



Final Report

Multi-Modal Transportation
Master Plan

City of Orillia

November 2019



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The best plans are rarely created alone. We would like to thank all the contributors and stakeholders who helped guide and create this Multi-Modal Transportation Master Plan.

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1.0 Introduction



1.0 Introduction



“Orillia is a very walkable/cyclable city but many choose to drive anyway. There needs to be creative incentive to help people to choose other methods than cars (ie removing the stigma that riding the bus is for people who are poor). If they don't choose it, all foward movement will be a waste of money and time.”

- Anonymous survey respondent

1.1 Building an interconnected Network

Transportation networks are comprised of several layers that interact with each other to provide a network for moving around the community and accessing businesses, homes, parks and institutions. In its deepest form, transportation networks integrate with land use and urban design at street-level to balance the City's vision and objectives. These pieces of transportation infrastructure are just as much public spaces where the community meets and interacts, as well as essential networks that move people and goods safely and efficiently.

Today, there are several mobility options at our fingertips that allow us to pick and choose how to get around. The barriers between different transportation modes are increasingly blurred as they become more integrated. Streets are no longer just for automobiles, but rather, a mixture of mobility options comprising a Multi-Modal Transportation Network where different modes, such as active transportation, transit, or smart mobility (such as autonomous vehicles), can serve diverse needs. Although the automobile may present an enticing option for many trips, there may be residents who are physically, economically and socially disadvantaged who cannot use or have access to an automobile. For instance, continuous safe, maintained sidewalks and paths may provide an option for children travelling to school or other local destinations rather than requiring a parent to drive them. Similarly, providing sustainable mobility options like transit or cycling can alleviate congestion on Orillia's roadways by shifting what would otherwise likely be single-occupant automobile drivers onto alternate options. Acknowledging the transportation network as a multi-modal network allows it to be planned more equitably, flexibly and efficiently to be served by a mixture of options that are not contingent on having access to an automobile.



1.2 Purpose of the plan

This Multi-Modal Transportation Master Plan (MTMP) is a long-range strategic plan for the entirety of Orillia that identifies transportation infrastructure requirements to address existing challenges and support growth, along with policies to guide transportation and land use decisions. MTMPs are integrated with environmental planning and sustainability principles and provide the framework and “blueprint” for implementing coordinated improvements on an area-wide or city-wide basis. A MTMP avoids the pitfalls of piece-meal planning and “band-aid” solutions and provides a vision for the City to strive for. This plan also provides the unique opportunity for proactive thinking, anticipating community needs, and preparing for emerging trends in transportation solutions. The City of Orillia outlined general requirements for the MTMP including the following components:

- Identify future transportation needs and opportunities over the short-term (1-5 years), medium-term (5-10 years), and long-term (10-20 years);
- To provide connectivity between transportation modes to move people and goods sustainably, efficiently, and safely;
- To establish a sustainably integrated multi-modal transportation system that reduces reliance upon any single mode and promotes walking, cycling, transit, and other forms of transportation including snowmobiles and all-terrain vehicles; and
- To define policies and long-term strategies that will

result in the protection of transportation corridors for all modes of transportation to address current and projected population and employment growth.

This plan expands upon previous planning work conducted for the 2011 Transportation Master Plan, the 2012 Active Transportation Master Plan, and the 2017 Operational Review of Orillia Transit Service to re-evaluate previously planned improvements, as well as consider and respond to changes in growth, both within the City and in adjacent municipalities since that time. The purpose of this study is to create a city-wide multi-modal transportation plan that not only identifies improvements within the City’s urban areas, but also considers opportunities to integrate the City’s new and emerging areas within and beyond Orillia in a manner that preserves the quality of life and character of the community.

1.3 Using the MTMP

The MTMP is meant to be used by several different transportation stakeholders either as both a reference and a guiding document for developing strategies and making investment decisions. It may also be used as a starting point for developing more detailed plans and analyses for transportation-related studies, projects and initiatives. This is all underpinned by the City’s transportation vision, goals, strategy and initiatives to help Orillia grow into the future.

More specific examples illustrating how the MTMP may be used include:

- The public may have an interest in following the development of transportation initiatives in the City and in gaining a better understanding of how mobility choices will improve in the future. The MTMP empowers the public to actively participate in the change.
- Elected Officials should use the MTMP to assist in decision making. They can also use it to educate and engage their constituents about transportation-related changes that will impact their neighbourhoods and the City as a whole.
- City staff should use the MTMP as a guide to making clear, balanced and fiscally prudent decisions on transportation initiatives, infrastructure investments and program administration. In general, MTMPs can be used as the basis for implementing the City's Official Plan.
- City engineers, designers and capital delivery programs staff should scope transportation capital programs and plans to implement the MTMP.
- City transportation professionals, planners and health practitioners will be able to use the transportation system performance targets to achieve modal-split aspirations and improve the reliability of travel by balancing the transportation network for all users, regardless of age, ability or income.
- The MTMP can be used to position the City into a "state-of-readiness" for partner-funded transportation initiatives (e.g. Federal, Provincial, Public-Private-Partnerships) as funding becomes available and partners are engaged.
- Prospective investors in the City may use it to make development decisions based on transportation initiatives that result in new available transportation connections.

1.4 The Environmental Assessment (EA) Process

This MTMP study was developed according to the Municipal Class Environmental Assessment process (October 2000, as amended in 2007, 2011 & 2015) for Master Plans (Approach 1).

The Master Plan approach recognizes that there are benefits to using the EA process when comprehensive plans are undertaken for projects that have a relatively minor impact according to their environmental significance and the effects on the surrounding environment. The outputs of this MTMP includes road and active transportation projects, as well as recommendations relating to public transit.

The Municipal Class EA process addresses Phases 1 and 2 of the EA process including the identification of problems & opportunities, as well as identifying and evaluating alternative solutions to address the problem and establish the preferred solution. Approach 1 for Master Plans involves the preparation of a Master Plan document at the conclusion of the first two phases of the Municipal Class EA.

Master Plans are typically done at a broad level of assessment thereby requiring more detailed analysis or investigations at the project-specific level in order to fulfill the requirements for specific Schedule B and C projects identified within the Master Plan. Certain projects (Schedule A+ and A) can be implemented upon approval of the MTMP. Examples of transportation projects under each schedule of environmental assessment are summarised in **Table 1.1**.

Master Plans should be reviewed every five years to determine the need for a comprehensive formal review and/or update. Potential changes which may trigger the need for a detailed review include:

- Major changes in the original assumptions.
- Major changes to components of the master plan.
- Significant new environmental effects.
- Major changes in proposed timing of projects within the master plan.

Additionally, other changes including significant new health effects, funding opportunities, changes or updates to internal guiding documents (i.e. an Official Plan Update) and changes to external guiding documents should also be considered to trigger a review of this MTMP.

Table 1.1 Examples of transportation projects associated with different EA Schedules

EA Schedule	Types of Road Projects*
Schedule A	Normal and emergency operations and maintenance projects (e.g. re-paving, local road improvements, re-designation of an existing General Purpose Lane)
Schedule A+	Smaller capital projects with minimal environmental impacts (e.g. construction of sidewalks or bicycle paths or lanes within the right-of-way)
Schedule B	Improvements and minor expansions to existing roads such as reconstruction or widening that may have some adverse environmental impact requiring environmental screening and notification of those affected (less than \$2.3M)
Schedule C	Construction of new facilities and major expansions requiring the full five-step EA process and public consultations

*Municipal transit projects follow the TPAP process

1.5 Engagement

Stakeholder engagement is an important component of the EA process and there are requirements for notifications and consultation with public, agencies, and other stakeholders at key phases of the process. This allows stakeholder issues, ideas and priorities to be incorporated into the plan in a meaningful way. The following consultation sessions were conducted throughout the study:

- Notice of Commencement | May 29, 2018
- Online Engagement Survey | December 20, 2018 to January 21, 2019
- Public Information Centre | April 9, 2019
- Notice of Draft Completion (30-day Public review period) | October 6, 2019

The MTMP study was initiated in May 2018 through a Notice of Commencement published on the City's website and local newspaper. Two rounds of consultation were conducted including an online survey and one Public Information Centre (PIC) along with stakeholder meetings culminating in approximately 835 people engaged and 69 comments received throughout the study process as summarised in **Table 1.2**.

Table 1.2 People involved through various methods of engagement

Type of Engagement	People Engaged
Survey	800
Public Information Centres	25
Stakeholder Meetings	10
Total People Engaged	835
Written Comments Received	69

The online survey was conducted at the onset of the study to inform and engage the public, as well as obtain key input to determine existing needs and opportunities. The online survey was posted on the City's website and was also available at a public computer where a city staff member was available to assist persons who could not fill the survey out themselves. The survey provided an engaging opportunity for respondents to provide input on existing issues & opportunities, as well as visionary feedback on what they would like to see in the future. An example of how the online survey looked is provided in **Figure 1.1**.

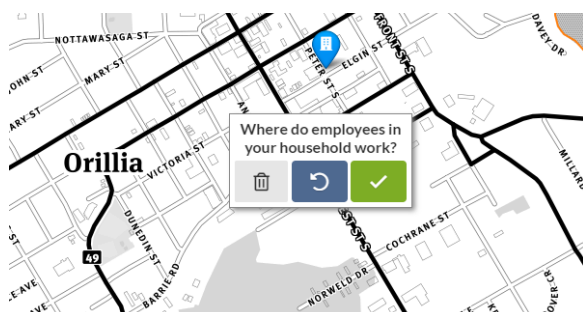


Figure 1.1 Example of the Online Survey between December 20 - January 21, 2019

Figure 1.2 Public Engaging during the Public Information Centre on April 9, 2019



Additional details on the input and results of the online survey are provided in the "What we heard" sections within Chapters 2 and 3 of this document.

One Public Information Centre was conducted during the development of alternative solutions to get public and stakeholder input on additional vision, ideas, and opportunities that should be considered (see **Figure 1.2**). The PIC was held on April 9 of 2019 between 6 p.m. and 9 p.m. at 50 Andrew Street South in Downtown Orillia. A notice of public consultation was released by the City four weeks prior to the PIC and public display boards were presented and posted to the City's website after the meeting.

In addition, several stakeholder engagement meetings and correspondences were held with key land use developers, community groups, local, county, provincial and neighbouring community representatives.

Throughout the entire study process stakeholders were able to provide their email or contact information so that they could directly be informed of the study's progress or upcoming engagement sessions. A summary of all comments received and the associated action or response is included in **Appendix D**.

1.6 Collaboration with other studies

There are several City initiatives, strategies, and plans that are related to the MTMP that were considered in parallel to ongoing planning work conducted including:

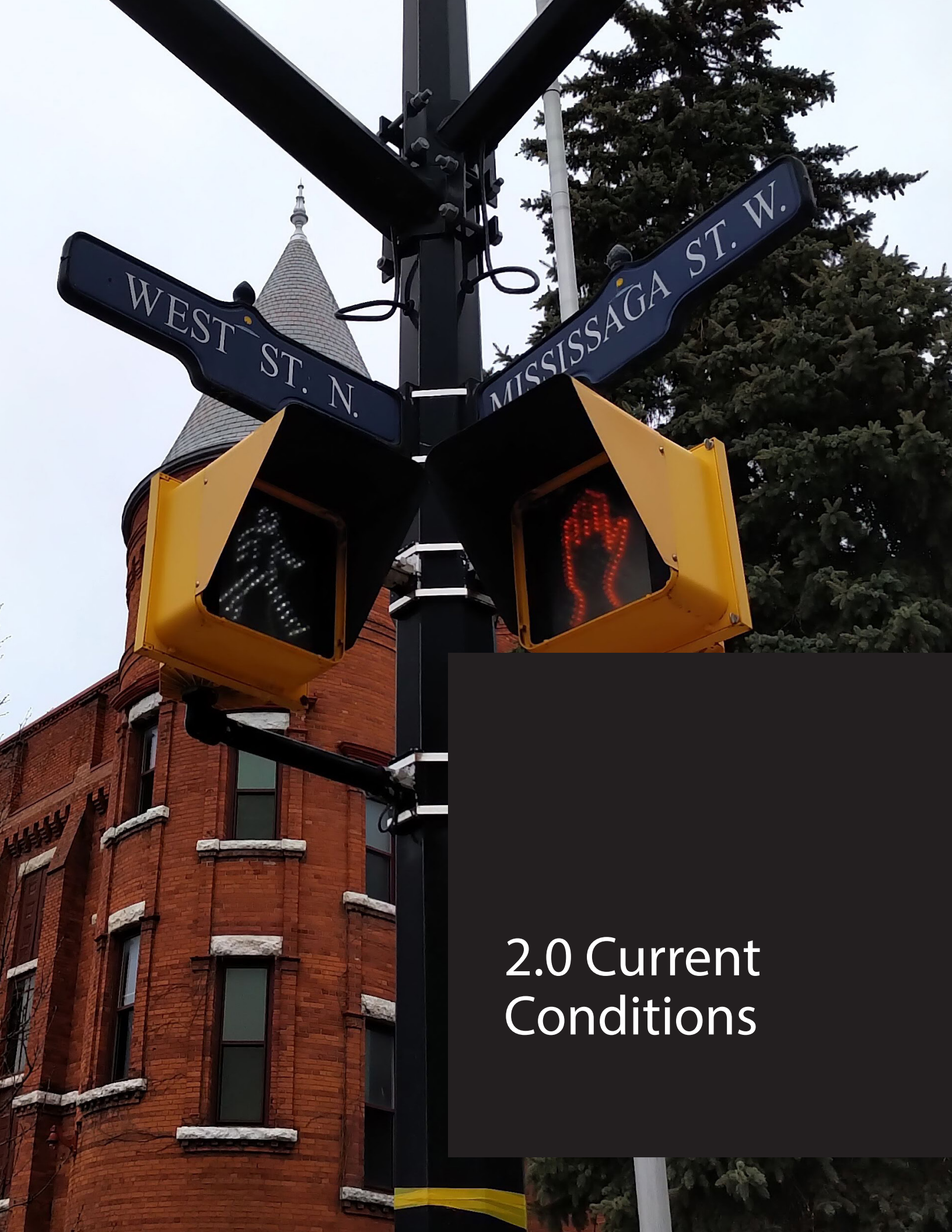
- Downtown Orillia Streetscape Plan (2018);
- City's Land Needs Assessment (On-going); and
- The Transit Terminal Study (On-going).

Beyond these studies there were several other strategies, plans, and studies at the Provincial, County and Municipal levels that were considered, and which are further described in Chapter 4 - Foundations of this document.



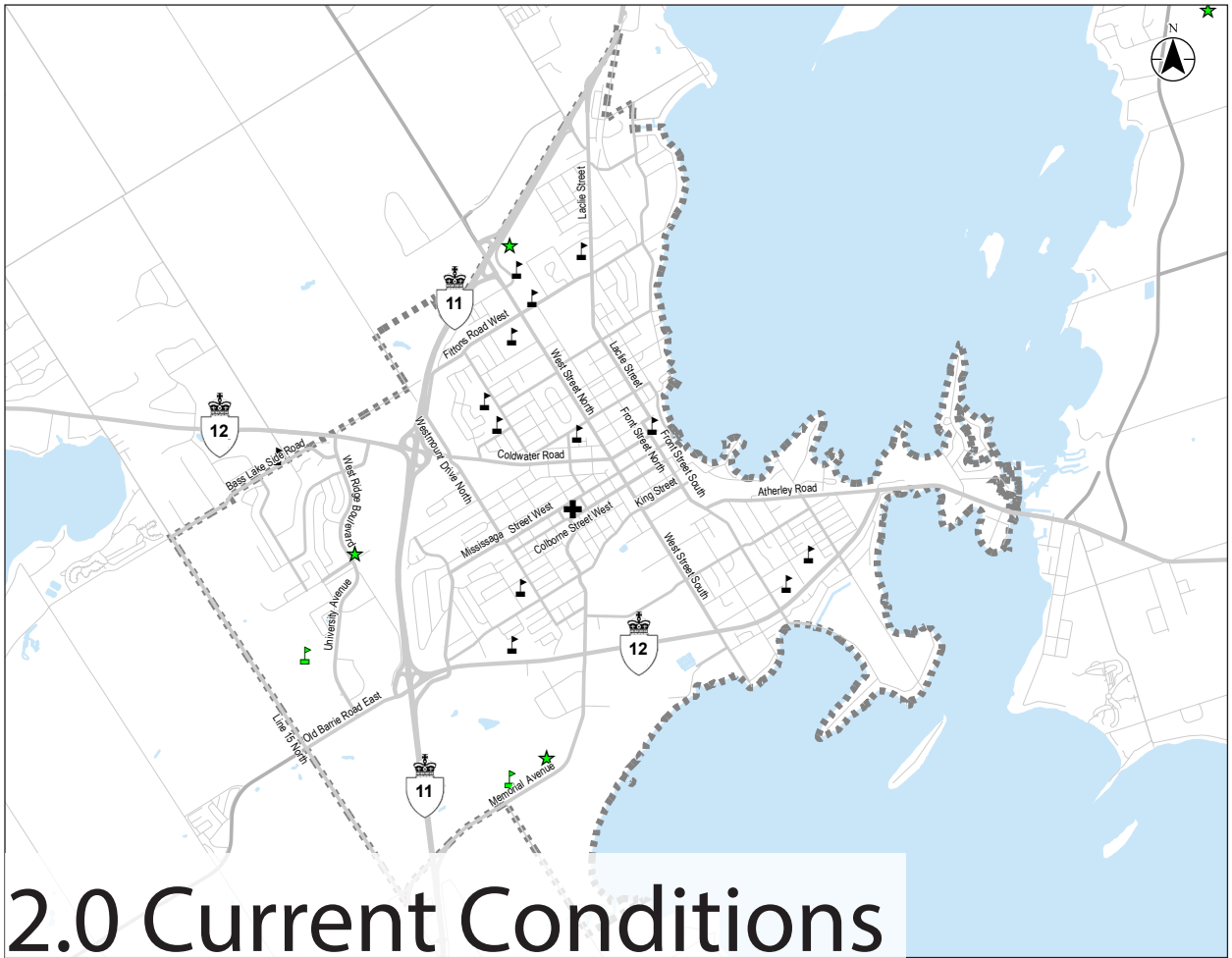
"Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody... Traffic congestion is caused by vehicles, not by people in of themselves."

- Jane Jacobs - Urbanist



2.0 Current Conditions

Figure 2.1
Existing Road
network



2.0 Current Conditions

2.1 The Community

A multi-modal transportation network must be planned according to the local geography and demographics to best address and recommend solutions tailored for the local context. Understanding the correlation between shifting age groups or land uses is imperative in understanding why the city moves in a particular way as well as understanding where residents and businesses will need to go in the future.

The City of Orillia is part of the broader Simcoe County, which extends as far south as New Tecumseth and as far north as Severn. The County has a total population of 525,600 with Orillia accounting for 31,160 or 6% of the County's population. The City of Orillia is primarily urban in nature with the downtown centred along Mississauga Street East toward Lake Couchiching with broader low-rise built form extending outward toward Provincial Highways 11 & 12 (see **Figure 2.1**).

The fastest growing age groups in Orillia are residents between 55 to 64 years of age and residents over 65 years of age; these two age groups grew by 12% and 43% respectively between 2011 and 2016 and now combine to

account for approximately 40% of the population as shown in **Figure 2.2** which shows the existing population pyramid of Orillia. The aging trend of the population is likely due to the large number of “Baby Boomers” that have entered these two age groups since 2011. The median age of Orillia is 47 compared to the provincial median of 41. This trend is expected to change through the year 2036 as some large younger cohorts in the 25 to 34 years of age and under 14 grow into the working-age bracket, however despite this, there will still be a significant elderly population in the future as outlined by broader regional trends within the Simcoe-Muskoka area.

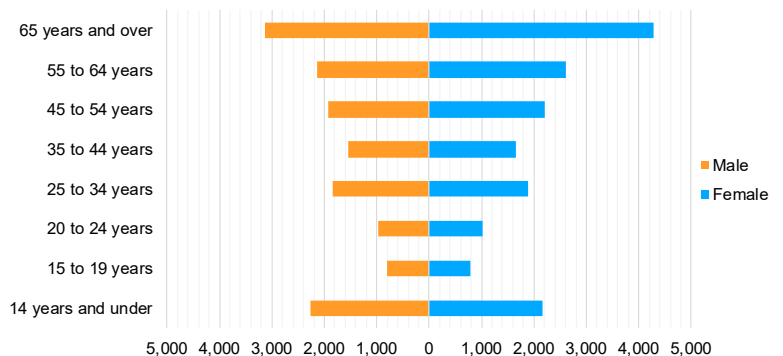


Figure 2.2 Population Pyramid | 2016

Source: Statistics Canada - Community Profile, 2016

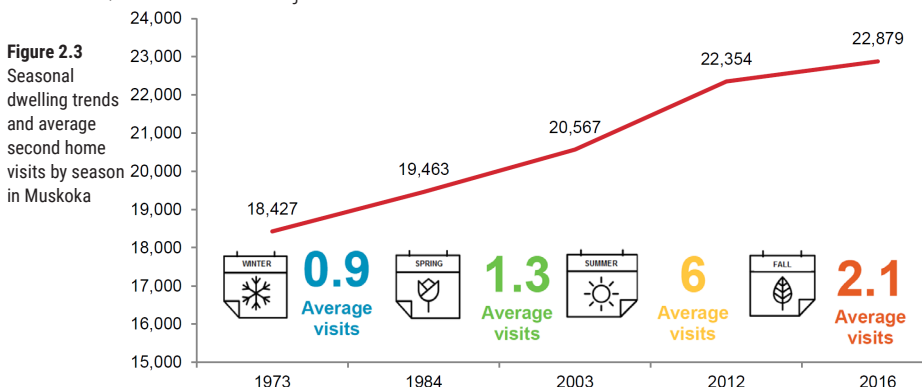
Orillia is bounded by the Township of Oro-Medonte to the southwest, Severn to the north, and Ramara to the east along with Lake Couchiching. The City's land use is diverse, with a mixture of urban and employment lands nestled between the surrounding Provincial Highways 11 & 12, with environmental protection areas in the south and residential/employment growth areas west of Highway 11 (see **Figure 2.4** and **Figure 2.5** for city-wide and Downtown land use map). The City is predominantly urban with an overall population density of 1,090 people per square kilometre (based on the 2016 population of 31,160).

The development of Orillia historically centred around the waterfront as the City began as a fur-trading settlement along a route that would eventually become Coldwater Road. This form of activity was spurred by the narrows that linked Lake Couchiching with Lake Simcoe facilitating canoe access. Over time the City began to grow with the advent of the Northern Railway connecting North Bay to Toronto by way of Orillia. This led the development of the City's core along Mississauga Street which has remained the City's core encouraging traditional two-to-three storey mixed-used development with ground-floor commercial activity and residential apartments above. Like most cities in Ontario, Orillia began to outgrow its downtown as new Provincial highways were built encouraging new forms of economic activity that leveraged roadways rather than waterways and railways to move their product. This led to a preference for low-rise residential development and a priority on the private automobile to facilitate this growth.

A look at Orillia's historical residential construction shows an overall housing supply that is 65% low-rise in the form of single family homes and semi-detached homes with the remaining 35% of supply comprising denser built forms such as Rows or Apartments (see **Table 2.1**).

The distribution of employment in the City is similar to that of the Simcoe County in general, with a high proportion of workers employed in sales & services, business, finance, education, and government sectors (as summarised in **Table 2.2**). A significant percentage of the population (13%) is also employed in the trades and the transportation sectors. These correspond directly with the City's top employers which include:

- Casino Rama – 2,800 jobs;
- Orillia Soldiers' Memorial Hospital – 1,200 jobs;
- Ontario Provincial Police – 1,141 jobs;
- Kubota Metal Corporation – 350 jobs; and
- Nordia / TeleTech – 300 jobs.



Source: The District Municipality of Muskoka - Second Home Study, 2017

Table 2.1 Historical Household Construction by Period

Period	Singles & Semis	Rows	Apartments	Total
1945-2011	7,705	1,135	3,185	12,025
%	65%	9%	26%	100%

Source: City of Orillia - Development Charges Background Study, 2017

Table 2.2 Municipal Occupation Split

Occupation	Employment	% Total
0 Management occupations	1,130	8%
1 Business, finance, and administration occupations	1,850	12%
2 Natural and applied sciences and related occupations	515	3%
3 Health occupations	1,165	8%
4 Education, Law and social, community and government services	1,725	12%
5 Art, culture, recreation, and sport	280	2%
6 Sales and service occupations	5,015	34%
7 Trades, transport and equipment operators and related occupations	1,960	13%
8 Natural resources, agriculture, and related production occupations	210	1%
9 Manufacturing and utilities	650	4%
Not Applicable	350	2%
Total	14,850	100%

Source: Statistics Canada - Commuter Profile, 2016

Seasonal Considerations

Beyond land uses within Orillia, broader growth in seasonal dwellings in the District Municipality of Muskoka north of Orillia, often dubbed 'Cottage Country', experienced an 11.2% increase in total number of second homes between 2004 and 2017 as summarized in **Figure 2.3**. From a transportation planning perspective, it is important to consider that there are clearly defined seasons where cottages are used such as during the summer with some minor use in the spring and fall shoulder seasons (as shown in **Figure 2.3**). The impacts to Orillia in a broad sense must be considered as the City serves as one of

the last significant urban centres before entering cottage country from Southern Ontario. The City's medical, entertainment and recreational facilities provide a range of needs for cottage-goers all of which are accessed by the City's multi-modal transportation network adding traffic to local roadways. The impacts of the seasonal nature of Orillia's broader surroundings are further expanded upon in Section 3.6 through a review of seasonal traffic volume fluctuations at Provincial ramps.

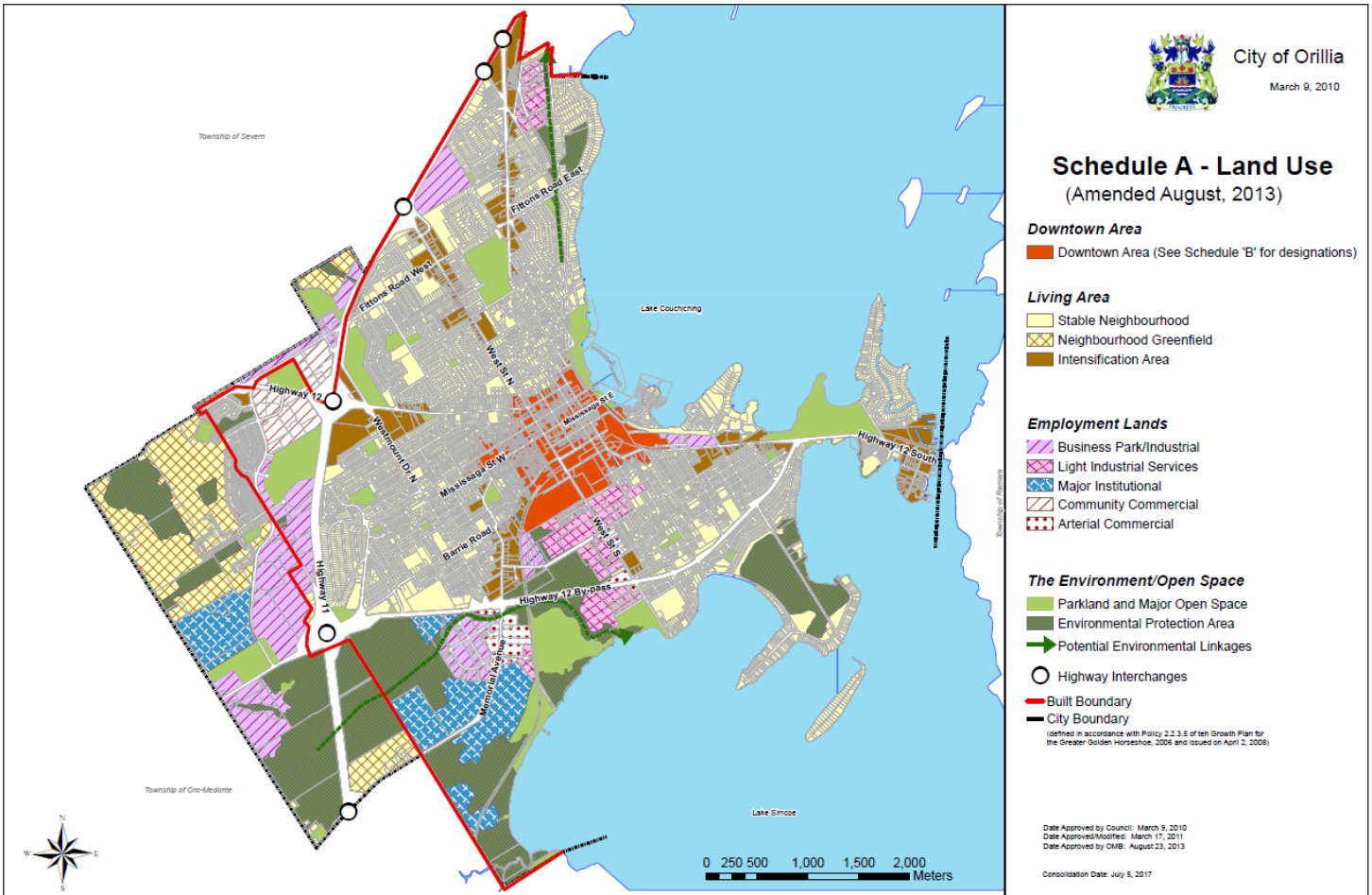


Figure 2.4 Existing Land Use in Orillia

Source: City of Orillia - Official Plan, 2019

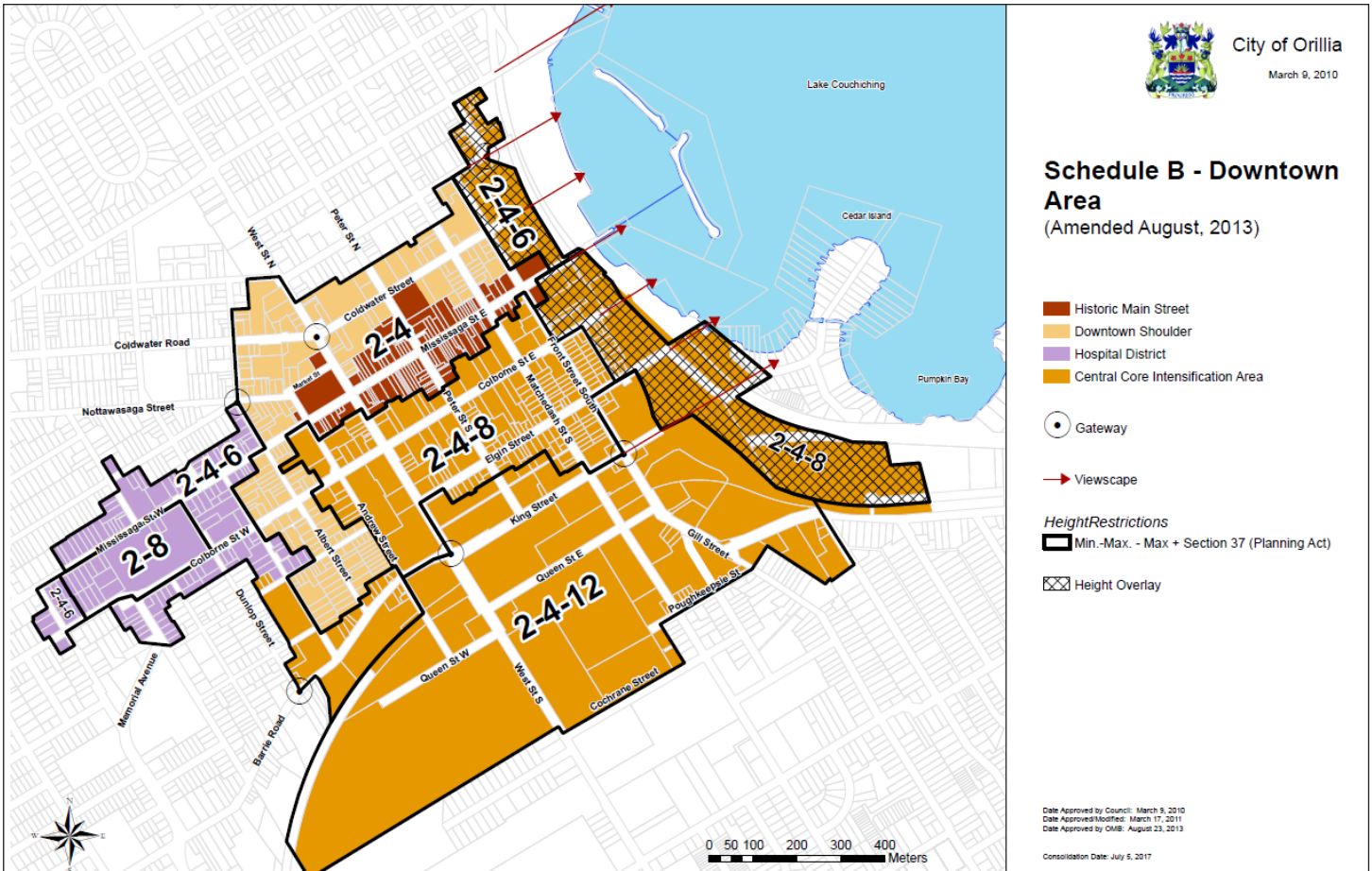


Figure 2.5 Existing Land Use in Downtown Orillia

Source: City of Orillia - Official Plan, 2019

2.2 Multi-Modal Network

2.2.1 Road Classification

Per the City of Orillia’s Official Plan (2019 consolidation) and 2011 Transportation Master Plan, the transportation infrastructure network consists of several different road types which are intended to serve and meet different objectives. The city’s road classification system is visualized in **Figure 2.6** and consists of the following:

- **Freeways:** are controlled-access routes with no service to land adjacent to the route. Their function is to carry traffic at high speeds and to provide for the longer trips in the area.
- **Highways:** are restricted or controlled access routes with little or no access to adjacent land. Their function is to carry traffic at higher speeds and provide for longer trips in and outside the area. The design and location of access will be strictly controlled so that any service to adjacent land does not detract from the primary function of moving traffic.
- **Arterial Roads:** are primarily transportation facilities, providing through routes for vehicles, pedestrians and cyclists across the City. Access to property can be permitted although the number, design and location of access points will be controlled so that the service to adjacent land does not detract from the primary function of moving the various modes of transportation. Arterial Roads will generally have a minimum right-of-way width of 26.0 metres. Where necessary, to minimize impacts upon existing land uses, a minimum right-of-way width of 20.0 metres may be considered. Sidewalks, where possible and practical, are required on both sides of Arterial Roads.
- **Collector Roads:** carry traffic between Arterial Roads and the Local Roads. Limited access to properties abutting these roadways will be permitted. Collector Roads will generally have a minimum right-of way width of 23.0 metres. Where necessary, to minimize impacts upon existing land uses, a minimum right-of-way width of 20.0 metres may be considered. Sidewalks, where possible and practical, are required on both sides of Collector Roads.
- **Local Roads:** are designed to accommodate low volumes of traffic at low speeds and generally serve local area trips. Local Roads will generally have a minimum right-of-way width of 20.0 metres, however this may be reduced in circumstances where adequate snow storage capacity can be provided within the right-of-way and alternative development standards have been approved by the City. Sidewalks are generally required on at least one side of all Local Roads with the exception of cul-de-sacs serving fewer than 20 residential dwelling units.

2.2.2 Truck Network

Commercial vehicles comprise an important component of the multi-modal transportation network particularly with regards to employment and economic activity, however they also present several concerns regarding wear & tear on infrastructure and safety. According to City of Orillia Traffic By-Law No. 2007-55 (Schedule “21”), Orillia’s road network generally allows trucks on most arterials, however there are some restrictions and reduced load requirements on several roadways as summarised in **Table 2.3** and visualized in **Figure 2.7**. These restrictions generally allow for the movement of trucks through the city via major corridors but protect roadways that are sensitive to damage during the spring seasons as frost comes out of the ground.

Beyond these restrictions, the City of Orillia does not currently implement an oversize load permit, but rather defers to the Highway Traffic Act in relation to provincial roadways and municipal roadways that have an indicated reduced load. It is important to note that municipal roads that do not have any restrictions within Orillia currently permit oversized/overweight loads to be transported on the network.

Simcoe County and the City of Barrie both have a permit requirement for oversized loads that exceed the dimensions and/or weight prescribed in the Highway Traffic Act on County/Municipal Roads. The permits cost between \$50 to \$370 and require a private escort to lead and follow vehicles. Oversize loads put physical strain on bridge and roadway infrastructure and require routes that can physically accommodate them. Several studies have been conducted across North America, including a study by the University of Texas that have found that most oversize/overweight permit fee structures are an important tool for maximizing infrastructure lifespan and for recovering costs associated with the impacts of oversize/overweight vehicles.

Table 2.3 Municipal Truck and Load Restrictions

Roadway	Description	Restriction
Line 15	From Old Barrie Road N to Bass Lake Sideroad	Reduced Load (March – May)
Bass Lake Side Road	From Line 15 east to Harvie Settlement Road	Reduced Load (March – May)
Victoria Crescent	From Lankin Boulevard east to cul-de-sac at end of Victoria Crescent (Rutherford’s Point)	Reduced Load (March – May)
Forest Avenue	From Atherley Road south to Victoria Crescent	Reduced Load (March – May)
Wilson Point Road	From Huronia Road east to Drinkwater Drive	Reduced Load (March – May)
Bay Street	From Fittons Road East north to Drinkwater Drive	Reduced Load (March – May)
Westmount Drive N	From Barrie Road north to Coldwater Road W	No Heavy Trucks
West Street N	From Coldwater Road W north to Fittons Road W	No Heavy Trucks
Forest Avenue N	From Highway 12 north to James Street E	No Heavy Trucks

Source: Schedule “21” to By-Law Number 2007-55 of the City of Orillia for Reduce Loads, 2018

Figure 2.6
Existing Road
Classification
according to the
Official Plan

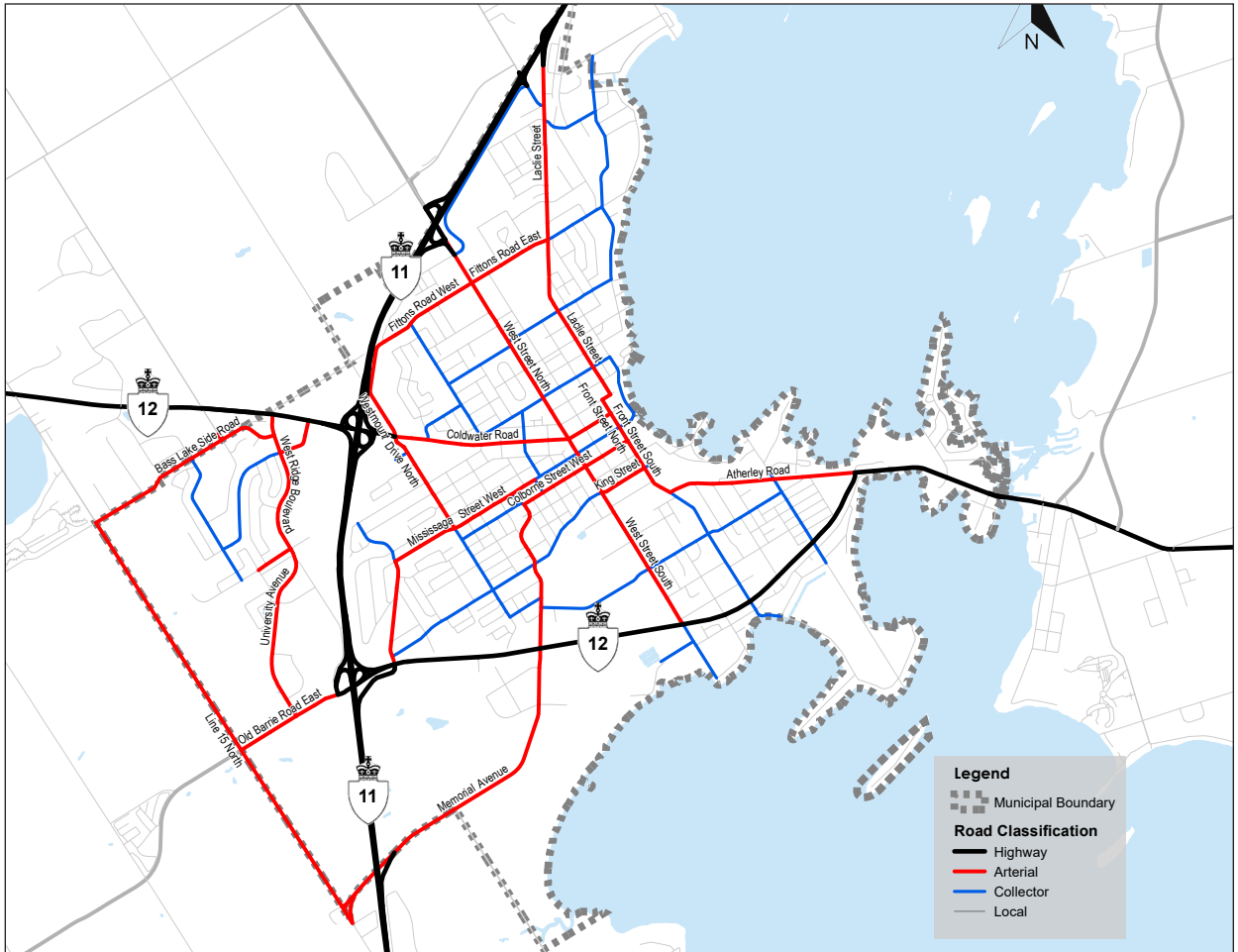
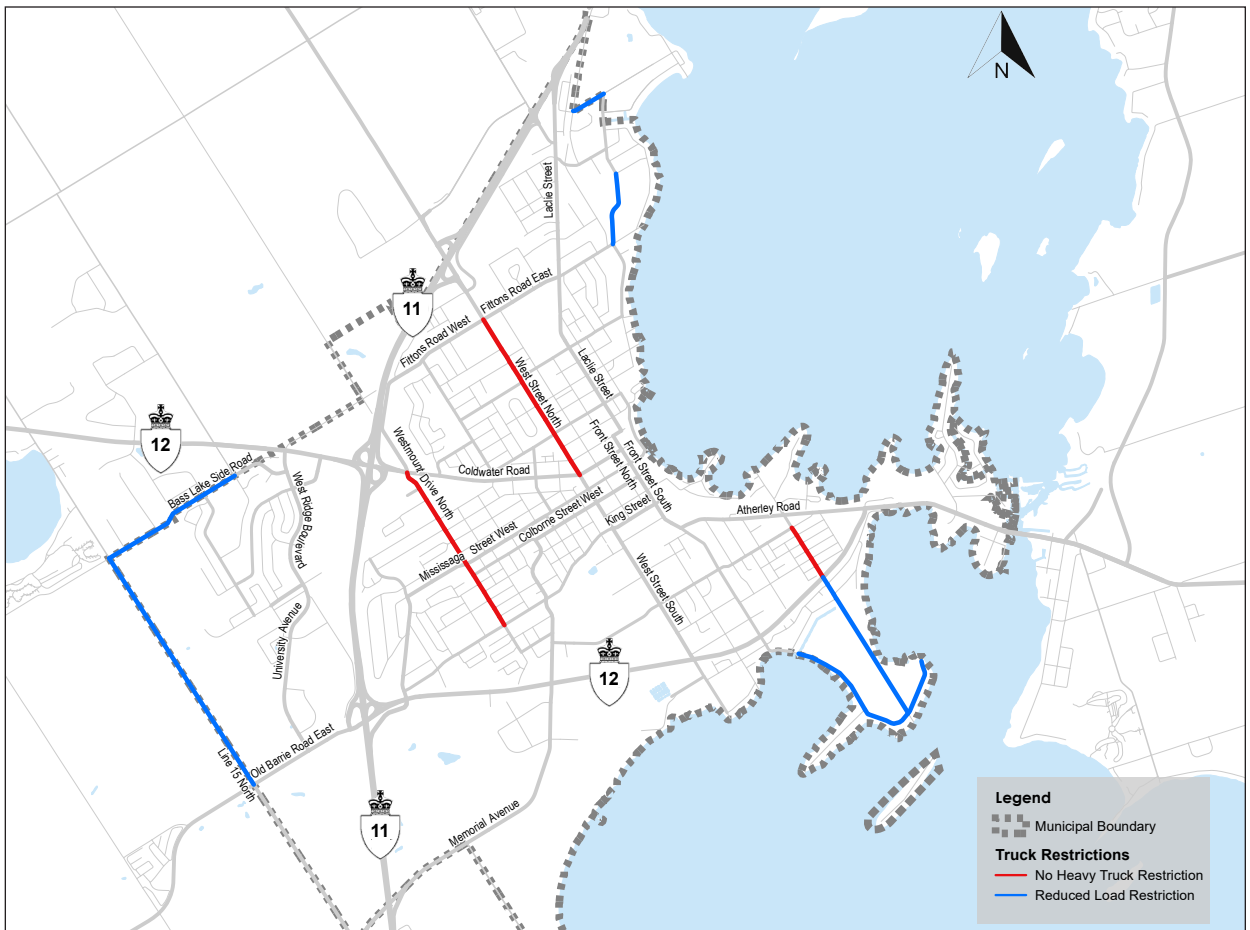


Figure 2.7
Existing Truck
Restrictions



2.2.3 Transit Network

The City of Orillia operates a conventional and paratransit service throughout the community. The conventional service can be characterized as a hub & spoke network that currently provides six routes operating at 30-minute headways in one-way circuitous loops out of the transit terminal at Mississaga Street & West Street in the Downtown as visualised in **Figure 2.8**. The service provides weekday service between 6:15 a.m. with final departures at 10:15 p.m., as well as weekend service on Saturdays and Sundays with service starting at 8:45 a.m. on both days, with final departures at 7:45 p.m. on Saturdays, and 4:15 p.m. on Sundays.

Exceptions to the one-way service nature of the network can be found via The West Ridge route which operates as two one-way circuitous loops that are interlined to provide two-way service along West Ridge Blvd / University Ave passing by Lakehead University Campus as well as the Walmart on Murphy Road and the adjacent commercial retail plaza on Monarch Drive. This has the additional effect of providing two-way service along Coldwater Road and along Mississaga Street.

Generally, the transit network provides good coverage across the city as approximately 72% of Orillia's area is within 400m of a transit stop as highlighted in **Table 2.4** and visualized in **Figure 2.9**. However, there are some notable gaps in West Orillia where new low-rise development has been occurring. Due to the hub & spoke nature of the network Highway 11 crossings presents a challenge to extend service in this area while maintaining 30-minute headways due to traffic congestion along Coldwater Road, particularly in the vicinity of Highway 11.

The highest utilized transit stops are generally found in areas with significant employment and commercial clusters such as the Walmart on Murphy Road, OPP Headquarters / Georgian College on Memorial Avenue, Lakehead University on University Avenue, West Ridge Place on Monarch Drive, and the Fittons West Plaza at Fittons Road and West Street. The top 5 stops for total daily boardings and alightings are summarised in **Table 2.5** and the entire daily stop ridership across the network is visualised in **Figure 2.8**.

Naturally, the routes servicing areas with high stop ridership are also the routes that have the highest overall ridership on the network. The North and West Ridge routes carry approximately 55% of the total weekday ridership, followed by the Georgian Route, South Route, and Laclie Route as summarised in **Table 2.6**.

Since 2015 Transit Ridership has been increase at a rate of approximately 6% annually culminating in a net gain of 80,000 riders since 2015 as summarised in **Table 2.7**. According to Orillia Transit's 2017 Operational Review the transit system's performance has been exceptional in terms of ridership growth, transit system efficiency and effectiveness in comparison to peer agencies.

