface indicator and flush curb, match width of trail (typical)
2. Curb transition (typically 1.2 metres)
3. Optional warning text painted on trail
4. Optional enhanced surfacing - greatly improves the visibility of the crossing
5. The refuge island design necessitates that trail users face oncoming traffic before exiting. As such, the configuration shown here must be used, and a mirror reflection of it should be avoided

Source: Based on Toronto Multi-use Trail Design Guidelines, 2014 (Figure 5.17, p. 55)

3.3 Ramp / Right Turn Channel Crossing

Ramp / Right Turn Channel Crossings are configured in a similar manner to mid-block crossings. The main difference is that on-coming vehicles may have poorer sightlines, so providing effective warning signs for the vehicles and good sightlines for waiting trail users is critical. ***Figure C-26*** illustrates the design of an unsignalized crossing configuration of a trail and a ramp / right turn channel.

Figure C-26: Ramp / Right Turn Channel Crossing Design (unsignalized)



Key

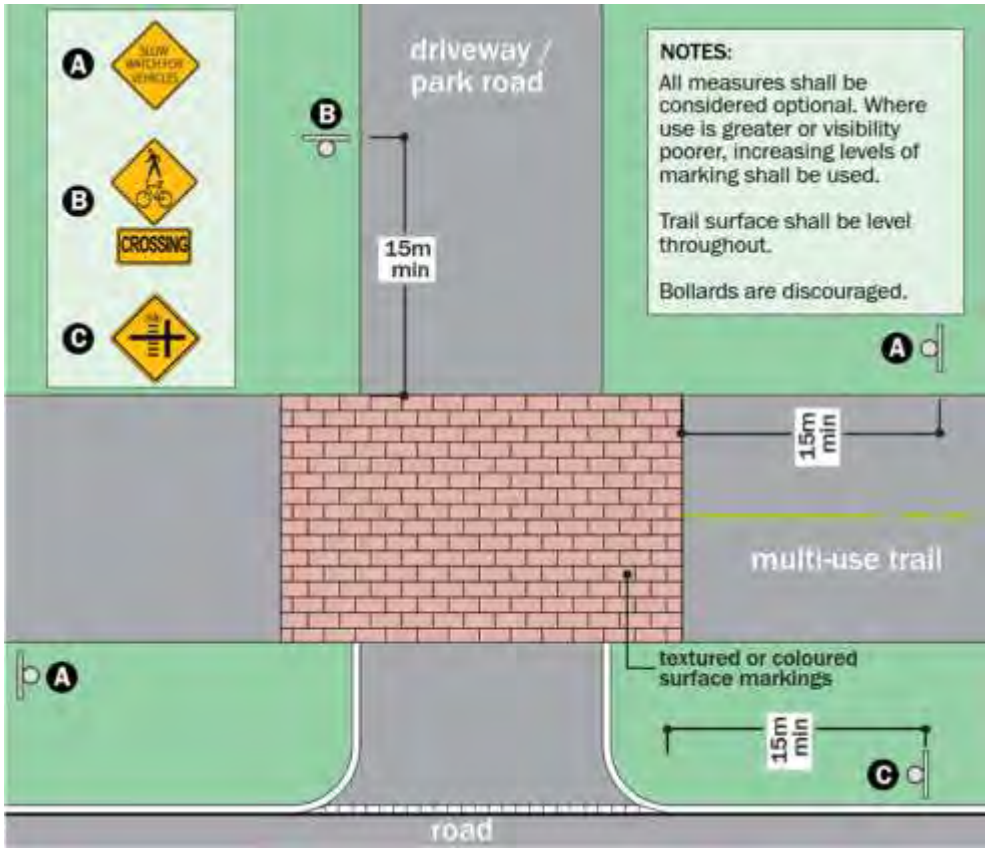
1. Tactile walking surface indicator and flush curb, match width of trail (typical)
2. Curb transition (typically 1.2 metres)
3. Optional warning text painted on trail

Source: Based on Toronto Multi-use Trail Design Guidelines, 2014 (Figure 5.18, p. 56)

3.4 Park Roads / Driveway Crossing

Trails running parallel to the road (within the road rights-of-way) will inevitably cross driveways. These crossings locations present a significant risk, especially for faster trail users, as motorists tend to expect slower traffic on trails and often focus their attention on road traffic. Additionally, trail users also may not anticipate a crossing motorist, especially at obscured or hidden entrances. It is for these reasons that roadways with numerous driveways are considered less suitable for multi-use trails in boulevards. ***Figure C-27*** illustrates the design option to help reduce risks for trail users crossing driveways.