Table 2.4 Percentage of Orillia within 400m of a transit stop

Total Area (Km2)	Area within 400m of a stop (km2)	Percentage (%)
28.5	20.4	72%

Source: Calculated by Stantec using GIS

Table 2.5 Existing Top 5 Ridership stops | Weekday Daily

Rank	Stop	2017		
		Boardings	Alightings	Total
1	Murphy Road at Walmart	87	105	192
2	Lakehead University	52	70	122
3	Georgian College	59	57	116
4	West Ridge Boulevard at Monarch Drive	44	68	111
5	West Street North at Fittons Road East	33	59	92

Source: City of Orillia Transit Ridership Data, 2017

Table 2.6 Average Daily Weekday Ridership by Route

Route	Boardings	Alightings	Total	% of daily ridership
Georgian	552	528	1,080	20%
Laclie	238	229	467	9%
North	680	743	1,423	26%
South A	224	173	398	7%
South B	187	169	356	7%
West Ridge / Coldwater	549	585	1,133	21%
West Ridge / Old Barrie	272	308	580	11%

Source: City of Orillia Transit Ridership Data, 2017

Table 2.7 Historical Ridership | 2015-2017

Year	Ridership	Difference
2015	750,000	-
2016	827,239	77,239 (+10%)
2017	829,970	2,731 (+<1%)
2015-2017		79,970 (+11%)

Source: City of Orillia Transit Ridership Data, 2017



Figure 2.8
Existing Orillia
Transit Routes
with average
daily weekday
ridership by stop

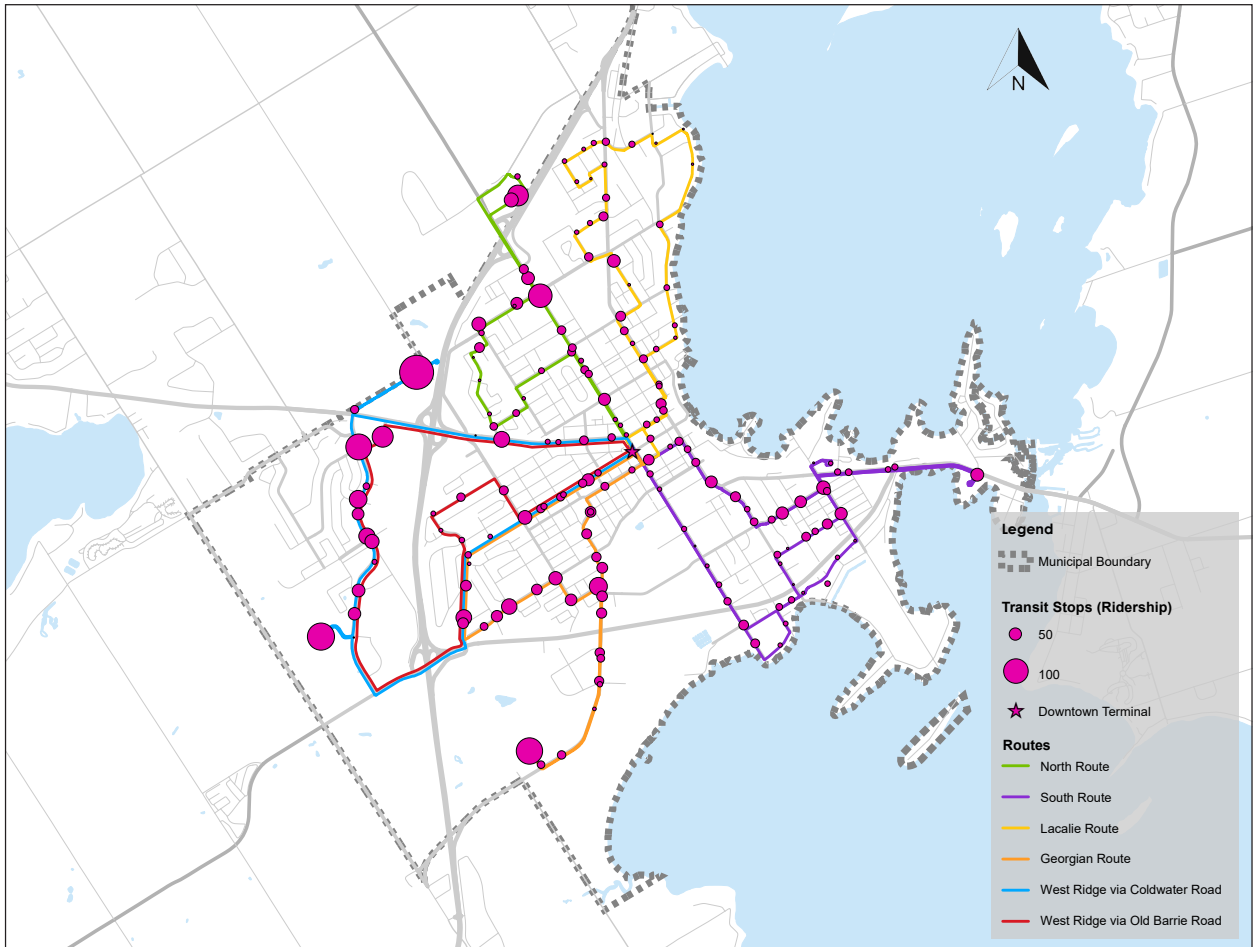
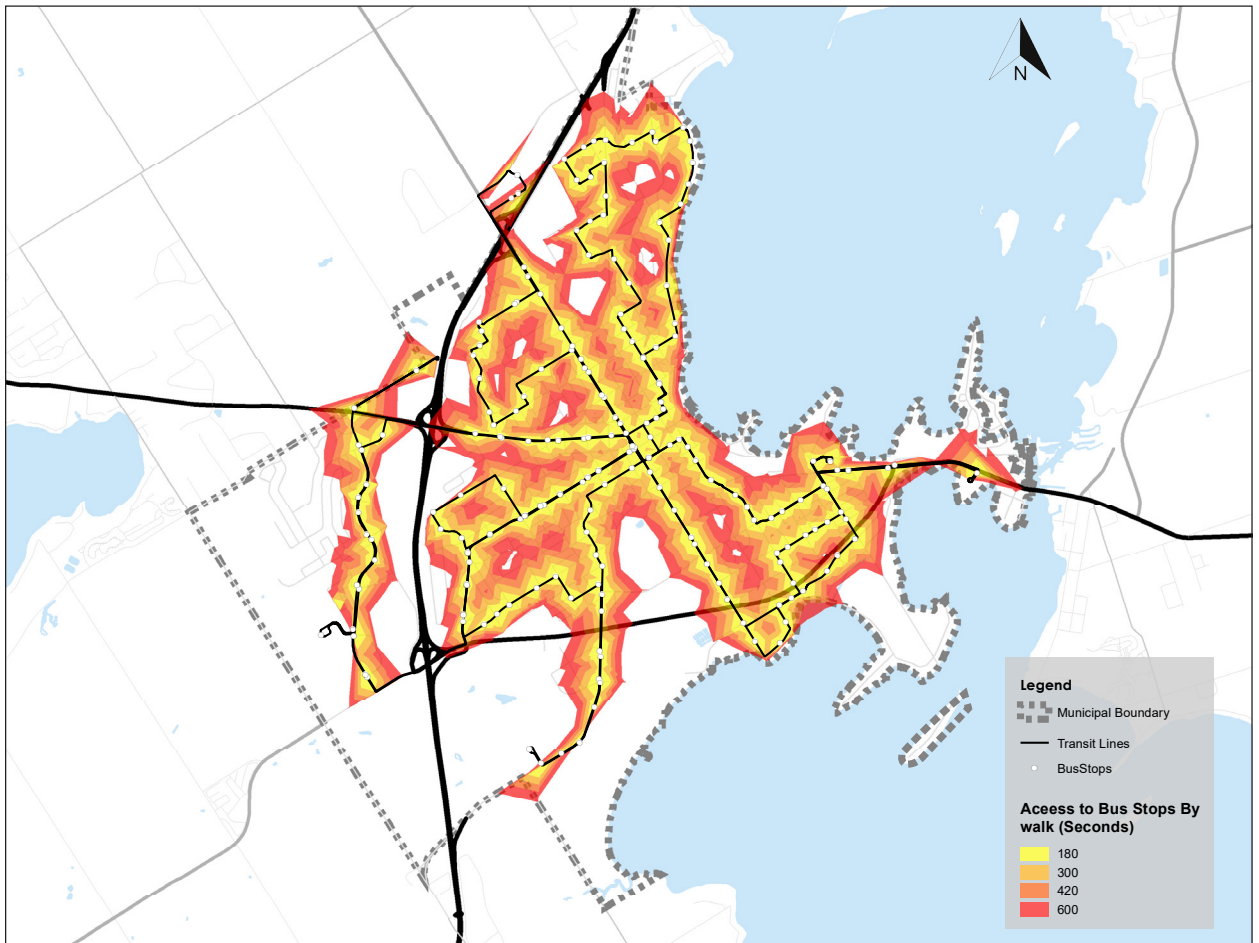


Figure 2.9
Existing transit
service coverage
based on walking
distance to a
stop



2.2.4 Active Transportation

Orillia's cycling network infrastructure is primarily comprised of multi-use paths which are mostly free of high traffic volume such as the Oro-Medonte Lake Country Rail Trail shown in **Figure 2.11**. Some of these routes are on paved roads or shoulders and, at certain locations, gravel roads and are more geared toward tourism rather than commuting, however new in-boulevard multi-use paths, particularly along West Ridge Boulevard and Old Barrie Road do serve local movement needs. Beyond multi-use paths, the city only has one section of dedicated bike lanes along Coldwater Road. These facilities culminate in approximately 28km of cycling infrastructure throughout the City as shown in **Figure 2.12**.

The existing pedestrian network is comprised of a mixture of sidewalks and multi-use trails primarily focused on providing links between schools and local residential neighbourhoods. Pedestrian sidewalks are primarily found within Orillia's downtown core with some extensions into west Orillia (via Old Barrie Road and Coldwater Road) and neighbourhoods adjacent to Lacie Street. Pedestrian facilities including sidewalks and multi-use trails culminate in 151 km of pathways as visualised in **Figure 2.13**.

Most sidewalk pathways create a connected network that is complimented by signalized intersections providing protected crossing opportunities along most major corridors such as collectors, arterials and highways.

The urban form and layout of the road network within Orillia's downtown core follows a traditional grid structure with a permeable pedestrian network that allows for ample connections. As the transportation network extends out from the downtown the road network and pedestrian network follow a suburban form with fewer gridded networks and more circuitous routes. The impacts of this form of road network creates large circuitous blocks that often require pedestrians to walk further to access collectors and arterial roadways. Large impermeable blocks can be seen south of Queen Street toward south Orillia, as well as large blocks adjacent to West Ridge Boulevard and Memorial Avenue which tend to have large format employment buildings.

New commercial and employment lands on the periphery of the city have scarce pedestrian networks, often separated by provincial highways. The West Street overpass of Highway 11 (as shown in **Figure 2.10**) is one such example where no pedestrian facilities are provided despite regular usage by pedestrians to access the commercial plaza north of the highway.



Figure 2.10 The existing West Street Overpass of Highway 11 has a grass desire line from all the pedestrians that use it to access the retail plaza north of the highway. There are currently no pedestrian facilities.



"It is hazardous to walk or bike across from older Orillia to Westridge via Coldwater Road. Especially hazardous are the cars coming on and off the Hwy 11 ramps. I tried biking from the Country Produce area to Staples ... really scary!"

- Anonymous survey respondent



Figure 2.11 The Oro-Medonte Lake Country Rail Trail provides broad regional connections to and from Orillia.

Figure 2.12
Existing Cycling Network

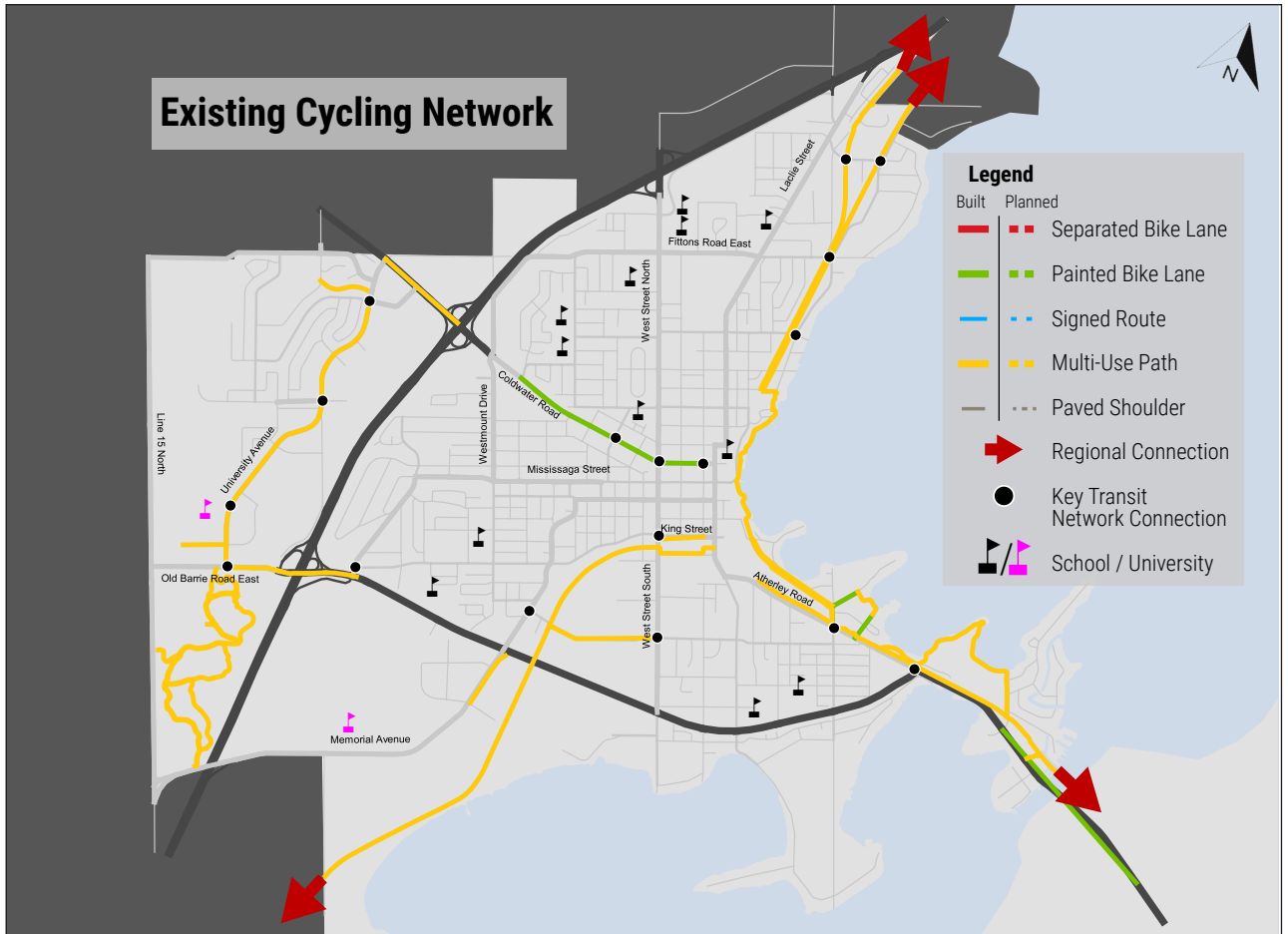
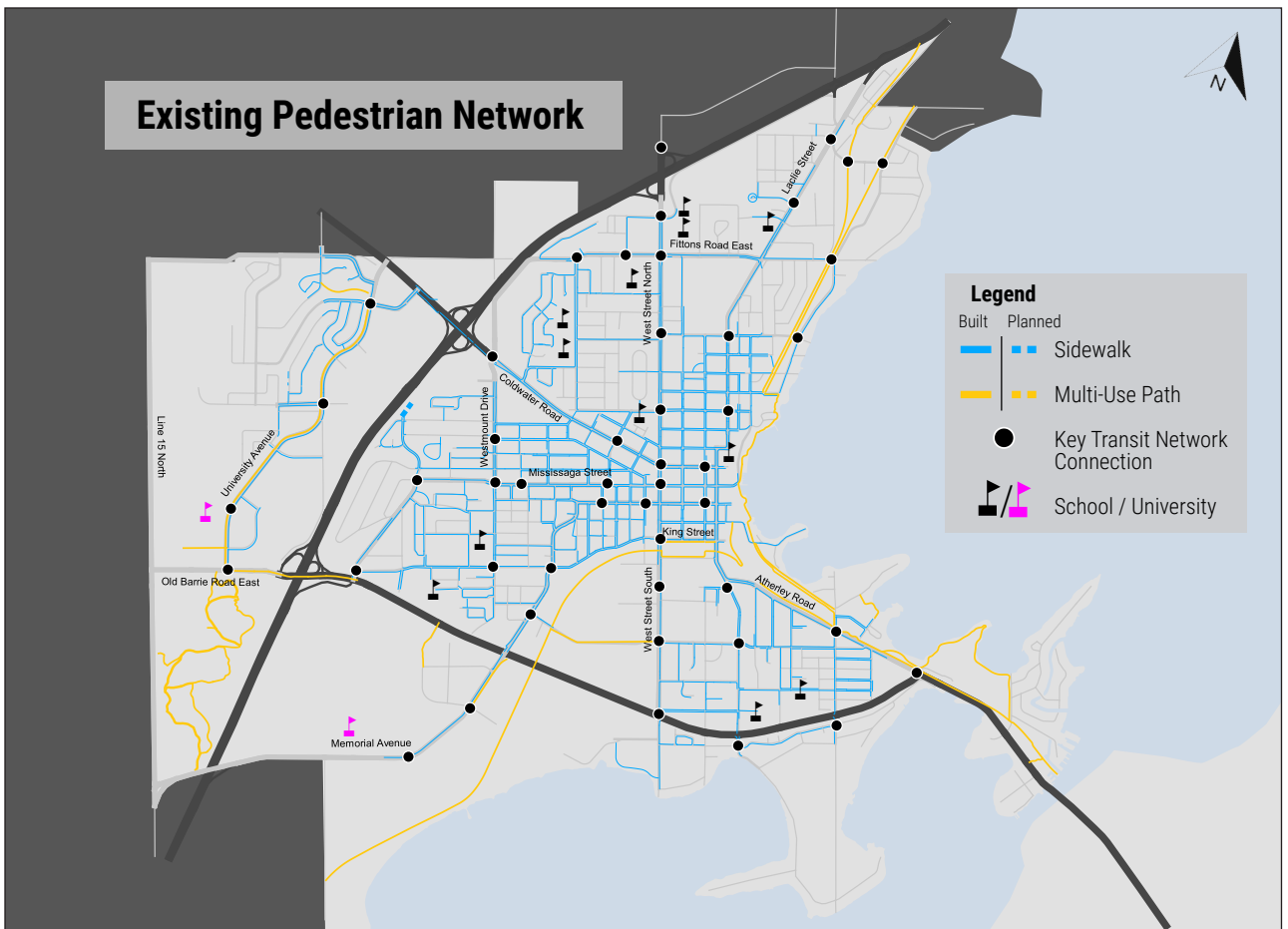


Figure 2.13
Existing Pedestrian Network



2.3 Travel Characteristics

2.3.1 Trip Distribution

Most peak period trips are external to Orillia with 38-41% of trips starting and ending within the City as summarised in **Table 2.8**. Despite internal travel accounting for a large proportion of trips, this segment has been declining since 2011 seeing a 17-20% decline compared to external trips that have experienced an 11% increase in the past five years.

The trip distribution dynamic is represented through the significant travel relationship that Orillia has with surrounding Simcoe County municipalities that are involved in over 50-54% of all peak period trips to/from Orillia culminating in approximately 14,000 trips. This represents a growth of 1,100 peak period trips since 2011 or 10% growth. There is a clear trend of higher inbound trips in the morning from neighbouring Simcoe County municipalities, with the exception of Barrie, with a reciprocal outbound trend in the afternoon. Meanwhile, Orillia currently has a relatively equal relationship of inbound and outbound trips to the City of Barrie during both peak periods. **Figure 2.14** and **2.15** show the AM and PM Peak period geographic distribution of trips to and from Orillia with volumes summarised in **Table 2.8**.

The existing trip distribution shows three clear trends whereby:

- Orillia acts as an employment hub for other Simcoe County Municipalities;
- Orillia serves, to an extent, as a bedroom community to the City of Barrie; and
- Orillia's trip distribution is shifting away from local internal trips toward more external trips.

Figure 2.14
Existing (2016)
AM Peak Period
Trip Distribution

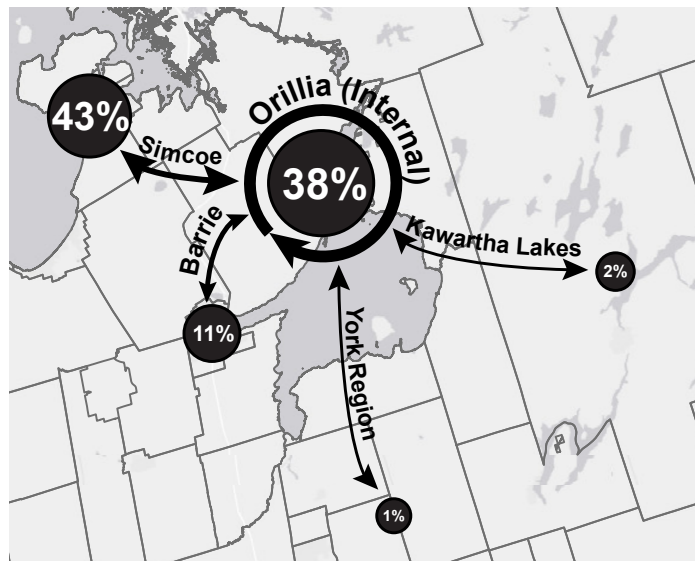


Figure 2.15
Existing (2016)
PM Peak Period
Trip Distribution

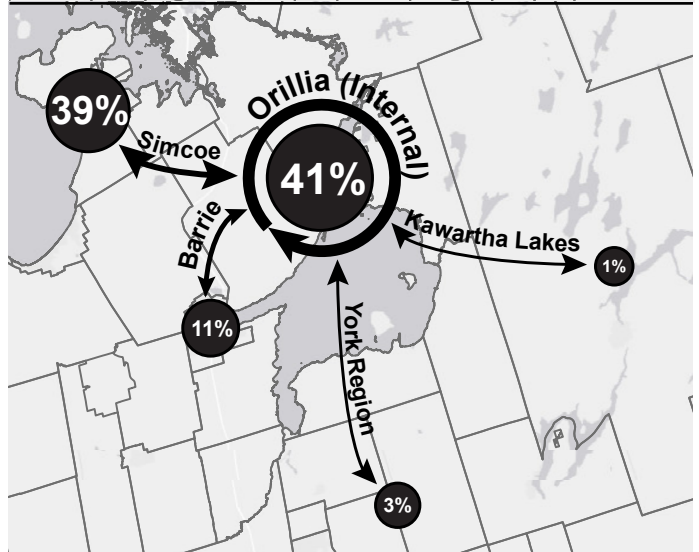


Table 2.8 Existing Trip Distribution | AM & PM Peak Periods

Distribution	2016					
	AM			PM		
	Volume	%	Change (2011-2016)	Volume	%	Change (2011-2016)
Internal	9,240	38%	-1,838 (-17%)	11,626	41%	-2,959 (-20%)
Internal->Barrie	1,425	6%	+308 (+28%)	1,717	6%	+ 699 (+69%)
Internal->Simcoe	2,461	10%	+ 58 (+2%)	7,425	26%	+ 634 (+9%)
Internal->Other External	1,003	4%	+ 226 (+29%)	1,318	5%	+ 554 (+73%)
Outbound Sub-total	4,889	20%	+ 592 (+14%)	10,460	37%	+ 1,887 (+22%)
Barrie->Internal	1,286	5%	+ 296 (+30%)	1,571	5%	+ 486 (+45%)
Simcoe->Internal	7,796	32%	+ 485 (+7%)	3,612	13%	-654 (-15%)
Other External->Internal	849	4%	+ 286 (+51%)	1,330	5%	+ 109 (+9%)
Inbound Sub-total	9,931	41%	+ 1,067 (+12%)	6,513	23%	-59 (-1%)
Total	24,060	100%	-179 (-1%)	28,599	100%	-1,131 (-4%)

Source: Transportation Tomorrow Survey - University of Toronto, 2016



"Moving away from private vehicles and towards public transportation, cycling, and walking, is vital for the future public and environmental health of the city."

- Anonymous survey respondent

Looking at trip data at a more localized level within the City of Orillia shows internal trips have been declining across all areas of Orillia since 2011, with the smallest declines observed in North Orillia and Orillia's West end as summarised in **Table 2.9**. A visualization of the traffic area zones (TAZ) in Orillia are shown in **Figure 2.16**.

The strongest internal origin-destination trip pairs involve travel to/from North and South-West Orillia where there are both strong internal trips within those two zones as well as trips between them likely due to the significant employment lands including the OPP Headquarters and Veterans' Memorial Hospital as summarized in **Table 2.9**.

Overall, trips going to/from West Orillia to other areas on the east side of Highway 11 show some of the lowest number of trips compared to all of the more established areas in the City. It is important to consider that West Orillia is not fully built-out and that most of the growth areas in Orillia are anticipated to occur here, as well as in the Downtown which will likely lead to higher internal trips from these areas.

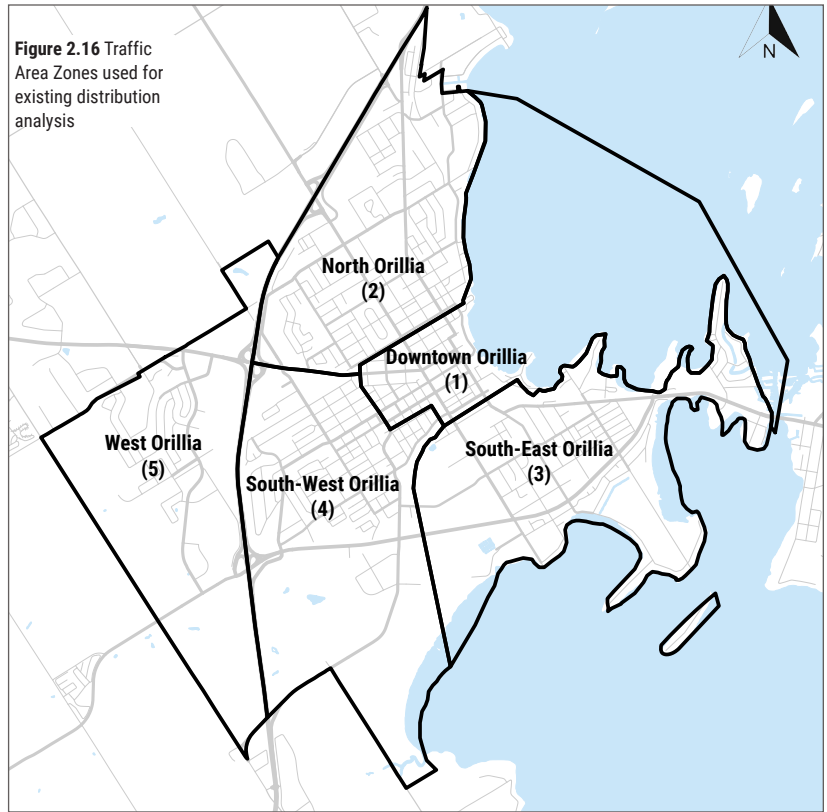


Table 2.9 Internal Trip Distribution in Orillia and the historical change between 2011 and 2016 | AM & PM Peak Period

Internal Trip Distribution 2016							Difference 2011-2016								
AM Peak Period		Destination					Total	AM Peak Period		Destination					Total
		1	2	3	4	5				1	2	3	4	5	
Origin	1 - Downtown	340	139	96	199	179	953	Origin	1	76	-54	-60	-147	147	-38
	2 - North Orillia	645	1,292	336	774	299	3,346		2	43	-698	68	127	-96	-556
	3 - South-East Orillia	435	178	572	541	188	1,914		3	-49	-253	1	88	-12	-225
	4 - South-West Orillia	359	824	164	892	182	2,421		4	-413	388	-93	-493	-177	-788
	5 - West Orillia	93	149	58	223	81	604		5	-8	-205	5	8	-33	-233
Total		1,872	2,582	1,226	2,629	929	9,238	Total	-351	-822	-79	-417	-171	-1,840	
PM Peak Period		Destination					Total	PM Peak Period		Destination					Total
		1	2	3	4	5				1	2	3	4	5	
Origin	1 - Downtown	494	822	509	534	322	2,681	Origin	1	-37	-39	-366	-585	132	-895
	2 - North Orillia	548	1,118	211	791	180	2,848		2	49	-317	-264	279	-214	-467
	3 - South-East Orillia	115	264	693	375	82	1,529		3	-391	-74	129	-124	-87	-547
	4 - South-West Orillia	388	812	628	775	510	3,113		4	-112	225	177	-677	-168	-555
	5 - West Orillia	219	755	191	382	344	1,891		5	-14	228	-37	-216	-20	-59
Total		1,764	3,771	2,232	2,857	1,438	12,062	Total	-505	23	-361	-1,323	-357	-2,523	

Source: Transportation Tomorrow Survey - University of Toronto, 2016

2.3.2 Trip Volumes

Intersection Turning Movement Count (TMC) volumes, obtained from the City of Orillia and the Ministry of Transportation of Ontario, were analysed for the AM and PM peak hour for Arterial and Collector corridors within Orillia. A summary of Traffic volumes at key locations are summarised in **Table 2.10** with the associated map of locations shown in **Figure 2.17**.

The largest traffic volumes were observed on Highway 12 west of Highway 11 with volumes at or approaching 1,000 vehicles per hour in the AM Peak Hour, and over 1,300 vehicles per hour in the PM Peak Hour. Other notable corridors include Highway 12 east of Mississaga Street, Memorial Avenue south of Highway 12, and Atherley Road west of Highway 12 each with observed AM Peak Hour volumes between 400-800 vehicles per hour and PM Peak Hour volumes of 600-900 vehicles per hour. These volumes show the impact of trip generators like retail outlets in West Orillia, as well as regional employment generators such as the OPP Headquarters on Memorial Avenue in South Orillia and the Casino Rama Resort east of Orillia.

Highway 12 between Highway 11 and Atherley Road is one lane in each direction accommodating vehicular volumes of up to 800 vehicles per hour in the peak direction during the AM and PM Peak Hours. Typically, when a roadway's peak volumes begin reaching between 800-1,000 vehicles an hour the roadway is monitored for the potential need for widening. This, however, is contingent on operations along the corridor, which are currently operating at acceptable levels of service as detailed in Section 2.3.4 of this document.



"The new lights [at Old Barrie Road/ Highway 11] have made my drive into town when I come this way so much easier! What a fabulous improvement. When I ride my bike into and out of town, I opt for this bridge over Hwy 11 as well."

- Anonymous survey respondent

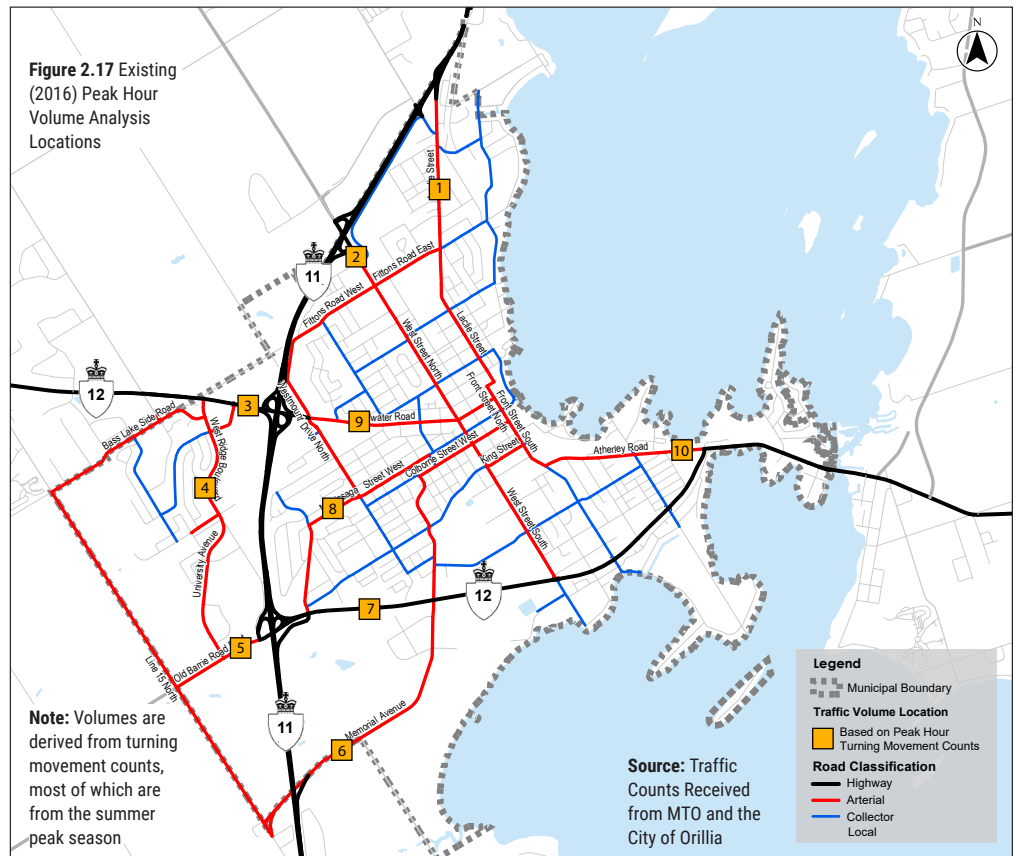


Table 2.10 Existing AM and PM Peak Hour Roadway Volumes by Direction

ID	Location	Direction	Peak Hr Volume		Number of Lanes
			AM	PM	
1	Lacie Street - south of Sundial Drive	Northbound	150	210	1 Lane
		Southbound	280	240	1 Lane
2	West Street N – south of Highway 11 Ramps	Northbound	430	690	2 Lanes
		Southbound	420	570	2 Lanes
3	Highway 12 – West of Highway 11 Ramps	Eastbound	890	1,360	2 Lanes
		Westbound	1,080	1,850	2 Lanes
4	West Ridge Boulevard – south of Highway 12	Northbound	310	500	2 Lanes
		Southbound	280	440	2 Lanes
5	Old Barrie Road E – east of University Avenue	Eastbound	250	310	1 Lane
		Westbound	230	330	1 Lane
6	Memorial Avenue – south of Highway 12	Northbound	450	940	2 Lanes
		Southbound	680	630	2 Lanes
7	Highway 12 – east of Mississaga Street	Eastbound	830	690	1 Lane
		Westbound	580	830	1 Lane
8	Mississaga Street – East of Westmount Drive	Eastbound	240	200	1 Lane
		Westbound	160	420	1 Lane
9	Coldwater Road – East of Collegiate Drive	Eastbound	340	450	2 Lanes
		Westbound	230	610	2 Lanes
10	Atherley Road – west of Highway 12	Eastbound	350	810	2 Lanes
		Westbound	600	670	2 Lanes

Seasonal Volumes

According to the City of Orillia, the surrounding areas in Muskoka accommodate approximately 150,000 seasonal residents which naturally creates seasonal variations in traffic volumes. A review of Provincial Highway traffic data for Friday volumes in Fall, Spring, and Summer show typically a 40-60% variation in traffic volumes between low-season volumes and summer peak volumes as summarised in **Table 2.11**. The impacts of seasonal volumes present their own set of challenges with regards to transportation as local roadways and infrastructure accommodate regional demand.

Table 2.11 Seasonal variation in traffic volume on Provincial Highways in Orillia

Location	Average Friday Traffic Volume			
	Fall	Spring	Summer	% variation
Hwy 11 between Old Barrie Road and Coldwater Road West	37,050	40,450	52,100	41%
Hwy 11 between Coldwater Road West and West Street North	35,350	23,550	53,400	127%
Hwy 12 between West Street South and Memorial Avenue	24,500	17,850	27,450	54%
Hwy 12 between Memorial Avenue and Mississauga Street West	23,300	15,700	25,450	62%

Source: Traffic Counts Received from MTO and the City of Orillia

2.3.3 Mode Split & Trip Purpose

Orillia's transportation network is impacted by the choices residents make every day in relation to moving around the city. Conversely, the nature of where people need to go may restrict peoples' mobility options further adding strain on the road network. As a result, it is important to not only understand where people go, but how and why people move around the city so as to add important context to the transportation network.

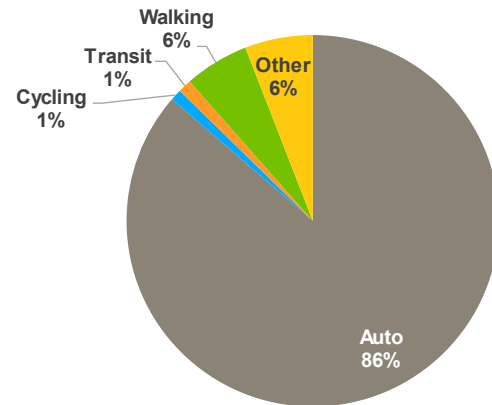
Currently, the majority of trips in Orillia are done by Automobile accounting for 86-91% of Peak Period trips as visualized in **Figures 2.18** and **2.19**. Since 2011 the automobile mode share has been decreasing for internal trips from 87% to 82%, while external trips have stayed consistent at around 93% (see **Table 2.11**). Historical mode splits also show us that alternative modes of transportation like cycling, walking, and transit have all seen increases in mode share during the last five years.

Orillia's peak period trip purpose is typical of a city its size with a defined spike in work and school trips in the morning (~60% of trips) and a work and discretionary spike in the afternoon (~70%) as summarised in **Table 2.12**.

When mode shares are broken down by trip purpose it reveals that the majority of all trip purposes are completed using an automobile, including school-related trips as visualized in **Figure 2.20**.

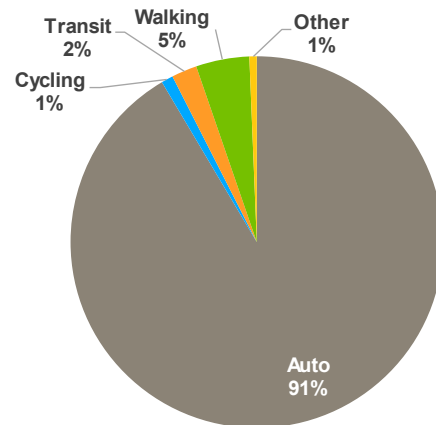
Current travel demand data indicate that the longer the trip, the more likely it is to be made by auto. An analysis of the distribution of 2016 Transportation Tomorrow Survey (TTS) data by mode and by purpose yielded several important findings. The analysis reflected the AM peak period conditions, but its trends generally were considered applicable to the PM peak period as well. The findings included:

Figure 2.18
Existing (2016)
AM Peak Period
Mode Shares



Source:
Transportation
Tomorrow Survey
- University of
Toronto, 2016

Figure 2.19
Existing (2016)
PM Peak Period
Mode Shares



Source:
Transportation
Tomorrow Survey
- University of
Toronto, 2016

Table 2.11 Existing and Historical Average Peak Period Mode Split | Internal Vs. External Trips

Mode	Internal Trip Mode Split		External Trip Mode Split	
	2011	2016	2011	2016
Auto	87%	82%	93%	94%
Cycling	0%	2%	0%	0%
Transit	2%	2%	0%	1%
Walking	8%	12%	0%	0%
Other	3%	1%	6%	4%
Total	100%	100%	100%	100%

Source: Transportation Tomorrow Survey - University of Toronto, 2016

- Shorter trips are more conducive to alternatives to the auto;
- Walking and cycling shares were the highest for school commutes; and
- Transit is most amenable to servicing moderate to longer distance trips.

Currently 90% of walk/cycling trips are made at distances of 3 km or less, while transit is more amenable to medium-distance trips between 2-6 km. Despite this, over 40% of car-related trips are made for trips under 3 km as summarised in **Figure 2.22**.

There are opportunities to shift a portion of short/medium-distance trips onto active transportation and transit. This is further supported by looking at trip purposes whereby over 45% of peak period active transportation trips are school related as shown in **Figure 2.21**.

These comparisons help to identify appropriate markets for alternatives to driving alone and appropriate future 20-year targets for these alternatives. For example, although mixed-use development may promote the localization of the home-based trip to the dentist (a trip in which the auto could be left at home), the reality is that many trips are linked to other purposes over longer distances, which may mandate the use of the auto. However, there are opportunities to carve a slice of the mode share pie toward active transportation and transit based on the distances and types of trip purposes that are most amenable to these modes.

Table 2.12 Existing Trip Purpose for trips to/from Orillia | AM & PM Peak Period

AM Peak Period								
Trip Purpose	Internal		From Orillia		To Orillia		Total	
	Volume	%	Volume	%	Volume	%	Volume	%
Work-Related	3,386	37%	3,033	62%	4,797	41%	11,216	43%
School-Related	1,737	19%	98	2%	2,421	21%	4,256	16%
Discretionary	2,883	31%	1,339	27%	2,249	19%	6,471	25%
Non Home-Based	1,234	13%	419	9%	2,249	19%	3,902	15%
Total	9,240	100%	4,889	100%	11,716	100%	25,845	100%
PM Peak Period								
Trip Purpose	Internal		From Orillia		To Orillia		Total	
	Volume	%	Volume	%	Volume	%	Volume	%
Work-Related	2,936	25%	4,367	42%	2,688	33%	9,991	33%
School-Related	579	5%	904	9%	167	2%	1,650	5%
Discretionary	5,226	45%	3,446	33%	2,662	33%	11,334	37%
Non Home-Based	2,885	25%	1,743	17%	2,662	33%	7,290	24%
Total	11,626	100%	10,460	100%	8,179	100%	30,265	100%

Source: Transportation Tomorrow Survey - University of Toronto, 2016

Figure 2.20 Orillia's Existing Trip Purpose by Mode | AM Peak Period

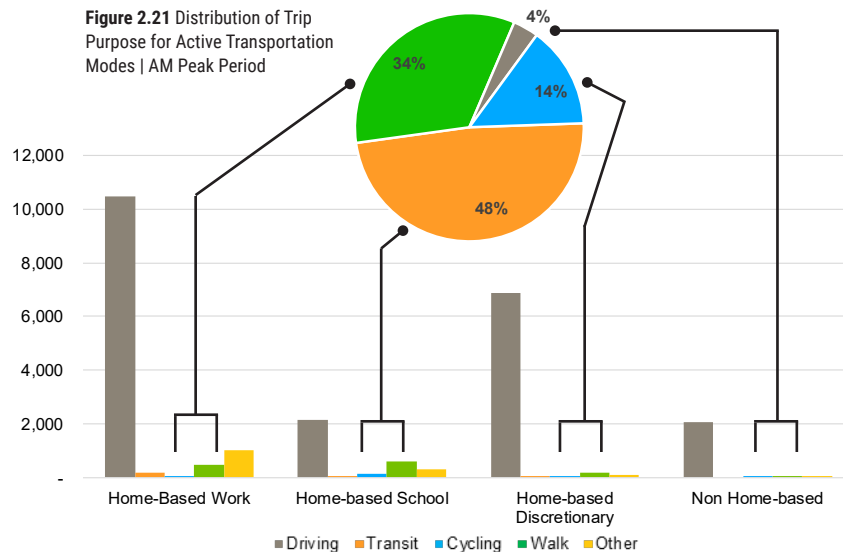


Figure 2.21 Distribution of Trip Purpose for Active Transportation Modes | AM Peak Period

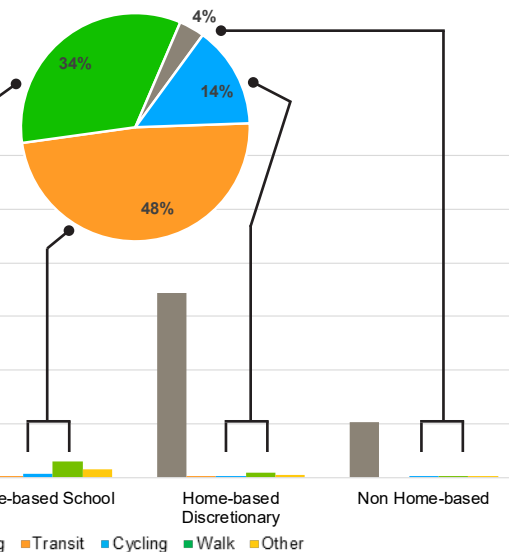


Figure 2.22 Orillia's Existing Distribution of trips by mode and by trip length | AM Peak Period

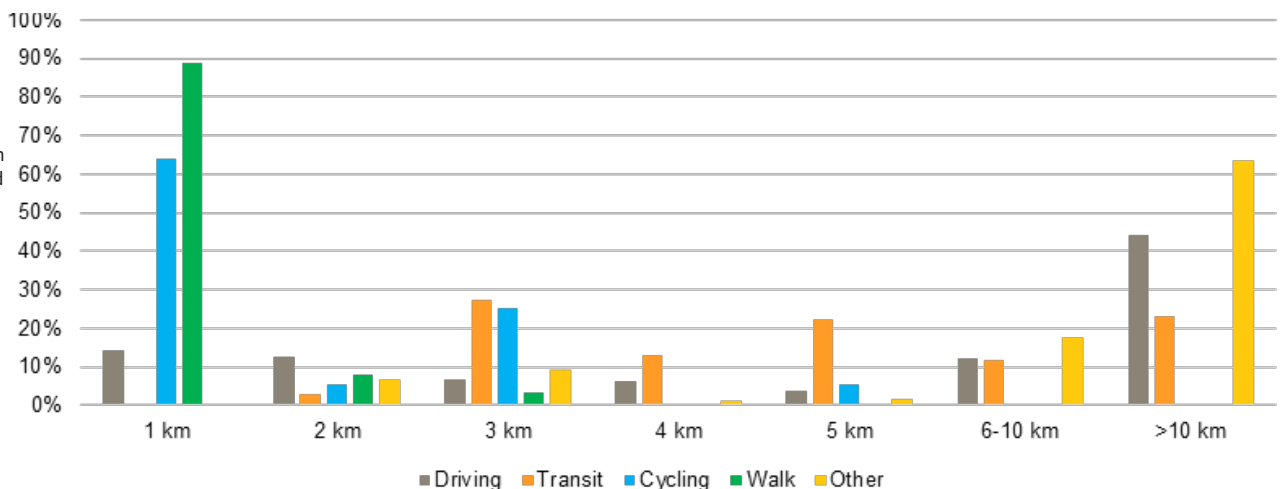
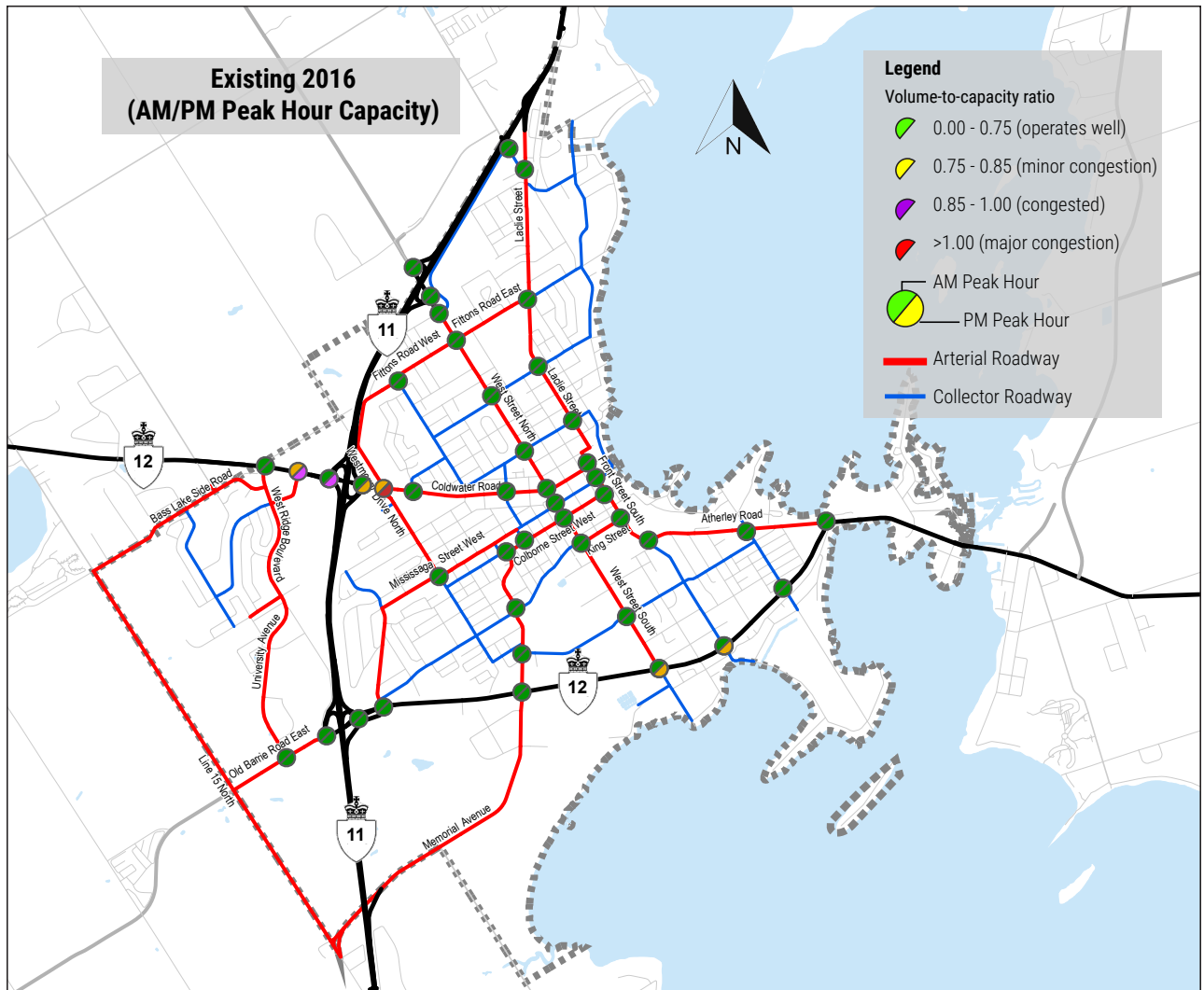


Figure 2.23
Existing
Intersection
volume-to-
capacity | AM &
PM Peak Hour



Note: Volumes are derived from turning movement counts, most of which are from the summer peak season

Source: Traffic Counts Received from MTO and the City of Orillia

2.3.4 Intersection Operations

Operations at signalized intersections in Orillia were analysed using the Quick Estimation Method, as described in the Highway Capacity Manual (HCM) 2000, which is a method of determining the critical volume-to-capacity ratio of an intersection when detailed data inputs are not available; particularly, in the absence of signal timing plan data. This method utilizes an intersection's lane configuration at each approach, the number of lanes available to each traffic movement, and considers whether turning movements are permitted or protected to assume a basic signal phasing plan. For this analysis it was assumed that any approach which featured a protected left-turn signal head was given a protected left-turn phase. To collect the necessary intersection information aerial imagery and street-level photography was reviewed on Google Earth and Google StreetView.

Based on the intersection data and assumed phasing plan, the critical volumes for each street at an intersection were calculated representing the highest hourly volume per lane that must be accommodated during each interval. The overall critical volume for the intersection (the critical sum) is the sum of the critical volumes for each street at an intersection. The maximum critical volume that each intersection can accommodate (the "reference sum") is assumed to be 1530 vehicles per hour per lane (vphpl), as suggested by the HCM. Assuming a reasonable choice of cycle length, the intersection's critical volume-to-capacity ratio is then calculated as below, using the intersection's critical sum, its reference sum, and the total lost time (determined by assuming 4 seconds of lost time per critical phase). Cycle lengths of 70 seconds were assumed for intersections in the downtown area with consideration for pedestrian and cyclist intersection calls (or actuations), and 90 seconds were assumed for all other signalized intersections.

The formula for the Quick Estimation Method is the following:

$$X_{cm} = \frac{CS}{RS \left(1 - \frac{L}{C}\right)}$$

Where:

- X_{cm} is the critical volume-to-capacity ratio;
- CS is the critical sum (in vphpl);
- RS is the reference sum (in vphpl);
- L is the total lost time (in seconds); and
- C is the cycle length (in seconds).

We note that the Quick Estimation Method only applies at signalized intersections. For unsignalized intersections, analysis was performed using Trafficware Synchro software.

Under existing AM Peak hour traffic conditions most intersections operate at acceptable levels of service. Only two intersections operate at levels that are approaching capacity as visualised in **Figure 2.23**. These intersections are: Coldwater Road West at Westmount Drive North, and Highway 12 at Monarch Drive. These intersections are constrained by significant turning movements at the westbound left and northbound right-turns at Monarch Drive as well as eastbound right, and northbound left-turns at Westmount Drive North to access Highway 11 as well as access commercial areas in Orillia on the west and east of the highway corridor.

Similar to the AM Peak Hour, under existing PM Peak Hour traffic conditions at most intersections operate at acceptable levels of service with some intersections at or approaching capacity within the vicinity of the Coldwater Road & Highway 11 interchange as well as two intersections along Highway 12 at West Street South, and at Gill Street as visualised in **Figure 2.23**. The intersections that were approaching capacity in the AM Peak Hour at Coldwater Road West & Westmount Drive North, and Highway 12 at Monarch Drive operate at or over capacity in the PM Peak Hour with the adjacent Highway 11 ramps intersections experiencing volumes that further push utilization to approach or operate at capacity. This is a result of high volumes of turning traffic toward the commercial areas south of Coldwater Road West, as well as high volumes of through traffic. Along Highway 12 at West Street South and at Gill Street high through eastbound and westbound movements in conjunction with shared right-turning movements constrain operations.



2.4 What we heard

Survey respondents identified travel time as having the most influence on their transport mode choice followed by cost and reliability while health benefits and environmental impacts were identified as having the least influence as shown in **Figure 2.24**.

Issues

Residents identified traffic congestion as the biggest mobility issue in the city, particularly at Highway 11 overpasses at Coldwater Road and Old Barrie Road, as well as within the Downtown at Mississaga Street/ West Street due to the transit terminal. Congestion accounted for 36% of the transportation issues mapped by survey respondents.

Dangerous conditions like speeding, or unsafe conditions for vulnerable road users like cyclists and pedestrians accounted for 31% of issues identified by respondents and a heatmap of the results are shown in **Figure 2.25**. Many of these revolved around a lack of safe pedestrian and bike facilities throughout the city as well as along high-volume corridors that had fewer crossing opportunities creating network barriers along Coldwater Road, Highway 11, and the Highway 12 By-Pass. Generally, respondent-identified dangerous areas coincided with identified congestion areas as high-volumes of vehicular traffic tend to create a higher likelihood of conflicts or collisions.

There was also a noticeable hotspot of respondent-identified conflicts in the Downtown as respondents highlighted several issues associated with the interaction between motorists, transit vehicles, pedestrians and cyclists as several modes of transportation interact with each other creating a greater number of conflicts. Conversely, successful transportation areas were identified on several high-volume corridors, particularly because of the associated pedestrian infrastructure and signaled intersections that are present on those corridors.

Successes

Segments of infrastructure that overcame barriers or connected neighbourhoods were identified as successful areas on the transportation network as shown in **Figure 2.26**. The new signals and associated multi-use crossing of Highway 11 along Old Barrie Road present a safe connection between the east and west ends, while the new bike lanes along Coldwater Road provide a much-needed east-west connection through established neighbourhoods connecting to commercial areas in the Downtown. The Downtown was praised by survey respondents for its high-quality pedestrian and placemaking facilities that make it a pleasant place to access.

The Online Survey summary document can be found in **Appendix A** which provides the full survey results.

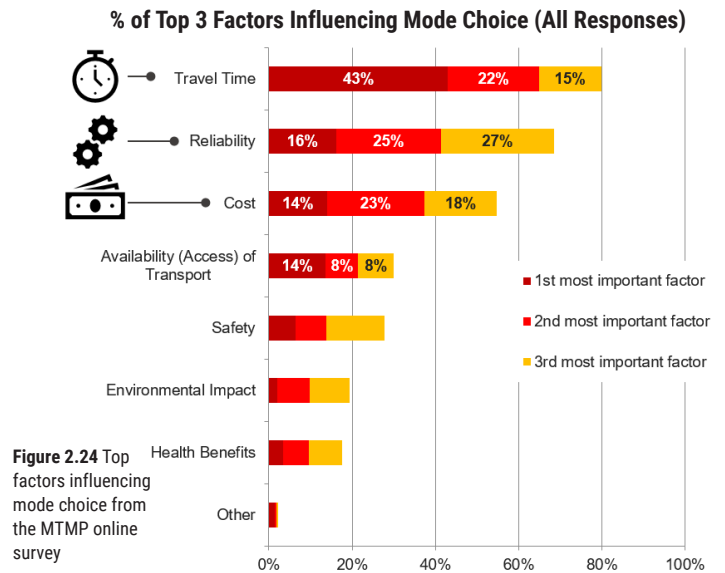


Figure 2.24 Top factors influencing mode choice from the MTMP online survey

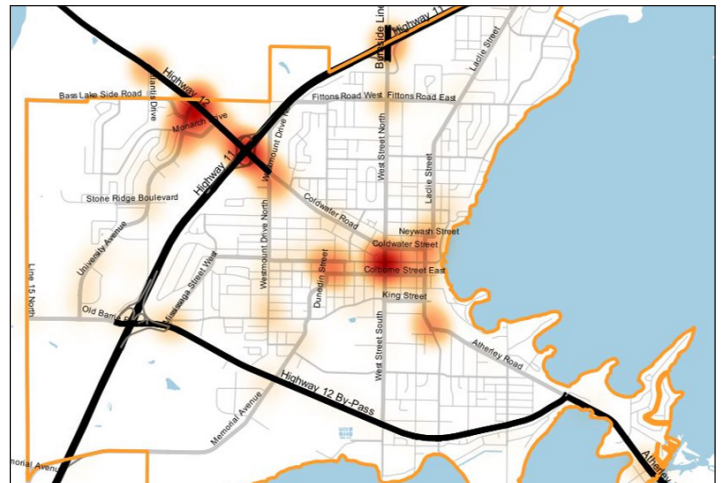


Figure 2.25 Survey-identified dangerous areas



Figure 2.26 Survey-identified successful areas



3.0 Future Conditions

3.0 Future Conditions

3.1 Historical & Future Growth

In the ten-year period between 2006 and 2016, the City of Orillia's population increased by 900 residents which represents a 0.3% annual growth rate; lower than Simcoe County, Barrie, the province of Ontario and Canada as a whole. **Table 3.1** shows the historic growth in population in Orillia and the peer municipalities within Simcoe County.

Most of this growth has occurred in the west of Orillia in an area bounded by Highway 12 in the north, Highway 11 in the east, Old Barrie Road in the south and Line 15 N in the west. One of the main reasons for this growth is likely the area's easy access to the provincial highway network presenting an opportunity for quick access to neighbouring municipalities such as the City of Barrie along with attracting people that prefer a suburban setting at a fraction of the cost in Barrie but still within a reasonable travel distance to employment opportunities.

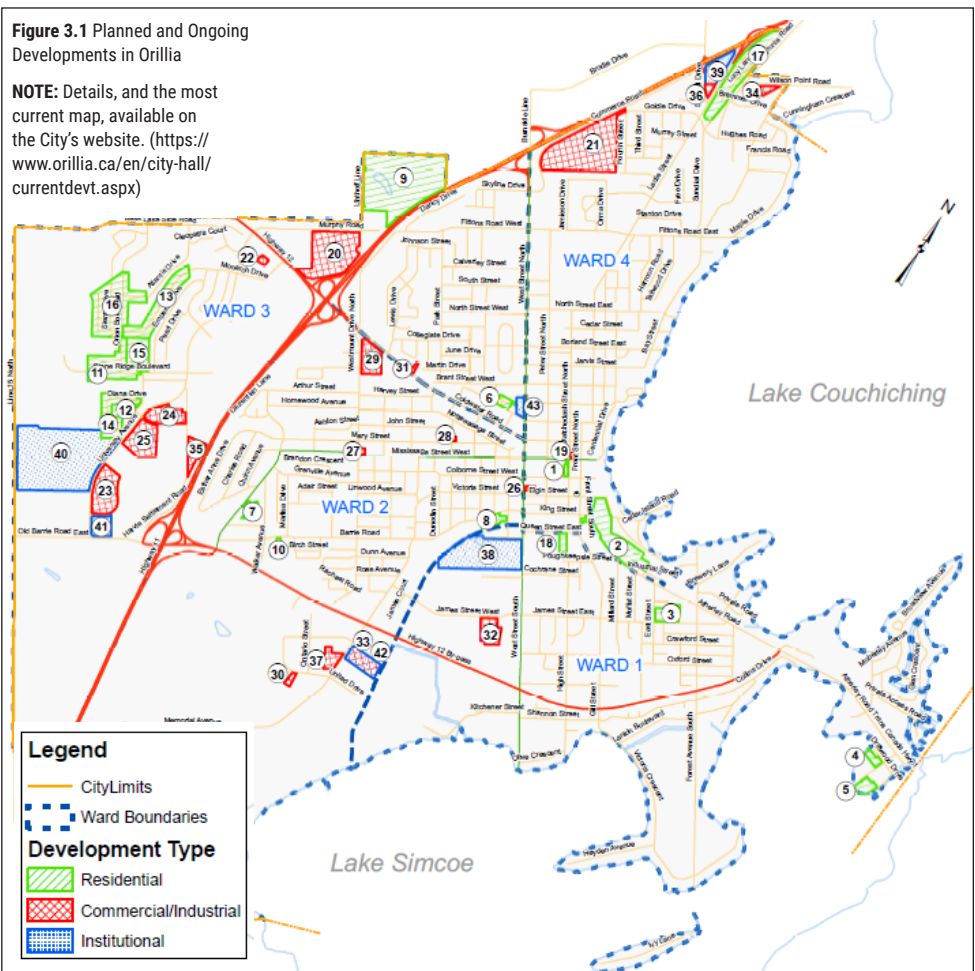
Provincial growth projections for Orillia over the next 20 years forecast a 41% increase in population and a 48% increase in employment by the year 2036, which would yield a population of around 44,000, or 12,800 new residents, and an additional 7,200 jobs as summarised in **Table 3.2**.

Similar to historical growth, the majority of new residents are anticipated to be accommodated within Orillia's west end, particularly between West Ridge Boulevard/ University Avenue and Line 15 N, as well as within the Downtown core as infill development as visualized in **Figure 3.1** showing the City's planned and ongoing developments.

Table 3.1 Historical Population Growth | 2006-2016

Jurisdiction	2006	2011	2016	Annual Growth (%)
Orillia	30,259	30,585	31,165	0.3%
Barrie	128,430	136,063	141,434	1.0%
Innisfil	31,175	32,727	36,566	1.7%
Bradford West Gwillimbury	24,039	28,077	35,325	4.7%
New Tecumseth	27,701	30,234	34,242	2.4%
Simcoe County	422,204	446,063	479,650	1.4%
Ontario	12,160,282	12,851,821	13,448,494	1.1%
Canada	31,612,897	33,476,688	35,151,728	1.1%

Source: Statistics Canada - Community Profile, 2016



Source: City of Orillia Development Status Map, 2018

Both West Orillia and Downtown are anticipated to account for over 70% of population and 60% of employment growth by 2036 as summarised in **Table 3.3**. Additionally, Orillia's south-east area which is already an area with dense employment activity, is expected to continue to have a relatively significant draw for employment as greenfield commercial/industrial zoned land in the area is developed.

Half of the population growth (50%) in the City is planned to be accommodated through low-rise singles, semis and townhouses as summarised in **Table 3.4**. However, higher density developments such as apartments and rows will comprise the other half as new retirement communities are built, and higher-density infill development occurs along the Waterfront and Downtown.

While not explicitly quantified in terms of forecasted development, it is expected that a portion of future infill development in the Downtown will be mixed-use comprising residential and commercial land uses. Mixed-use developments present an opportunity to bring a mixture of land uses and development types together to promote higher densities, sustainable modes, as well as live/work opportunities.

Despite growth in population, employment is expected to grow at about half the rate of population creating disproportionate growth in population compared to jobs at a rate of nearly 2:1 as visualized in **Figure 3.2**.

According to Provincial Growth forecasts, the majority of employment growth in the region will be accommodated within the City of Barrie, as well as York Region and other municipalities south of Orillia. This will result in approximately 100,000 new jobs being created in Barrie and the rest of Simcoe County creating a significant draw and opportunity for Orillia's working-age population to fill those positions. Forecasts for future external population and employment are summarised in **Table 3.5** in the following section.

Table 3.2 Future Population and Employment Forecasts | 2016-2036

Demographic	2016	2026*	2031	2036
Population	31,165	37,722	41,000	44,000
Employment	14,840	19,613	21,000	22,000

*Back-estimated based on a linear growth rate between 2016 and 2031
 Source: Provincial Growth Plan for the Greater Golden Horseshoe, 2018

Table 3.3 Future Population and Employment Forecasts by Area | 2016-2036

Area	Population Growth	Employment Growth
Downtown Orillia	+4,600	+207
North Orillia	+1,514	+983
South-East Orillia	+1,098	+1,317
South-West Orillia	+1,505	+484
West Orillia	+4,117	+4,169
City of Orillia	+12,835	+7,160

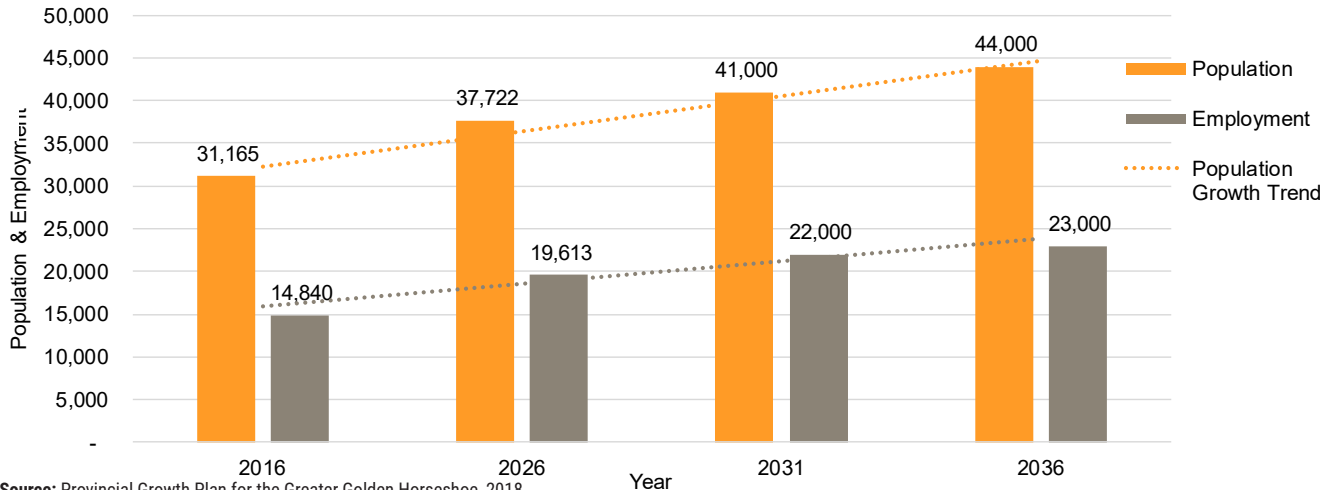
Source: Estimate based on: Provincial Growth Plan for the Greater Golden Horseshoe, 2018

Table 3.4 Future Forecasted Developments in Orillia | 2016-2031

Year	Singles & Semis	Rows	Apts	Total
2016-2023	970	359	528	1,857
2024-2031	1,253	499	783	2,535
Total	2,223	858	1,311	4,392
%	50%	20%	30%	100%

Source: Development Charges Background Study, 2017

Figure 3.2 Projected Population & Employment forecasts in Orillia by 2036



Source: Provincial Growth Plan for the Greater Golden Horseshoe, 2018

3.2 Future Forecasts

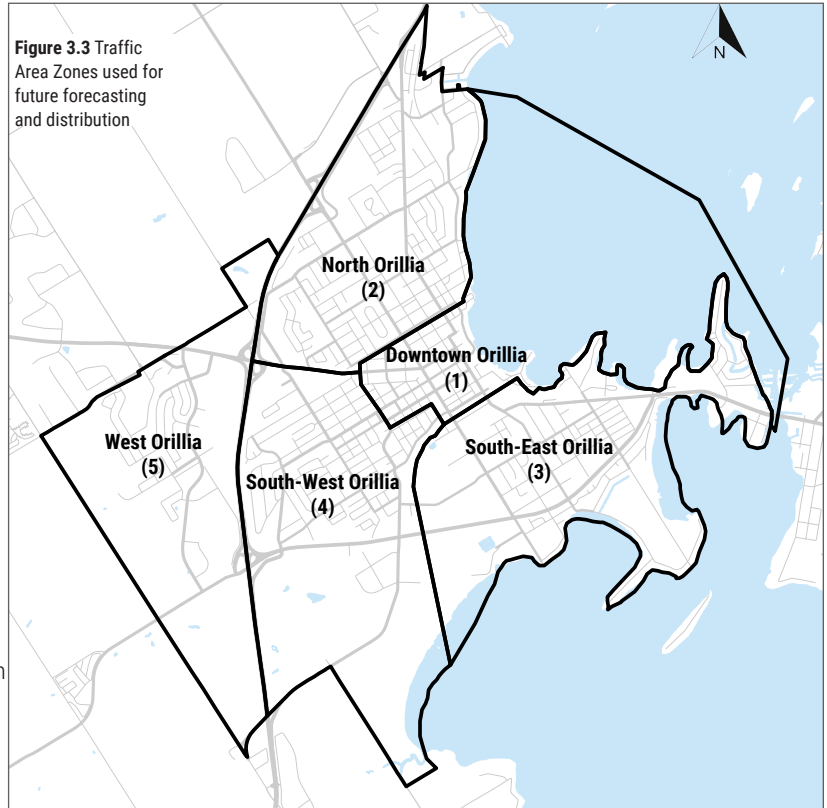
Methodology

To forecast trip growth at a more granular level within Orillia, population and employment growth forecasts were disaggregated and distributed between five Transportation Tomorrow Survey (TTS) Traffic Area Zones (TAZ) that comprise the City's boundaries (see **Figure 3.3**).

The City of Orillia development summary map and associated data was used to identify the distribution of population growth based on planned dwelling units by TAZ, while employment growth was based on commercial/industrial/institutional square footage. Residential and employment growth for the city was proportionately split between each of the zones based on their forecasted population and employment sizes as summarized in **Table 3.5**.

The results of this distribution of growth show that most population growth will be split between infill development in the Downtown/Waterfront and West Orillia, whereas employment growth is expected to primarily be focused in West and South-East Orillia. This broadly conforms with planned land uses and growth areas identified in the City's Official Plan.

Growth in other municipalities were grouped into broad regions. While the Provincial Growth Plan provides future population and employment figures, it does not provide the existing numbers. To calculate the growth, 2016 population figures were obtained through census data while 2016 employment figures were estimated based on a present value calculation using the linear growth rate between the



2031 and 2036 forecasts. Overall it is anticipated that external population and employment will grow by up to 39% and 26%, respectively by 2036 as summarised in **Table 3.5**.

With a direct highway connection to urban areas south of the City that are anticipated to far outpace Orillia for jobs, it is likely that Barrie and other Simcoe County municipalities would present enticing areas for future residents to work considering

Table 3.5
Aggregated Future Forecasted Population & Employment by internal and external traffic area zone | 2016-2036

TAZ	Description	Population			Employment		
		2016	2036	Growth	2016*	2036	Growth
1	Downtown Orillia	2,754	7,354	4,600 (+167%)	3,974	4,182	207 (+5%)
2	North Orillia	10,490	12,005	1,514 (+14%)	2,721	3,704	983 (+36%)
3	South-East Orillia	8,359	9,457	1,098 (+13%)	1,489	2,806	1,317 (+88%)
4	South-West Orillia	7,163	8,668	1,505 (+21%)	4,738	5,222	484 (+10%)
5	West Orillia	2,399	6,516	4,117 (+172%)	1,917	6,086	4,169 (+217%)
Sub-Total City of Orillia		31,165	44,000	12,835 (+41%)	14,840	22,000	7,160 (+48%)
Barrie		141,434	231,000	89,566 (+63%)	59,951	114,000	54,049 (90%)
Resto of Simcoe		307,051	456,000	148,949 (+49%)	100,303	141,000	40,697 (+41%)
York Region		1,109,909	1,700,000	590,091 (+53%)	612,318	840,000	227,682 (+37%)
Durham Region		645,862	1,080,000	434,138 (+67%)	257,228	390,000	132,772 (+52%)
Peel Region		1,381,739	1,870,000	488,261 (+35%)	733,093	920,000	186,907 (+25%)
Toronto		2,731,571	3,300,000	568,429 (+21%)	1,581,805	1,680,000	98,195 (+6%)
Other External Areas (GTHA)		2,786,920	3,996,000	1,209,080 (+43%)	1,319,606	1,814,000	494,394 (+37%)
Sub-Total External		9,104,486	12,633,000	3,528,514 (+39%)	4,664,304	5,899,000	1,234,696 (+26%)

Sources:
Provincial Growth Plan for the Greater Golden Horseshoe, 2018

* Present value calculation for 2016 employment based on linear growth between 2031 and 2036

the relatively low number of jobs that are anticipated to be created within the city.

Future transportation network trip growth was estimated by applying 2036 population and employment growth rates to existing trips based on purpose. Existing trip distribution and mode split data were obtained from the Transportation Tomorrow Survey and split into four main trip purposes including: work-related trips, school-related trips, discretionary trips, and non-home-based trips.

Growth rates were applied to the existing network trips and re-distributed based on the Fratar method which distributes total trips for each zone based on interzonal movements and relative attractiveness of each movement. This results in the future trips estimated for any zone being distributed to movements involving that zone in proportion to the existing trips and the expected growth between it and each other zone. This method is expressed through the following equation with the resulting Origin-Destination matrix outputs provided in **Appendix C** of this MTMP:

$$T_{i-j} = t_{i-j} \times \frac{P_i}{p_i} \times \frac{A_j}{a_j} \times \frac{\sum_k t_{i-k}}{\sum_k \left[\frac{A_k}{a_k} \right] \times t_{i-k}}$$

Where,

- o T_(i-j)=Future trips from zone i to zone j
- o t_(i-j)=Present trips from zone i to zone j
- o P_i=Future trips produced at zone i
- o p_i=Present trips attracted at zone i
- o A_i=Future trips attracted to zone j
- o a_i=Present trips attracted to zone j
- o k=Total number of zones

Results

The City of Orillia’s relatively small growth of 2% per year for population & employment until 2036 points to a municipality that is growing within its own right but is forecasted to experience external demand due to greater growth beyond the City’s boundaries. Over the next 20 years it is anticipated that this growth will add an average of 5,600 peak period trips onto the transportation network that will impact travel demand in terms of a larger proportion of trips going to/from external areas as new residents look to access jobs in other Simcoe County municipalities, Toronto, York Region, and Kawartha Lakes as summarised in **Table 3.6** and visualized in **Figures 3.4** and **3.5**.

Although total trips are anticipated to grow, it is estimated that there will be a decrease in internal trips as future residents look to access employment opportunities in areas beyond Orillia as a result of internal population growth outpacing employment growth.

Figure 3.4
Forecasted Trip Distribution from Orillia | 2016 - AM Peak Period

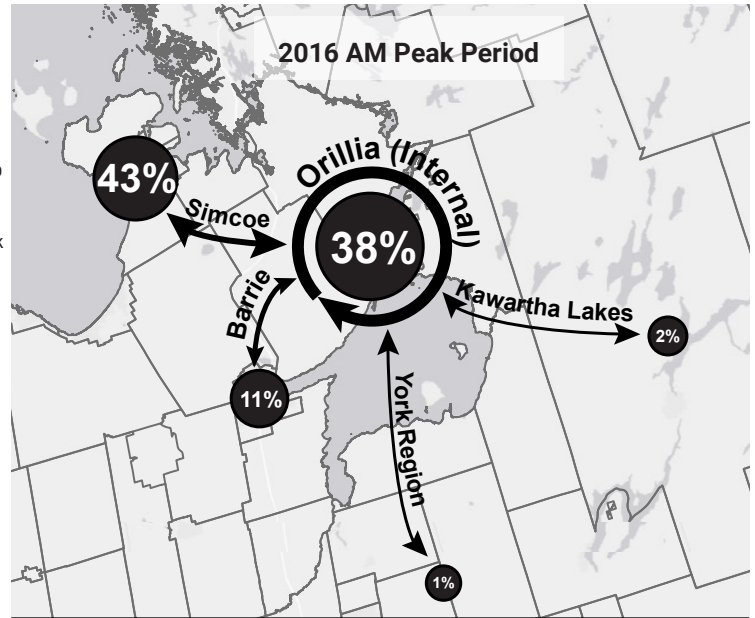


Figure 3.5
Forecasted Trip Distribution from Orillia | 2031 - AM Peak Period

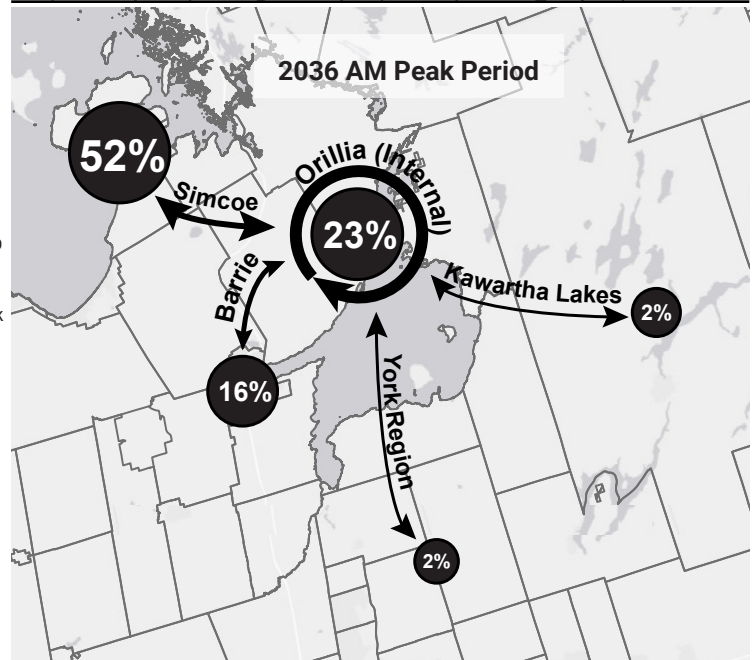


Table 3.6 Forecasted Trip Distribution | 2016 vs 2036 - AM & PM Peak Periods

Distribution	2016		2036	
	AM	PM	AM	PM
Internal	9,240	11,626	6,644 (-28%)	8,651 (-26%)
Internal->Barrie	1,425	1,717	2,668 (+87%)	2,727 (+59%)
Internal->Simcoe	2,461	7,425	3,900 (+58%)	11,041 (+49%)
Internal->Other External	1,003	1,318	1,389 (+39%)	1,896 (+44%)
Outbound Sub-total	4,889	10,460	7,957 (+63%)	15,664 (+50%)
Barrie->Internal	1,286	1,571	2,812 (+119%)	2,812 (+79%)
Simcoe->Internal	7,796	3,612	11,397 (+46%)	5,681 (+57%)
Other External->Internal	849	1,330	401 (-53%)	1,880 (+41%)
Inbound Sub-total	9,931	6,513	14,611 (+47%)	10,373 (+59%)
Total	24,060	28,599	29,212 (+21%)	34,688 (+21%)

3.3 Future Operations

3.3.1 Potential Mode Splits

Although much of our work is technical in nature, and often requires looking at historical trends for an explanation of the present; there are also qualitative and human factors among several other considerations that represent the proverbial ‘Tomorrow’ we are heading toward. Within this vein, although the future is a continually moving target, it is also one that we must attempt to account for through our analysis; and one which is intimately connected to Orillia’s local context and existing mode splits.

With the advent of autonomous vehicles and smart mobility solutions ‘Tomorrow’ has never had a more nebulous definition. A tomorrow that Orillia as a city is challenged to address as the ways in which people interact with transportation change. New ridesharing solutions such as Uber and Lyft are being introduced around North America, and locally in Simcoe County to service gaps in the transportation network, and new and emerging smart mobility solutions such as autonomous vehicles, micro-transit, e-scooters, and bike-shares are presenting new and creative ways to accommodate growth in ways that mitigate the need for continual roadway expansion.

The future is a moving target that is difficult to predict. As a result, it is important to compare a few scenarios so that the transportation network can be planned in a flexible manner that can pivot with changing demands over time. For this reason, we’ve identified three mode split scenarios that range from the status quo to more aggressive changes that would shift a considerable amount of people away from their vehicles and onto alternative modes of transportation. These scenarios are summarised in **Table 3.7** and were developed based on existing travel demand information that considers existing mode share, trip purposes, trip distance, and the planned future land uses & vision that are identified in Orillia’s Official Plan.

Table 3.7 Potential Mode Split Scenarios for future operational analysis

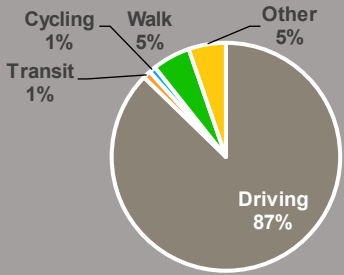
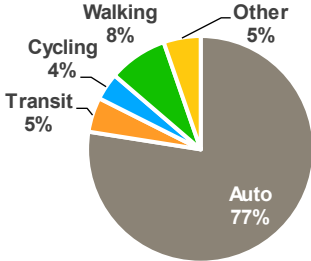
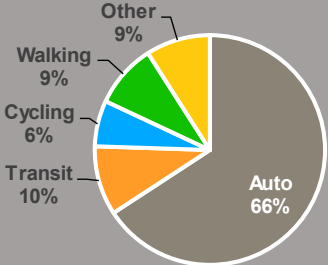
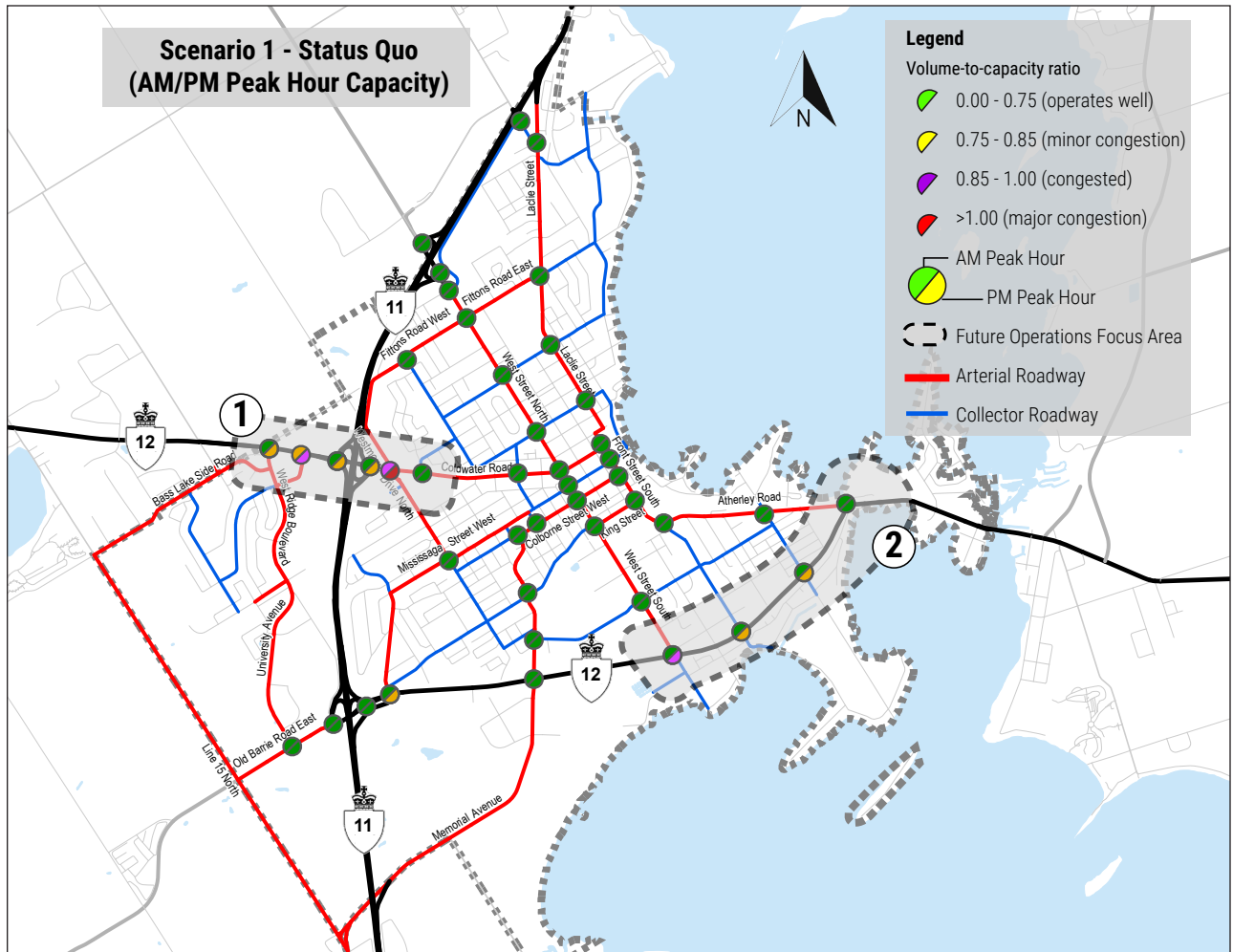
Scenario	Description	Mode Split												
<p>1 - Status Quo</p>	<p>This scenario maintains the existing mode splits as they are, likely requiring several additions to the already planned roadway improvements. The status quo would maintain a highly car-dependent transportation network with pockets of urban areas that have higher walking mode splits, particularly in the Downtown and Waterfront.</p> <p>NOTE: For the purposes of this analysis the widened Laclie Street (one lane in each direction with a centre turning lane) was assumed to be built, but we also note that it has minimal impacts on capacity at a master planning macroscopic level and the upcoming EA for the corridor will much better gauge whether widening to accommodate a centre turning lane is justified.</p>	 <table border="1"> <caption>Mode Split Data for Status Quo</caption> <thead> <tr> <th>Mode</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Driving</td> <td>87%</td> </tr> <tr> <td>Other</td> <td>5%</td> </tr> <tr> <td>Walk</td> <td>5%</td> </tr> <tr> <td>Transit</td> <td>1%</td> </tr> <tr> <td>Cycling</td> <td>1%</td> </tr> </tbody> </table>	Mode	Percentage	Driving	87%	Other	5%	Walk	5%	Transit	1%	Cycling	1%
Mode	Percentage													
Driving	87%													
Other	5%													
Walk	5%													
Transit	1%													
Cycling	1%													
<p>2 - Partial Change</p>	<p>This scenario partially shifts auto drivers onto active transportation and micro-mobility for trips under 3 km, and transit for trips under 6km at a rate of 1% per year until 2036 resulting in a mode split of 77% for automobile, 4% for cycling, 8% for walking, 5% for transit, and 5% for other emerging solutions as visualized in the figure to the right. This scenario would likely involve minor roadway improvements to enhance auto movement in key areas throughout the city, along with filling in key active transportation gaps in the existing network with connections to transit stops and facilities. This may involve micro-mobility or bikeshare solutions in specific areas of the City such as Downtown or other densely populated areas of the city.</p>	 <table border="1"> <caption>Mode Split Data for Partial Change</caption> <thead> <tr> <th>Mode</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Auto</td> <td>77%</td> </tr> <tr> <td>Other</td> <td>5%</td> </tr> <tr> <td>Walking</td> <td>8%</td> </tr> <tr> <td>Transit</td> <td>5%</td> </tr> <tr> <td>Cycling</td> <td>4%</td> </tr> </tbody> </table>	Mode	Percentage	Auto	77%	Other	5%	Walking	8%	Transit	5%	Cycling	4%
Mode	Percentage													
Auto	77%													
Other	5%													
Walking	8%													
Transit	5%													
Cycling	4%													
<p>3 - Aggressive Change</p>	<p>This scenario is more aggressive and shifts auto drivers onto active transportation and micro-mobility for trips under 3 km, and transit for trips under 6km at a rate of 2% per year until 2036 resulting in a mode split of 66% for automobile, 6% for cycling, 9% for walking, 10% for transit, and 9% for other emerging solutions as visualized in the figure to the right. This scenario would involve minor roadway improvements, likely at key intersections, accompanied by an aggressive implementation of planned active transportation facilities along with some additional pieces that integrate with an expanded transit network and other emerging mobility options throughout the city such as bike sharing, micro-mobility, ridesharing, and autonomous vehicles.</p>	 <table border="1"> <caption>Mode Split Data for Aggressive Change</caption> <thead> <tr> <th>Mode</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Auto</td> <td>66%</td> </tr> <tr> <td>Other</td> <td>9%</td> </tr> <tr> <td>Walking</td> <td>9%</td> </tr> <tr> <td>Transit</td> <td>10%</td> </tr> <tr> <td>Cycling</td> <td>6%</td> </tr> </tbody> </table>	Mode	Percentage	Auto	66%	Other	9%	Walking	9%	Transit	10%	Cycling	6%
Mode	Percentage													
Auto	66%													
Other	9%													
Walking	9%													
Transit	10%													
Cycling	6%													

Figure 3.6 Future 2036 Peak Hour Capacity under Scenario 1 - Status Quo conditions



3.3.2 Status Quo

Future 20-year (2036) roadway operations were analysed assuming Scenario 1 – Status Quo mode splits applied onto the existing road network with no changes. This reflects the worst-case scenario in which trip growth is applied to the network, but no improvements are added.

Under Future 2036 AM Peak hour traffic conditions most intersections operate within capacity. Only two intersections are anticipated to experience significantly deteriorated operations as visualised in **Figure 3.6**. These intersections are: Coldwater Road West at Westmount Drive North, and Highway 12 at Monarch Drive. These intersections are already currently constrained by significant turning movements at the westbound left and northbound right-turns at Monarch Drive as well as eastbound right, and northbound left-turns at Westmount Drive North to access Highway 11 as well as access commercial areas in Orillia on the west and east of the highway corridor.

Similar to the AM Peak Hour, under Future 2036 PM Peak Hour traffic conditions most intersections operate at acceptable levels of service with some intersections at or approaching capacity within the vicinity of the Coldwater Road West & Highway 11 interchange as well as two intersections along Highway 12 at West Street South, and at Gill Street as visualised in **Figure 3.6**. The intersections that

are expected to approach capacity at Coldwater Road West & Westmount Drive North, and at Monarch Drive in the AM Peak Hour operate at or over capacity with the adjacent Highway 11 ramps intersections experiencing volumes that further constrain this entire stretch of Highway 12 between Monarch Drive and Westmount Drive North. This is a result of increases in external trip growth that is anticipated to use Highway 11 to access other external markets for work-related trips. Along Highway 12 at West Street South and at Gill Street high through eastbound and westbound movements in conjunction with shared right-turning movements deteriorate operations.

Overall, the major anticipated pinch-points on the future road network revolve around the provincial highway corridors and the natural funnel that is created at crossing corridors such as Coldwater Road, or Old Barrie Road to cross between the major West Orillia growth area and the rest of the city. This results in two focus areas that are visualized in **Figure 3.6**:

- **Focus Area 1:** The Coldwater Road / Highway 12 / Highway 11 interchange area - between Monarch Drive in the west and Westmount Road in the east; and
- **Focus Area 2:** The Highway 12 By-pass area - Between Mississauga Street in the west and Atherley Road in the east.

3.3.3 Recommended Mode Split Targets

A multi-scenario analysis was conducted on the focus areas to identify the potential operational improvements that could be achieved if the future potential mode splits were applied for scenarios 2 and 3 as described in **Table 3.7** in section 3.3.1.

Auto Mode share was shifted onto active transportation and micro-mobility for trips under 3 km, and transit for trips under 6 km at a rate of 1% per annum (Scenario 2), and 2% per annum (Scenario 3), respectively, until 2036. The assumption is that investments and enhancements in active transportation, transit, and emerging technology will be catalysts for mode shifts. It is important to note that only trips that fit into the distance-based ranges identified above were shifted. The rationale behind this scenario-based process is to first identify what target mode split we need to achieve to mitigate operational concerns, and then develop recommended facilities and solutions that will help achieve the target mode split. A comparison of volume-to-capacity ratios between potential mode split scenarios is visualized in **Figure 3.7**.

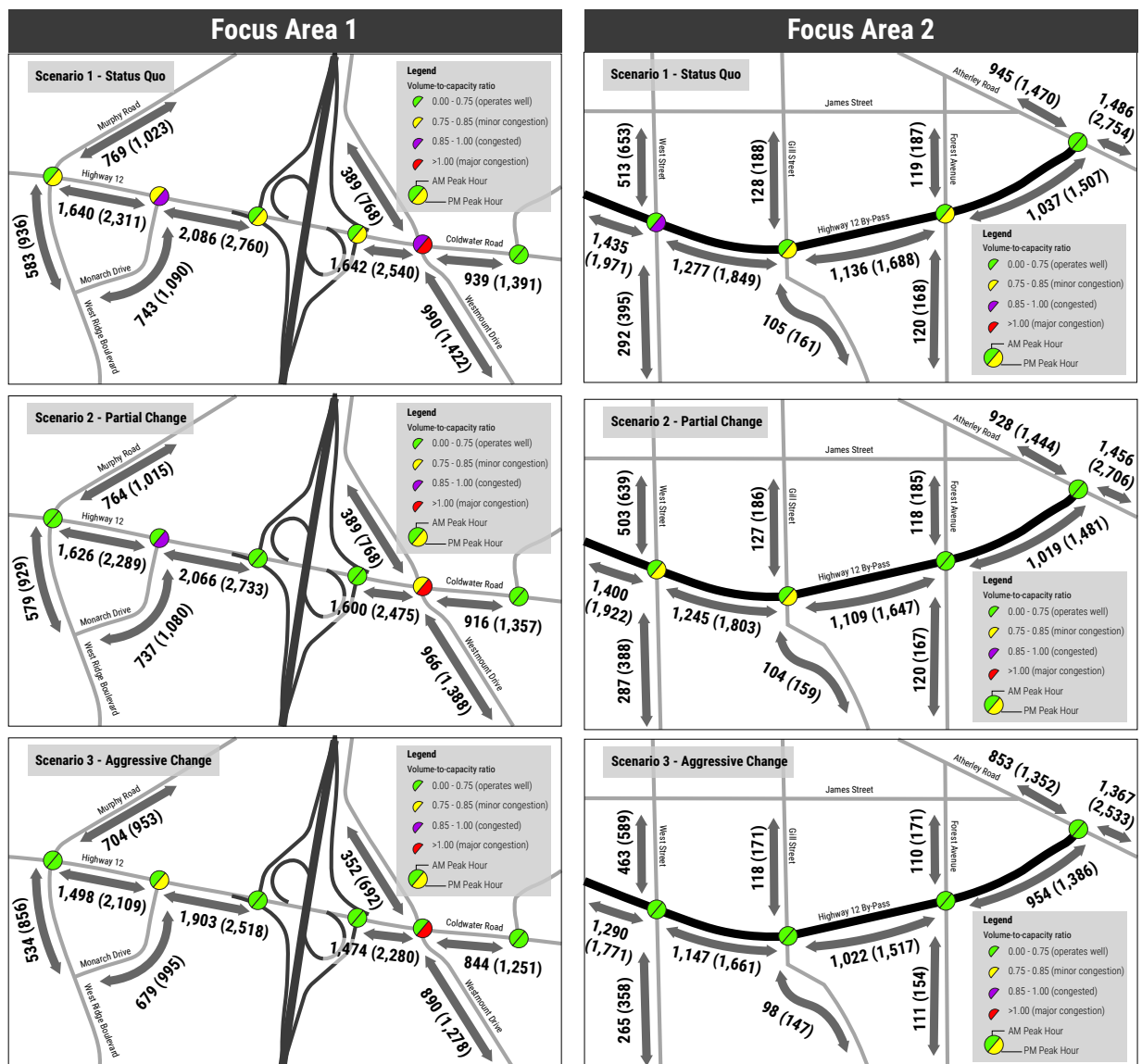
Generally, Scenario 2 – Partial Change is sufficient to mitigate most major capacity issues in Focus Area 1, and all of the major

capacity concerns in Focus Area 2. In the AM Peak hour, all intersections in Focus Area 1 are anticipated to operate well or with minor congestion, however during the PM Peak hour, Focus Area 1 is still anticipated to experience congestion at the intersections of Highway 12/Monarch Drive, and Coldwater Road/Westmount Drive. Despite these intersections operating at-capacity, Scenario 3 – Aggressive Change provides little additional benefit to the focus area. The analysis conducted is a high-level evaluation that did not evaluate detailed intersection operations and signal-timing enhancements, as a result it is expected, that while two intersections may operate at or above capacity in terms of vehicular volumes, there are further opportunities to mitigate operational concerns through corridor enhancements such as dynamic signal coordination, or corridor signal optimization that would negate the need to spend on costly road widenings or an additional vehicular crossing of Highway 11.