Figure C-27: Park Road / Driveway Crossings Design Options



Source: Based on Toronto Multi-use Trail Design Guidelines, 2014 (Figure 5.19, p. 57)

Appendix D

Unit Costs

Unit Costs -
Orangeville Cycling and Trails Master Plan

Description	Unit	Cost	Comment/Assumption
Signed Bike Route with "Sharrows"	linear KM	$3,500	- Cost for both sides of the road - Includes route signs every 330m and a painted "sharrow" every 75m
Signed Bike Route with "Super Sharrows"	linear KM	$8,000	- Cost for both sides of the road - Includes route signs every 330m and a thermoplastic "Super sharrow" every 75m
Signed Bike Route with Paved Shoulder - in conjunction with existing road reconstruction / resurfacing project	linear KM	$55,000	- Cost for both sides of the road - 1.5m paved shoulder, assumes cycling project pays for additional granular base, asphalt and edge line - Assume $110,000 per kilometre if additional widening of granular base required
Signed Bike Route with Buffered Paved Shoulder - in conjunction with existing road reconstruction / resurfacing project	linear KM	$110,000	- Cost for both sides of the road - 1.5m paved shoulder, assumes cycling project pays for additional granular base, asphalt and edge line - Price may vary from $110,000 to $150,000 depending on work needed to improve platform
Conventional Bicycle Lanes - Adding Bike Lane Markings and Signs	linear KM	$12,000	- Cost for both sides of the road - Includes signs, stencils and edge line - Assumes conventional paint, increase budget to $20,000 /km for Thermoplastic
Conventional Bicycle Lanes - in Conjunction with a New Road or Road Reconstruction Project/Widening already Planned	linear KM	$250,000	- Cost for both sides of the road - Assumes 1.5m bicycle lanes - Includes catch basin leads, asphalt, signs, pavement markings sub-base only, road project funds all other components
Buffered Bicycle Lane with Hatched Pavement Markings - New Road or Road Reconstruction/Widening already Planned	linear KM	$290,000	- Cost for both sides of the road - Assumes 1.5m bike lanes + 0.5m - 1.0m buffer with hatched pavement markings - Includes catch basin leads, asphalt, signs, pavement markings sub-base only, road project funds all other components
Buffered Bicycle Lane with Flex Bollards - New Road or Road Reconstruction/Widening Already Planned	linear KM	$365,000	- Cost for both sides of the road - Assumes 1.5m bike lanes + flex bollards centred in hatched buffer zone at 10m intervals - Includes catch basin leads, asphalt, signs, edge line pavement markings sub-base only, road project funds all other components
Buffered Bicycle Lane with Pre-Cast Barrier - New road or Road Reconstruction/Widening Already Planned	linear KM	$400,000	- Cost for both sides of the road - Assumes 1.5m bike lanes + pre-cast and anchored curb delineators - Includes catch basin leads, asphalt, signs, edge line pavement markings sub-base only, road project funds all other components
Conventional Bicycle Lanes - Retrofitting / Widening Existing Road	linear KM	$700,000	- Cost for both sides of the road - Includes the cost for excavation, adjust catch basins, lead extensions, new curbs/driveway ramps, asphalt and sub-base, pavement markings and signs
Paved Multi-use Trail - Within Road Right-of-Way	linear KM	$375,000	- 3.0m wide asphalt pathway within road right of way - Does not include utility relocations - Price depends of scale / complexity of project and if existing sidewalk is being removed
Paved Multi-Use Trail - Outside of Road Right-of-Way in an Urban Setting	linear KM	$350,000	- 3.0m wide asphalt pathway within a park setting - 90mm asphalt depth - Price depends of scale / complexity of project
Paved Multi-Use Trail - Outside of Road Right-of-Way in an Urban Setting, Upgrade existing granular surface	linear KM	$225,000	- 3.0m wide asphalt pathway within a park setting - Includes approximately 25% new base work and half of the material excavated is removed from site - Price depends of scale / complexity of project.
Granular Multi-Use Trail - Outside of Road Right-of-Way in an Urban Setting	linear KM	$165,000	- 3.0m wide compacted stone dust surface - Price depends of scale / complexity of project
Granular Multi-Use Trail - Outside of Road Right-of-Way in an Rural Setting	linear KM	$200,000	- 3.0m wide compacted stone dust surface - Includes cost of clearing and grubbing - Price depends of scale / complexity of project
Unsignalized Mid Block Crossride	each	$10,000 - $25,000	- Prince range for an unsignalized mid-block crossing - Includes pavement markings on pathway, warning signs, curb cuts and minimal restoration - Does not include median refuge island