Recommended Mode Split Target

As a result it is recommended that Scenario 2 – Partial Change be the target mode split for the City of Orillia. The recommended future roadway, transit, and active transportation improvements to support Scenario 2 are detailed in Chapter 5.

Figure 3.7 Future 2036 Peak Hour Capacity between Status Quo, Partial, and Aggressive Change scenarios



3.4 Previously Planned Improvements

Roadway Plans

The previous Transportation Master Plan completed in 2011 identified several major roadway improvements that have yet to be constructed as summarized in **Table 3.8** and visualized in **Figure 3.8**.

Future 2036 forecasts identify a need for capacity improvements at key areas on Orillia's arterial road network including Coldwater Road and the Highway 12 By-Pass. While previously planned road improvements don't directly address these corridors, they do provide additional capacity and connections to growth areas such as the Waterfront via the King Street extension, operational improvements along Laclie Street, reconstruction and streetscape enhancements in the Downtown, and roadway enhancements in employment areas in South Orillia along Memorial Avenue and West Street South.

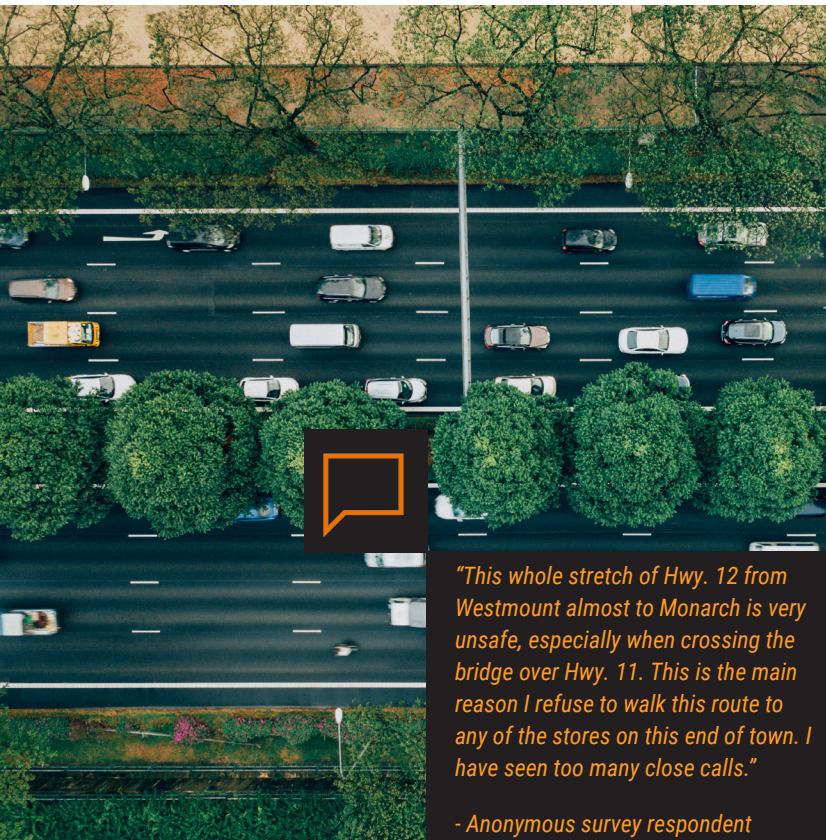
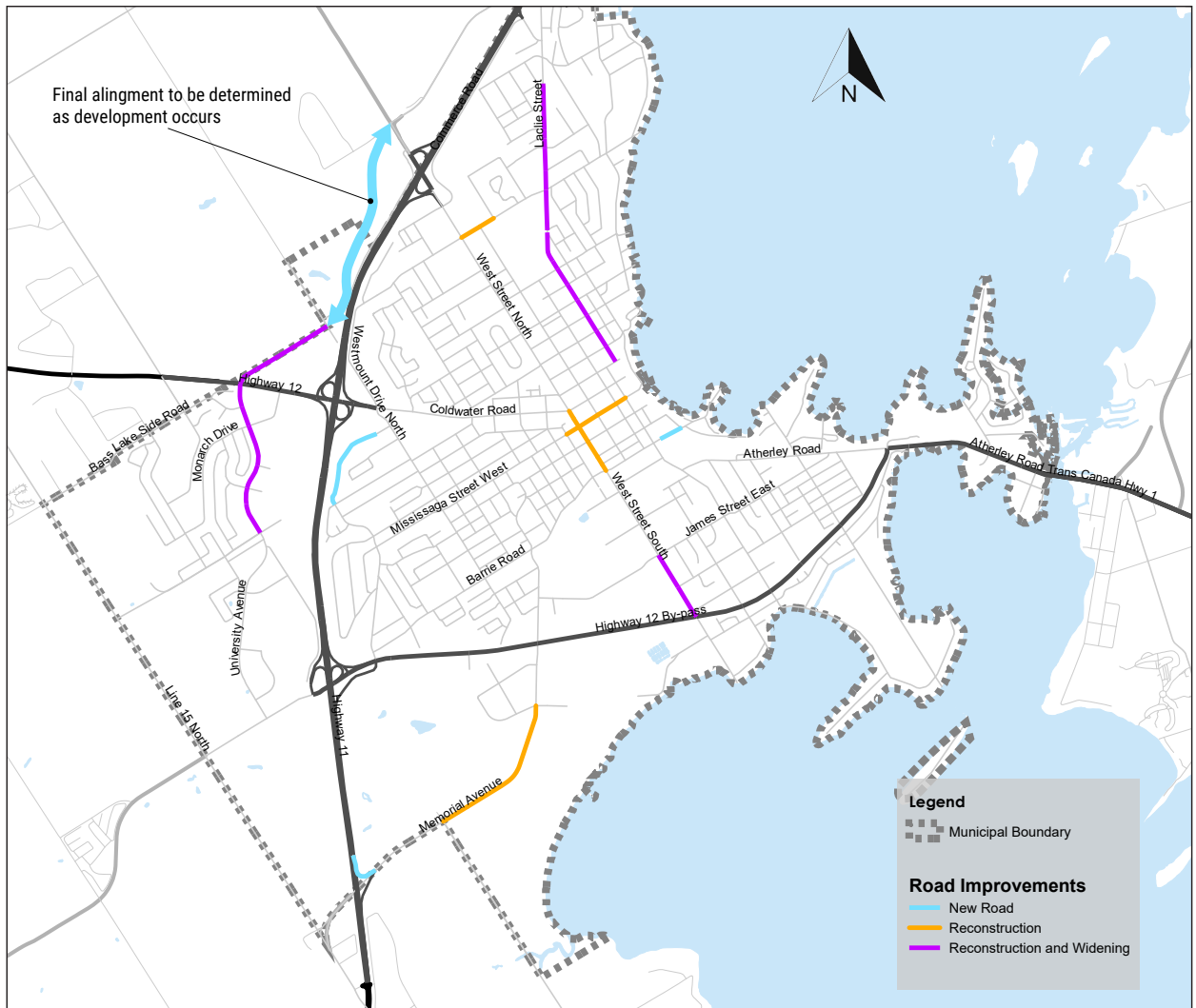
Beyond the previously planned roadway improvements, as well as recommended improvements that are identified in Chapter 5 of this document, it is expected that further operational improvements may be needed at specific intersections over time as development occurs. It is anticipated that these micro-level operational enhancements such as dedicated turning lanes, or signal updates will be determined and analyzed at the development application level in the form of traffic impact studies that will be able to provide more detailed micro-analysis of intersections than this study can account for.

Table 3.8 Recommended Improvements from the 2011 Transportation Master Plan | Yet to be completed

Location	Description	Proposed Timeline (From 2011)	Current Status
West Street - Coldwater Road to Barrie Road	Reconstruction	5 to 7 years	Not Completed
Fittons Road - Jamieson Drive to West Street	Reconstruction	6 to 8 years	Current Schedule - 2023 Construction
Laclie Street - Neywash Street to Borland Street	Reconstruct and widen to 3 lanes	4 to 6 years	Current Schedule - 2021 Construction
Laclie Street - Borland Street to Fittons Road	Reconstruct and widen to 3 lanes	6 to 9 years	Current Schedule - 2022 Construction
West Street - James Street to Highway 12	Reconstruct and widen to 4 lanes	7 to 10 years	Current Schedule - 2021 Construction
Laclie Street - Fittons Road to Murray Street	Reconstruct and widen to 3 lanes	9 to 12 years	Current Schedule - 2023 Construction
Mississaga Street - Albert Street to Front Street	Reconstruct and street scape	10 to 13 years	Currently in planning and design
West Ridge Boulevard-Hunter Valley Road to Highway 12	Construct a five-lane cross section	As required by future development	Current Schedule - 2019 Construction
Woodside Drive Extension-Mississaga Street to Westmount Drive	Connect existing sections to Woodside Drive	As required by future development	Not Completed
King Street Extension-Front Street to Cedar Island Road	Extend King Street to Cedar Island Road	As required by future development	Not Completed
Murphy Road-Highway 12 to City Limits	Widen from two lanes to accommodate and match future section to east	As required by future development	Not Completed
High Street at Highway 12	Close High Street (north & south) at Highway 12	Coordinate with unknown Highway 12 reconstruction date	Not Completed
Memorial Avenue at Highway 11	Provide north bound ramp from Memorial Avenue to Highway 11	Unknown	Not Completed
Murphy Road Extension	Extend between Highway 12 and West Street via Brodie Drive.	As required by future development	Not Completed

Source: Orillia Transportation Master Plan Update, 2011 | Council Information Package – Asphalt Resurfacing Program – Future Roadworks, 2018

Figure 3.8
Recommended
Improvements from the
2011 Transportation
Master Plan



"This whole stretch of Hwy. 12 from Westmount almost to Monarch is very unsafe, especially when crossing the bridge over Hwy. 11. This is the main reason I refuse to walk this route to any of the stores on this end of town. I have seen too many close calls."

- Anonymous survey respondent

Active Transportation Plans

Since the development of the City's Transportation Master Plan in 2011, an Active Transportation Plan was prepared in 2012. The plan was meant to guide the City of Orillia toward developing and implementing an active transportation network over the following 15+ years culminating in the implementation of over 70 linear km of cycling infrastructure. Additionally, the plan also included design guidelines and supporting policies and programs to encourage walking and cycling.

A list of the major active transportation network recommendations including Bike Lanes and Multi-Use Trails are summarised in **Table 3.9**.

Since the development of the active transportation plan in 2012, few of the recommended active transportation network improvements have been built with the exception of:

- Bike lanes along Coldwater Road - between Collegiate Drive and Front Street;
- Highway 12 By-Pass Multi-Use Trail - between University Avenue and Mississauga Street West; and
- Trail Connections along Memorial Avenue - between the Highway 12 By-Pass and Woodland Drive.

A map of the existing and previously recommended active transportation networks are shown in **Figures 3.9 through 3.12** by implementation horizon (i.e. short-term, medium-term, and long-term).

We note that Environmental Assessments (EAs) were conducted for Front Street (Between Neywash and Queen Street) and Candice/Centennial Drive (between Jarvis and Cedarland) in 2018 and 2019, respectively. Both studies assessed that the availability of existing or planned cycling facilities on parallel roadways would mitigate the need for on-road facilities on these two streets.

Since 2012 a significant amount of research has been conducted within the transportation planning industry including the development of new updated bike facility designs including the Ontario Traffic Manual - Book 18 Cycling Facilities which was developed in 2014 to guide the development of cycling facilities, as well as other documents including the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide.

The AT Plan relied heavily on multi-use paths to service areas on the periphery of Orillia which aren't always ideal or safe for pedestrians depending on the location and context. Additionally, the plan identified several corridors for bike lanes however there were no

corridors that were explicitly identified for separated facilities such as cycle tracks, or flex bollards. New industry research out of Melbourne's Monash University suggests that on roads with a painted bike lane, overtaking motorists typically gave cyclists an average of 27cm less space compared to on roads without a bike lane creating a more dangerous situation for cyclists. This is an important consideration for high-volume corridors such as Arterial Roadways, or roads prone to speeding. Despite these findings, bike lanes are still considered superior to signed routes as they visually carve out road space for cyclists and overall create greater awareness for motorists. New data and new realities within Orillia present an opportunity to recommend updates and changes to the previously planned active transportation network to enhance safety and support future mode split targets.

There are opportunities to refine the previous AT Plan to consider transportation and design data. As a result of recommended improvements in this document identified in Chapter 5, there are differences between this MTMP and the 2012 AT Plan. For future reference this MTMP should be the guiding document in the event of discrepancies.

Table 3.9 Recommended Improvements from the 2012 Active Transportation Plan (Bike Lanes / Multi-Use Trails Only) | Yet to be completed

Location	Description	Facility	Proposed Timeline (from 2012)	Status
Mississauga Street	Highway 12 to Albert St N	Bike Lane	Short-Term (0-5 years)	Not Completed
Memorial Avenue	Highway 12 to Woodland Dr	Multi-Use Trail	Short-Term (0-5 years)	Partially Completed (Highway 12 to United Dr)
Old Barrie Road / Highway 12	Line 15 N to West St S	Multi-Use Trail	Short-Term (0-5 years)	Not Completed
Fittons Road W	Park St to West Street N	Bike Lane	Short-Term (0-5 years)	Not Completed
Park Street	Fittons Rd to Coldwater Street	Bike Lane	Short-Term (0-5 years)	Not Completed
West Street S	Highway 12 to King Street	Multi-Use Trail	Short-Term (0-5 years)	Not Completed
Matchedash Street N	Coldwater Rd to North St E	Bike Lane	Short-Term (0-5 years)	Not Completed
Monarch Drive	Highway 12 to West Ridge Blvd	Bike Lane	Mid-Term (6-10 years)	Not Completed
West Ridge Boulevard	Stone Ridge Blvd to Highway 12	Multi-Use Trail	Mid-Term (6-10 years)	Partially Completed (Stone Ridge Blvd to Monarch Dr)
Stone Ridge Boulevard	West Ridge Blvd to Line 15 N	Multi-Use Trail	Mid-Term (6-10 years)	Not Completed
Laclie Street	North St to Goldie Dr/Hughes Rd	Bike Lane	Mid-Term (6-10 years)	Not Completed
Memorial Avenue	Highway 12 to Barrie Rd	Bike Lane	Long-Term (11-15+ years)	Not Completed
Coldwater Street W	Murphy Dr to Collegiate Dr	Bike Lane	Long-Term (11-15+ years)	Not Completed (Active Transportation Trails in Design and Planning)
Murphy Road	Highway 12 to Burnside Line	Multi-Use Trail	Long-Term (11-15+ years)	Not Completed
Westmount Drive N	Coldwater St to Park St	Bike Lane	Long-Term (11-15+ years)	Not Completed

Source: Orillia Active Transportation Plan, 2012 | Stantec Field observations and Google Maps, 2018

Figure 3.9 Existing Cycling Network

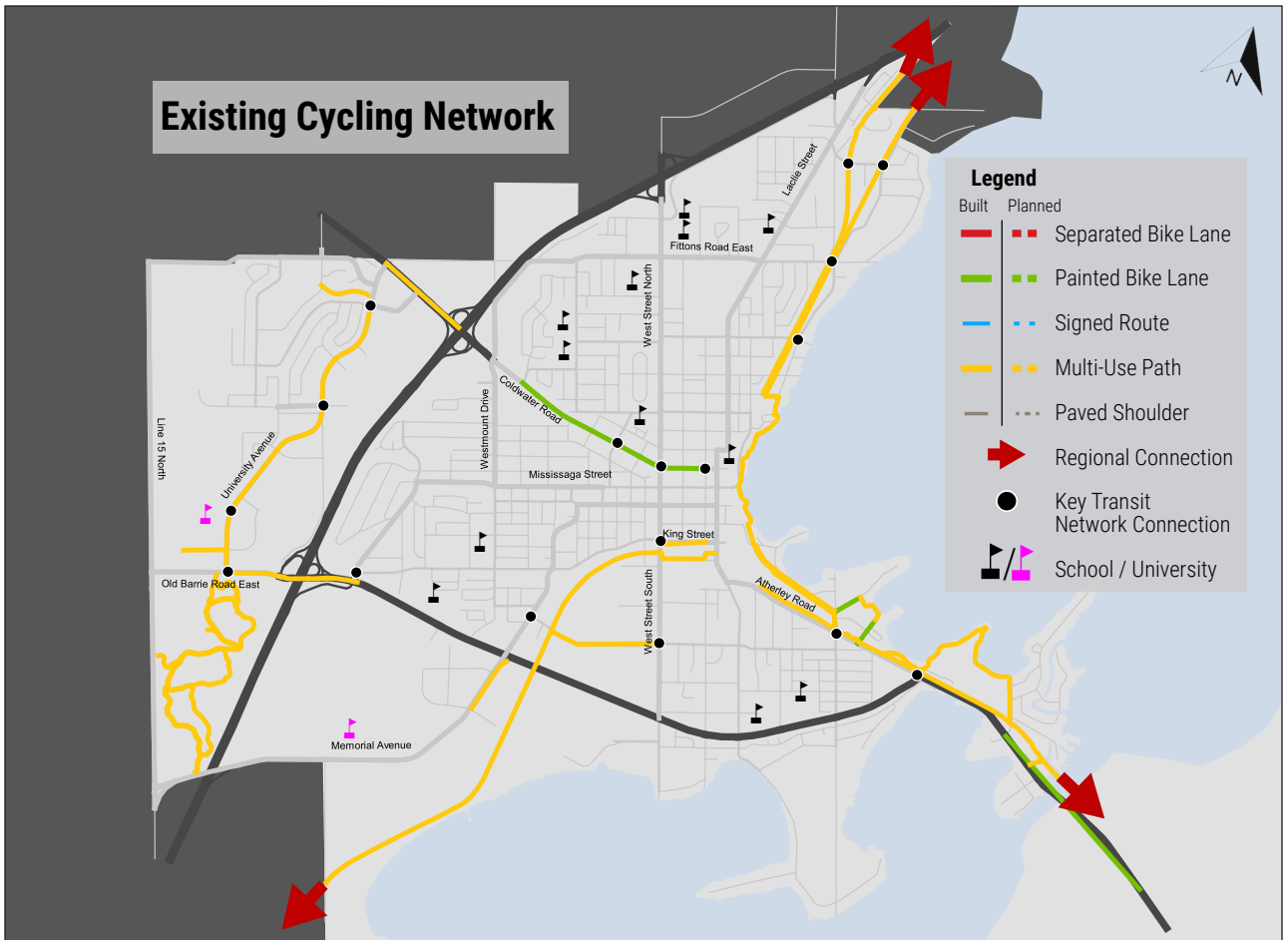
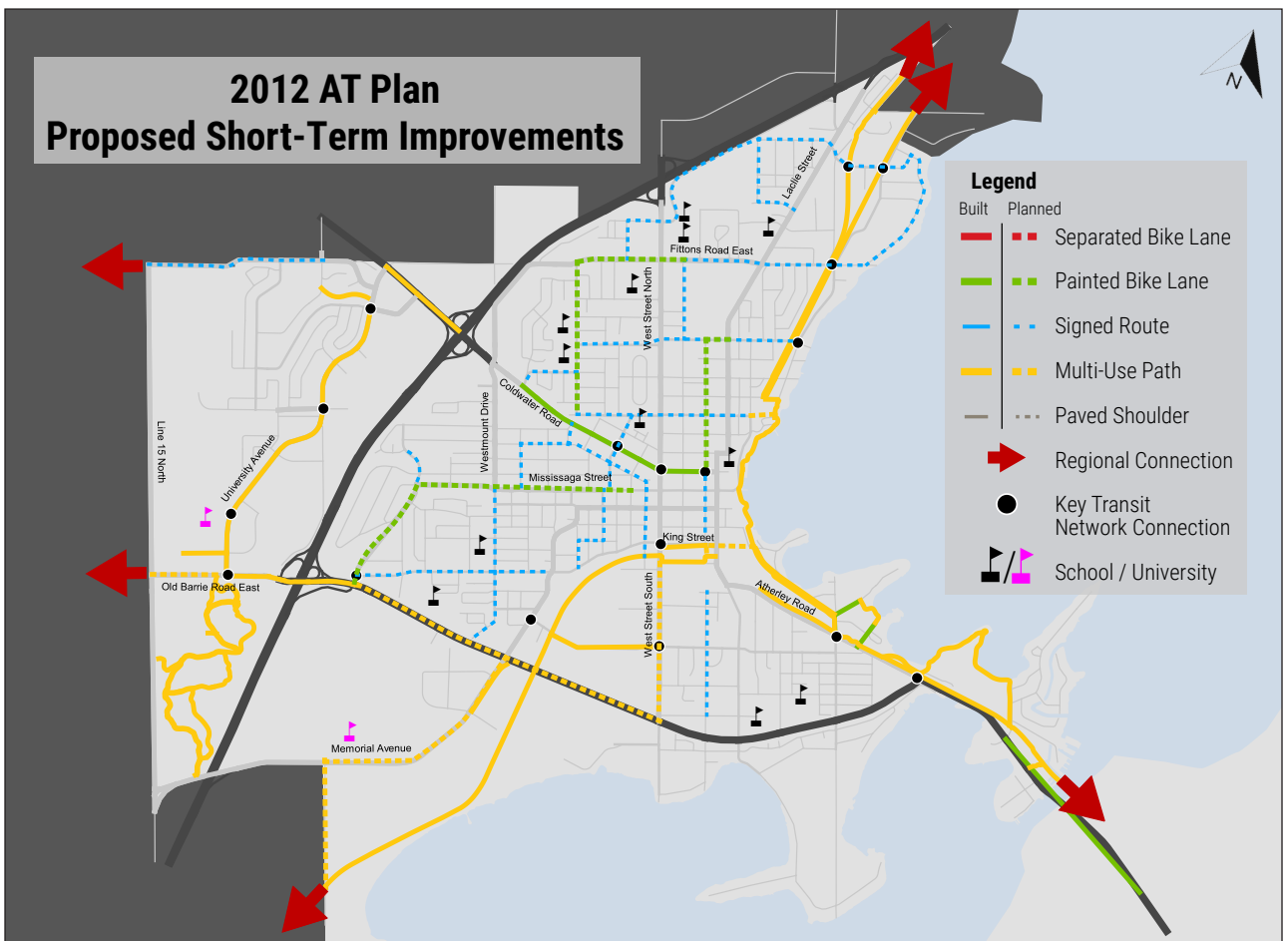


Figure 3.10 Previously Planned Short-Term Cycling Network



Source:
Orillia Active Transportation Plan, 2012

Figure 3.11
Previously Planned
Medium-Term
Cycling Network

Source:
Orillia Active
Transportation
Plan, 2012

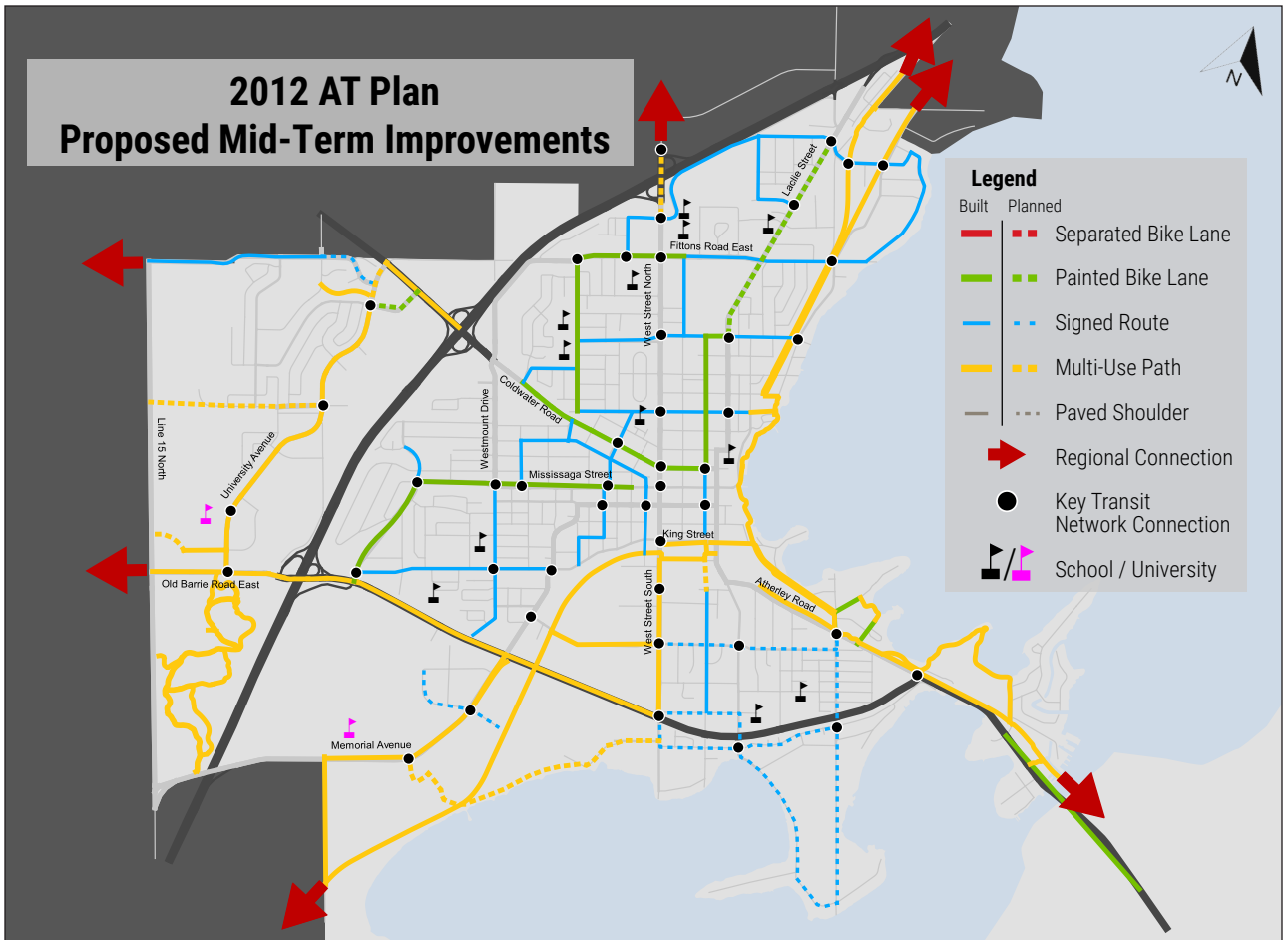
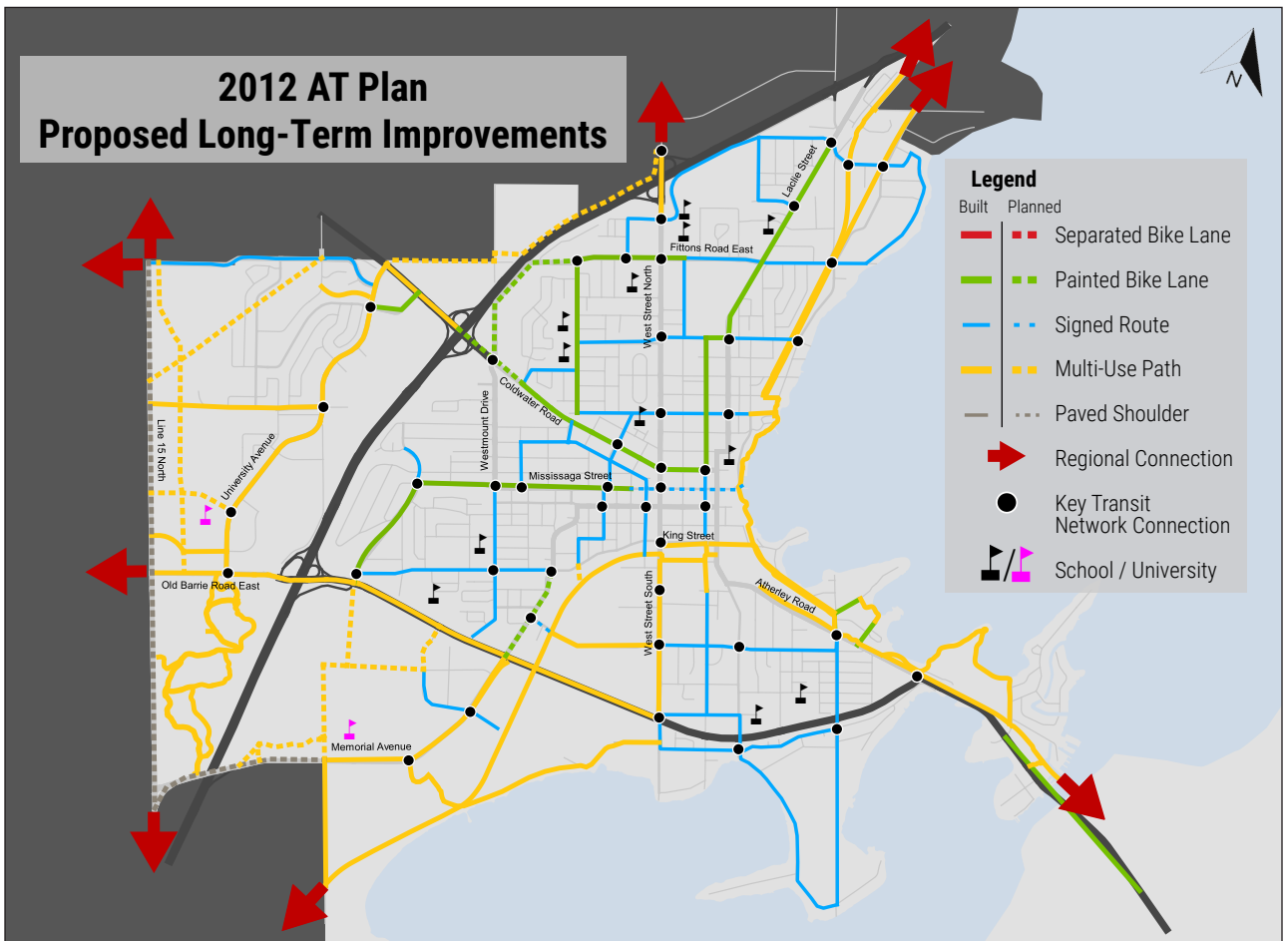


Figure 3.12
Previously Planned
Long-Term
Cycling Network

Source:
Orillia Active
Transportation
Plan, 2012



Transit Plans

The City of Orillia conducted an operational review of Orillia's Transit service in 2017 which identified a five-year transit service plan culminating in a 39% increase in service including the introduction of a sixth route to meet community priorities such as:

- o Service Reliability;
- o Extended Hours of Operation;
- o Improving Accessibility; and
- o A better bus transfer (terminal).

Table 3.10 summarises the five-year operational recommendations of the transit review, and **Figure 3.13** visualizes the proposed future route network concept including the addition sixth route (New West Ridge Route).

Additionally, several capital improvements were recommended in the transit review including:

- o Bus Fleet Replacement across three years instead of purchasing all three in one year for \$1.5 million;
- o Build three new shelters every year at a cost of \$7,500 per shelter with priority given to high ridership stops;
- o Purchase a heated shelter for the existing downtown terminal;

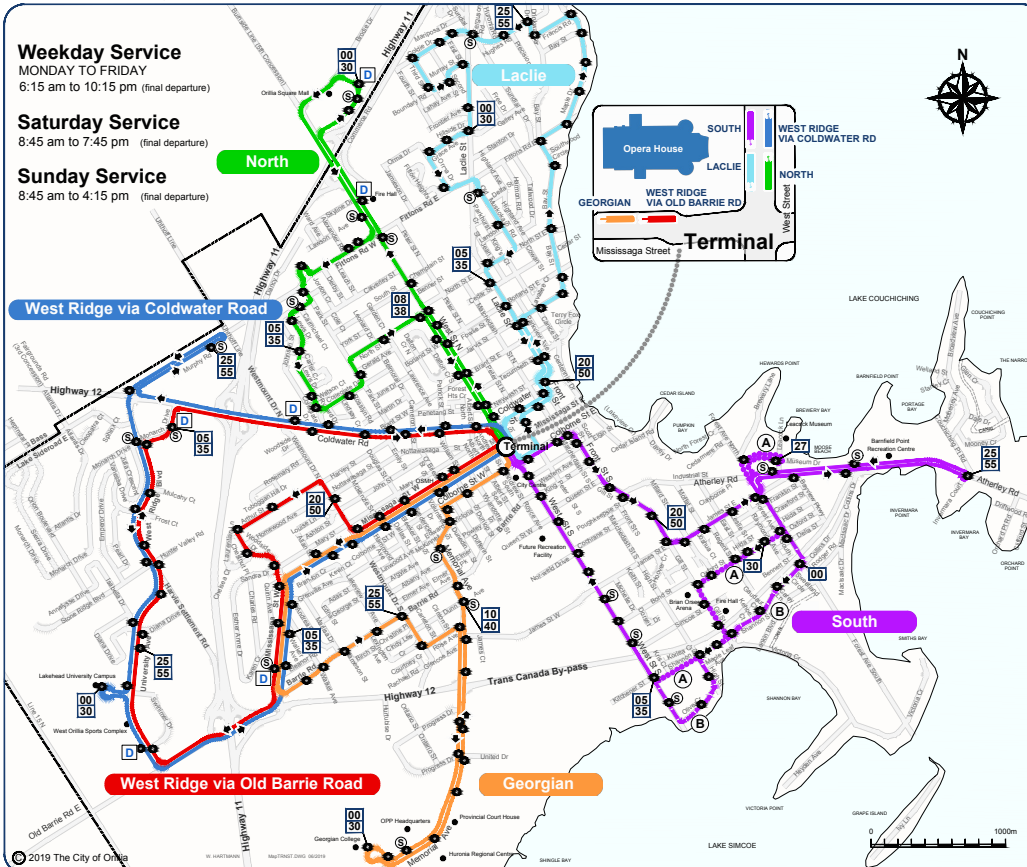
- o Conduct a high-level downtown bus terminal location and functional design study (being conducted in coordination with this MTMP);
- o Install bike racks on all 11 transit buses at a cost of approximately \$2,000 per bike rack; and
- o Determine new fare pricing strategy and further explore implementing smart card technology.

Table 3.10 Operational Recommendations of the Transit Review

Proposed Timeline	Recommendations
Quick-Wins	<ul style="list-style-type: none"> • Interlining routes such that bus circulation in the downtown is minimized and routes that are experiencing schedule adherence problems are inter-lined with routes with excess layover time. • Improve traffic signal timings at intersections along Coldwater Road in the vicinity of Highway 11.
Year 1	<ul style="list-style-type: none"> • Add Georgian Route Special bus to provide 15-minute service 2 hours in the morning peak, 2 hours in the mid-day and 2 hours in the afternoon peak. • Add new route with full service to match other bus routes.
Year 2	<ul style="list-style-type: none"> • Begin Saturday service 90 minutes earlier to accommodate early work start times. • Extend Sunday service half an hour later.
Year 3	<ul style="list-style-type: none"> • Extend weekday service by one hour to accommodate late night shifts. • Extend Sunday service half an hour later.
Years 4 & 5	<ul style="list-style-type: none"> • Service hours increase to match population growth at a rate of 1 hours of service per capita.

Source: Operational Review of Orillia Transit Service, 2017

Figure 3.13 Previously Planned Transit Route Network Concept



Orillia Transit

- North Route
- South Route
- Lacle Route
- Georgian Route
- West Ridge via Coldwater Road
- West Ridge via Old Barrie Road

Each route departs the terminal at 15 and 45 minutes past the hour providing half hourly service to each stop on all routes. Except, hourly service is provided on the SOUTH route at (A) departing terminal at 15 minutes and (B) departing terminal at 45 minutes past the hour.

- Half Hourly Service**
Departs terminal 15 and 45 minutes after the hour.
- Hourly Service (A)**
Departs terminal 15 minutes after the hour.
- Hourly Service (B)**
Departs terminal 45 minutes after the hour.
- Bus Stop**
- Terminal Transit Terminal**
- Bus Shelter**
- Dash Stop**
- Bus arrival times at stops noted in minutes after the hour

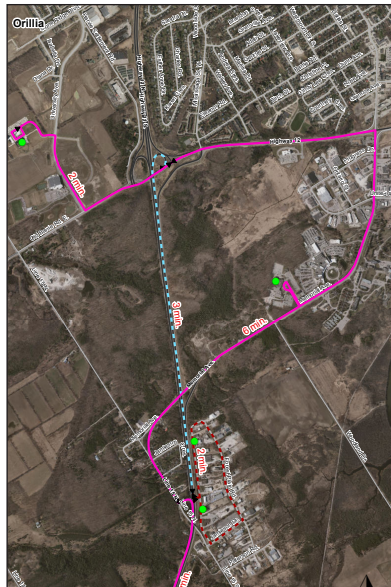


ORILLIA Effective January 2, 2019
Information: 326-8300

Source: Operational Review of Orillia Transit Service, 2017

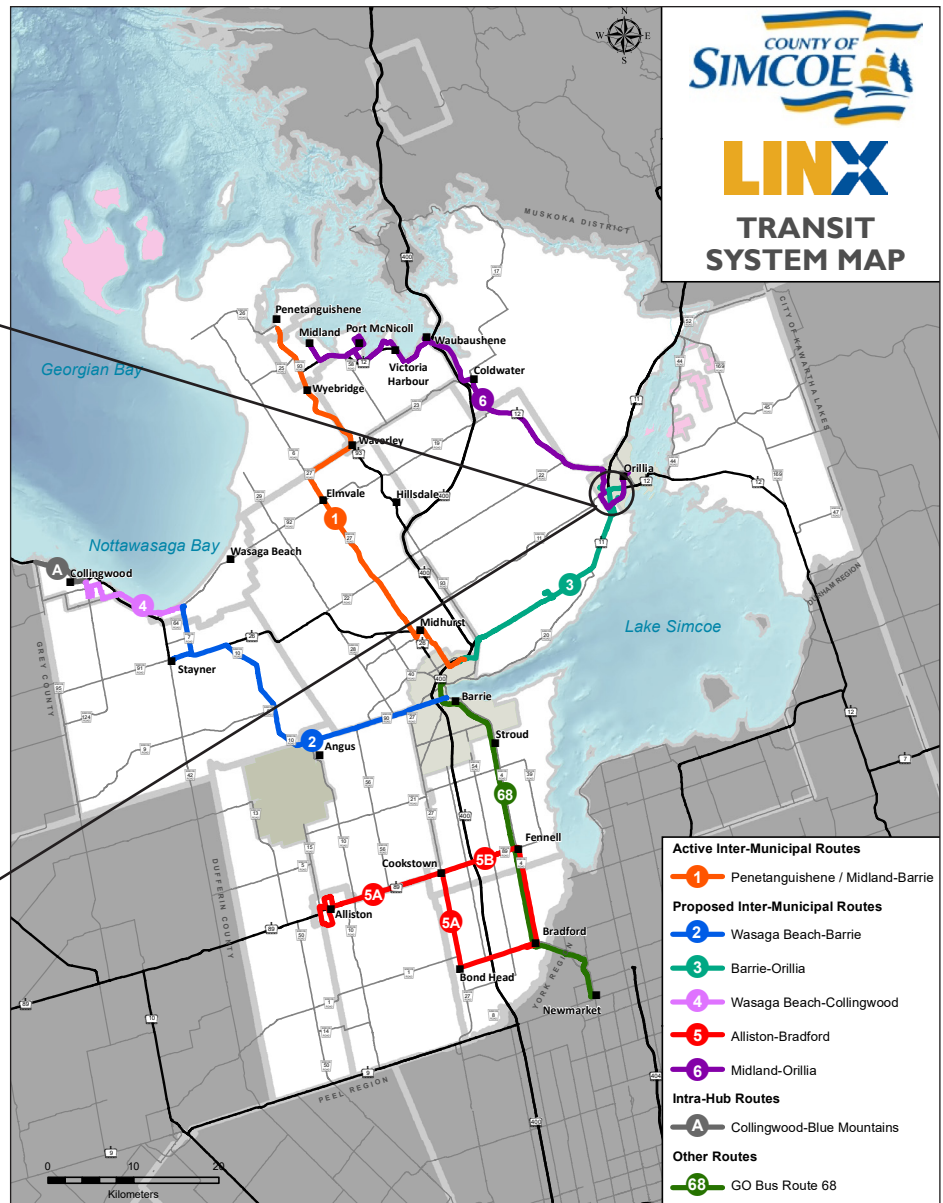
Figure 3.14
Proposed Simcoe
County LINX
Transit network

Source: Simcoe
County Committee
of the Whole
Transit Roundtable
Discussion,
September 7, 2016



"Bus routes are so long, that it is impractical for me to consider going anywhere else except downtown on the bus system."

- Anonymous survey respondent



In 2015, the County of Simcoe conducted a study on the feasibility of supporting transit in and between its various urban communities focusing on how to:

- Provide transit service to local communities;
- Improve connectivity between urban centres;
- Improve and support commuter travel at the local, regional, and inter-regional levels; and
- Support the social, environmental, and economic objectives of the County.

The County of Simcoe recently launched the first phase of its proposed county-wide transit network on August 7, 2018 under the brand LINX along with a smartcard fare payment system. This route currently operates between Midland/Penetanguishene and Barrie along with an accompanying specialized transit service called LINX+ that provides a pre-arranged door-to-door and/or service to and from conventional transit for registered users.

The County has another four (4) routes planned to be added between 2019-2021 as visualized in **Figure 3.14** including:

- Orillia to Barrie (2019);
- Collingwood to Barrie (2019);
- Alliston to Bradford West Gwillimbury (2020-2021); and
- Midland to Orillia (2020-2021).

The local LINX stops within Orillia are still being planned, however in anticipation of the expansion of County transit service the City is planning to include provisions for LINX buses at a new transit terminal when it is built. A transit terminal study for Orillia is currently being conducted; integrating outputs from this MTMP document to plan necessary multi-modal connections and facilities to support the terminal.

3.5 What we heard

Priorities

Residents identified a future need to continue to plan for automobiles, however on average respondents identified that 58% of the MTMP should focus on sustainable modes of transportation such as transit, cycling, and walking.

The preference to use a vehicle is highest amongst the oldest respondents while alternative modes of transportation (primarily transit) are preferred by younger respondents as summarised in **Figure 3.15**. This is likely impacted by the presence of Lakehead University and Georgian College which are generally more conducive of transit usage for the 20-24 age group. As residents age a preference for the automobile emerges likely as a result of employment opportunities beyond Orillia's borders that require a car to access.

Another consideration is the aging demographic in Orillia that is moving to the City to retire, along with younger residents who may not own, or be eligible to drive creating a demand for alternative forms of transportation beyond private automobiles.

Future Corridors

Through the online survey residents were able to identify corridors to be explored for automobile (**Figure 3.16**), transit (**Figure 3.17**), cycling (**Figure 3.18**), and walking.

Automobile: Generally, automobile corridors revolved around greater access across Highway 11 as well as capacity improvements along existing pinch-points such as Highway 12 By-pass, and the Coldwater Road overpass area. Respondents identified a desire to explore potentially adding additional Highway 11 crossings to mitigate operational concerns at pinch-points. Currently there are only two crossings within the City to access major commercial and retail spaces in west Orillia.

Transit: Respondents identified a need to have more direct transit routes that aren't circuitous, along with a desire to improve the existing transit terminal facilities so that transfers between routes don't require crossing vehicular traffic. The complexities with transit operations is that most of the highest utilized transit stops are on the periphery of the City with few direct connections between major nodes. Most trips currently require riders to make a transfer to get from one part of the city to another.

Figure 3.15 Survey Respondent mode priority by age group

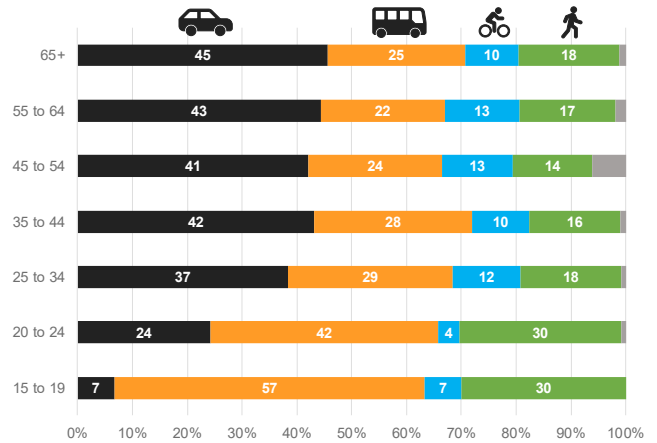


Figure 3.16 Survey identified automobile desire corridors

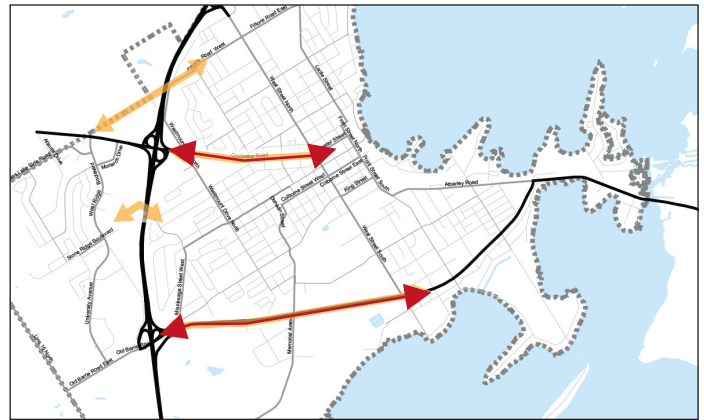
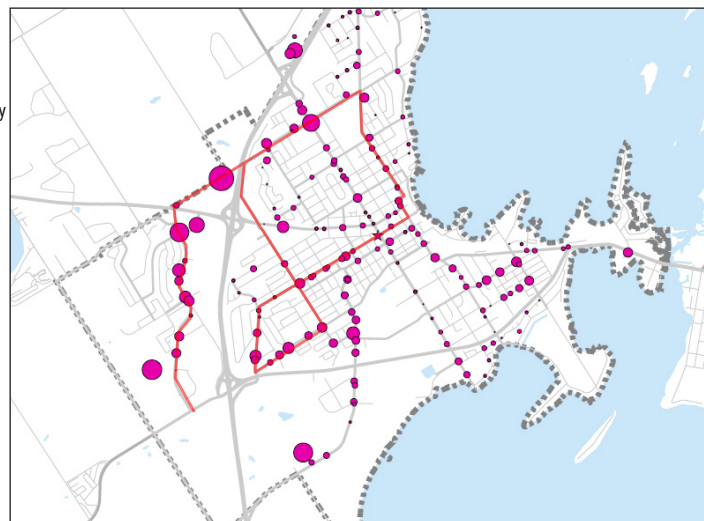


Figure 3.17 Survey identified transit desire corridors



Cycling: Residents identified a need for future cycling connections to fill in the gaps between the existing disconnected network, particularly for crossing Highway 11. Arterials such as West Street, Highway 12, and Mississauga Street were highlighted as potential cycling corridors. Additionally, several corridors were identified as opportunities to leverage infrastructure to not only provide efficient connections to work or school, but also to serve as recreational facilities themselves including connections to the County trail system, city parks, and the Waterfront.

Over half of survey respondents identified safety and comfort as the primary factor encouraging them to cycle, followed by access to facilities and travel time. This is an important distinction that separates cyclists from the broader group of road users that have specific needs and priorities that translate more toward accessibility and safety, underpinned by a broader overall desire to cut down on travel time, which is shared across all modes.



Figure 3.18 Survey identified cycling desire corridors

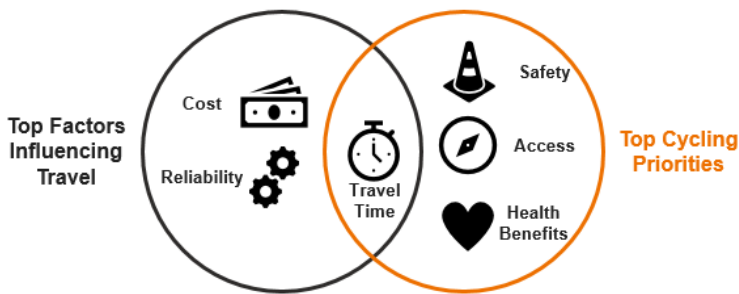


Figure 3.19 Ven Diagram of factors influencing mode choice and cycling priorities

Pedestrian: Similar to cycling corridors, the survey identified candidate pedestrian routes focused around filling-in the gaps between existing pedestrian facilities to connect to transit, as well as create a more permeable pedestrian network with better connectivity. Similar to the cycling feedback, respondents identified the opportunity for recreational pedestrian facilities and connections.

Vision

Overall, residents want an MTMP with a vision focused on sustainable forms of transportation. However, residents still acknowledge the need to plan for motor vehicles. Sidewalk safety is a vision that is consistently demanded across all age groups and areas. Residents also identified a vision toward having access to active transportation options to be able to leave their car behind as well as make use of the recreational aspects of these modes.

For a more detailed summary of online survey results, the Online Survey summary document can be found in **Appendix A**.

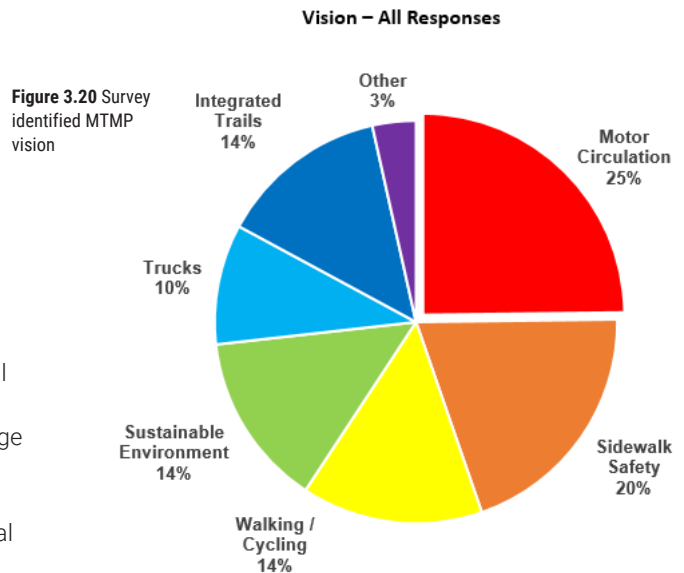


Figure 3.20 Survey identified MTMP vision

3.6 Needs & Opportunities

Five key needs & opportunities were identified through our analysis and public engagement and are summarised here:

Orillia has limited Cycling Facilities



Currently:

- Orillia's cycling network infrastructure is primarily comprised of Multi-Use trails with disconnected pieces of bike lanes culminating in 33 km of cycling infrastructure

In the future:

- The City of Orillia's active transportation plan identifies up to 160 km of additional cycling infrastructure to be built over the long term.

The **objectives** for the development of alternatives are:

Prioritize the development of a bicycle network based on:

- Needs (Safety, connection to points of interests etc.)
- Available Right-of-Way
- Connectivity to Existing Network

The **opportunities for improvement** are:

- The development of a cycling network and implementing facilities that connects trip generators in a way that doesn't create isolated sections of the network is key to gradually growing cycling mode share and providing options for safe movement across the City

External Trips to/from Orillia are anticipated to increase



Currently:

- Internal trips have been declining since 2011 leading to an annual decrease of 3% per year while external trips have been increasing.
- This growth presents impacts on the provincial roadway network that connects Orillia with employment areas.
- There is a limit as to how much growth the provincial road network can accommodate

The **objectives** for the development of alternatives are:

- Reduce travel demand by car for those travelling in and out of Orillia, especially for trips being made externally.

The **opportunities for improvement** are:

- Coordinate transit between local, regional, and provincial services to connect Orillia beyond its borders in the face of increasing external travel demand. Potential for car pool lots.
- Introduction of Simcoe County's LINX system to shift external trips onto transit and mitigate vehicular impacts on the highway network
- Introduce more sustainable modes of transportation and transit-oriented developments (TOD).

Transit Routing is Indirect



Currently:

- The current transit network is setup as a hub & spoke system despite all the major trip generators located on the fringes of the city. This requires passengers to often make two transfers to complete a round trip between one destination and another.

In the future:

- As internal trips are anticipated to decrease, there will be a need to look at directly servicing these areas and making direct connections between high-demand corridors.

The **objectives** for the development of alternatives are:

- Promote better integration between modes of transport

The **opportunities for improvement** are:

- Re-evaluate the transit network to leverage new forms of transit such as micro-transit, micro-mobility, and active transportation to allow the network to integrate with complimentary modes of transportation for more direct connections to various parts of the city.
- Provide express services to major trip destinations, and on-demand services for low-density areas that may not generate enough ridership for a full route

Most of Orillia's Residential Development is Low-Density



Currently:

- Orillia's overall housing supply is 65% low-rise and over 50% of planned development is expected to be constructed as singles or semis by 2031

In the future:

- Most of the growth in Orillia is planned to be accommodated through mixed-used developments primarily through infill in the downtown as well as greenfield development west of Highway 11

The **objectives** for the development of alternatives are:

- Promote higher-density developments in Orillia

The **opportunities for improvement** are:

- Develop complete streets and parking strategies
- Adjust Orillia's road classification to emphasize and reflect a changing transportation network
- Prioritize space for walking and cycling in designated locations in Orillia so that they may complement Transit service
- Connect the high-density areas to transit services
- Improving corridors to be able to serve multi-modal function

Provincial Highways create barriers and funnel traffic onto only a few crossing areas



Currently:

- There are currently only two highway crossings between growth areas in West Orillia and the remainder of the city
- This adds further pressure onto Coldwater Road and the Highway 12 By-pass/Old Barrie Road
- Increases travelling distance for active transportation road users, contributing to creating a disconnected sense of place between both sides of Highway 11

In the future:

- Recommended to expand upon the the City of Orillia's active transportation plan

The **objectives** for the development of alternatives are:

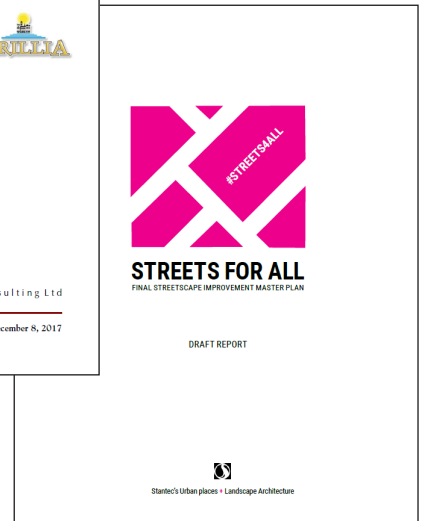
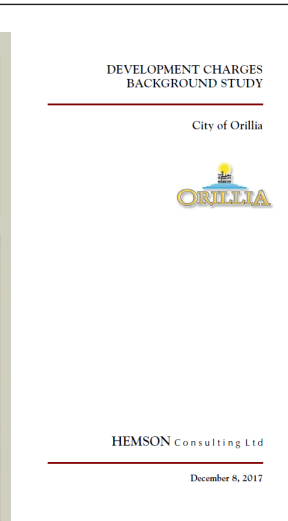
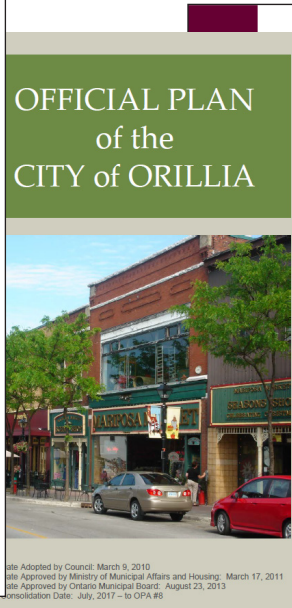
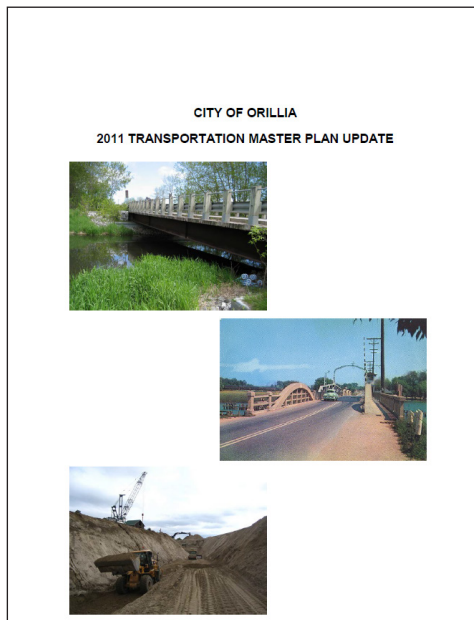
- Break down barriers presented by Highway 11

The **opportunities for improvement** are:

- Explore potential active transportation crossings of Highway 11



4.0 Foundations



4.0 Foundations

4.1 Planning Context



"In order to meet the transportation needs of our residents and those travelling in Orillia, we as the city need to evolve and improve."

- City of Orillia Mayor, Steve Clarker

The MTMP is directed by several key Provincial, County and local municipal policies that set a strong foundation to manage growth while building strong, healthy and sustainable communities.

4.1.1 Provincial

#CycleON Strategy, 2013: #CycleON is Ontario's 20-year vision through the year 2033 to have cycling recognized as a respected and valued mode of transportation within Ontario. This plan acknowledges Cycling's potential to bringing province-wide benefits in terms of personal and public health, the environment, tourism and traffic congestion. The guiding principles of this strategy are safety, partnership, accessibility and connectivity which culminate in five strategic directions including:

- Design healthy, active and prosperous communities;
- Improve cycling infrastructure;
- Make highways and streets safer;
- Promote awareness and behavioural shifts; and
- Increase cycling tourism opportunities

Provincial Policy Statement (PPS),

2014: These are the Province's policies on land use planning to promote strong communities, a strong economy and a clean and healthy environment. It requires transportation systems that are safe, energy efficient, facilitate the efficient movement of people and goods and maximize the use of the existing infrastructure. Orillia is required to plan to protect for future corridors and major goods movement facilities.

Growth Plan for the Greater Golden Horseshoe, 2017:

The Growth Plan for the Greater Golden Horseshoe ("Growth Plan") was released by the Ministry of Municipal Affairs and Housing in 2006, as Ontario's growth strategy for the Greater Golden Horseshoe region to the year 2031. The Growth Plan is a "framework for implementing Ontario's vision for building stronger, prosperous communities by better managing growth in this region". The Growth Plan complements the Provincial Policy Statement and Places to Grow Act and has the objective to develop and optimize infrastructure while protecting and enhancing natural resources and heritage. The Growth Plan forecasts a population growth of 41,000 people within the City of Orillia and requires

the establishment of a minimum density target for all City employment areas, in consultation with the Province and the County of Simcoe.

The Greenbelt Plan, 2017: The Greenbelt Plan, released by the Ministry of Municipal Affairs under the Greenbelt Act in 2005, identifies where urbanization should not occur in the Greater Golden Horseshoe region and complements the Growth Plan for the Greater Golden Horseshoe. The Greenbelt Plan is a band of permanently protected land with the objective of supporting agriculture as the dominant land use, protecting natural heritage and water systems while encouraging eco-tourism and recreation in protected areas. The Greenbelt Plan details environmental protection and restoration of Lake Simcoe including its watershed and Lake Algonquin Shoreline areas.

4.1.2 County

Simcoe Area Growth Plan, 2008: The Simcoe Area Growth Plan, completed by Hemson Consulting in 2008, establishes a growth management strategy for the County of Simcoe, City of Barrie and City of Orillia ("Simcoe County Area") in the current planning period to 2031. The Plan incorporates provincial policy including direction from the amended Planning Act and Growth Plan for the Greater Golden Horseshoe, providing a policy framework for land-use planning with the vision of building more compact and sustainable communities while protecting the County's natural environment and regional agricultural resources. The Plan iterates the importance of municipalities as a key stakeholder in implementing new density and intensification targets and exercising conformity to the growth strategy through local plans.

County of Simcoe Transportation Master Plan, 2014: The Transportation Master Plan, undertaken in 2008 and updated in 2014, is a comprehensive study of the existing transportation network with the objective of producing a transportation strategy and policy framework for the County. The Plan uses collected traffic data, projected employment and population growth figures, and input from municipal staff and the public to develop strategic multi-modal transportation direction and an implementation plan that accommodates the needs of both the existing community and planned growth over a thirty-year horizon. The Plan provides a detailed overview of Simcoe's travel demands and recommends specific capital infrastructure expansion and improvements for corridors within the overall network concept, as well as identifies strategy alternatives and design challenges.

Recommendations include endorsing the development of a County Transit Plan involving the engagement of public and private stakeholders to increase transit

services, improving design conformity of the on-road cycling network to the Ontario Traffic Manual, and introducing design guidelines aimed at improving road infrastructure for uptake in municipal official plans including sidewalk and cycling facility requirements.

Simcoe Trails Strategy, 2014: The Simcoe County Trails Strategy, produced in 2014, examines in detail the County-wide network of trails and outlines five long-term goals to facilitate development and preservation of the trail network. The five long-term goals include supporting a variety of passive trail uses, maximizing trail investments, enhancing user experience and awareness, and engaging with municipal stakeholders. The Strategy encourages partnerships for trail development and funding via County's Trails Connecting Communities program which provides \$800,000 each year to municipal trail improvements; the strategy notes opportunity to generate greater awareness of County trails and the Trails Connecting Communities program via Regional Tourism Organizations and the Ministry of Tourism, Culture & Sport.

Simcoe Muskoka Health Unity Policy

Statements for Official Plans, 2014: The Healthy Community Design Policy for Official Plans, produced by the Simcoe Muskoka District Health Unit in collaboration with stakeholders and professional planners are a set of policy guidelines that address environment, injury and safety, physical activity and sun safety, food access, social cohesion and well-being regarding official plan policies. The guideline acknowledges negative health impacts directly related to the built environment, specifically towards vulnerable populations including lower socio-economic status, children, youth, the elderly, and people with disabilities. Access to walkable destinations, transit, and active transportation networks are highlighted as cohesive elements of a healthy community.

County of Simcoe Official Plan, 2016: The Official Plan provides guidance and direction for growth, development, and land-use planning within the County of Simcoe for a twenty-year planning period. This includes detailing the policy framework for regulatory tools within the County's constituent lower-tier municipalities, which comprises zoning by-laws, plans of subdivision and consents, and municipal budgets and by-laws. The most recent County of Simcoe Official Plan was adopted by County Council on November 25, 2008 and was approved by the Ontario Municipal Board on December 29, 2016. As with all municipal official plans in Ontario, under the Planning Act, the County's Official Plan must be reviewed and updated every five to ten years.

4.1.3 Local

City of Orillia Transportation Master Plan, 2011:

The Transportation Master Plan was first introduced by the City of Orillia in 2005 with the objective of integrating transportation infrastructure policy with concurrent planning initiatives in a responsible and efficient manner over a 20-year horizon. The Plan identifies four major transportation corridors and analyses major road links for improvements including lane extensions, signalizations and reconstruction. Using input from public and private stakeholders collected through multiple public consultation and information centres, a detailed Schedule of Works was developed outlining all the construction required for completion and their associated costs and timelines. The Master Plan is to be reviewed and updated for approval by the Ministry of Environment at least once every five years to meet the requirements of the Environmental Assessment Act.

City of Orillia Downtown Parking Study, 2011: The Parking Study, completed in 2011, provides direction to inform and support future initiatives related to Orillia's public parking system. This first phase report assesses existing parking capacity, demand and forecasted needs to outline recommendations regarding public and private parking policy over a 10-year horizon. The Study ultimately recommends maintaining the level of parking supply in downtown, secure parking assets to accommodate future parking demands, and to investigate new parking financing opportunities, such as on-street permit parking.

The City of Orillia Active Transportation Plan, 2012: The Active Transportation Plan identifies the opportunity to expand Orillia's existing trail network and support active transportation planning initiatives throughout the City, providing an implementation plan for achieving this over a fifteen-year horizon. Completed in 2012, the Plan presents a detailed inventory analysis of potential trails, bike lanes and routes for connection within Orillia's Lightfoot Millennium Trail System, following input from stakeholders and members of the public. All candidate routes for expansion were evaluated qualitative route selection principles and field investigation, resulting in a network of recommended routes. A comprehensive implementation plan including short-term, mid-term and long-term phases provides construction, facility and operational costs totaling up to eleven-million.

West Orillia Employment Lands Traffic Study, 2013: The Employment Lands Traffic Study prepared in 2013, provides a traffic review of the proposed industrial development areas including the West Orillia Employment Lands, Charter Employment Lands, Lakehead University and West Orillia Sports Complex. The Study uses collected traffic data and projected employment to forecast future transportation conditions, making

recommendations on phased intersection improvements for the horizon years 2018, 2023, 2028, and 2033. This Study references and provides an update to the Orillia West Transportation Planning Study 2011, which evaluated 5- and 10-year improvement plans.

City of Orillia, Parks, Recreation & Culture Master Plan, 2014: The Parks, Recreation & Culture Master Plan sets out a strategic framework of priorities and recommendations intended to guide the development of community park, recreation, culture and trail services in the City of Orillia. The Plan provides detailed guidelines with regard to planning, financial, and implementation strategies to fulfill the City's stated objectives of parks and recreation playing an active role in the lives of the City's residents. Referencing the City of Orillia Active Transportation Plan and City of Orillia Trails Master Plan as a key document supporting the success of municipal parks and recreational facilities, the Plan makes recommendations to a horizon year of 2031.

City of Orillia Trails Master Plan, 2014: The Trails Master Plan is a companion document to the City of Orillia Parks, Recreation & Culture Master Plan, providing specific details on the development of Orillia's Lightfoot Millennium Trail System and supporting text on the expansion of overall open space networks. Trail identity and visual guidelines, including signage and accessibility are reviewed for improvement and potential budgetary costs are assigned.

Downtown Orillia Tomorrow Community Improvement Plan, 2016: The City of Orillia initiated its Community Improvement Plan to develop strategies to revitalize the City's downtown core, which includes the Historic Downtown Core, Waterfront, Hospital District and the Barrie Road and King Street/Atherley Road Corridors. The Background Study, prepared in 2016, involves a thorough review of the planning and policy context, as



well as existing conditions in the area to help develop the options available to the City to realize the Plan's goals. The Plan incorporates a community improvement needs assessment focusing on land use, building conditions and business activity in Downtown Orillia while considering urban design principles to guide development. The Study ultimately proposes a marketing strategy and phased implementation document that outlines the priorities and timelines for undertaking the various actions in the Community Improvement Plan.

The City of Orillia Official Plan, 2017: The Official Plan presents a strategy to direct the future development of the City's urban area over a twenty-year, and is consistent with the Provincial Policy Statement, the Planning Act, and the County of Simcoe Official Plan. The most recent City of Orillia Official Plan was adopted by Council on March 9, 2010 and approved by the Ontario Municipal Board on August 23, 2013. The Official Plan establishes a planning vision, guiding policies and implementation strategies to manage growth and development in the City of Orillia. It also sets out the City's priorities with respect to planning initiatives including transportation facilities, downtown redevelopment, zoning, parks and open space, heritage, and economic growth and development. The Plan articulates a vision for the City as a safe, healthy and liveable community with a vibrant downtown and interconnected trail network and is structured with the goals of ensuring that the City's growth is managed in a sustainable and efficient manner while preserving natural heritage and recreational opportunities for residents.

City of Orillia Development Charges Background Study, 2017: The Development Charges Background Study was completed in 2017 on behalf of the City of Orillia under the provisions of the provincial Development

Charges Act, which requires that such a study be prepared when a development charges by-law is proposed. The Study analyzed the costs of services provided by the City, including the costs associated with maintaining and expanding municipal transportation infrastructure, and provides growth forecasts for the City between 2017 and 2026, thus allowing for calculation of costs related to servicing that growth. Development charge rates which fully recover those costs are therefore calculated and recommended in accordance with the requirements and limitations of the Development Charges Act.

City of Orillia Pedestrian Charter, 2018: In October 2018 the City of Orillia's Active Transportation Committee presented the Pedestrian Charter that provides the municipality with guiding principles to support an encourage a pedestrian-friendly community. The charter outlines what walking means to the city as well as the over-arching elements that walking contributes toward in terms of accessibility, equity, health and well-being, environmental sustainability, personal and community safety, and community cohesion and vitality.

Downtown Orillia Streetscape Improvement Plan, 2018: A Downtown Streetscape Improvement Plan was developed by Stantec to re-imagine the Downtown and waterfront streetscapes to refresh their identity and invigorate the street economy. The Final Streetscape Improvement Master Plan responds to the site with a Flex street approach that incorporates elements necessary to enhance pedestrian and active transportation safety in the Downtown. This concept grew naturally over the course of the project through analysis of streetscape, workshops with residents and discussions with the City of Orillia.



Figure 4.1 Concept of a flex street on Mississaga Street from the Streetscape plan

4.2 Guiding Themes

Transportation networks are influenced and shaped by the communities they serve. Their role within the context of a municipality's quality of life can vary widely depending on how the community would like the network to serve them. Orillia is a modern municipality that elegantly balances its rural charm with urban vitality. It is also a diverse city comprised of several unique communities. The City's transportation and active transportation systems must reflect the City's vision to foster multi-modal transportation options that address the needs of people of all ages and abilities.

Not every trip can or should be served by alternative modes of transportation, but it must be recognized that private vehicles, transit, and active transportation are part of a larger multi-modal mobility network that works together to provide transportation for the community as a cohesive system. To that effect, it is important that the planning of multi-modal transportation services acknowledge the City's role in a regional context and provides connections to both local and regional facilities. This must all be done with a delicate balance between a focus on the people that the multi-modal transportation network serves and the City's fiscal and environmental responsibilities of maximizing the network's efficiency while reducing the dependence on private automobiles.

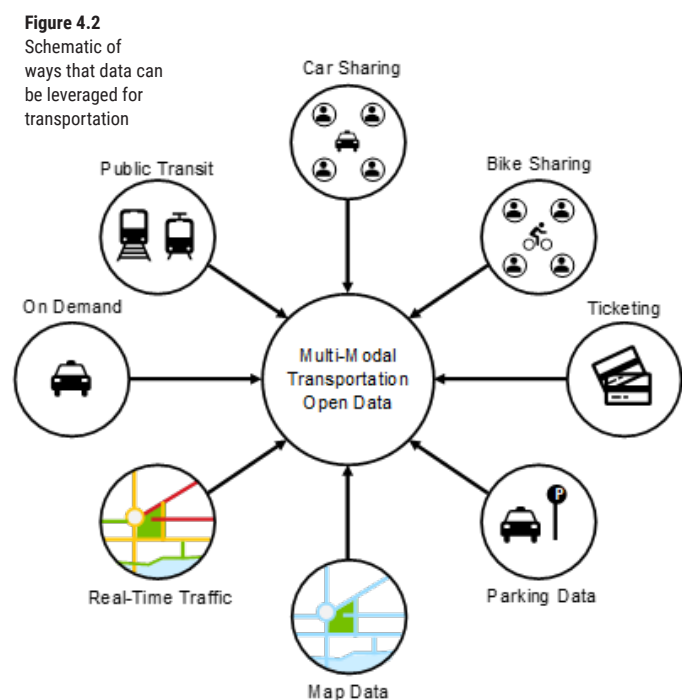
4.2.1 Smart Cities & Open Data

In 2018, the City of Orillia teamed up with Bell on an innovative Internet of Things (IOT) pilot project leveraging Bell's Smart City platform to collect, organize and centralize data from wireless IOT applications to help the City make better informed decisions on matters like municipal operations and infrastructure. While this initiative is in its infancy there are further opportunities to expand this with a focus on multi-modal transportation and associated infrastructure.

Smart cities are a new trend gaining traction across Canada and the world, whereby municipalities are starting to leverage Big Data to assist in municipal planning. A smart city is an urban area that uses different types of electronic data collection sensors to supply information which is used to manage assets and resources efficiently. In terms of mobility, traditional methods of data collection use pneumatic tubes or manual counting for automatic traffic recording which are often costly to implement, prone to high maintenance costs, and difficult to leverage for alternative modes of transportation like transit, cycling and walking. As shown schematically in **Figure 4.2**,

there are new ways to leverage information and communication technology to optimize the cost-effectiveness of data collection and the efficiency of city operations to promote a dialogue between city planners and the public and to better inform on how the city travels.

Hundreds of municipalities across Canada are leveraging open data to work with residents and businesses to develop cost-effective solutions to several issues. The expansion of open data, combined with advances in big data analytics, is freeing information that was once trapped inside the dusty pages of overlooked reports, enabling improved decision making, new product and service offerings, and greater accountability. This change comes at a time of heightened focus on data-driven knowledge and evidence-based decision making. Smart City technology and Open Data can help improve transportation-demand forecasting, prioritize transport infrastructure improvements, and synchronize the ways different modes of transportation inter-operate. For example, in Toronto the local transit agency, the Toronto Transit Commission (TTC), was able to avoid having to build their own mobile application to identify next-bus arrival times, by making their real-time vehicle GPS data open through an application programming interface (API). This avoided the need to procure a developer and handle the continual maintenance of a mobile application. This same process has been leveraged in the City of Barrie for Barrie Transit where there's been several mobile applications built using open data.



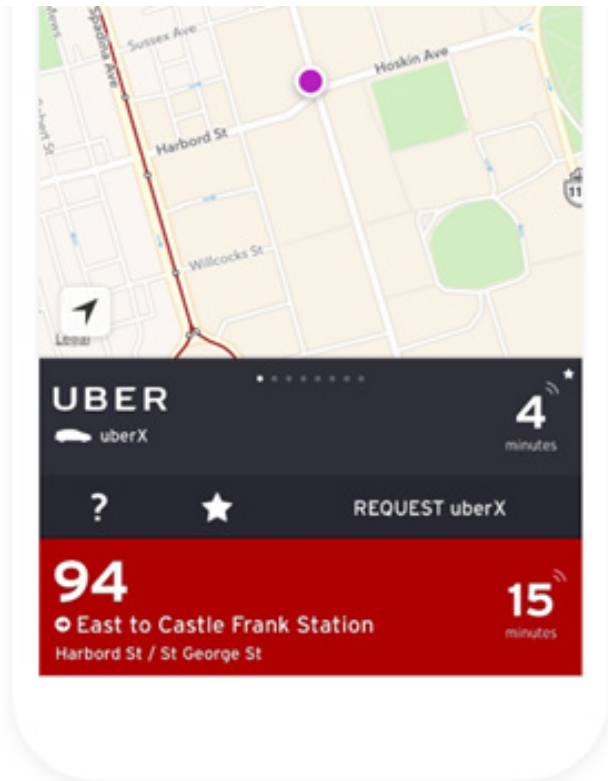


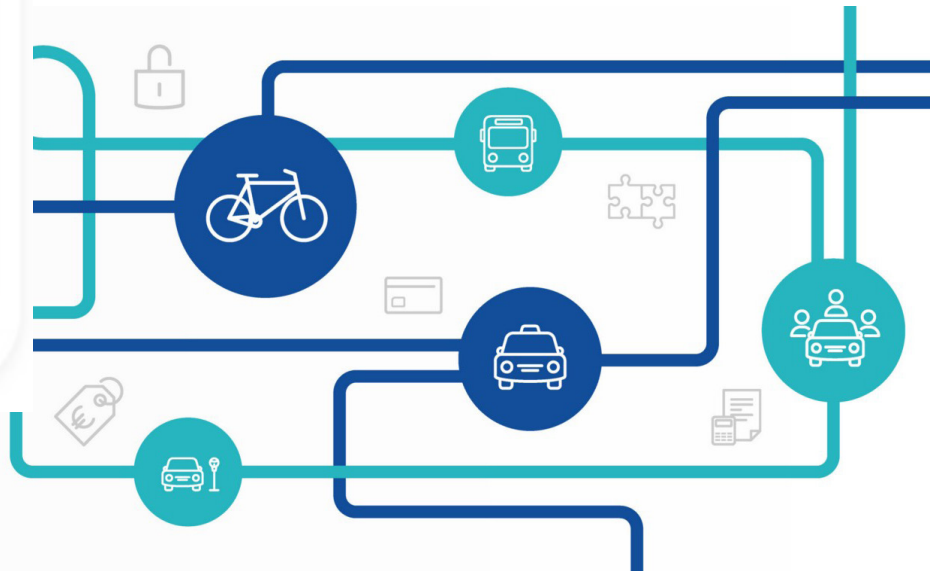
Figure 4.3 Screen of the Transit app and the integration it has with other modes

Source: transitapp.com



“MaaS is a new concept of service, combining services from public and private transport providers through a unified gateway that creates and manages the trip, which users can pay for with a single account..”

- CIVITAS - Initiative co-financed by the European Union



4.2.2 Mobility as a Service (MaaS)

Mobility as a Service (MaaS) is the integration of various forms of transport services into a single mobility service accessible on demand. To meet a municipality’s transportation demand, MaaS facilitates a diverse menu of transport options, be they public transport, ride-, car- or bike-sharing, taxi or private automobile, or a combination thereof. For residents this approach can offer added value through use of a single application or service to provide access to mobility, with a single payment channel instead of multiple ticketing and payment operations. At its most basic level, MaaS fits within a value proposition by helping residents meet their mobility needs and solve the inconvenient parts of individual journeys as well as the entire system of mobility services. The aim of MaaS is to provide an alternative to the use of the private car that may be as convenient, more sustainable, help to reduce congestion and constraints in transport capacity, and can be even cheaper.

MaaS is a relatively new concept and approach to transportation planning, with elements primarily integrated in a piecemeal fashion in many jurisdictions across North America. The most abundant form of

MaaS is via integrated ride-hailing mobility services such as Uber or Lyft and bikeshare services integrated into transit planning or maps applications such as The Transit App or Google Maps as visualized in **Figure 4.3**. In Europe and Asia various cities have managed to fundamentally change the way people search for, consume, and pay for transportation, much like how Netflix has changed video consumption. Since 2016, Helsinki residents have been able to use an app called Whim to plan and pay for all modes of public and private transportation within the city – be it by train, taxi, bus, carshare, or bikeshare. Anyone with the app can enter a destination, select his or her preferred mode of getting there-or, in cases where no single mode covers the door-to-door journey, a combination thereof-and go.

While there are obvious stark differences between the City of Orillia and Helsinki, it is important to acknowledge that MaaS can be moulded to create a localized and tailored solution that works with the available transportation assets and is scaled to the City of Orillia.

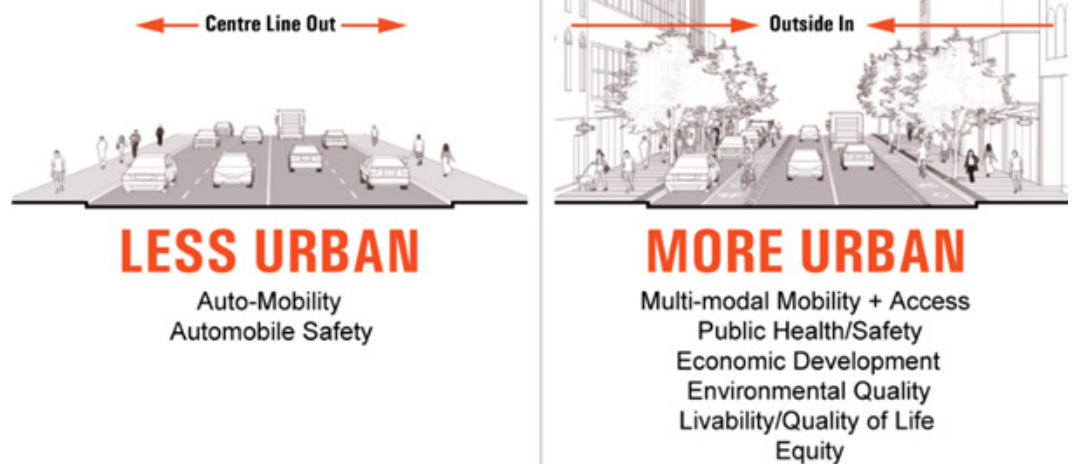
4.2.3 Complete Streets

Streets are vital places within the City of Orillia. They are the common spaces where the city comes together, where children learn to ride bicycles, neighbours meet and couples stroll. They are the proverbial front door to our homes, businesses, parks, and institutions. They reflect the values of the city and, at their best, are a source of pride for residents and visitors alike. Understanding how our transportation network can equitably be shared between different road users such as auto drivers, transit riders, cyclists, or pedestrians is imperative to promoting a multi-modal transportation network that provides a range of attractive choices for mobility by integrating all modes into a seamless network.

Complete Streets is an approach whereby streets are designed to be safe for everyone: people who walk, bicycle, take transit, or drive, and people of all ages and abilities. This ensures that transportation is planned and designed for all road users, not only motorists. There is no singular approach to Complete Streets, however, it acknowledges that a delicate balance needs to be struck between different road users and stakeholders regarding how transportation infrastructure is disseminated. The local context determines this based on the needs and opportunities that dictate the necessity for different infrastructure in different parts of the multi-modal transportation network as visualized in **Figure 4.4**. The link between Complete Streets and public health is well documented as it enhances human and environmental health by providing an environment that enables and encourages active transportation.

Since 2003, Complete Streets has seen over 1,200 policies adopted (as of July 2017) in the United States with a growing interest across Canada including Ottawa (2013) and London (2018) to name a few.

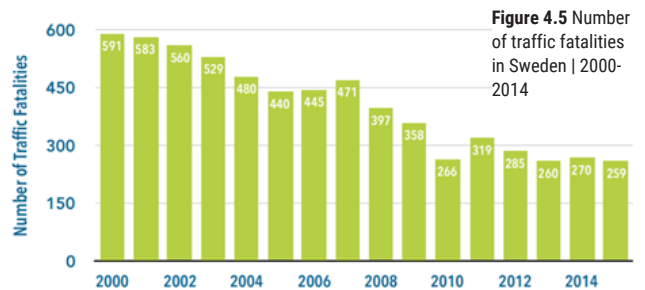
Figure 4.4 Complete Streets philosophy between planning complete streets in urban and less urban environments



Source: Toronto Complete Streets Guidelines, 2017

4.2.4 Vision Zero

Vision Zero is a multi-national road traffic safety project that aims to achieve a transportation network with no fatalities or serious injuries involving road traffic. This approach started in Sweden and was approved by their parliament in October 1997. A core principle of the vision is that 'Life and health can never be exchanged for other benefits within society' rather than the more conventional comparison between costs and benefits, where a monetary value is placed on life and health, and then that value is used to decide how much money to spend on a road network towards the benefit of decreasing how much risk. Sweden has made tremendous progress in road safety. For example, between 2000-2015 the number of traffic fatalities in Sweden decreased by over 50% as visualized in **Figure 4.5**.



Several municipalities across Canada are beginning to embrace the Vision Zero approach to road safety by implementing road safety plans and actions to reduce road-related fatalities and protect vulnerable road users. In 2015, Edmonton became the first major Canadian City to officially adopt Vision Zero with the City of Toronto soon following suit in 2017. Vision Zero is now a recognized approach toward planning for road safety with other cities including the City of Ottawa considering the potential for implementing Vision Zero.

4.3 Strategic Priorities

The City of Orillia is committed to the provision of municipal services in a sustainable manner to meet the present and future needs of the community. In 2014 a Strategic Plan to guide the City through to 2018 was created focusing on six strategic pillars including:

- Supporting Recreation:** The recreation needs of Orillia's growing and changing population is a priority for Council. The opening of the Orillia Recreation Facility in 2019, as well as diversifying recreation programming, will help ensure these recreation needs are met.
- Enable Economic Development:** Council is committed to enabling economic development by creating a sustainable economic delivery model, investing in waterfront revitalization and tourism.
- Participate in and Promote Community Wellness:** Council is committed to participating in and promoting community wellness. Combating homelessness and reducing poverty through investment in affordable housing and supporting resident and community driven initiatives that promote wellness as a priority.
- Excel in Corporate Governance and Administration:** Governance is about people, structure, institutions, policies and, above all, relationships. Council will excel in corporate governance and administration by ensuring the community is aware, engaged and consulted on important issues facing the community. Demonstrating excellence in corporate governance through the evaluation of core services, promoting staff excellence and continually reviewing by-laws, policies and procedures is a priority.
- Demonstrate Environmental Leadership:** Council will demonstrate environmental leadership by committing to brownfield redevelopment, expanding support for resident and community driven initiatives that encourage waste reduction and other environmental friendly behaviours.
- Invest in Transportation:** Council is committed to investing in transportation including public transit, bicycle routes, pedestrian accommodations, the City's trail system and other active transportation initiatives.

These six strategic pillars and their relation to the MTMP vision & objectives are summarised on the following page.

Figure 4.6 Orillia's Streetscape Improvement Master Plan identified mobility pillars in relation to how Flex Streets should function. Each project has a unique vision & objective

4.4 Vision & Objectives

A well-designed multi-modal transportation network can be a strong contributor to achieving the local goals that are articulated in various plans. Simplicity in design and functionality usually means establishing a **simple and effective multi-modal transportation network** that everyone can understand and use. Understanding why people may react to transportation options in different ways, based on their personal needs and circumstances, helps to create a multi-modal network that is intuitive and that reduces the barrier to use - potentially offering new and sustainable ways to travel for many. The expectation of the network is captured and incorporated in its overall vision and the MTMP articulates this vision by describing what that might look like in terms of service and infrastructure, and then outlines a plan to evolve towards that vision.

Similar to the mobility vision that was developed during the Streetscape Improvement Master Plan as shown in **Figure 4.6**, each project has unique contextual needs that are reflected in the vision & objectives. The creation of a vision is necessary to inform other plans and create a sense of unity and cohesion amongst them.

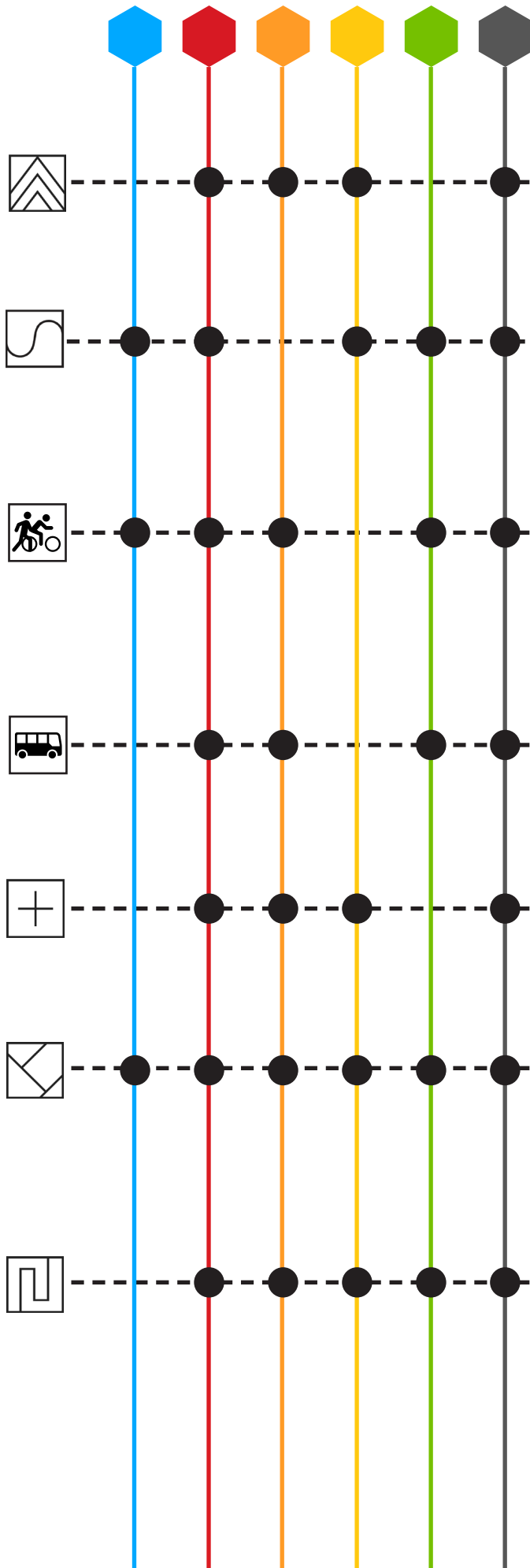
The vision statement of this MTMP is intended to describe the end state of the transportation network (the ideal outcome)—in the future when all the objectives have been achieved. By its nature, it is inspirational and idealistic.



Vision Statement: A transportation network that safely integrates all modes of transportation, allowing residents options beyond personal vehicles when travelling within or beyond the City.

It is important to note that the emphasis of the vision statement is on what the end will be like, and less on what Orillia needs to do to get there. Statements on how this is achieved are secondary and are stated as objectives and measures.





Taking into consideration the various components of this study seven (7) objectives were developed to achieve the vision statement. These objectives were tailored and adjusted throughout the study through consultation & stakeholder engagement:

Objective 1: Provide Infrastructure for Growth:

Plan for the multi-modal transportation network’s future needs over the next 5 to 20 years so that it not only addresses existing issues, but also accommodates future growth sustainably.

Objective 2: Plan Flexible Infrastructure for Seasonal Changes

Plan the multi-modal transportation network in a manner that allows a dynamic use of transportation infrastructure that can change with seasonal cottage levels to minimize under-utilized infrastructure.

Objective 3: Prioritize and Encourage Active Transportation

Cycling and walking should be options not only as separate modes of transportation, but also as a means to address future growth and traffic congestion. Active transportation infrastructure should be complimentary toward promoting transit, tourism, and healthier communities.

Objective 4: Prioritize and Encourage Transit

Transit should be a viable alternative for residents, leveraging multi-modal connections and emerging/creative service solutions to maximize its investment.

Objective 5: Improve Safety for All Road Users

The multi-modal transportation network should be safe, comfortable, and reliable for all road users regardless of how residents choose to travel throughout Orillia.

Objective 6: Enhance Multi-Modal Connections

Infrastructure should be planned and coordinated between different modes of transportation to create one multi-modal transportation system instead of separate siloed networks for each mode. This should promote the idea of using different modes for different trips and needs.

Objective 7: Leverage technology and data for the future

Trying to plan for the future is a continually moving target, and one that is bound to change based on new technology and data that is developed over time. The multi-modal transportation network should be planned to leverage emerging and future technology in a way that allows the system to grow proactively and flexibly to maximize investments in transportation.



5.0 A Plan for the Future

5.0 A plan for the future

5.1 Active Transportation Evaluation

The City of Orillia currently has a small disconnected network of active transportation facilities, primarily comprised of multi-use pathways that are primarily geared toward recreation. This MTMP provides an opportunity to re-evaluate the previously planned active transportation network and update it to consider new active transportation best-practices, research, updated growth trends and travel demand in Orillia, as well as integrate it holistically with the broader multi-modal network. Our approach is one that considers linkages between the existing network, as well as creating new connections to places that residents want to go. To develop a recommended network the following steps were conducted:

- Identify Existing/Future Trip Generators and Network Gaps (summarized in Chapter 2)
- Identify Previously Planned and Candidate corridors through consultation with residents (summarized in Chapters 2 and 3)
- Evaluate and refine the candidate corridor network (summarized in this Section)
- Recommended Active Transportation Network (summarized in Chapter 5.2)

5.1.1 Facility Selection

Research shows that one of the most effective measures for improving overall cyclist safety within a road network is increasing the number of cyclists using the system.

However, in order to encourage cyclists of different ages and abilities, a variety of bicycle facilities with different degrees of separation between motorists and cyclists must be available. Separation of cyclists and motor vehicles becomes increasingly more important as traffic volumes and operating speeds increase, and on corridors with a high propensity for conflicts.

The selection of active transportation facility type focuses around:

- **Vehicular Speed;**
- **Vehicular Volume;**
- **Number of accesses onto the roadway; and**
- **Availability of On-street parking.**

Bicycle facilities provide various levels of separation between cyclists and motorists. These range from shared travel lanes with no separation but with the option to provide sharrow markings, to bicycle lanes with a painted buffer or physical barrier. Other alternatives are in-boulevard bicycle facilities within the highway right-of-way, or off-road multi-use pathways outside of the highway right-of-way as summarized in **Table 5.1**.

A direct comparison of the relative safety of different types of bicycle facilities and degrees of separation is difficult. A bicycle facility with greater separation may appear to be 'safer' but may result in more conflicts at intersections and driveways, especially if the separation makes the cyclist less visible to the motorist. The overarching cycling facility selection follows a 3-step process:

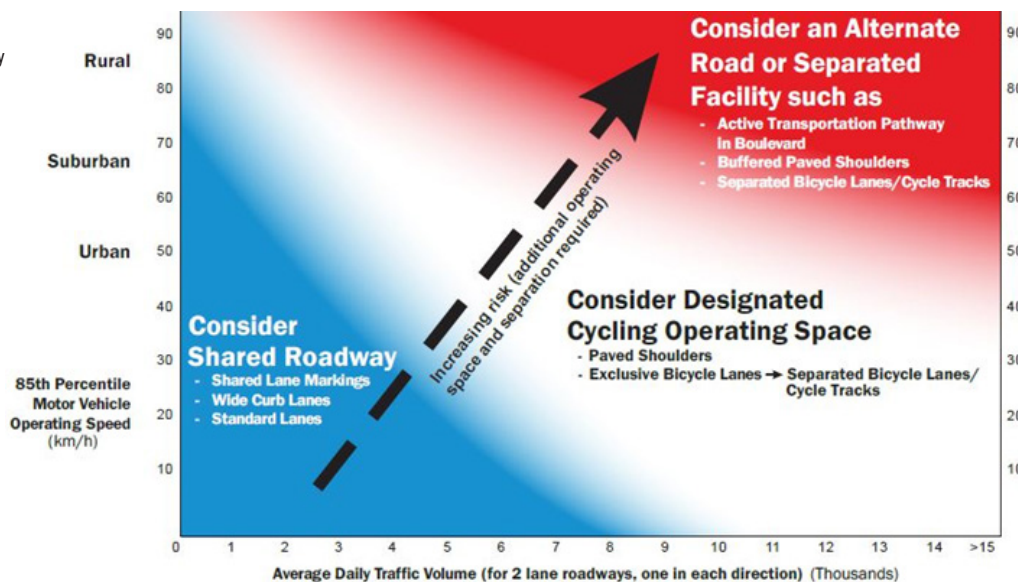
Step 1: Facility Pre-Selection: Pre-select an appropriate facility type based on vehicular volume and speed using the Ontario Traffic Manual Book 18 Nomograph as shown in **Figure 5.1**.

Step 2: Consider corridor specific characteristics: Consider design characteristics such as visibility of cyclists, number of driveway accesses and whether on-street parking is provided.

Step 3: Justify Decision and Identify Design Enhancements: Document the rationale.

Figure 5.1 Cycling Facility Selection Nomograph from OTM Book 18

Source: Ontario Traffic Manual Book 18

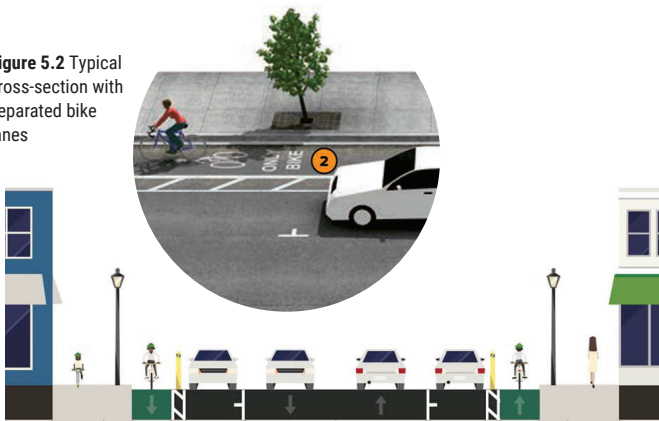


Generally, there are four types of cycling facilities that are distinguished based on their degree of separation from traffic and placement within the roadway right-of-way. These four facility types and their associated geometric requirements are summarized in **Table 5.1** and are further described below.