Unit Costs -
Orangeville Cycling and Trails Master Plan

Description	Unit	Cost	Comment/Assumption
Unsignalized intersection Crossride	each	$10,000 - $25,000	- Prince range for an unsignalized intersection crossing - Includes pavement markings on pathway, warning signs, curb cuts and minimal restoration
Signalized Mid Block Crossride	each	$100,000 - $250,000	- Prince range for a signalized mid-block crossing - Includes installation of 4 signal heads, 2 poles, 2 foundations, 2 controller connector, 2 arms, pavement markings on pathway, warning signs, curb cuts and minimal restoration - Does not include median refuge island
Signalized Intersection Crossride	each	$100,000 - $250,000	- Prince range for a signalized intersection crossing - Includes installation of 4 signal heads, 2 poles, 2 foundations, 2 controller connector, 2 arms, pavement markings on pathway, warning signs, curb cuts and minimal restoration

Notes:

1. Unit costs reflect 2018 dollars and are based on averages obtained from a number of projects in southern Ontario.
2. Unit costs are for functional design purposes only, include installation, but exclude contingency, design and approvals costs.
3. Unit costs do not include the following (unless otherwise noted): property acquisitions, signal modifications, utility relocations, major roadside drainage works, or costs associated with site-specific projects such as bridges, railway crossings, retaining walls, and stairways.
4. Assumes typical environmental conditions and topography.
5. Applicable taxes and permit fees are additional.
6. Unit costs listed here are for guideline purposes only

Source: Based on City of Kingston Active Transportation Master Plan, 2018

Appendix E

Seniors' Cycling Education – Example Course Outlines

1.0 Safe Cycling – 2-hour 55+ Course Outline

Equipment safety checks — 45 min- 1 hour

- Clothing
- Helmet Fit
- Bike Requirements
- Bike Fit
- Equipment & Maintenance
- ABC Quick Check

Skills Training — 30 min

- Straight Line Riding
- Gearing
- 55+ specific questions (may include mirrors, shoulder checks with limited mobility, electric assist bikes, or other participant questions)
- Shoulder Checking (right and left)
- Signaling (right, left, stop)
- Stopping on a line
- Slalom

Riding practice — 30 min

- Participants learn about the rules of the road and group riding techniques. Stop signs, stop lights, signals, shoulder checks, and right-of-way are covered. Participants are taught to use independent decision making before they follow the riders ahead.
- Start on multi-use trails adjacent to Thunder Bay 55+ Centre. Progress to on-road bike lanes and residential streets

2.0 Safe Cycling – 4-hour 55+ Course Outline

Equipment safety checks — 9am – 10am

- Clothing
- Helmet Fit
- Bike Requirements
- Bike Fit
- Equipment & Maintenance
- ABC Quick Check
- Bike Security
- Tool Kit
- Flats (optional; depends on time)

Skills Training — 10am – 11am

- Straight Line Riding
- Gearing
- 55+ specific questions (may include mirrors, shoulder checks with limited mobility, electric assist bikes, or other participant questions)
- Shoulder Checking (right and left)
- Signaling (right, left, stop)
- Stopping on a line
- Slalom
- Rock Dodge (optional; depends on participants' levels)
- Quick Stop (optional; depends on participants' levels)

Break for lunch — 11am – 11:30am

Riding theory — 11:30am – 12:15 pm

- Riding Conditions and Energy Basics
- Group Riding Etiquette
- MVPC Principal
- Entering the roadway
- Position within the lane & lane choice (Laminate A, B, C)
- Principals of Traffic Flow
- Parked Cars (Laminate D)
- Lane choice and Changing Lanes (Laminate E)
- Intersection Positioning (Laminate F, G)
- Residential and Pedestrian Style Right and left Turns (Laminate H, J)
- Crossing Railway tracks (Laminate M)
- Yielding and Right of Way (Laminate O, R, S)
- Merges (Laminate Q) (optional; depends on participants' levels)

Riding practice — 12:15 pm – 1:00 pm

- Start on multi-use trails adjacent to Thunder Bay 55+ Centre. Progress to on-road bike lanes and residential streets