Table 5.1 Type of cycling facilities and their desired and minimum widths according to OTM Book 18

Facility	Type	Desired Width	Suggested Minimum Width
Separated Bike Lane	Bike Lanes	<ul style="list-style-type: none"> • 2.0m lane • 1.2m buffer 	<ul style="list-style-type: none"> • 1.5m lane • 0.5m buffer
Painted Bike Lane		<ul style="list-style-type: none"> • 1.8m lane • 1.2m buffer (if on-street parking) 	<ul style="list-style-type: none"> • 1.5m lane • 0.5 buffer (if on-street parking)
Signed Route	Shared Roadways	• 4.0-4.5m shared lane	• 3.0-4.0m shared lane
Paved Shoulder		• 1.5-2.0m shoulder	• 1.2m shoulder
Raised Cycle Tracks		<ul style="list-style-type: none"> • 2.0m lane • up to 1.0m curb 	<ul style="list-style-type: none"> • 1.5m lane • up to 1.0m curb
Multi-Use Path	In-Boulevard Facilities	<ul style="list-style-type: none"> • 4.0m two-way operation • up to 1.0m curb 	<ul style="list-style-type: none"> • 3.0m two-way operations • up to 1.0m curb

Figure 5.2 Typical cross-section with separated bike lanes



Separated Bike Lanes:

Bike lanes with flex bollards are meant for roadways with a large number of trip generators, high volumes of traffic and on-street parking to provide an additional layer of safety for cyclists separating them from motorized vehicles using flex bollards or planters. This mitigates the chances of getting hit by a door from a parked car or from vehicles stopped at the curb. According to the Ontario Traffic Manual, Book 18, for cycling facilities, it is recommended that this type of facility have between 1.5-2.0m of lane width and 0.5-1.2m buffer.

Figure 5.3 Typical cross-section with painted bike lanes



Painted Bike Lanes:

Painted bike lanes serve many of the same functions as separated bike lanes to service areas with high trip generation, but do not need the same degree of protection due to lower traffic volumes and fewer roadway conflicts such as parked vehicles or pick-up & drop-off locations. Painted bike lanes often consist of painted lanes on the roadway with associated signage. According to the Ontario Traffic Manual, Book 18, for cycling facilities, it is recommended that this type of facility have between 1.5-1.8m of lane width and 0.5-1.2m buffer where bike lanes are adjacent to on-street parking between the parking lane and a general purpose lane.



Figure 5.4 Typical cross-section with sharrows

Signed Routes:

Signed routes are shared roadway facilities recommended on low-volume roadways meant to connect to higher-order cycling facilities. Sharrows comprise primarily of road painting and signage that is intended to alert motorists to share the lane.



Figure 5.5 Typical cross-section with paved shoulders

Paved Shoulders:

Paved Shoulders are meant for rural areas with low cycling volumes. The shoulder is paved to allow for cyclists to travel separated from traffic when the shoulder is not being used for other purposes. Paved shoulders provide an opportunity to connect Orillia to neighbouring municipalities or rural areas by cycling.



Figure 5.6 Example of a multi-use path



Multi-Use Paths:

Multi-use paths are shared pathways that can be used by pedestrians and cyclists that are separated from traffic and provide a much safer environment, particularly on roadways with high motor vehicle speeds and volumes. Multi-use paths are often 3m to 4m wide to allow for two-way movement and are often used as mid-block connections within and between parks and other recreational areas, but can also be used in boulevards to provide pedestrian and cyclist access to neighbourhoods.

5.1.2 Network Evaluation Criteria

The evaluation criteria for active transportation improvements are focused around five (5) criteria including:

- **Population Density;**
- **Incline;**
- **Crossing Barriers;**
- **Access to Major Destinations; and**
- **Network Connectivity**

These evaluation criteria and rationale are described in this section, with a line-by-line summary of each recommended improvement with the associated costs, implementation timing, and evaluation score provided in **Appendix B** of this MTMP document.

Population Density

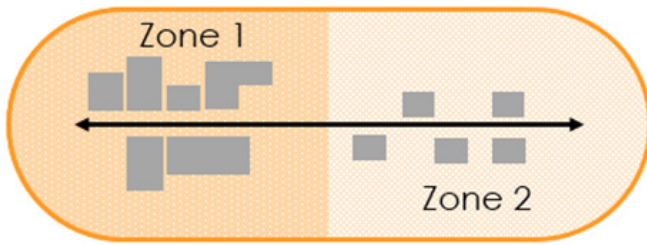


Table 5.2 Evaluation Criteria for Population Density

Criteria	Points
< 15 people/Km ¹	0
15 - 50 people/Km ¹	10
>50 people/Km ¹	15
Maximum Points:	15

Rationale: Active transportation facilities are more likely to be used where they are connected to more people or jobs. The higher the density, the higher the likelihood that active transportation facilities will encourage and shift people to use them.

Analysis Approach: Due to the lack of employment data, 2016 census population data was used to calculate population density by dissemination area. A buffer of 500 meters was developed around each candidate corridor and the population density in the buffer area was determined as a weighted average of the density within each dissemination zone it stretched across.

Evaluation: The criteria points that were assigned based on population density thresholds are summarised in **Table 5.2**.

Incline

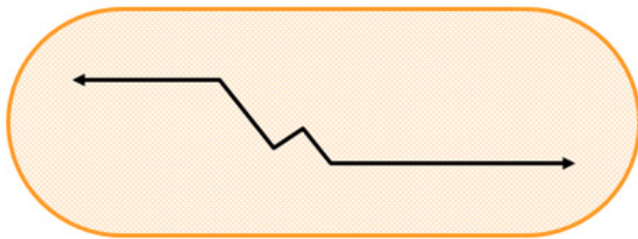


Table 5.3 Evaluation Criteria for Incline

Percent Incline	Description	Points
<1%	A flat road	15
1-3%	Slightly uphill but not particularly challenging	10
4-6%	A manageable gradient that can cause fatigue over long periods	5
7-9%	Starting to become uncomfortable for seasoned riders, and very challenging for casual riders	1
10%+	Difficult for all riders	0

Rationale: Roadway incline can present a significant challenge and deterrent for cyclists using available facilities. If a route is too challenging, cyclists will choose to use an alternate route to access their destination. A flat route provides the most comfortable ride, while inclines of 1-3% present a slight impact on cycling effort, but are mostly manageable for casual riders, a 4-6% incline presents some challenge over extended lengths for casual users and inclines greater than 7% presents a challenge for all riders.

Analysis Approach: An average incline percentage was calculated for each segment of active transportation improvements leveraging GIS data and validating it with Google Maps data.

Evaluation: The criteria points that were assigned based on incline percentage thresholds are summarised in **Table 5.3**.

Crossing Barriers

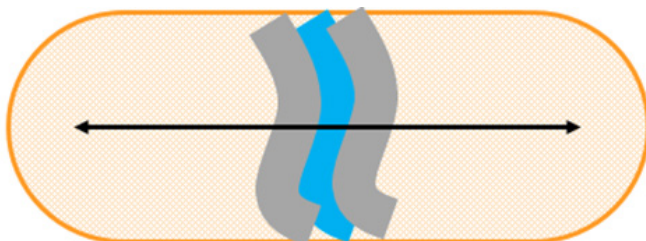


Table 5.4 Evaluation Criteria for Crossing Barriers

Criteria	Points
Crosses Highway 11	15
Crosses Highway 12 By-Pass	15
Maximum Points:	30

Rationale: Resident survey response identified Highway 11 and the Highway 12 By-pass as barriers between East-West and North-South travel, respectively. Providing linkages across these barriers can present vital connections to areas of the City that may feel isolated. For instance, it is currently difficult to get to the commercial retail area on Monarch Drive from Downtown or any other area in the east due to the limited cycling facilities crossing the highway coupled with high volumes of traffic making it intimidating for active transportation users. Similarly, due to the high volume of traffic on the Highway 12 By-Pass there are limited crossing opportunities between Mississauga Street and Atherley Road.

Analysis Approach: Any links crossing one of the two barriers identified were assigned 15 points per barrier crossed.

Evaluation: The criteria points that were assigned based on each candidate corridors ability to provide a connection across barriers are summarised in **Table 5.4**.

Access to Major Destinations

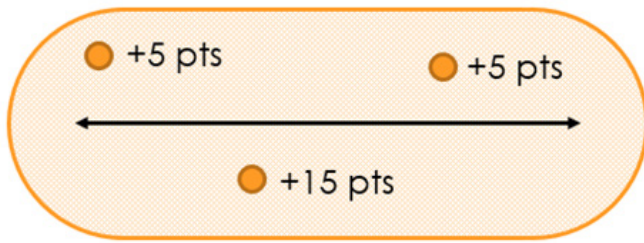


Table 5.5 Evaluation Criteria for Major Destinations

Criteria	Points
Community Destinations	5
Supporting Active School Travel	10
Key Commercial Areas	5
Last mile connections to Transit	5
Maximum Points:	25

Rationale: Major destinations such as community centres, employment centres, or schools are all places that people typically want to go to. Providing an active transportation network is as much about providing an available, and connected option, as well as creating a network that takes people where they want to go.

Analysis Approach: 500m buffer was assigned around each candidate corridor and the number of trip generators within the buffer was used to determine its score for the criteria, up to a maximum of 25 pts. The Orillia zoning map and common points of interest obtained through the online survey were used to determine the trip generators. community centres, parks, libraries and arenas were classified as community destinations. Business parks, commercial core areas and commercial service providers were classified as key commercial destinations. Location of current transit stops were used to determine last mile transit connections.

Evaluation: The criteria points that were assigned for each major destination type within a candidate route's buffer area are summarised in **Table 5.5**.

Network Connectivity

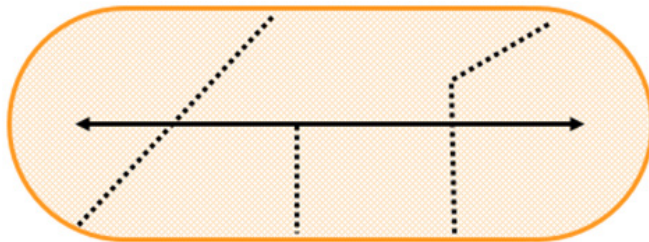


Table 5.6 Evaluation Criteria for Network Connectivity

Criteria	Description	Points
Existing Facility	Connects to an existing active transportation facility.	10
Minor Additions	A future candidate corridor that would require minor cost/effort to implement.	10
Rehab Additions	A future candidate corridor that would be able to be implemented as part of a regular rehab or maintenance work, which would typically be more long-term.	5
Capital Investments	A future candidate corridor that would require specific capital investment to implement, thus potentially being much longer-term.	2
Maximum Points:		25

Rationale: It is important that active transportation corridors create a connected network that doesn't leave users isolated or stranded. Greater connections improve the usability of active transportation infrastructure. This factor evaluates which candidate corridors will provide the best network connections between existing and future corridors.

Analysis Approach: The number of network connections for each candidate corridor were evaluated based on whether they are existing connections, thus requiring no additional investment and providing an immediate benefit once built, or whether it would connect to future corridors that would require varying degrees of investment to make a useful connection. Each of the different connection types were assigned points.

Evaluation: The criteria points that were assigned based on network connectivity attributes are summarised in **Table 5.6**.

5.2 Recommended Multi-Modal Network

This section of the MTMP summarises the full-build out of the recommended multi-modal networks. Details on costing and implementation are provided in subsequent sections.

5.2.1 Pedestrian Network

The recommended pedestrian network focuses on providing a connected network of walking routes that address residents' most important needs and underline this MTMP's objectives in terms of:

- Objective 1: Providing Infrastructure for Growth;
- Objective 2: Plan Flexible Infrastructure for Seasonal Changes;
- Objective 3: Prioritizing and Encouraging Active Transportation;
- Objective 4: Prioritizing and Encouraging Transit;
- Objective 5: Improving Safety for All Road Users, and
- Objective 6: Enhancing Multi-Modal Connections.

All of these objectives can be distilled into the following broad criteria that include:

- Improving Safety,
- Improving Accessibility;
- Creating connections to places people want to go to; and
- Integrating the pedestrian network with other modes of transportation such as transit and cycling.

At first blush it may seem as if the pedestrian network separately serves an isolated need for walking, but it can provide a vital first/last mile link between other complementary modes of transportation.

For instance, there is a saying that says, "every transit trip begins and ends with a walk". Pedestrian connections are vital to supporting and encouraging transit usage by providing safe access to transit stops. Similarly, sidewalks support local retail and neighbourhood trips, even when automobiles are used to make final endpoint connections to destinations. Nowhere is this more prevalent than along Mississauga Street where the sidewalks support and provide a connection to retail, or along Barrie Road where sidewalks provide a key connection to various schools.

The recommended pedestrian network incrementally expands upon the existing network that is already extensive in the older core of Orillia to fill in gaps and create connections to schools, transit stops, and several other community amenities. This is visualized in **Figure 5.7** that highlights all the infill pedestrian links that are proposed.

Due to the nature of the typical distances that are amenable to walking, the network was designed to fill-in network gaps, particularly within neighbourhoods, to connect residential areas with retail, community facilities,

schools, and parks. The short-term (2026) pedestrian network fills-in several of these gaps (as visualized in **Figure 5.8**) particularly between Park Street and West Street, while the subsequent horizon years (**Figures 5.9** and **5.10**) incrementally expand toward new development areas to culminate in an additional 52 km of pedestrian facilities across Orillia as summarised in **Table 5.7** by the 2036 horizon year.

Major new pedestrian improvements were primarily focused in West and South-West Orillia as new development is anticipated to occur and create opportunities to serve new neighbourhoods through a mixture of multi-use paths and sidewalk as new roads are built.

The network was planned based on limited information of what the completely built-out network in these areas will be. Despite this, pedestrian connections in other areas could be planned and made as development occurs in the future.

Many communities struggle with expanding the sidewalk network due to the high cost of concrete. It is currently estimated that one (1) km of sidewalk costs approximately \$300,000. To mitigate the high costs of providing pedestrian infrastructure many of the greenfield residential neighbourhoods are recommended to have a network of multi-use paths as a means to provide flexible active transportation infrastructure that can both serve pedestrian and cyclist demands, particularly in low-density areas. These corridors can have concrete sidewalks added over time as development occurs and usage increases.

As the multi-use path network is expanded to connect to county trails, there are opportunities to allow a portion of these new pathways to be used in the winter for recreational vehicles, while in the summer they would serve as pathways for cyclists and pedestrians.

A detailed line-by-line summary of each individual improvement along with their associated costs and associated evaluation scores are provided in **Appendix B** of this MTMP document.

Table 5.7 Recommended Linear Kilometres of Pedestrian Facilities added by Horizon year

Pedestrian Facility	Existing	Kilometres Added			Total	Change
		2026	2031	2036+		
Sidewalks	124.7	7.7	18.1	-	150.5	+ 25.8
Multi-Use Paths / Context	26.1	2.6	9.8	14.0	52.5	+ 26.4
Total	150.8	10.3	27.9	14.0	203.0	+ 52.2

Figure 5.7
Recommended
Pedestrian links

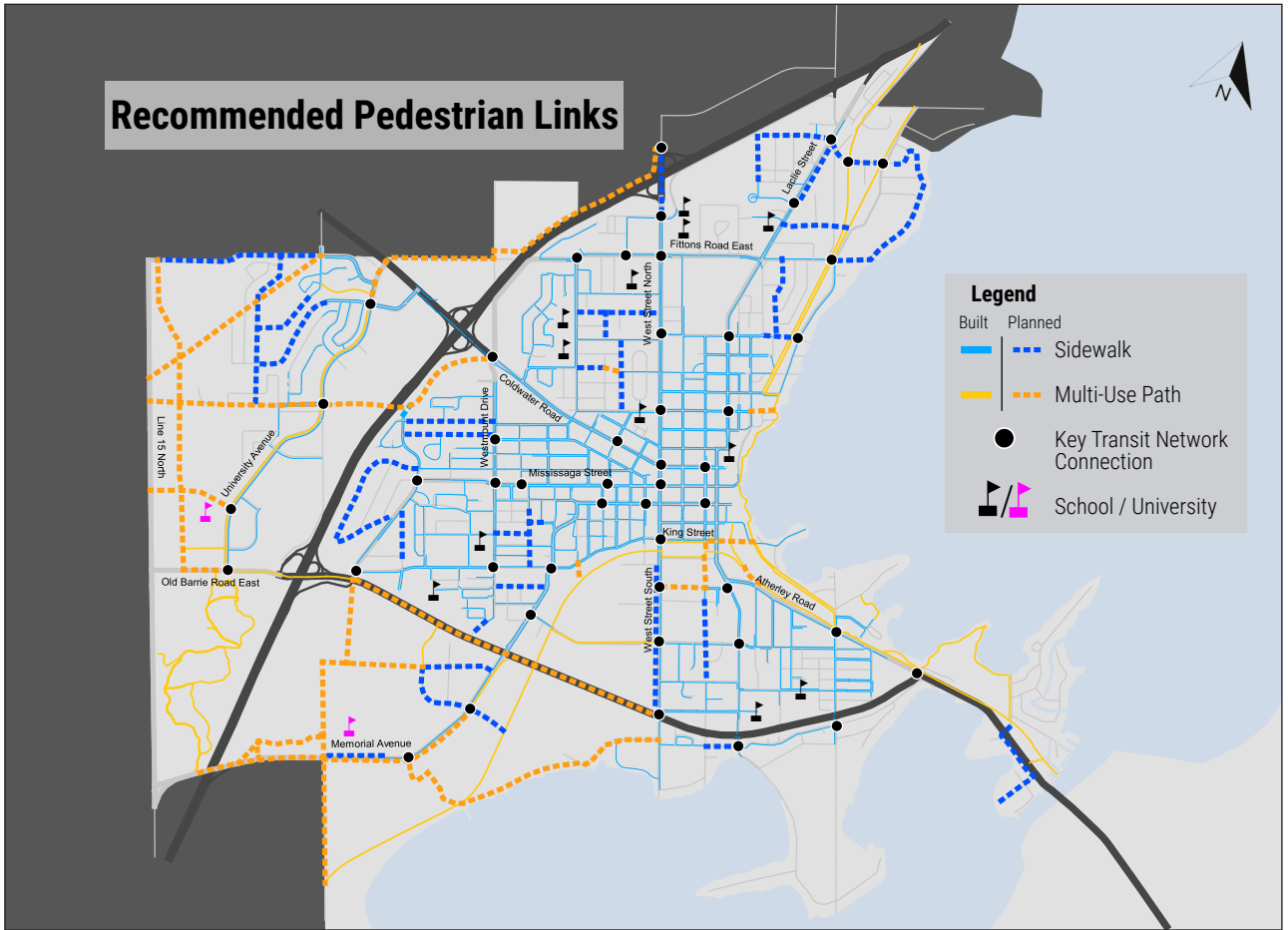


Figure 5.8
Recommended
Short-Term
Pedestrian
Improvements

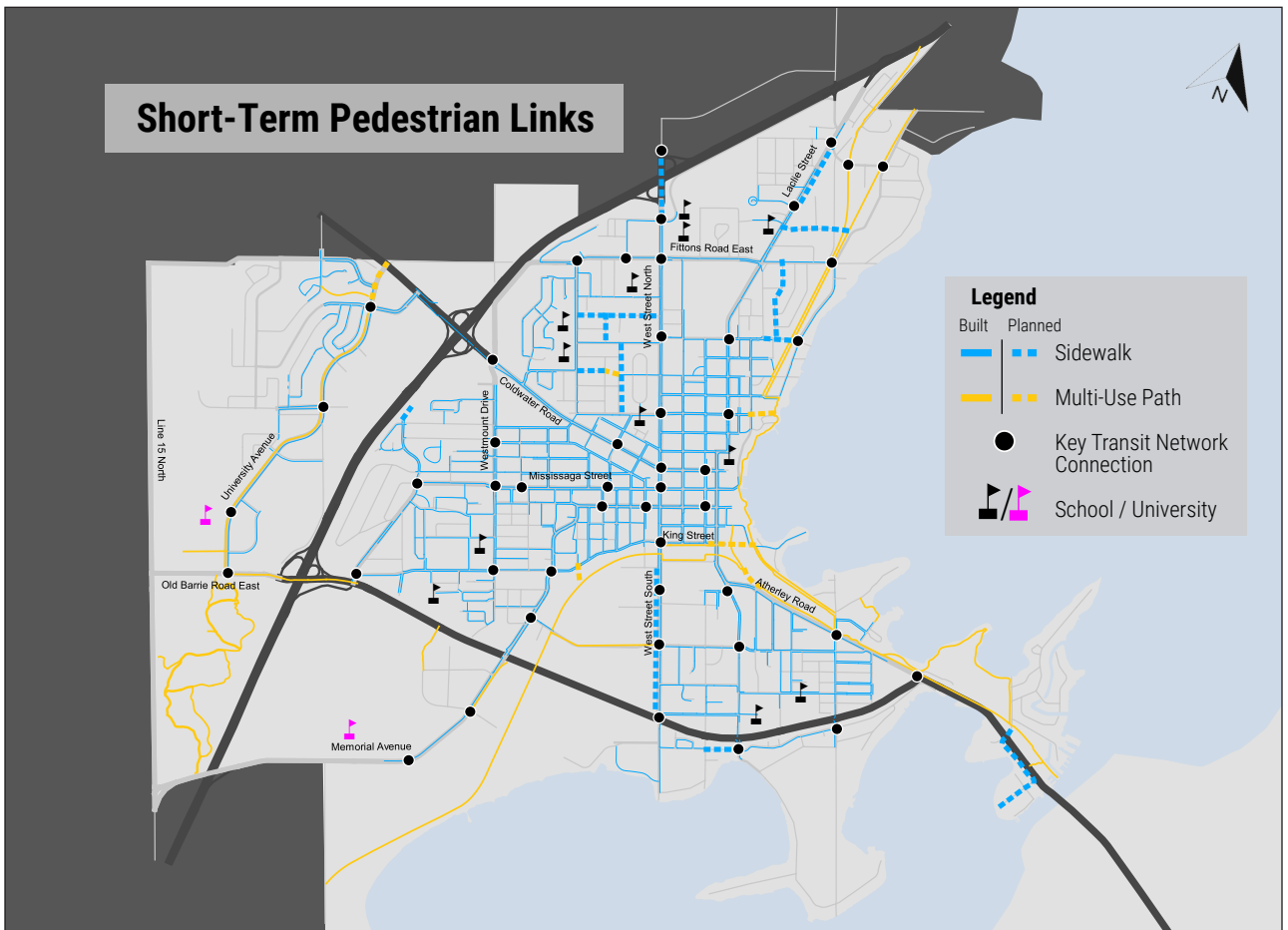


Figure 5.9
Recommended
Medium-Term
Pedestrian
Improvements

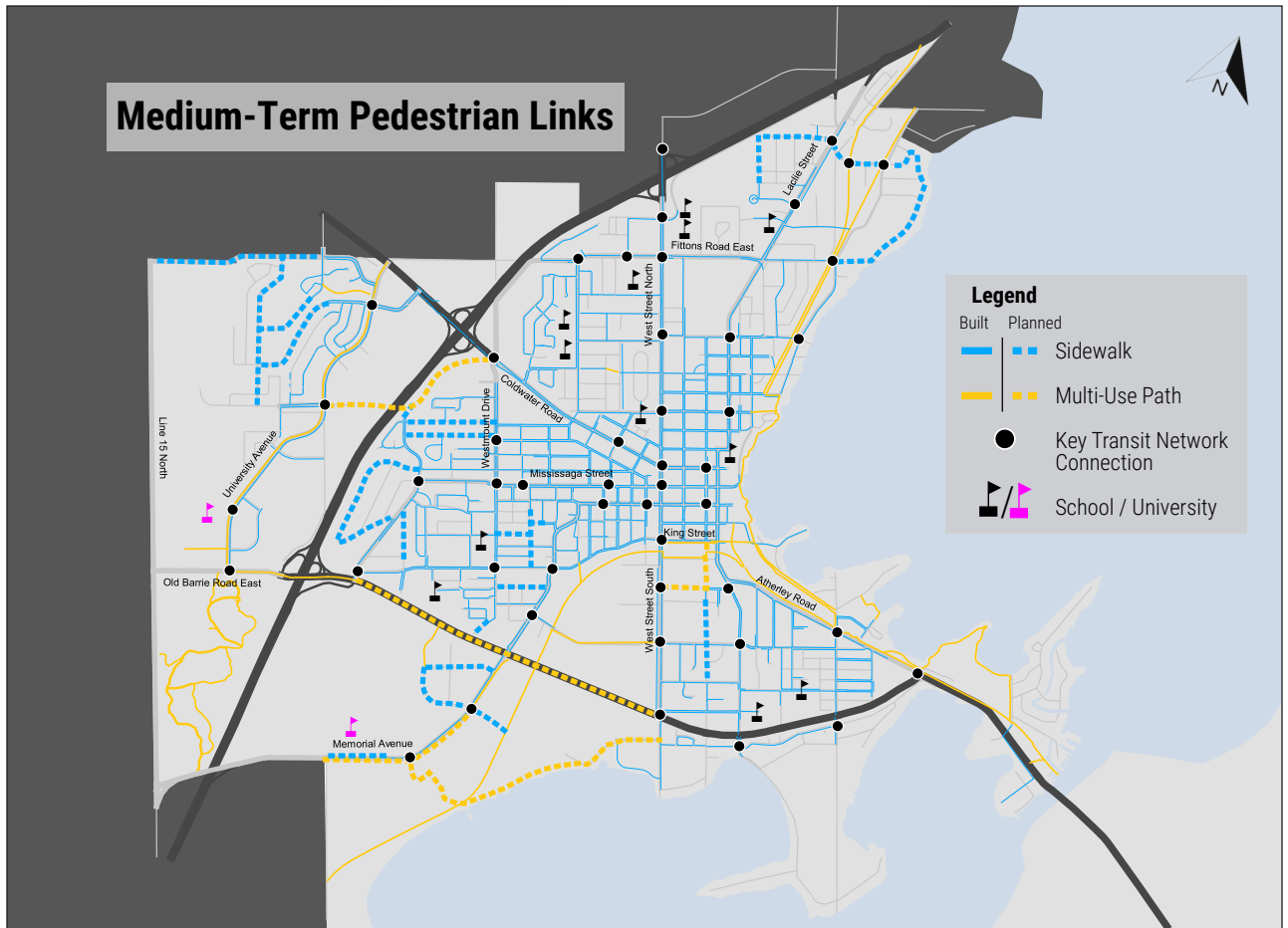
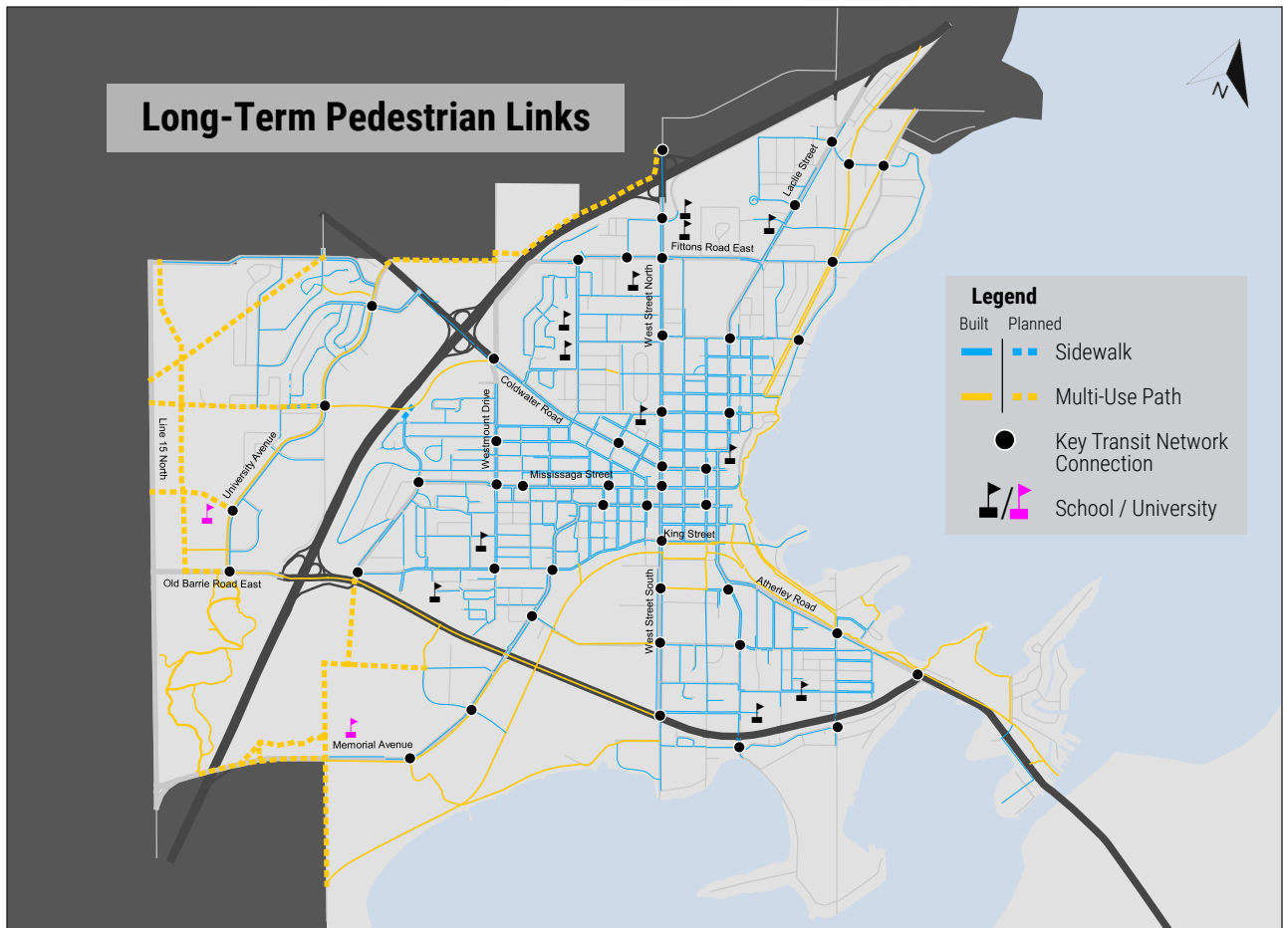


Figure 5.10
Recommended
Long-Term
Pedestrian
Improvements



5.2.2 Cycling Network

The recommended cycling network focuses on the same objectives and needs as the pedestrian network including a focus on improving safety, accessibility, creating connections to key trip generators, and integrating the network with other modes of transportation.

It is important to distinguish that cycling is typically best suited for trips that go distances of three (3) km or less, whereas most walking is typically done for distances of one (1) km or less. As a result, cycling is complimentary to short-to-medium-distance internal trips and fits nicely between walking and other modes of transportation such as transit to create cohesion between different modes.

The resulting recommended cycling network comprises a mixture of dedicated and shared cycling infrastructure culminating in an overall network of 113 km of cycling routes that are recommended to be added incrementally through the 2036 horizon as visualized in **Figures 5.14 to 5.16** and summarised in **Table 5.8** by horizon year. These improvements are anticipated to bring some form of cycling facility within 100m of 67% of the city within the next 20 years compared with only 18% today. Additionally, the MTMP recommended network provides a 9% greater coverage than the previously planned cycling network.

Recommended Changes

Recommended improvements and changes to the 2012 Active Transportation Plan are summarised in **Figure 5.13** and in **Table 5.10**. The bulk of recommended improvements revolve around providing a network of protected cycling facilities that will both provide greater safety to cyclists and drivers, as well as work towards encouraging more residents to bike. Beyond these, the existing waterfront trail is recommended to be updated to have dedicated pedestrian and bicycle lanes in the central section between Jarvis Street and Elgin Street to avoid conflicts during the busy summer months.

The backbone of the system will focus around the Protected and Painted bike lanes that are primarily placed along Major and Minor collector roadways to provide high-quality cycling infrastructure connections across the broader city. Lower-order cycling facilities such as signed routes are planned to provide short connections to the back-bone network, or last mile connections to destinations on low-volume corridors.

Orillia's road network is a complex one where there are few cross-city corridors that continue uninterrupted between north/south and east/west. Through an evaluation of the network, West Street and a new active transportation link across Highway 11 were identified as the two major active transportation improvements needed in Orillia.

West Street: was identified as a key corridor on account of several characteristics that include:

- A defined travel corridor for transit and automobile

usage. Many residents in Orillia need to access vital services and employment opportunities along West Street including Downtown Retail, Industrial Employment, and Commercial retail;

- It is the most direct route between north and south Orillia;
- It intersects more existing and potential cycling routes than any other roadway in the network; and
- Although average annual daily traffic (AADT) volumes are around 11,000 vehicles, the posted speed limit is 50 km/h, and vehicular volume concerns can be mitigated with appropriate cycling facilities such as a protected bike lane.

Highway 11 Crossing: A new active transportation crossing of Highway 11, including dedicated lanes for cyclists and pedestrians, is recommended due to the challenging geography and layout of the road network between east and west Orillia. Currently, all traffic is funnelled to either Old Barrie Road or Coldwater Road to go from east to west. A deviation to one of these two crossings could result in upwards of 2.5 km of travel just to go directly across Highway 11. This deviation equates to only a handful of minutes by car, however by bicycle it represents a strong deterrent to cycling. This is important to consider when looking at the issue in terms of equity. West Orillia represents not only existing employment opportunities, but a significant forecast of future employment opportunities as well. Low-income residents may not be able to



"Used to go to school at Lakehead and live on Pearl. Easy to get the bus to school/walk to school or ride my bike to school. Options allowed me to avoid driving most of the time."

- Anonymous survey respondent

Table 5.8 Previously recommended Linear Kilometres of Cycling Facilities added by Horizon year

Previously Planned Improvements from 2012 ATP						
Cycling Facility Type	Existing	Kilometres Added			Total	Change
		2026	2031	2036		
Protected Bike Lanes	-	-	-	-	-	-
Painted Bike Lanes	2.0	9.0	2.2	3.2	16.4	+14.4
Signed Route	-	18.4	8.6	-	27.0	+27.0
Paved Shoulders	-	-	-	5.9	5.9	+5.9
Multi-Use Paths	26.1	7.0	4.2	12.6	49.9	+23.8
Total	28.1	34.5	15.0	21.7	99.3	+71.2

Table 5.9 Recommended Linear Kilometres of Cycling Facilities added by Horizon year

Recommended MTMP Improvements						
Cycling Facility Type	Existing	Kilometres Added			Total	Change
		2026	2031	2036		
Protected Bike Lanes	-	16.8	6.3	3.0	26.0	+26.0
Painted Bike Lanes	2.0	7.9	2.7	0.0	12.6	+10.6
Signed Route	-	15.5	9.0	0.0	24.4	+24.4
Paved Shoulders	-	0.0	0.0	5.9	5.9	+5.9
Multi-Use Paths / Context	26.1	2.6	9.8	14.0	52.5	+26.4
Total	28.1	42.8	27.8	22.9	121.5	+93.4

afford living in proximity to their employment, nor may they be able to afford a car. A link across Highway 11 opens up a large proportion of the community to within a 10-15 minute bike ride.

A comparison of estimated travel times between the previously planned active transportation network and the recommended MTMP network is shown in **Figures 5.11 and 5.12**.

Emerging Subdivisions: Within new emerging subdivisions in west and south Orillia, multi-use paths can provide a flexible solution to addressing combined pedestrian and cycling needs in low-density areas, as well as provide an off-road solution that would encourage young riders to bike. The multi-use trail on West Ridge should be upgraded to an on-road separated facility in the long-term when the street is rebuilt.

Due to the lack of information on how the future road network will look like in periphery areas, it is recommended that context-sensitive cycling facilities be planned and implemented as subdivision applications are made. It is also recommended that enhanced cycling facilities such as separated and painted bike lanes be explored within new subdivisions as they are developed, particularly to conform with our proposed complete streets approach to providing pedestrian, cyclist, and transit measures on the various road classifications. This is expanded further in Section 5.3.2.

Additionally, Orillia's varying landscape and elevation presents an opportunity to create a cycling network that provides desirable routes that also mitigate the physical strain for movement across the city. For instance, the elevation between West Ridge Boulevard and Woodside Drive can be a difference of up to 30m of elevation. The recommended network is laid out to provide softer inclines across the network that both respect the impact on cyclists as well as the natural landscape.

Many of the cycling corridors align with pedestrian corridors and provide connections to transit stops. The recommended cycling network presents an opportunity to leverage cycling connections to provide short-to-medium distance first/last mile connections to transit as well as the potential to leverage transit to climb inclines at key areas for less capable cyclists. There may be opportunities to explore allowing cyclists to hop onto transit for free to climb specific challenging sections of the network to further encourage cycling.

Another component of the network includes long-term connections to a rural network leveraging planned improvements at the County level to implement paved shoulders along County Roads that integrate with the existing trails, as well as provide connections to adjacent municipalities such as Oro-Medonte and Ramara.

As bike lane designs are continually changing, it is recommended that the City of Orillia continually monitor the latest industry design standards such as the Ontario Traffic Manual - Book 18, and the National Association of City Transportation Officials (NACTO) design guide. Within this vein, the City should continually strive to provide the safest cycling solution whenever implementing new facilities or rehabilitating an existing roadway facility.

A summary of recommended changes and new cycling routes is provided in **Table 5.10** on the following pages. A detailed line-by-line summary of each individual improvement along with their associated costs and associated evaluation scores are provided in **Appendix B** of this MTMP document. As a result of recommendations within this chapter, there are differences between this MTMP and the 2012 AT Plan. For future reference this MTMP should be the guiding document in the event of discrepancies.

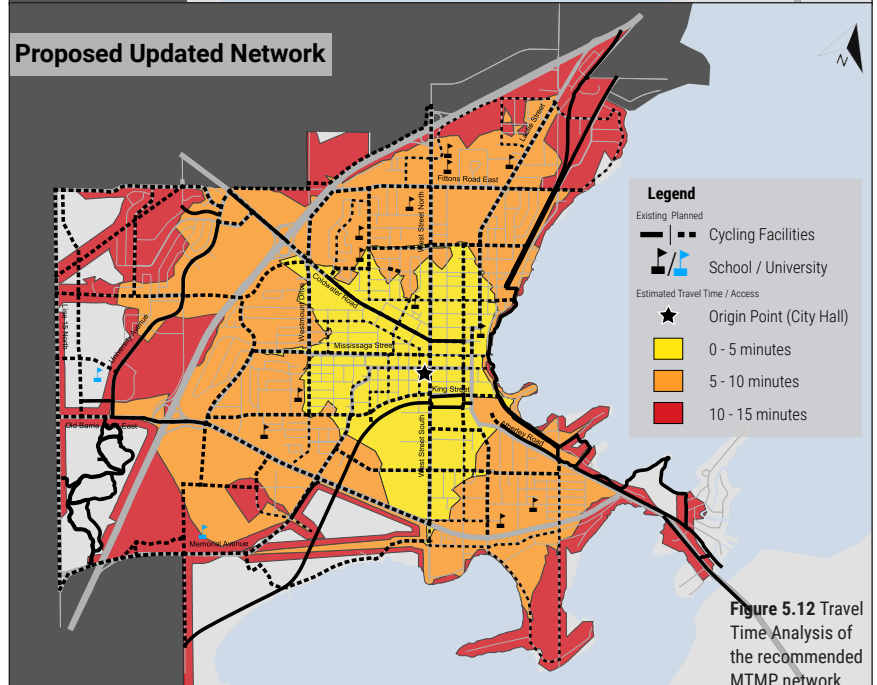
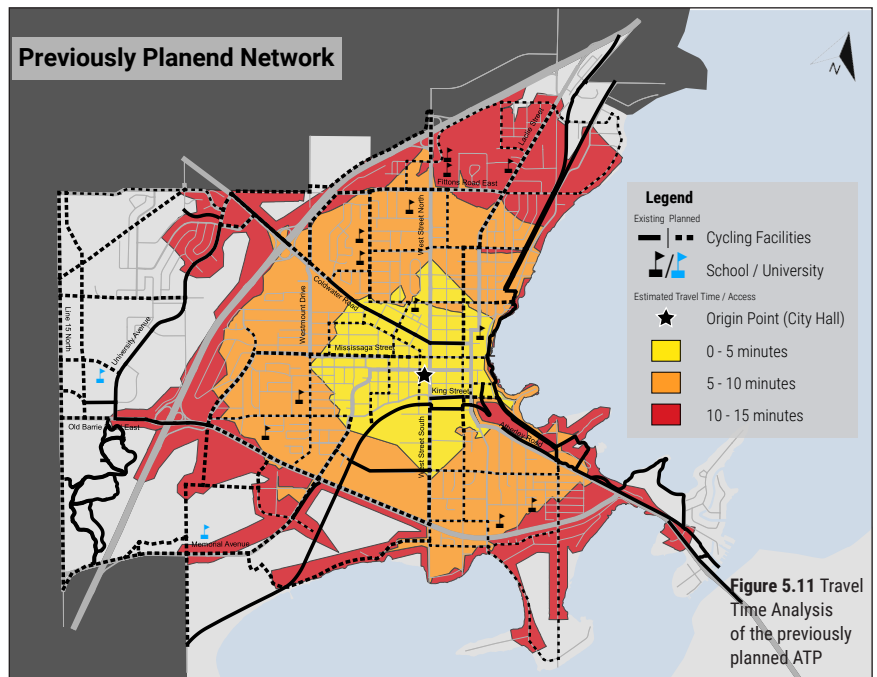


Figure 5.13
Recommended
MTMP Cycling
Improvement
changes to the
2012 Active
Transportation
Plan

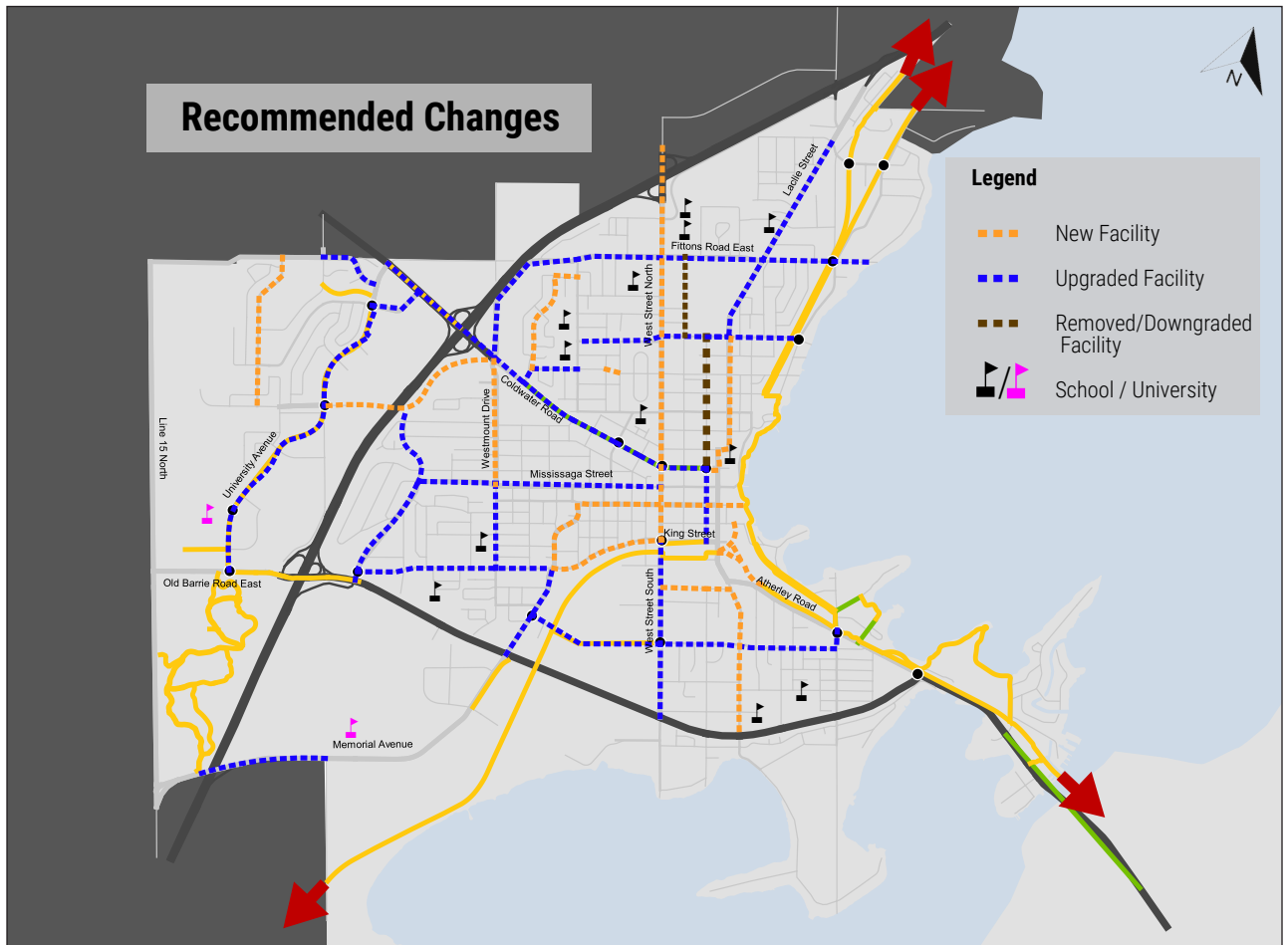


Figure 5.14
Recommended
Short-Term Cycling
Improvements

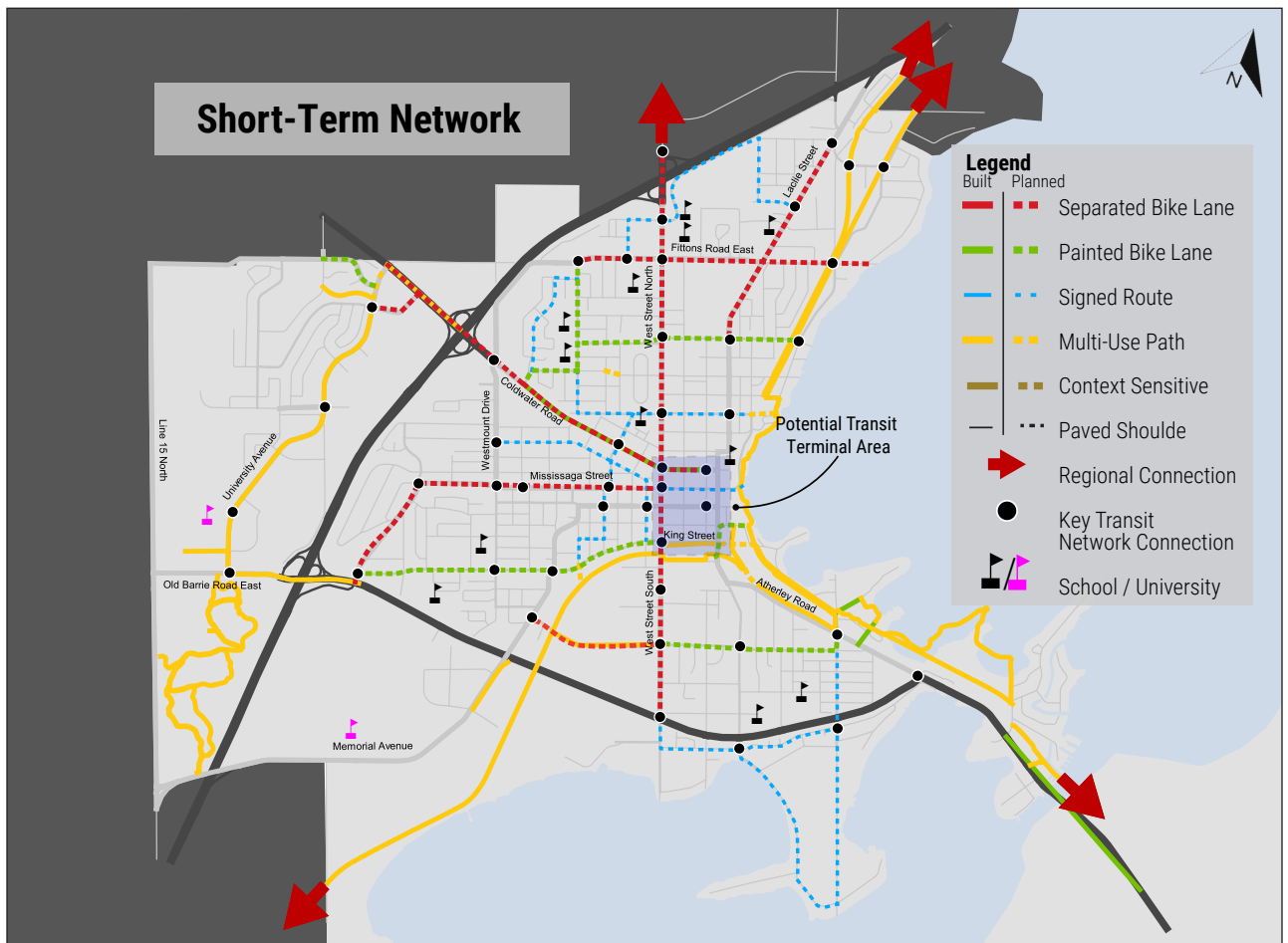


Figure 5.15
Recommended
Medium-
Term
Cycling
Improvements

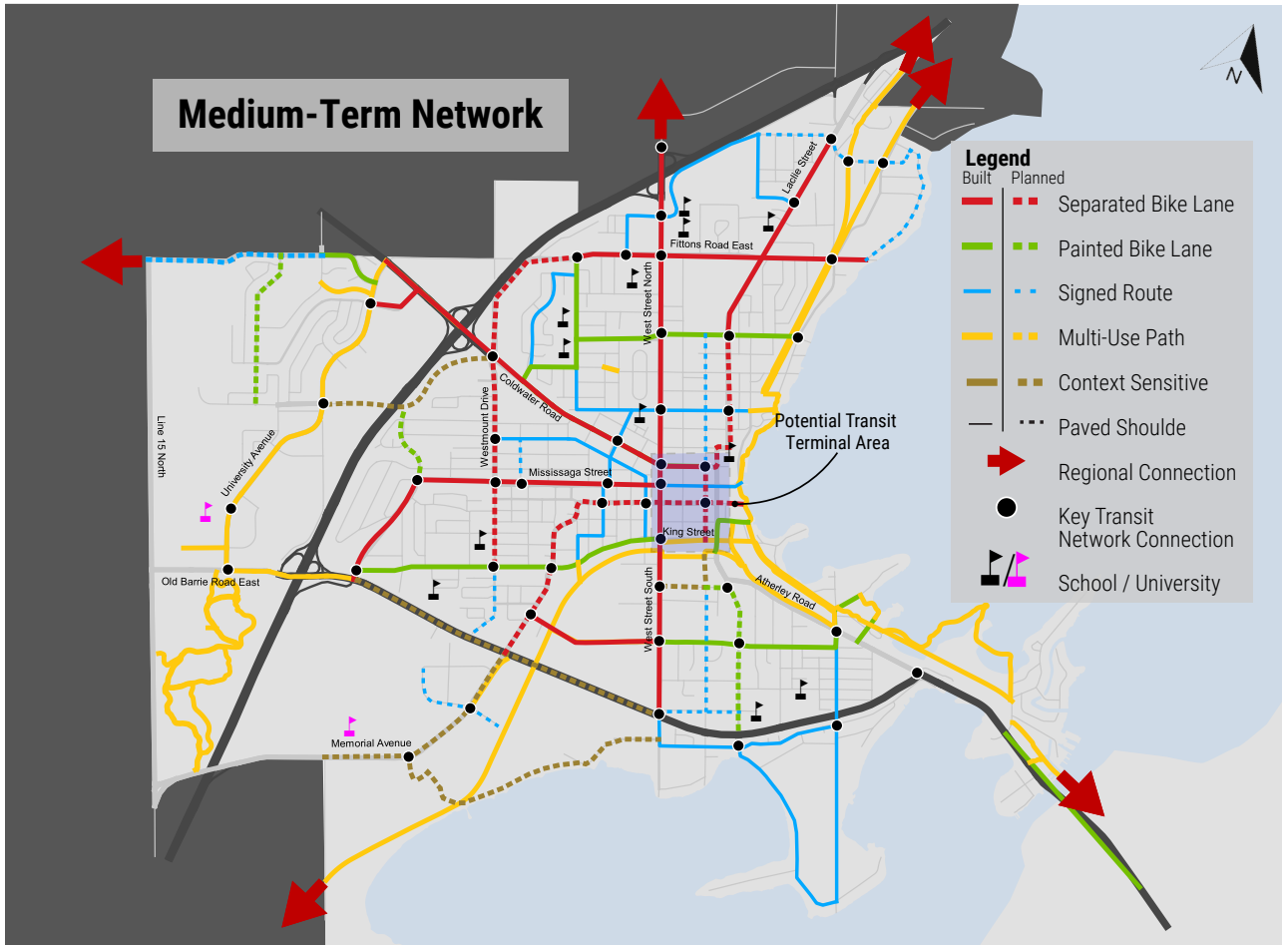


Figure 5.16
Recommended
Long-Term
Cycling
Improvements

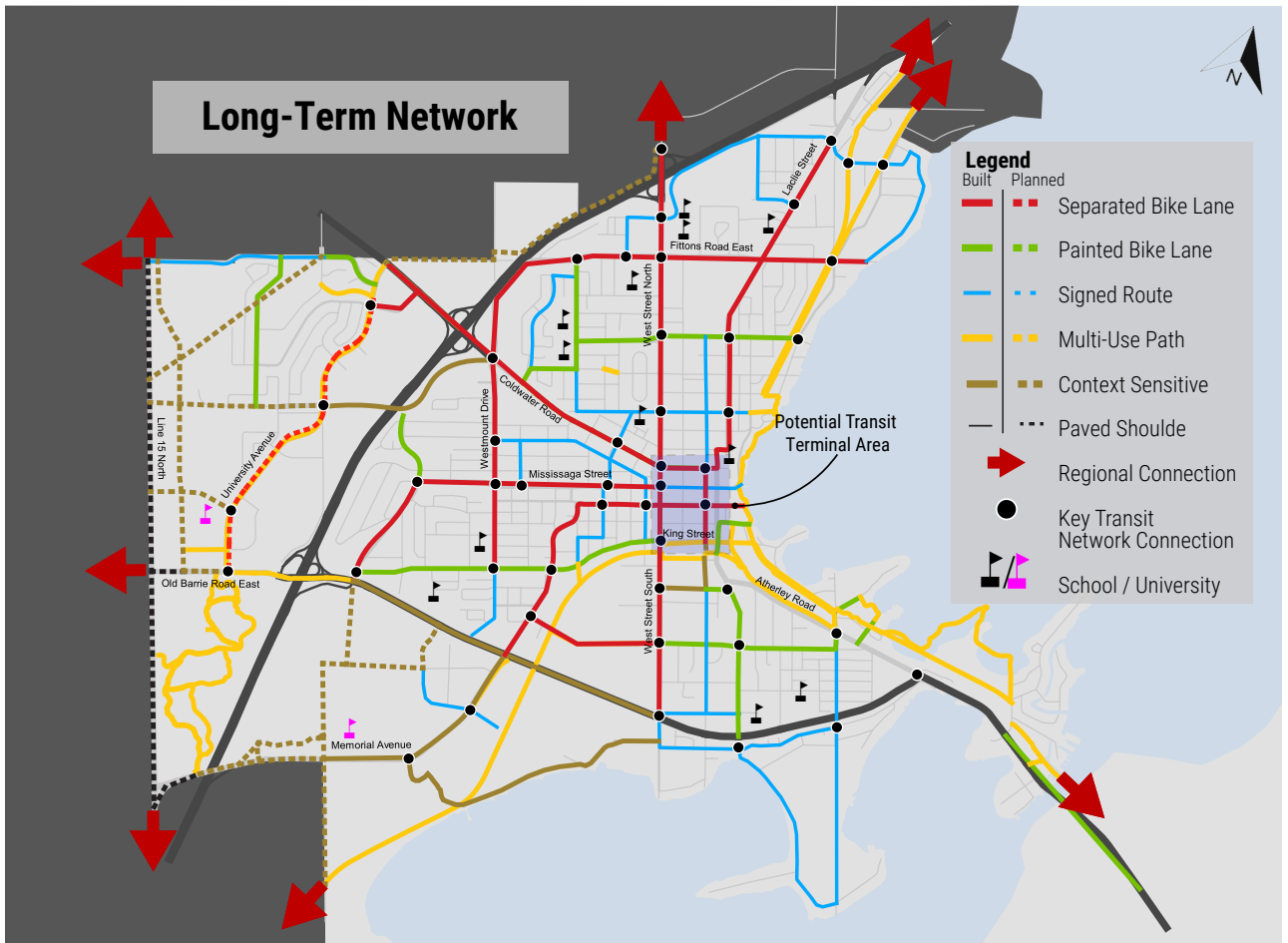
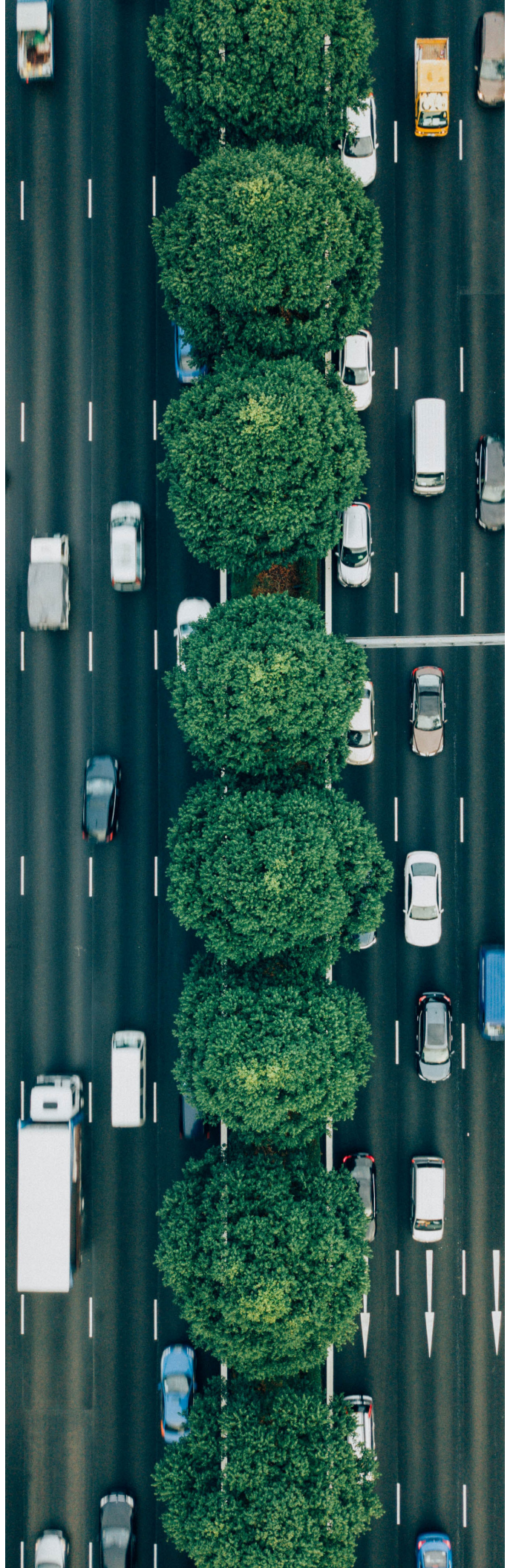


Table 5.10 Summary of recommended cycling network changes

Description	Change	Facility	Limits	KM	Phasing
Coldwater Street	Upgraded Facility	Protected Bike Lane	Front Street on the East to Collegiate Street on the West	1.8	Short-Term
Fittons Road West	Upgraded Facility	Protected Bike Lane	West Street on the East to Park Street on the West	2.3	Short-Term
Matchedash Street North	Downgraded	Signed Route	Changed Painted Bike Lane between North Street in the North to Coldwater Street in the South	1.0	Short-Term
Matchedash Street South	New Recommendation	Protected Bike Lane	Between Coldwater Street in the North and King Street in the south to interline with the Laclie Street protected bike lanes and provide parallel service to Front Street.	0.6	Short-Term
Central Waterfront Multi-Use Path	Upgraded Facility	Multi-Use Path	Upgrade the existing waterfront multi-use trail to provide dedicated pedestrian and cycling lanes between Jarvis Street and Cedar Island Road.	1.4	Short-Term
West Street South	Upgraded Facility	Protected Bike Lane	King Street on the North to Highway 12 on the South	1.4	Short-Term
Mississaga Street	Upgraded Facility	Protected Bike Lane	Albert Street on the East to Woodside Drive on the West	1.7	Short-Term
Peter Street North	Removed		Fittons Road in the North to North Street in the South	0.6	Short-Term
North Street West	Upgraded Facility	Painted Bike Lane	Bay Street in the East to West Street in the West	1.9	Short-Term
Collegiate Drive	Upgraded Facility	Signed Route	Park Street in the East to ColdWater Road in the West	0.5	Short-Term
Nottawasaga Street	Minor Extension	Signed Route	Emily Street in the East to Westmount Drive in the West	0.4	Short-Term
Barrie Road	Upgraded Facility	Painted Bike Lane	Memorial Avenue in the East to Mississaga Street in the West	1.6	Short-Term
Westmount Drive South	Upgraded Facility	Protected Bike Lane	Mississaga Street in the North to Highway 12 in the South	1.3	Short-Term
New Multi-Use Path connection	New Recommendation	Multi-Use Path	Existing Atherley Road Trail end near Millard Road / Atherley Road to the existing trail by the old Train station.	0.75	Short-Term
New Multi-Use Path connection	New Recommendation	Multi-Use Path	Between the intersection of Borland Street/ Lawrence Avenue in the east and Belmoral / Collegiate Drive in the west	0.1	Short-Term
Front Street	Removed		Mississaga Street in the North to King Street in the South removed due to findings from the recently completed Environmental Assessment conducted for the street	0.4	Short-Term
Mississaga Street West	Upgraded Facility	Protected Bike Lane	Albert Street on the North to Highway 12 on the South	1.0	Short-Term
Bass Lake Sideroad E	Upgraded Facility	Painted Bike Lane	Atlantis Drive in the west to West Ridge Boulevard in the east	0.5	Short-Term
Lewis Drive / Johnson Street	New Recommendation	Signed Route	Park Street in the North to Collegiate Drive in the South	1.0	Short-Term
West Street	New Recommendation	Protected Bike Lane	Highway 11 westbound off ramp in the north to King Street in the south	3.1	Short-Term
Barrie Road	New Recommendation	Painted Bike Lane	Memorial Avenue in the west to West Street in the east	0.9	Short-Term
Monarch Drive	Upgraded Facility	Protected Bike Lane	Highway 12 on the North to West Ridge Boulevard on the South	0.4	Mid-Term
Colborne Street / Memorial Ave	New Recommendation	Protected Bike Lane	Waterfront in the East to Barrie Road in the West. Will provide an alternate route when Mississaga Street is closed for special events.	1.9	Mid-Term
James Street E	Upgraded Facility	Painted Bike Lane	Forest Ave in the East to West Street in the West	1.4	Mid-Term
James Street W	Upgraded Facility	Protected Bike Lane	Memorial Avenue in the west to West Street in the East	1.1	Mid-Term

Description	Change	Facility	Limits	KM	Phasing
Ladle Street	Upgrade Facility	Protected Bike Lane	Hughes Road on the North to Coldwater Street on the South	2.8	Mid-Term
Highway 11 Overpass and Multi-Use Trail	New Recommendation	Multi-Use Path	West Ridge Boulevard in the west to Westmount Drive in the east	1.48	Mid-Term
New Roadway in West Orillia	New Recommendation	Painted Bike Lane	Bass Lake Side Road in the north to Stone Ridge Boulevard in the south	1.3	Mid-Term
Westmount Drive	New Recommendation	Protected Bike Lane	Coldwater Road in the north and Barrie Road in the south	1.7	Mid-Term
Gill Street / Poughkeepsie Street	New Recommendation	Painted Bike Lane	Highway 12 By-Pass in the south to the western end of Poughkeepsie Street in the north	1.43	Mid-Term
New Multi-Use Path	New Recommendation	Multi-Use Path	West Street in the west to Matchedash Street/King Street in the north	0.75	Mid-Term
Memorial Avenue	Upgraded Facility	Protected Bike Lane	Barrie Road on the North to Highway 12 on the South	0.8	Long-Term
Coldwater Road	Upgraded Facility	Protected Bike Lane	Collegiate Drive on the East to Murphy Drive on the West	1.1	Long-Term
Fittons Road West	Upgraded Facility	Protected Bike Lane	Park Street on the North to Coldwater Street on the south	1.3	Long-Term
West Ridge Boulevard	New Recommendation	Protected Bike Lane	Long-term addition of on-street protected bike lanes as the roadway is rebuilt between Highway 12 in the North and Old Barrie Road in the south	3.0	Long-Term



5.2.3 Vehicular & Transit Network

The recommended vehicular network comprises a mixture of new roadways, extensions, widenings, transit priority measures and signal optimizations to primarily accommodate new growth areas and increase capacity on existing highway crossing corridors. The recommended improvements are summarised in **Table 5.11** and visualized in **Figure 5.20** along with their recommended phasing.

It should be noted that major road projects recommended within this section would require an Environmental Assessment (EA) study which would allow the solution to be further refined through public consultation to develop a preferred design that balances the needs of all road users compared to the benefits, cost, and environmental impacts of the proposed solution.

During the development of this MTMP several public comments were received in relation to justification for the proposed widening of Laclie Street, which was identified in the 2011 TMP. In consultation with City staff it was apparent that the EA for Laclie was going to be put out for tender imminently. As a result, to align with this work, this MTMP has identified it within the plan. However, we note that the EA for Laclie and any other corridor would include more detailed micro-analysis and public consultation than what is provided within this MTMP allowing for the refinement of context-sensitive designs and solutions.

Short-Term

In the short-term several previously planned improvements are needed to accommodate growth along the Waterfront and enhance the Downtown core to attract new investment and development. The King Street extension will provide a much-needed connection to the waterfront to alleviate demand along Mississaga Street so that it can be transformed into a flex street to further encourage placemaking activities within the core such as the 'Streets Alive', or the classic car show.

In addition to improvements within the core, MTO has planned to reconstruct the Coldwater Road and West Street overpasses over the next five years presenting an opportunity to coordinate roadway, transit, and active transportation improvements at these locations.

Orillia's current hub & spoke transit system relies on efficient crossing of Highway 11 via Coldwater Road to service high trip generators in West Orillia including Lakehead University and Walmart. The reconstruction of the overpass presents an opportunity to incorporate transit-priority measures such as queue-jump lanes (as visualized in **Figure 5.17**), or transit signal priority to

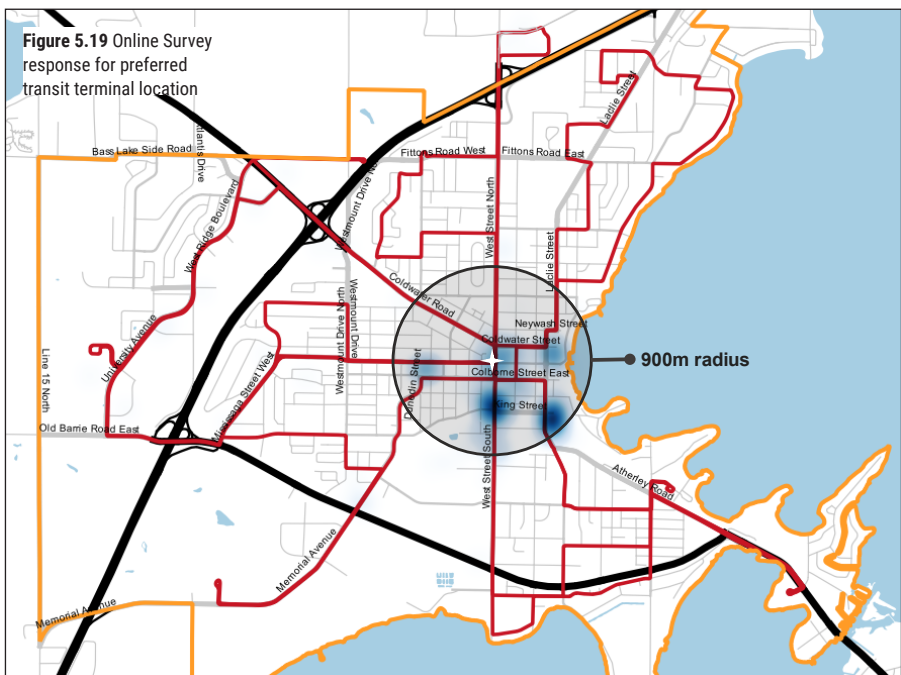
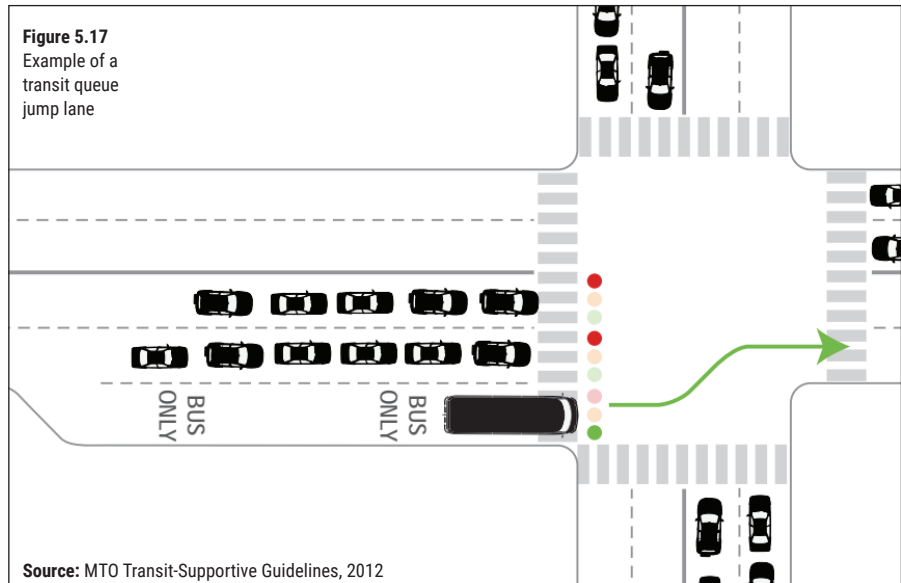
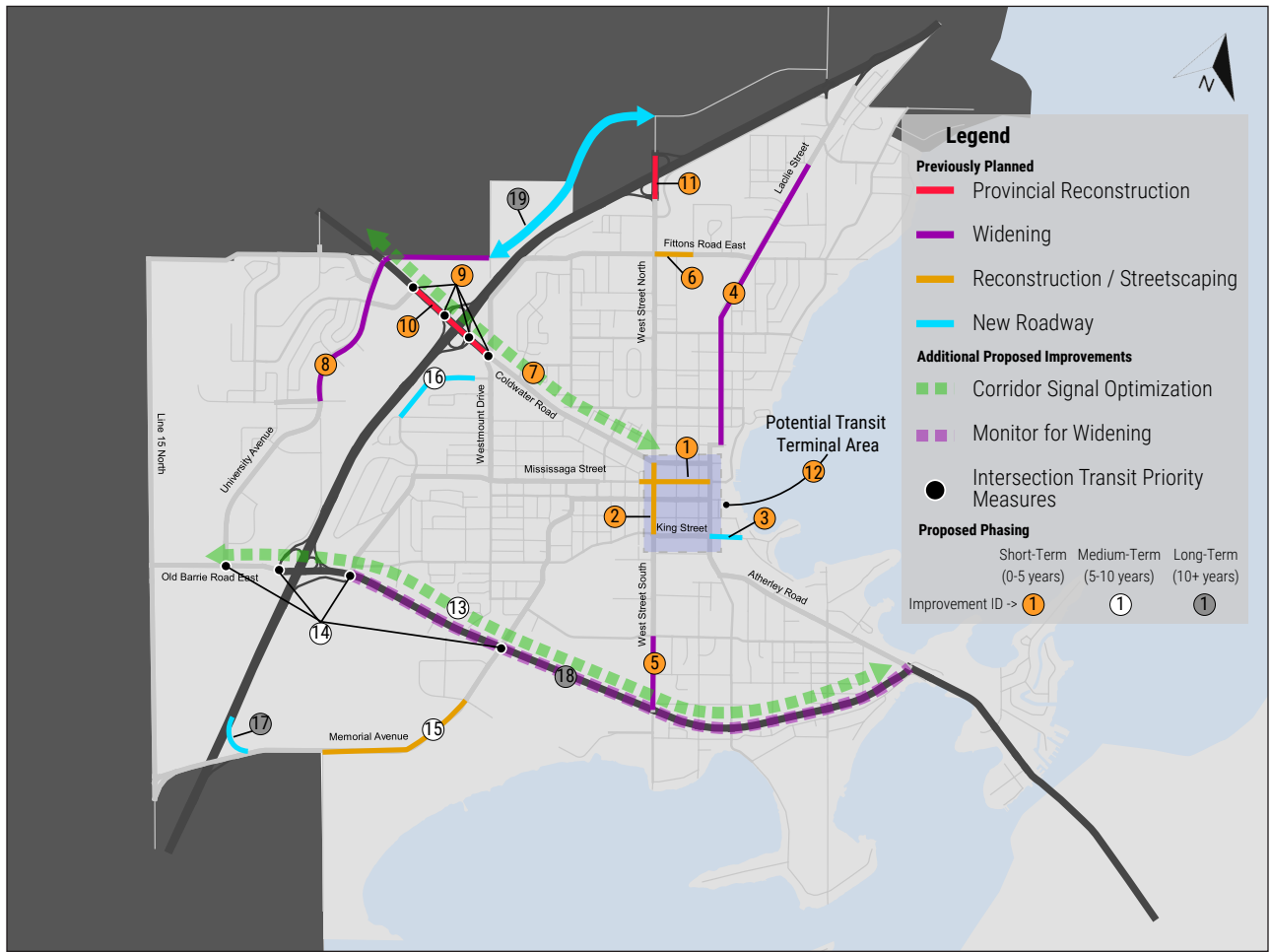


Figure 5.20
Recommended
Roadway
Improvements
and phasing



improve transit on-time performance to west Orillia, which is identified as a growth area. Based on consultation with Orillia Transit, the crossing has been identified as a pinch point on the transit network that affects performance. Additionally, Coldwater Road is a key active transportation corridor between the east and west of Orillia. Due to the high volumes of vehicular traffic it is recommended that protected bike lanes be provided to improve safety and encourage drivers to shift to transit or active transportation.

Parallel to this MTMP document is a transit terminal study to develop a conceptual plan and location of a future transit terminal. The development of a transit terminal will work towards addressing operational issues and safety concerns revolving around the existing on-street transit terminal at West Street and Mississauga Street. While the transit terminal study is a separate study from this MTMP significant integration has occurred including results from our online survey providing input and understanding regarding the need for the new terminal to be placed within relative proximity to the existing one (as visualized in **Figure 5.19**). The importance of this is so to mitigate impacts to existing riders, continue to allow the network to provide the same level of service coverage, along with 30-minute headways, as well as support the Downtown core and create a mobility hub.

As discussed in section 2.2.4 of this document the existing West Street overpass is already currently used by pedestrians and cyclists to access the retail plaza north of Highway 11. The overpass reconstruction should be coordinated to include active transportation provisions to improve safety for drivers, and vulnerable road users. Survey respondents identified the recently built multi-use path across Highway 11 at Old Barrie Road (as visualized in **Figure 5.18**) as a successful highway overpass rebuild that effectively incorporated active transportation.

With regard to transit, as the LINX and GO transit systems expand toward Orillia, the City should coordinate with County and Provincial transit partners to coordinate a fare integration strategy to mitigate the disproportionate impacts of double or triple fares on transit riders. This is particularly important given the external travel demand trends that will present themselves in the future as more people come in/out of Orillia for work.

Medium-Term

Medium-Term improvements revolve around roadway capacity in south-west Orillia, particularly with regards to signal optimization and transit signal priority along the Highway 12 by-pass to improve operations along the corridor and accommodate growth. It is anticipated that an extension of Woodside drive between the existing

terminus north and east to Westmount Drive will be needed as new development occurs. This extension also provides an important future connection to the proposed active transportation crossing of Highway 11 linking it to major future cycling corridors like Mississauga Street, Westmount Drive and Coldwater Road.

Long-Term

The recommended long-term improvements focus on monitoring and evaluating the need for the widening of the Highway 12 by-pass as well as an extension of Murphy Road to serve new areas, contingent on when they are built. As discussed in Section 3.3.3 of this document; under recommended mode split targets it is anticipated that volumes along the corridor will be between 1,100 and 1,700 vehicles per hour in the peak hours by the year 2036. These volumes would typically trigger the need for evaluating a potential road widening on the Highway 12 By-Pass, however they key consideration would revolve around roadway operations. As this is a provincial roadway, improvements will need to be coordinated through coordination and engagement between MTO, the City of Orillia, and the County of Simcoe.

A detailed line-by-line summary of each individual improvement along with their associated costs are provided in **Appendix B** of this MTMP document.

Table 5.11 Recommended Roadway Improvements through 2036

ID	Improvement	Description	Phasing	Jurisdiction
1	Mississauga Street - Albert Street to Front Street	Reconstruction / Streetscape improvements including a flex street	Short-Term	City
2	West Street - Coldwater Road to Barrie Road	Reconstruction, including provisions for protected bike lanes on both sides of the road	Short-Term	City
3	King Street Extension - Front Street to Cedar Island Road	Extension of King Street from the existing terminus to Cedar Island Road along with provisions for a multi-use path on the south side of the roadway and a sidewalk on the north side.	Short-Term	City
4	Laclie Street - Murray Street to Neywash Street	Reconstruction and widen to 3 lanes comprising two general purpose lanes and a centre turning lane, as well as provisions for protected bike lanes on both sides of the road.	Short-Term	City
5	West Street - James Street to Highway 12	Reconstruct and widen to 4 lanes including provisions for protected bike lanes on both sides of the road as well as the addition of a sidewalk on the west side of the roadway.	Short-Term	City
6	Fittons Road - Jamieson Drive to West Street	Reconstruction including provisions for protected bike lanes on both sides of the road.	Short-Term	City
7	Coldwater Road - Signal Optimization	Signal Optimization along Coldwater Road between West Street and West Ridge Boulevard. Will require coordination with MTO for coordination across Highway 11 and at the intersections with Monarch Drive and West Ridge Boulevard.	Short-Term	City/MTO
8	West Ridge Boulevard - Hunter Valley Road to Highway 12	Reconstruction and widening of the existing two-lane cross-section to a five-lane with two general purpose lanes in each direction and one centre turning lane. The widening will also be accompanied by an extension of the existing Multi-Use path to Highway 12 from its existing terminus at Bass Lake Side Road.	Short-Term	City
9	Coldwater Road – Transit Priority Measures	Evaluate and build transit priority measures between Westmount Drive and Monarch Drive. Transit Priority measures may include Transit Signal Priority (TSP), queue jump lanes, or a dedicated transit lane. This should be coordinated with MTO as part of their reconstruction of the Coldwater Road bridge.	Short-Term	City/MTO
10	Coldwater Road – Highway Overpass	MTO planned reconstruction of the existing overpass. Opportunity to coordinate the inclusion of protected bike lanes on both sides of the road along with Transit Priority Measures.	Short-Term	MTO
11	West Street N – Highway Overpass	MTO planned reconstruction of the existing overpass. Opportunity to coordinate the inclusion of protected bike lanes on both sides of the road and a pedestrian sidewalk on one side of the road to connect the mall and high school on both sides of the highway.	Short-Term	MTO
12	New Transit Terminal	New Transit Terminal within proximity to Downtown including provisions for local, county, provincial, and regional transit, as well as provisions for active transportation connections.	Short-Term	City

ID	Improvement	Description	Phasing	Jurisdiction
NA	Transit Fare Integration Strategy	Coordinate with County and Provincial transit agencies to develop a transit fare integration strategy to mitigate the disproportionate impact of transit costs on Orillia residents.	Short-Term	City
13	Old Barrie Road / Highway 12 By-Pass – Signals	Signal Optimization along the Highway 12 By-Pass between University Avenue and Atherley Road. Will require coordination with MTO for all intersections.	Medium-Term	City/MTO
14	Old Barrie Road / Highway 12 By-Pass – Transit Priority Measures	Evaluate and build transit priority measures between University Avenue and Memorial Avenue. Transit Priority measures may include Transit Signal Priority (TSP), queue jump lanes, or a dedicated transit lane. This must be coordinated with MTO.	Medium-Term	City/MTO
15	Memorial Avenue - United Drive to Woodland Drive	Reconstruction of the roadway between United Drive and Woodland Drive including provisions for the construction of a multi-use path at the same time connecting with other planned cycling connections.	Medium-Term	City
16	Woodside Drive Extensions - Mississauga Street to Westmount Drive	Extension of Woodside Drive from its existing terminus north and east to connect with Westmount Drive including provisions for sidewalks and painted bike lanes on both sides of the road between Arthur Street for half the extension, and then a multi-use path and sidewalk on opposite sides for the remainder of the way to Westmount Drive. Pedestrian and cycling connections will be made to a new Highway 11 active transportation crossing.	Medium-Term	City
17	New Memorial Avenue Northbound Ramp	New northbound on-ramp to Highway 11 from Memorial Avenue that will facilitate transit operations and access to from employment lands along Memorial Avenue.	Long-Term	County/MTO
18	Highway 12 By-Pass Widening	Widening of the Highway 12 By-Pass from the current two-lane cross-section. The roadway should be monitored and evaluated for an appropriate cross-section closer to the horizon year. For cost estimation purposes a four-lane cross-section is assumed.	Long-Term	MTO
19	Murphy Road Extension	Extension of Murphy Road parallel to Highway 11 to connect with existing Brodie Drive, providing a connection between Highway 12 and Burnside Line/West Street. This construction and alignment will be contingent on development and evaluated as part of the development process.	Long-Term	City



5.3 Policies & Strategies

A successful multi-modal transportation network relies on a mixture of physical infrastructure and policies that regulate and guide the city toward a vision for the future. The City's Official Plan provides a blueprint for how the community will grow into the future, while the zoning by-laws dictate the operational and physical specifications for the land uses prescribed within the Official Plan. This is done so that the vision identified in the Official Plan can be implemented.

In a similar regard, the transportation network needs policies and zoning by-laws to enhance transportation holistically over time. There are several recommended infrastructure improvements identified in this MTMP that have a deeply connected relationship with land-use that requires a lock-step approach to addressing the City's multi-modal mobility needs.

For instance, as new cycling routes are built across the city, it will be important to ensure that new developments are built in a way that strategically connects to these facilities so that their benefits can be fully realized. This not only involves identifying potential on-site design measures that are amenable to walking and cycling (called Transportation Demand Management), but also parking policies to promote alternative modes of transportation.

Beyond new developments, as more residents are encouraged to use active transportation, there will be an increase in interactions between vehicles, cyclists, and pedestrians. Leveraging the City's existing traffic calming policy will be important so that the City can appropriately and equitably address concerns relating to roadway safety.

Many safety considerations are intrinsically connected to municipal design standards for roadways that will need to be updated to equitably accommodate different road users through design in a way that is amenable to encouraging safe movements of all modes of transportation through Complete Streets.

All of this is impacted by the environmental reality that faces Orillia each year in terms of rain and snow that impact how residents use the transportation system. Despite these weather events, residents still need to have a maintained network of roads, bicycle lanes, and sidewalks in the winter.

This section summarises and outlines policy-driven recommendations for:

- Transportation Demand Management;
- Complete Streets;
- Active Transportation Winter Maintenance;
- Downtown Parking Management; and
- Smart Mobility.

5.3.1 Transportation Demand Management

Currently the City of Orillia does not have a defined Transportation Demand Management (TDM) process for new developments. As a result, it is difficult to develop a coordinated integration of development with active transportation investment. This section outlines a summary and recommendations for how the City of Orillia can incorporate TDM to leverage development in a way that supports and encourages alternative modes of transportation.

5.3.1.1 What is TDM and why is it important?

Transportation Demand Management (TDM) focuses on understanding how people make their transportation decisions to help manage the demand placed on the transportation network. At its most basic level, TDM is a program of information, incentives and policies to help inform people about the available transportation options, as well as guide land use development to promote the use of sustainable transportation options to mitigate development impacts on the network.

There is also a deeper dimension of TDM that guides the design of transportation and physical infrastructure that underlies major objectives outlined within this MTMP including:

- Objective 1: Provide Infrastructure for Growth;
- Objective 2: Plan Flexible Infrastructure for Seasonal Changes;
- Objective 3: Prioritize and Encourage Active Transportation;
- Objective 4: Prioritize and Encourage Transit; and
- Objective 6: Enhance Multi-Modal Connections.

TDM provides tools to help maximize recommended investments for active transportation, transit, and roadway infrastructure identified in this MTMP to

encourage sustainable travel choices by supporting alternative options over the convention of frequently driving alone. Achieving these objectives encompasses a wide range of strategies including:

- Shifting travel modes (e.g. walking, cycling, taking transit or carpooling instead of driving alone);
- Reducing the number of trips people must make (e.g. destinations and activities such as work and shopping, near each other); and
- Travelling more efficiently (e.g. making trips outside of peak hours)

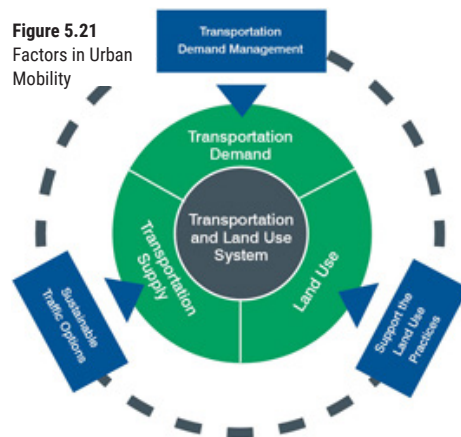


Figure 5.21
Factors in Urban
Mobility

TDM plays a vital role in the design of urban environments and its influence on travel choices. Some of the outcomes that the City should aim to achieve by integrating TDM and development are:

- More attractive streetscapes that are inclusive and inviting for all road users (motorists, pedestrians, cyclists, transit riders);
- Preserving streets and public space for a more balanced transportation system with more and better active transportation infrastructure and better integration with transit; and
- Promoting public health and active lifestyles.

The development community has an important role and influence over the urban environment. There is a growing understanding that TDM can be more effectively pursued and implemented when it is incorporated into new developments during the initial planning and design stage, as well as during construction. By integrating TDM into development applications, both the development community and City can influence travel behaviour for all residents, employees and visitors.

5.3.1.2 Development-Based TDM Measures

There are several TDM measures that can be leveraged through the development application process that have varying levels of effectiveness depending on the proposed land use and urban context. For instance, due to the nature of industrial land uses, and the associated shift work, there are fewer incentives that will be effective in shifting employees onto alternate modes of transportation. A factory may be difficult to serve during overnight shifts with transit fare incentives, however a measure such as promoting ridesharing or carpool spaces may provide opportunities for a development to mitigate their spatial impact on the natural environment while also mitigating their impact on the transportation network. **Table 5.12** provides a matrix of TDM measures and their appropriate contexts that could be considered by developments. This is not an exhaustive list; however, it provides a toolbox of measures that can be used for

Table 5.12 Transportation Demand Management Measure Matrix by Land Use and Urban Context

Measure	Land Uses			Urban Context		
	Residential	Commercial	Industrial	Urban	Suburban	Rural
Multi-Modal Information Packages: New residents and employees to a site should be given transit, cycling, and pedestrian maps when they move in or start to work on a site to help identify alternative transportation options and routes. There is also the option of utilizing an app or website-based interface to make trip planning convenient, especially for students and youth.	●	●		●	●	
Transit Fare Incentives: Free or subsidized transit fares to encourage residents or employees to try transit. Pre-arranging with Orillia Transit, or the City on a bulk purchase agreement for new residents or employees.	●	●		●	●	
Alternative Transportation Amenities: Provide on-site amenities such as safe, attractive, and direct walkways for pedestrians, or bicycle repair stations, or employee showers to encourage cycling. If a site is adjacent to transit, there may opportunities to incorporate weather protected areas into the building design or display transit arrival information in the building lobby.	●	●	●	●	●	●
Private Transit Service: Unavailability of transit in rural or industrial areas can create obstacles to connectivity which are not feasible to serve with conventional transit. An employer can initiate private shuttle services to create a last-mile connection to transit to be more feasible and attractive. Private Transit Service can also be possible with special events or areas of residential developments with residents of limited mobility.	●	●	●		●	●
Carsharing/Bikesharing: Provide shared bikes or cars so that residents and the surrounding community may use a shared option instead of needing to own a car or bike. Many services offer 24-hour access, self-service reservation systems, monthly billings, financing, insurance, and maintenance of the vehicles	●	●		●	●	●
Ridesharing: Greatest in situations where transit ridership is low and, parking costs are high, and where larger numbers of car commuters live reasonably far from the workplace. Possible partnerships with Personal Transportation Providers such as Uber or Lyft to subsidize these trips can increase connectivity for people with limited mobility. Employers can have a dedicated portal for employees seeking and offering rideshare services. Discounted parking fees for carpools can be an extra incentive to rideshare.	●	●	●	●	●	●

inspiration during development site plan, or secondary planning applications to encourage development to consider integrating multi-modal transportation into their designs to enhance and leverage available or planned transportation improvements.

5.3.1.3 Parking-Based Measures

Parking is a key component of transportation demand management that has a direct correlation with automobile use. Historically, parking rates were developed to satisfy forecasted future parking demand, itself extrapolated from historical parking trends. This tends to create a self-fulfilling prophecy, since parking supply increases vehicle use and urban

sprawl, causing parking demand and parking supply to ratchet further upward as illustrated in **Figure 5.22**.

This brings to light the question of the optimal parking supply for a given development. Conventional planning determines how much parking to provide at a particular site based on recommended minimum parking standards

published by professional organizations and codified in municipal zoning by-laws. These standards are often excessive and can usually be significantly reduced. Most parking standards have historically erred toward oversupply as a way of mitigating externalities – reducing on-street parking. Applying such historical parking rates provides far more parking supply than is usually needed, reinforcing automobile dependency. This is particularly the case at mixed-use destinations, serviced with good travel options, and where parking can be efficiently priced or managed.

Oversupply of on-site parking has additional externalities: the high costs of the parking structures themselves, along with the societal costs of the upkeep and maintenance of underutilised structures, and high water and energy usage.

Contextual Parking By-Laws

Currently, the City of Orillia applies blanket parking rates across most of the municipality based on land use. The one exception is within the Downtown where Commercially zoned properties can reduce their parking requirements by 50%. There are opportunities to expand upon this and create specific zones where reduced parking requirements are applicable for residential, and other land uses to encourage higher-density housing and transit-oriented development.

Many municipalities create specific zones or

secondary plan areas where parking rates are adjusted to reflect the local context. For instance, a high-density development adjacent to transit or active transportation may require less parking by the nature of having additional mobility options. The average underground parking space costs approximately \$50,000 per space to construct underground.

Reducing parking requirements in areas that are capable of shifting drivers onto alternative modes of transportation can enhance not only the built form, but also support transit and active transportation to make those modes viable.

Parking Maximums

Traditionally, the supply of parking is regulated through zoning codes that prescribe minimum parking requirements calculated as a ratio of the number of parking spaces required per square foot, dwelling area or other measure of intensity. The methodology often results in oversupply of parking leading to vast expanses of parking which in turn separate land uses, reduce densities, impair walkability, and create obstacles to providing transit and pedestrian friendly communities.

Maximum parking requirements on the other hand limit the number of parking spaces that may be built and prevent the developer from building additional spaces than required. This will guide developers toward developments that are more transit-oriented in nature.

Shared Parking

Best-practices for parking utilize shared parking strategies to minimize a building’s parking footprint while simultaneously maximizing parking utilization. Shared parking serves multiple land uses that have different peak demand periods with one set of parking spaces that are shared as visualized in **Figure 5.23**.

Considering the City’s Official Plan, Community Improvement Plan, and this MTMP’s objectives, it is important that development parking requirements do not result in an oversupply of spaces. An oversupply of parking represents underutilized infrastructure that will continually need to be maintained and paid for with little operational benefit and can even work against other municipal investments in transit and active transportation.

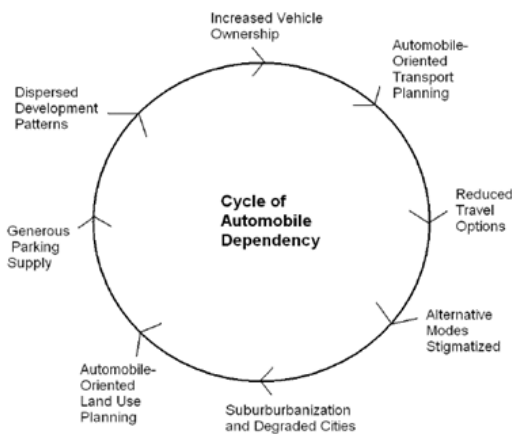
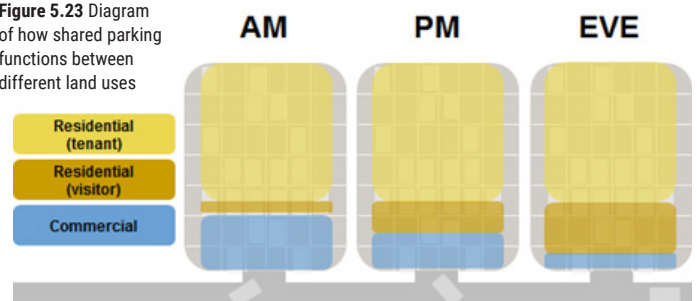


Figure 5.22 Cycle of Automobile Dependency

Figure 5.23 Diagram of how shared parking functions between different land uses





Carpool Spaces

Carpooling is the sharing of car journeys so that more than one-person travels in a car and prevents the need for others to have to drive to a location themselves. In addition to alleviating the demand for driving, carpooling reduces personal travel costs such as fuel, tolls, maintenance and driving stress.

Municipalities and transit agencies could provide an interface for people to share their trips and available spaces helping to connect potential commuters travelling in the same direction.

Carshare Spaces

Car share programs provide access to short-term car rentals and are operated by private transportation network companies. Language can be included into the zoning bylaws which encourage or require developers to provide dedicated carshare spaces and partnerships with private companies. In turn, developers could be provided incentives for providing car share vehicle spaces through reduced parking requirements.

Priced Parking- Increased Parking Fees

Setting the price of parking involves much more than just revenue generation because it can address a number of transportation objectives. It can be implemented as a Transportation Demand Management (TDM) strategy to reduce vehicle traffic in an area by encouraging use of alternative modes of travel. The price of parking also forms part of a parking management strategy to reduce parking problems in a particular location such as a downtown. Also, to make transit a financially competitive option compared to driving, tying the pricing of monthly parking passes to monthly adult transit passes is strongly advised.

Increased parking revenue could be invested back into the neighborhoods where it originated in smarter ways rather than going into the City's general fund.

Additional revenue could be used to pay for services such as: additional street patrols, transit, streetscaping, advanced parking management systems, additional parking lots/garages, etc

Priced Parking - Demand-priced Parking

A system could be developed whereby the city compares the actual parking occupancy with the desired parking occupancy and every few weeks nudge prices up or down accordingly based on demand. Prices can be set by block and time of day to produce one or two open spaces on every block and thus reduce demand.

Cash-in-Lieu of Parking

Cash-in-lieu (also called fee-in-lieu or payment-in-lieu) parking programs allow developers to provide fewer on-site parking stalls in exchange for contributing money to the cash-in-lieu fund. Typically, these funds are then used to facilitate construction of offsite shared parking facilities. Most often, cash-in-lieu is intended to allow commercial development to occur, especially the redevelopment of existing buildings on lots that are too small to accommodate on-site parking, without providing the full amount of parking that is required under the Bylaw. The funds could also be used to develop active transportation facilities and streetscaping to motivate a mode change.

5.3.1.4 School Travel Planning (STP)

A study by York University and the Hospital for Sick Children in 2016 found that the most dangerous part of a kid's day may be during the morning school drop-off. Researchers observed at least two instances of dangerous driving during the morning rush at 88% of the Toronto public elementary schools that were monitored as part of the study. In relation to this, they also observed that each dangerous driving behaviour during school drop-off periods were associated with 45% times greater risk of collisions.

The study looked at collisions, injury rates as well as parents' driving habits during a typical day. Some of the observed issues included parents doing U-turns in front of a school during rush hour, blocking wheelchair loading zones, not stopping or putting their car in the park while their children exit. Over a 12-year period this study identified that 411 children in Toronto were hit by car within 200 metres of a school.

Schools have become hot spots for vehicle/pedestrian conflicts as fewer students walk or bike to school which has led to the increase in parents driving their children to

a school and inadvertently putting other children at risk in doing so. A tool that has been gaining traction in reducing school-related traffic injuries is implementing a School Travel Planning (STP) program.

STP is a process that involves school staff, parents and students working with transportation/traffic staff, police and public health to develop a plan to address parental concerns and challenges about school routes, and get more students walking and cycling for the school journey. The focus of this is to apply context-sensitive TDM measures in collaboration with schools to reduce the number of private automobile student drop-offs in favour of active transportation options.

The organization Green Communities Canada currently delivers the Ontario Active School Travel program which is an Ontario-wide program dedicated to children's mobility, health and happiness. The organization leverages a six-phase process over an initial period of two to three years, guided by a facilitator whose role is to bring everyone together, coordinate activities and compile the STP. The six phases of this framework include:

- **Phase 1: Set-up the project:** Getting STP started involves appointing a Facilitator, identifying the schools and stakeholders to participate, and establishing STP committees to support and oversee the process.
- **Phase 2: Assess conditions:** The second phase of STP involves collecting the information needed to identify and understand local school travel issues. The data collected in this phase also provides a baseline against which progress can be measured over the course of the STP process.
- **Phase 3: Develop Action Plan:** The third phase of STP is to develop a plan of action based on the issues and barriers to active school travel that have been identified in Phase 2. Action items should be realistic and measurable, and it's important to identify responsibilities and deadlines.
- **Phase 4: Implement Action Plan:** The fourth phase of STP is all about making the Action Plan happen! This requires ongoing communication with the school community and STP committees and requires updating the Action Plan at regular intervals to track progress.
- **Phase 5: Evaluate progress:** The fifth phase is the evaluation of the STP project and involves collecting follow-up data to compare to the baseline data collected in Phase 2 and updating the School Travel Plan to document Action Plan progress. Phase 5 also involves celebrating successes and planning resources for the continuation of the project.

- **Phase 6: Keep it going:** The sixth phase involves transitioning the STP Committees to continue working on STP once the Facilitator reduces their involvement. The STP Committee will keep the STP process going through Phases 3 to 6 on a cyclical basis to implement the Action Plan, reassess conditions, and update the Action Plan.

There is an opportunity for the City of Orillia to coordinate with local school boards to implement STP within the community to not only enhance roadway safety around schools, but to also encourage a better utilization of planned active transportation improvements identified in this MTMP. According to the analysis shown in Chapter 2 of this plan, the majority of school trips are made by automobile or school bus, there are significant opportunities to shift automobile trips in favour of cycling or walking by leveraging STP.

5.3.1.5 TDM Recommendations

The City of Orillia should develop context specific TDM policies, including associated zoning by-law updates for parking policies. This will provide a mechanism by which the City can use to collaborate with developers to encourage active transportation and transit, while also presenting opportunities for developers to mitigate their impact on the vehicular network as well as mitigating the spatial needs of parking on a site.

Recommended Policy Documents:

- Develop a Transportation Demand Management Checklist of applicable TDM measures for new developments based on land use;
- Context-sensitive amendments to zoning and parking by-laws including developing maximum and reduced vehicular parking rates for new developments based on the implementation of TDM measures; and
- Coordinate with local school boards to develop a School Travel Planning program.





Figure 5.24 Sketch of an urban complete street

5.3.2 Complete Streets & Road Classification

5.3.2.1 What are Complete Streets?

Complete Streets are streets that are safe for everyone including people who walk, bike, take transit, or drive, and people of all ages and abilities. A Complete Street policy ensures that transportation planners and engineers consistently design and operate the entire street network for all road users, not only motorists.

Smaller communities face unique transportation challenges. Major roads that bring traffic through the City can present significant safety barriers for residents on foot or on bike, and in Orillia's case key roadways are controlled by a higher tier government. These major roads are not only strategic transportation routes but are also important to the economic vitality of the community. With a Complete Streets approach, Orillia is empowered to coordinate with outside agencies on new project designs to ensure that it will serve residents as well as visitors.

5.3.2.2 What does a Complete Street look like?

There is no singular design prescription for Complete Streets; each one is unique and responds to the community context. A complete street may include sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible public transportation stops, frequent and safe crossing opportunities, median islands, accessible pedestrian signals, curb extensions, narrower travel lanes, roundabouts, and more.

The over-arching philosophy is that Complete Streets takes a holistic approach to equally sharing the roadway for all road-users based on the contextual needs.

5.3.2.3 Recommended Road Classification

The City of Orillia is served by a mixture of municipal and provincial roadways as described and visualized in section 2.2.1 of this document. While the existing road classification has a robust definition of motor vehicle requirements, there are opportunities to re-define the road network in a way that incorporates appropriate design parameters and considerations for active transportation and transit, as well as integrate the road classification to reflect work completed as part of the Streetscape Master Plan.

The Classification Framework

A framework has been developed to define the function of the street network to inform the planning outcomes and investment decisions for the City. The framework defines the future function of the street network on the basis of overall land use and transport objectives.

The roads within Orillia will provide two primary functions:

- **Movement:** the ability to travel between places; and
- **Place:** the ability to access origins and destinations of travel.

An understanding of the two functions that street environment play is especially important when the two functions compete, such as through increased movement requirements or improved place amenity. The movement place function of the street environment informs planning for the level of access across each mode of transport. The following different road classifications based on the function they serve within the transportation network:

- **Arterial Roadways:** Dedicated to the quick and efficient movement of goods and people over long distances with Arterials playing a strategically significant function within the road network.
- **Collector Roadways:** Provide safe, reliable and efficient movement between neighbourhoods and strategic centres.
- **Flex Streets:** A "flex street" is a street with a single grade or surface that is shared by people using all modes of travel at slow speeds. Curbs are removed, and the sidewalk is blended with the roadway. Speeds are slow enough to allow for pedestrians to intermingle with bicycles, motor vehicles, and transit.
- **Local Streets:** Facilitates local access to communities.

The recommended road classification is visualized in **Figure 5.25** and changes are summarised in **Table 5.13**. With a comparison of current and recommended design standard complete streets cross-sections on the following pages.

Figure 5.25
Recommended
Road
Classification

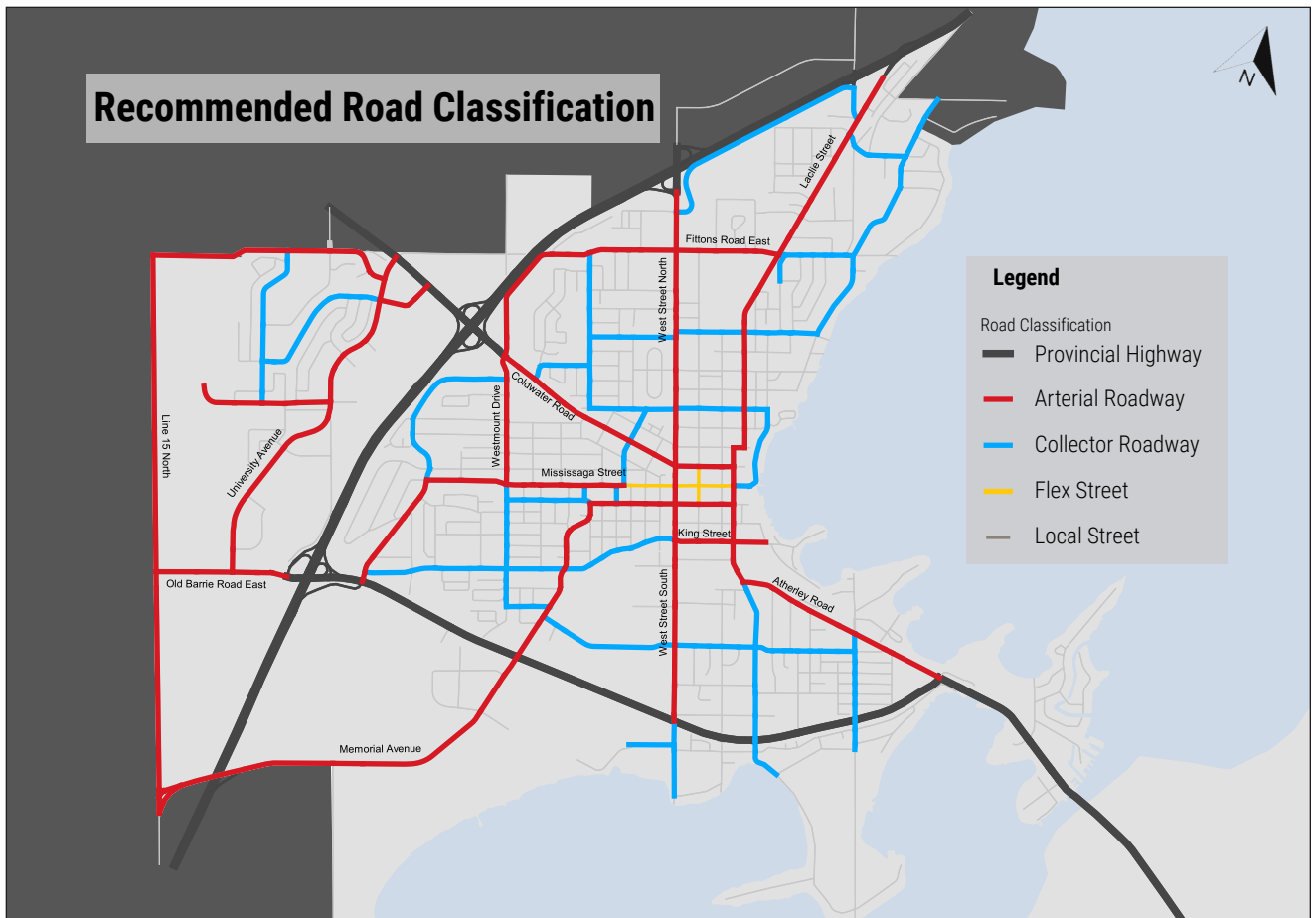


Table 5.13 Recommended Changes to Road Classification and their Implications

Roadway	Description	Recommended Classification	Implications
Mississauga Street	Between William Street and Front Street.	Flex Street	<ul style="list-style-type: none"> Shared space, traffic calming, discourages through traffic.
Peter Street	Between Coldwater Road and Colborne Street.	Flex Street	<ul style="list-style-type: none"> Shared space, traffic calming, discourages through traffic.
King Street Extension	Extend the existing Arterial Roadway designation east to Cedar Island Road.	Arterial Roadway	<ul style="list-style-type: none"> New roadway that needs to meet Arterial Road maintenance standards.
Stone Ridge Boulevard	Extend the existing Arterial Roadway designation to the west as the roadway is extended.	Arterial Roadway	<ul style="list-style-type: none"> Needs to meet Arterial Road maintenance standards.
Woodside Drive Extension	Extend the existing Collector Roadway designation to the extended roadway to Westmount Drive as it gets built.	Collector Roadway	<ul style="list-style-type: none"> New roadway that needs to meet Collector Road maintenance standards.

5.3.2.4 Complete Streets Recommendations

The recommended changes to roadway classification are intimately connected with land use planning. As a result, the proposed changes to roadway classification should be amended in the next Official Plan Update. This should be done in coordination with specific parameters to account for Transit, Active Transportation, and roadway safety for each road classification category so that municipal geometric design standards support the over-arching policy.

Recommended Policy Documents:

- Official Plan Amendments to account for the updated road classifications and changes;
- Updated Municipal Design Standards for the Road Classification categories to include Transit, Active Transportation, and road safety parameters conducive of Complete Streets.



Existing Typical → **Recommended Typical**

Arterial

Arterial roadways should connect to the provincial and county road network as well as service major commercial or employment areas in Orillia. They should accommodate designated pedestrian and cycling facilities, along with transit priority measures where applicable. The type of pedestrian or cycling facility is determined by vehicular volume and speed, where higher volume roadways will need greater safety measures. Preference should be for protected bike lanes, followed by painted bike lanes. Signed routes are not recommended on Arterial roadways. Where needed on-street parking should also be accommodated. Typical right-of-way width should be 18m - 30m depending on the configuration.

Existing Typical → **Recommended Typical**

Collector

Collector roadways should service major neighbourhood nodes such as schools and community centres as well as provide a link to the broader Major collector roadway system. They should accommodate pedestrian sidewalks on at least one side of the roadway as well as allow for bicycle infrastructure such as protected or painted bike lanes, however a signed route may be appropriate based on vehicular volumes. On-street parking may be accommodated depending on the available space. Typical right-of-way width should be 12m to 26m.

Existing Typical → **Recommended Typical**

Flex Street

The Orillia Streetscape Master Plan identified Mississauga Street and Peter Street to be reconstructed as Flex Streets to so that the roadway's function can change with time and with the seasons. By narrowing the roads to the appropriate width, it slows traffic allow for the pedestrian streetscape to be widened as much as possible, inviting everyone to enjoy this urban space together as pedestrians, cyclists and motorists. As the average speed inevitably drops, the enjoyment of the moment increases. Flex streets offer a diverse platform for varying activities along the street, supported by an integrated sustainable infrastructure of lighting, trees and furnishings. The flexible zone frames a mix of uses including cycling, sidewalk play, tree canopies, laneway greening, water play, performance areas, murals and art platforms.

Existing Typical → **Recommended Typical**

Local Street

Local Streets facilitates local access to communities. Due to the low volumes of traffic that travel along Local Streets strategically located streets may accommodate pedestrian sidewalks on one or both sides of the street as well as signed bicycle routes to connected to the broader dedicated cycling system (i.e. painted or protected bike lanes) on Collector and Arterial roadways. On-street parking may be accommodated depending on the available space and need. Typical right-of-way width should be 14m to 18m.

5.3.3 Pedestrian Crosswalks

Pedestrian and Cyclist safety presents challenges for municipal authorities and traffic engineering communities across North America. The challenge is created by the inherent vulnerability of pedestrians and cyclists in relation to all other modes of mobility on the transportation network, particularly where conflicting movements between modes exist. Since pedestrians and cyclists involved in traffic accidents are much more likely to be injured, safety must be a high priority in analyzing active transportation facilities.

During public consultation through this MTMP, several safety-related comments pertaining to pedestrian crosswalks were submitted, particularly with regards to the lack of protected pedestrian crossings on major arterials where major existing and planned cycling or pedestrian facilities cross as visualized in **Figure 5.26**. These areas need to be further evaluated prior to implementation to determine the appropriate design treatments to enhance active transportation safety.

Orillia has jurisdiction over most roads within the City's boundaries. While pedestrian facilities, including crosswalks, are under the jurisdiction of the City of Orillia there are potential safety and liability impacts to the County of Simcoe and the Province when municipal roadways direct pedestrians across County and Provincial roads. When deciding on appropriate pedestrian traffic control, it is important to consider governing provincial legislation and guidelines such as the Ontario Traffic Manual (OTM) series

which provides information and guidance to transportation practitioners to promote uniform traffic control devices and systems across the province.

5.3.3.1 Provincial pedestrian Crossing guidelines

The Ontario Traffic Manual (OTM) provides a set of guidelines consistent with the intent of the Highway Traffic Act (HTA) to provide a basis for road authorities to generate or update their own guidelines and standards. OTM Book 15 – Pedestrian Crossing Treatments provides practical guidance and application information on the planning, design, and operation of pedestrian roadway crossing treatments for transportation practitioners.

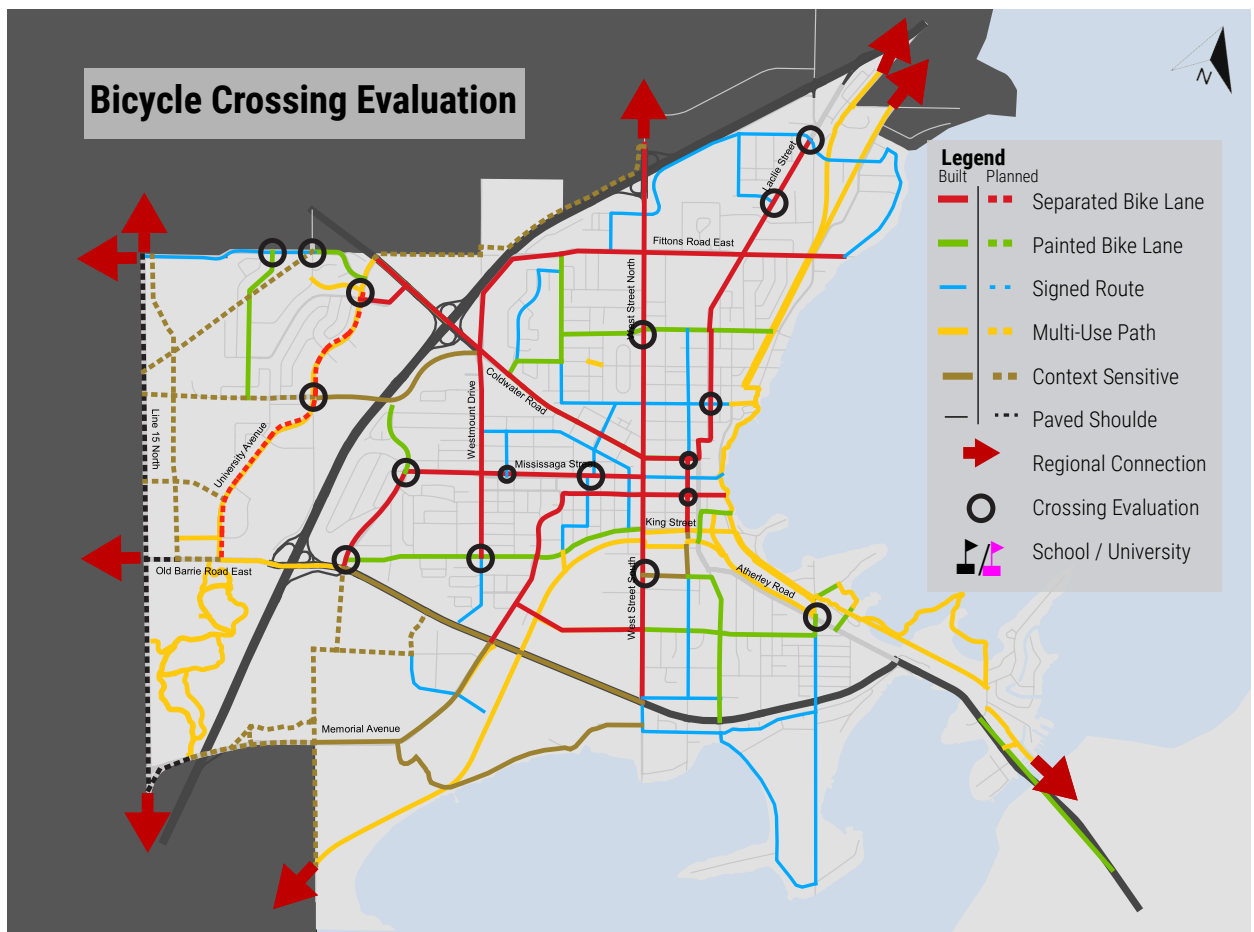
To support efficient and consistent deployment of treatment systems, the book provides a Decision Support Tool (DST) to assist in the process. The DST includes two components:

- Preliminary Assessment; and
- Pedestrian Crossing Selection.

The preliminary assessment for pedestrian crossover (PXO) is based on the following three factors:

- **Pedestrian Volumes:** If the 8-hour pedestrian volumes are greater than 100 then the location is a candidate for a PXO.

Figure 5.26 Key Unprotected Active Transportation Crossings



- **Vehicular Volumes:** If the 8-hour vehicular volumes are greater than 750 then the location is a candidate for a PXO.
- **System Connectivity:** If the facility is a key link and provides connectivity and is more than 100 meters to the nearest traffic control device then the location is a candidate for a PXO.

The OTM guidelines are best suited for high volume provincial roads and the volume warrants might not always trigger the need for a pedestrian crossing on local municipal roads. Though OTM Book 15 is quite comprehensive in describing where, how, and why to provide pedestrian crossing controls, it provides little guidance when vehicular volumes do not warrant a crosswalk such as when a pedestrian facility is required to address concerns with system connectivity, pedestrian safety or pedestrian desire lines. It is predominantly a volume-based approach, which presents a challenge for local municipalities with lower vehicular volumes to justify pedestrian crossing facilities through the OTM. For this reason, many smaller municipalities across Ontario often implement courtesy crosswalks. However, courtesy crosswalks do not provide any legal protection and right-of-way for pedestrians under the Highway Traffic Act (HTA) and are often a band-aid solution for a larger safety concern.

5.3.3.2 Guiding Principles

This MTMP identifies the following relevant objectives related to pedestrian safety including:

- Objective 2: Plan Flexible Infrastructure for Seasonal Changes;
- Objective 3: Prioritize and Encourage Active Transportation;
- Objective 5: Improve Safety for All Road Users; and
- Objective 6: Enhance Multi-Modal Connections.

Building on these objectives, the following four (4) Guiding Principles were developed to help with the development and identification of initiatives to enhance pedestrian safety:

- **Reduce collision risk and severity:** This is the key objective in providing pedestrian crossing control and other supporting facilities and devices. It is fundamental that the road system protects pedestrians and other vulnerable road users by achieving a high level of compliance from drivers, bicyclists, and pedestrians and by minimizing pedestrian exposure to traffic.
- **Enhance connectivity:** Effective crossing opportunities should be provided to ensure system connectivity for pedestrians while considering driver workload and expectation, proximity to other crossings, and the safety of pedestrians. Facilitating connectivity between crosswalks and sidewalks, and/

or trail networks involves understanding and monitoring pedestrian desire lines, which evolve as a function of land use, the location of pedestrian generators and attractors, and proximity to existing crossing facilities. When alternatives to pedestrian desire lines are required due to other factors, these facilities should be simple, convenient, and clearly marked, and should effectively channel pedestrians so that they modify their natural choice with the shortest possible deviation.

- **Enhance accessibility:** The demographics of the pedestrian population, as well as the mix of road users at different time periods, should be considered and crossing treatment systems should be designed accordingly. As the population changes, a “design pedestrian” should be considered to ensure the accessibility of all road users and not only those with good visual, mental, and physical capabilities.
- **Enhance system maintenance:** Ongoing rehabilitation and maintenance of pedestrian infrastructure should be equally as important as its implementation. A safe transportation system must not only be properly planned and designed but should also be properly maintained through an annual maintenance program. Maintenance-related issues such as irregular surfaces, debris on sidewalks, inadequate snow removal, water accumulation due to drainage problems, and others, can pose safety hazards for pedestrians, particularly the elderly and those with disabilities.

5.3.3.3 Candidate site prioritization methodology

A methodology for objectively evaluating pedestrian crossing implementation sites that do not satisfy volume warrants was developed with criteria that focus on evaluating based on increased pedestrian network connectivity, pedestrian demand, and safety. There is no scientific methodology to select the criteria to use when evaluating candidate sites. Rather, the criteria and methodology should balance the unique needs of the town and the availability of existing data to quantify criteria.

Three pedestrian prioritization criteria themes were developed including:

- **Connectivity-based criteria;**
- **Demand-based criteria; and**
- **Safety-based criteria.**

Each of these three broad criteria categories have several additional specific criteria, levels and draft scoring, as shown in **Table 5.14** on the following page, that were developed based on public consultation and analysis throughout this MTMP study. The scoring system was developed based on best practices in various

Table 5.14 Potential Pedestrian Crossing Criteria and Points for Consideration

Criteria	Categories	Score
Connectivity		
Proximity to senior facilities and major medical centres	Adjacent to senior facility	15
	≤ 100 m from facility	12
	101 – 200 m from facility	8
	201 – 400 m from facility	5
	>400 m from facility	0
Proximity to elementary and middle schools	Adjacent to School	10
	≤ 100 m from School	8
	101 – 200 m from School	5
	201 – 400 m from School	3
	>400 m from School	0
Proximity to high schools and post secondary institutions	Adjacent to School	5
	≤ 100 m from School	4
	101 – 200 m from School	3
	201 – 400 m from School	2
	>400 m from School	0
proximity to Transit stop or Transit route	Adjacent to transit stop/route	5
	≤ 100 m from transit stop/route	4
	101 – 200 m from transit stop/route	3
	201 – 400 m from transit stop/route	2
	>400 m from transit stop/route	0
Proximity to a Major trip generator	Adjacent to facility	5
	≤ 100 m from facility	4
	101 – 200 m from facility	3
	201 – 400 m from facility	2
	>400 m from facility	0
Connection to Multi-use trail or major trail facility crossing	Yes	5
	No	0
Proximity to nearest controlled crossing opportunity	>300 m	5
	200 -300 m	2
	< 200m	0

Criteria	Categories	Score
Demand		
Community request	Yes	5
	No	0
Land use	Low density residential	1
	Medium density residential	2
	High density residential	3
	Core commercial	5
	Other commercial	3
	Institutional	5
	employment	3
	Growth area	3
Safety		
Pedestrian collision history	≥ 1 pedestrian collisions in the last 5 years	5
Road Class	Major arterial	5
	Minor arterial	4
	Major collector	3
	Minor collector	2
	Local	1
Posted speed limit	60 km/h	5
	50 km/h	3
	40 km/h	1

municipalities across Ontario with the intention of providing a framework that will empower residents, councillors, and town staff to move beyond OTM Book 15 for the implementation of pedestrian crosswalks in Orillia based on the vision and objectives developed within this MTMP, which may or may not be shared by provincial standards that take a broader approach to planning.

Beyond identifying a suitable location for a pedestrian crosswalk, additional consideration should be given for what type of crosswalk is appropriate. **Table 5.16** on the following page summarises several different pedestrian crosswalk solutions and their applicability based on where a potential crossing is desired. There is no standard criteria or threshold for most crosswalk facilities, as such recommended solutions often require consulting with the local community to determine which solution would best serve a location. For instance, if the crossing location will also serve cyclists, it may be beneficial to incorporate cycling elements into the recommended solution.

Although this evaluation methodology is critical for developing an objective and quantifiable score for potential pedestrian crosswalks, there are other factors that are considered when the

feasibility or appropriateness of locations (e.g., coordination with other planned roadway projects, site investigation to select exact crossing location, and site-specific installation costs).

Additionally, it must be recognized that the evaluation scores might change in between the planning and implementation stages (e.g., implementation of new nearby PXOs, new transit routes, changes in roadway characteristics, changes to surrounding built environment). It should be noted, that although this MTMP provides broad guidance on specific criteria to consider, these should be refined and formalized to determine a total evaluation score that must be achieved to satisfy the Town for implementation. This should be done through additional study and consultation between Town staff, councillors, and the local community.

5.3.3.4 Pedestrian Crosswalk Recommendations

Pedestrian crosswalks and Traffic control devices play a vital role in pedestrian safety and must be implemented to ensure that the most troublesome locations receive attention commensurate with the problem. It is essential that Pedestrian traffic control issues be continually monitored to ensure that the treatment measures remain effective and the available funds derive the best value.

The City of Orillia should develop a pedestrian safety program to systematically and proactively address pedestrian safety issues. This is an important undertaking, especially given the population growth projected for the town and the town's focus on promoting active transportation as an encouraged mode of travel. The plan should lay out a vision for improving safety, examining existing conditions, and using a data-driven approach to match safety programs and improvements with demonstrated problems

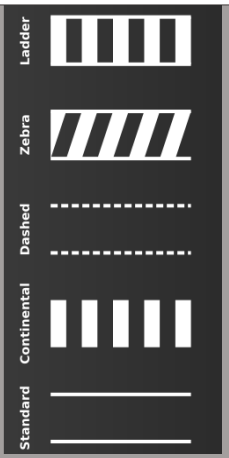


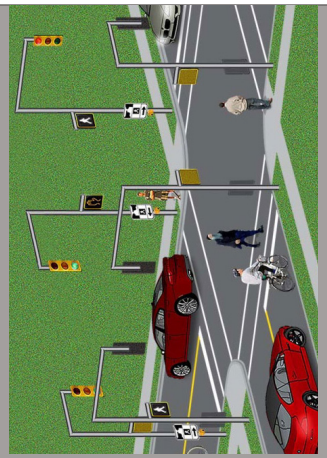
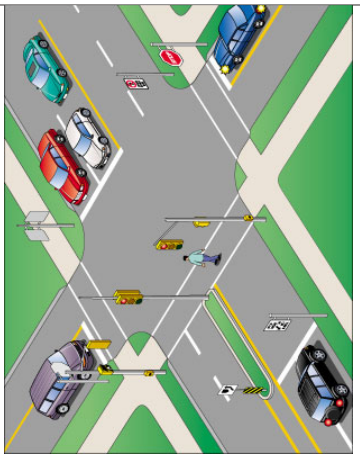
Recommended Policy Documents:

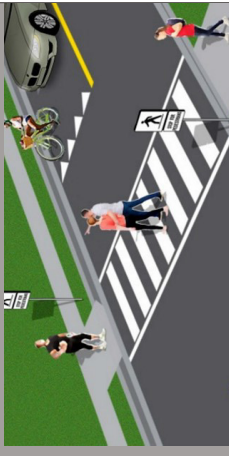
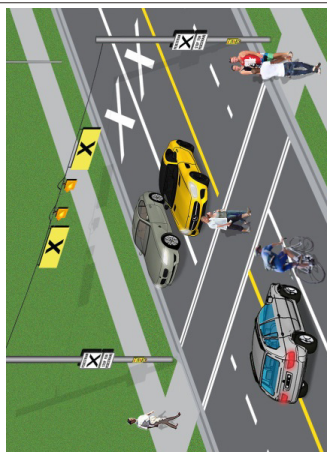


- Develop a active transportation safety plan that encompasses an evaluation scoring system for pedestrian crossings and considers the items presented in **Table 5.15**.





Table 5.15 Considerations to include in an Active Transportation Safety Plan for Orillia

	Reduces Risk and Severity	Enhances Connectivity	Enhances Accessibility	Enhances System Maintenance
Devise a road safety review program to evaluate the safety and operations of locations with a high frequency of collisions or conflicts involving pedestrians or cyclists.	✓			
Re-evaluate signal timing practices to ensure that seniors and people with disabilities have enough time to clear signalized intersections.	✓		✓	
Implement street lighting strategies that ensure street lighting is appropriate for pedestrian needs and safety.	✓			✓
Develop an implementation strategy to eliminate gaps in the sidewalk network on all roads.	✓	✓	✓	✓
Implement a program to identify and continuously evaluate locations that have pedestrian desire lines. This would assist with the definition of sites that would require improved connectivity.	✓	✓		
Adopt and implement pedestrian crossing control treatments identified in OTM Book 15.	✓	✓	✓	✓
Investigate opportunities to work with transit agencies to maximize connectivity between the pedestrian and transit facilities	✓	✓	✓	
Implement wayfinding information that would not only assist residents but also visitors.		✓		
Ensure accessible detours are provided for pedestrians during construction and maintenance of infrastructure that interrupts pedestrian access and mobility	✓	✓		
Develop an implementation strategy for accessible pedestrian signals (APS), including tactile surfaces, to assist blind, visually impaired or deaf-blind users to safely cross at signalized intersections.	✓		✓	
Develop a sidewalk maintenance prioritization program.				✓
Develop the capability to use GIS to incorporate collision data, traffic data and road inventory data for better road safety analysis in the future.	✓			✓
Constantly Review and update current sidewalk snow removal requirements as per provincial maintenance standards.	✓			✓
Develop design guidelines for the separation of pedestrian and turning vehicles at intersections with turning controls.	✓			
Develop an Active and Sustainable School Transportation program and encourage schools in Orillia to participate in the program.	✓		✓	

Table 5.16 Typical Pedestrian Crossing Measures, their applicability, and examples

Pedestrian Crossing Facility	Description	Purpose	Applicability				Example
			Mid-block	Inter-section	Roundabout	Right-Turn Channel	
Improved Crosswalk marking	Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by signs or by lines or other markings on the surface	Crosswalk marking create reasonable expectations where pedestrians may cross a roadway and help channelization of pedestrians to designated crossing locations. The use of a patterns like , Continental, Zebra, or a Ladder could increase driver awareness	✓	✓	✓	✓	 
Decorative Crosswalk markings	Non-traditional Crosswalk marking for improved visibility and elevating public spaces. This could include textured, colored or paved crosswalks that contrast with the adjacent roadway	Decorative Crosswalk provide a unique streetscape design treatment to emphasize pedestrians' presence and primacy. Marked crosswalks alert drivers to expect crossing pedestrians and to direct pedestrians to desirable crossing locations	✓	✓	✓		
Full Traffic Signal	Traffic signals that alternate the right-of-way between conflicting streams of vehicular traffic, or conflicting movements between vehicular traffic and pedestrians crossing a road for all approaches of an intersection	Full traffic signals provide a protected phase for pedestrian to cross the roadway when the corresponding vehicular flow has a green light		✓			
Intersection Pedestrian Signal	Traffic control signal systems that are dedicated primarily to providing traffic gaps for pedestrian right-of-way at intersections	Intersection pedestrians signal help pedestrians cross the road safely by signally traffic to stop by the use of push buttons			✓		

Pedestrian Crossing Facility	Description	Purpose	Applicability				Example
			Mid-block	Inter-section	Roundabout	Right-Turn Channel	
Midblock Crossings	Traffic control signal systems that are dedicated primarily to providing traffic gaps for pedestrian right-of-way at Midblock locations	Midblock crossings facilitate protected crossings across midblock desire lines and decreases pedestrian collision risk with vehicles	✓				
Pedestrian Crossover	Pedestrian facility that provide protected crossing opportunities to pedestrians by requiring motorists to yield to pedestrians over the crosswalks. They may employ illuminated overhead lights and/or warning signs and pedestrian push buttons.	Pedestrian crosswalks increase predictability of pedestrian actions and movements. They help direct pedestrians to locations of best sight distance	✓	✓	✓	✓	
Hybrid Crossing	Hybrid traffic control allows protected pedestrian and cyclist crossings functioning similar to a pedestrian crossover, allowing cyclists to avoid having to actuate if vehicular volumes are low, but provides the option for actuation when volumes are high.	Hybrid beacons are specifically used to improve non-motorized crossings of major streets in locations where side-street volumes do not support the installation of a conventional traffic signal (or where there are concerns that a conventional signal will encourage additional motor vehicle traffic on the minor street). Hybrid beacons may also be used at mid-block crossing locations (e.g., trail crossings).	✓	✓			
Stop or Yield Control	For pedestrian crossing treatments at intersections that are not warranted for traffic signals, stop control and yield-control provides an alternative opportunity for pedestrians to make a safe and convenient crossing	Stop and Yield signs improves motorists yielding behavior towards pedestrian in a crosswalk		✓		✓	

Pedestrian Crossing Facility	Description	Purpose	Applicability				Example
			Mid-block	Inter-section	Round-about	Right-Turn Channel	
Crossing Guards	Crossing guards to direct and supervise the movement of persons across a roadway at designated school crossing locations	Crossing guards help create gaps by stopping traffic temporarily to allow enough time for children to safely cross the streets	✓	✓	✓	✓	
Pedestrian Signal Re-Timing	Signal timing program that provides more time for vulnerable pedestrians to cross at signalized intersections.	Pedestrian Signal Re-Timings helps safely accommodate pedestrian walking at slower speeds		✓			
Leading Pedestrian Interval	An exclusive pedestrian phase that provides an advanced walk signal so that pedestrians begin to cross the street before the corresponding vehicle green indication.	Leading pedestrian interval helps in Increases pedestrian visibility and reinforces Pedestrian right-of-way over turning vehicles. It also Provides additional time to older pedestrian to clear the crosswalk		✓			
Signage	Regulatory and warning signing around school zones to assist, restrict and prohibit selected vehicular or pedestrian movements to reduce potential conflicts	Single Builds awareness among road users and students. They help improve pedestrian safety and reduce traffic congestion around school zones	✓	✓			

5.3.4 Active Transportation Winter Maintenance Strategy

In snowy cities across Canada, cycling volumes drastically decrease in the winter months. For instance, in the City of Ottawa, it was estimated that approximately 17% of yearly bike trip volumes along major routes occur during the period between December and March.

Currently, the City of Orillia maintains pedestrian sidewalks and multi-use pathways, but does not have an explicit standard for bike lanes. The snow maintenance in Orillia utilizes sand on roadways in the winter which significantly impacts road markings as shown in **Figure 5.27** and leftover sand, once the snow melts, presents a safety concern for active transportation and transit riders walking to/from bus stops.

Public engagement identified reliability as being one of the top three factors influencing mode choice in Orillia. Walking and Cycling are mode choices that can be a year-round option for getting around Orillia, particularly for short-distance trips to community centres, schools, or nearby commercial areas.

In the early implementation of cycling facilities across North America design practices ignored winter operations and many agencies were unsure how to shift their roadway-focused maintenance experience to maintaining new infrastructure that has different considerations. All-seasons maintenance is critically important to provide people with a viable and safe travel option throughout the year. In colder climates, several communities have shown the ability to retain people walking and cycling through the winter if winter operational considerations are part of the design process and if they have predictable and consistent maintenance practices.

5.3.4.1 Design and Operation Considerations

Maintenance techniques for active transportation facilities are different than those of roadways, the design treatments used for active transportation infrastructure must be sensitive to and enable good maintenance techniques so walking and bicycle riding in the winter months can occur with minimal impedence.

Key considerations for winter maintenance and operations include:

- Coordination of street/sidewalk/bikeway clearing to minimize the transfer of snow and debris between the various facilities and to reduce the level of effort required to perform maintenance operations;
- Snow clearance, storage, and removal practices to ensure clear travel paths are provided to all users;
- Facility dimensions consider equipment dimensions to

Figure 5.27
Example of the impact that winter sand has on bike lane markings on Coldwater Road



- allow for maneuverability around design elements and efficient clearing of streets; and
- Snow clearing, and ice-control practices are appropriate for pedestrians and cyclists, taking into account their unique movement weight, narrow tires, and lack of radiating heat

The buffer space between the travel lane and the protected bike lane can be used for snow storage and its width must consider the sufficient linear space to store the snow plowed from the sidewalk, bikeway, and/or vehicle travel lanes as shown in **Figure 5.28**.

In the absence of a buffer between the bike lane and the travel lane the buffer between the sidewalk and the vehicular/bike lanes can be used to store snow allowing the bike lanes to be cleared in conjunction with vehicular lanes.

Where there is limited buffer space between the sidewalk and travel lanes, an organized snow removal method between the roadway and sidewalks can be implemented to gradually shift the snow from vehicular, cycling, and pedestrian facilities.

5.3.4.2 Provincial Minimum Maintenance Standards

As of May 3, 2018, substantive changes were made to the Minimum Maintenance Standards for Municipal Highways, O Reg 239/02 including:

- The introduction of winter maintenance standards for bicycle lanes;
- The introduction of winter maintenance standards, including patrol obligations, for sidewalks;
- The ability for municipalities to declare a “significant weather event” with implications for winter maintenance on roadways, bicycle lanes and sidewalks during the duration of the event; and
- Inspection standards for areas “adjacent to sidewalks.”

Bicycle Lanes

The Minimum Maintenance Standards (MMS) now provide a definition for a bicycle lane which includes a portion of the roadway with marked or buffered lanes, whether for the exclusive or preferential use of cyclists.

The MMS now include specific sections outlining winter maintenance standards for snow accumulation in bicycle lanes.

Table 5.17 compares the new snow accumulation depth standards for bicycle lanes as compared to the existing standards for roadways.

Figure 5.28
Example of
buffer areas
between active
transportation
and roadway
facilities being
used for snow

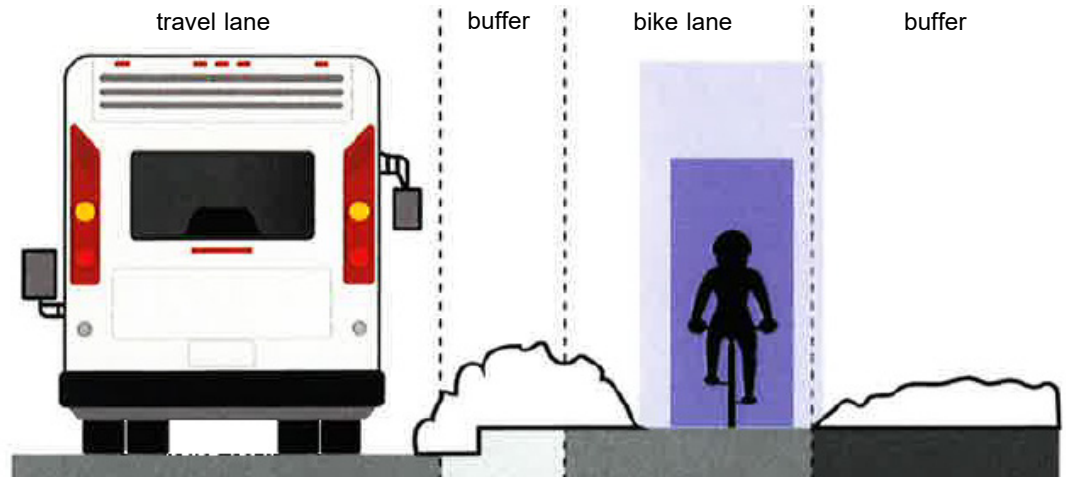


Table 5.17 Provincial winter minimum maintenance standards for bicycle lanes and roadways

Class of Highway or Adjacent Highway	Snow Depth	Time for bicycle lanes	Time for roadways
1	2.5 cm	8 hours	4 hours
2	5 cm	12 hours	6 hours
3	8 cm	24 hours	12 hours
4	8 cm	24 hours	16 hours
5	10 cm	24 hours	24 hours

The snow accumulation standards for bicycle lanes is lower than for the adjacent roadways in which they are contained, with the implication that where maintenance is performed on the roadway and bicycle lane in unison, both standards should be satisfied.

Similar to the sections dealing with roadways, the MMS provide that where the depth of snow accumulation on a bicycle lane is less than or equal to the depth set out in the table, the bicycle lane is deemed to be in a state of repair in respect of snow accumulation.

While there is no separate section dealing with ice formation on bicycle lanes, the section which sets out the standards for ice formation on roadways does note in section 5(5) that “this section applies in respect of ice formation on bicycle lanes on a roadway, but does not apply to other types of bicycle facilities.”

Sidewalks

For the first time, the MMS now contain specific sections dealing with sidewalk winter maintenance. Section 16.3 provides that snow accumulation on sidewalks shall be reduced to less than or equal to eight centimetres within 48 hours of the end of a snow event. The section further provides a standard of a minimum maintained width of one metre. This section appears to mirror the standards which many municipalities on their own initiative have had in place for some time. Notably, the section does not require clearing to bare pavement; rather, simply reducing the depth to less than or equal to eight centimetres (cm).

Sidewalks are deemed to be in a state of repair with respect to snow accumulation (a) where snow depth is less than or equal to eight centimetres; and (b) during ongoing snow accumulation, even where it exceeds eight cm, until 48 hours after the snow accumulation ends.

Section 16.5 sets out standards with respect to ice formation on sidewalks. It requires that municipalities monitor weather in accordance with section 3.1, and to “treat the sidewalk if practicable to prevent ice formation or improve traction within 48 hours if the municipality determines that there is a substantial probability of ice forming on a sidewalk, starting from the time that the municipality determines the appropriate time to deploy resources for that purpose”. This appears to be an effort to impose standards for sidewalk maintenance during ice formation events. Necessarily, this standard still leaves the municipality with considerable discretion in terms of the deployment of resources during such events.

Similar to the other “deeming” provisions found in the MMS, where ice forms on a sidewalk despite complying with the standard in subsection (1), the sidewalk is deemed to be in a state of repair in respect of ice until 48 hours after the municipality first becomes aware of the fact that the sidewalk is icy. Pursuant to subsection (3), an icy sidewalk is deemed to be in a state of repair for 48 hours after it has been treated.

The deeming provisions with respect to snow accumulation and ice ought to provide municipalities with more objective arguments in defending sidewalk slip-and-fall claims together with the gross negligence defence provided in section 44(9) of the Municipal Act, 2001 and section 42(5) of the City of Toronto Act, 2006.

Section 16.7 for the first time introduces standards for winter sidewalk patrols, which are to be conducted by the municipality where “the weather monitoring referred to in Section 3.1 indicates that there is a substantial probability of snow accumulation on sidewalks in excess of eight cm, ice formation on sidewalks or icy sidewalks.” The patrols are to be conducted on sidewalks that the municipality selects “as representative of its sidewalks at intervals deemed necessary by the municipality.” Accordingly, there is no expectation that all sidewalks are to be patrolled; rather, this section appears to reflect the practice already in place in many municipalities to inspect “representative” sidewalks for winter maintenance conditions.

Multi-Use Trails

There are no provincial minimum maintenance standards for multi-use trails. Standards are set at the municipal level. This presents a potential gap in winter maintenance requirements for communities such as Orillia where a significant portion of cycling infrastructure is provided as a multi-use trail.

5.3.4.3 Orillia’s Current Winter Maintenance Standards

Orillia’s Winter Control Policy identifies the winter maintenance period being between November 15 and April 15.

The policy states that sidewalks and multi-use pathways will be cleared as soon as practicable after becoming aware that the snow accumulation is greater than 8 cm depending on the roadway class. The expected standard is for snow to be cleared between 24 and 48 hours depending on the roadway priority. Sidewalk snow clearing priority is in the following order:

- School zones;
- Major collectors;
- Minor Collectors; and
- Local Streets.

Due to the sensitive environmental features surrounding Orillia, the City uses a sand and salt mix that is sprayed on sidewalks and roads to mitigate salt leaking into watercourse. At the end of winter, the sand is cleared, collected and stored for reuse the following year.

While there are provisions for sidewalks and multi-use paths there are no explicit provisions for bike lanes.

5.3.4.4 Maintenance Service best-practices

Setting maintenance policies, priorities, and service standards is important so agencies can avoid inconsistent levels of service across the active transportation network, fragmentation of the network, and/or uncoordinated efforts between off-street and on-street facility maintenance. To have a coherent, continuous winter active transportation network, the maintenance priority for facilities should be based on contiguous routes, independent of road maintenance priority.

Each municipality has its own needs and standards that are set to reflect changing priorities. **Table 5.18** summarises some of the best-practices for active transportation snow clearing standards across Canada and Europe.

Generally, municipalities will create a priority or classification system for cycling facilities to distinguish varying levels of snow clearing priority (similar to what is currently done in Orillia for roadways and sidewalks).

5.3.4.5 Fleet Considerations

The City’s winter maintenance fleet includes:

- 7 plows;
- 5 sanders;
- 6 sidewalk plows;
- 1 grader;
- 1 loader-plow;
- 2 loaders (for loading in yard and snow hauls);
- 1 tractor blower; and
- 1 sidewalk plow (Hako).

The addition of over 90 km of cycling infrastructure (including multi-use paths), as well as 25 additional kilometres of sidewalk will add further demand on the existing winter maintenance fleet.

Certain on-street cycling facilities such as shared or painted bike lanes can be serviced by existing roadway snow clearing, however additional off-street facilities like sidewalks, and multi-use paths may require additional sidewalk plows to adhere to the City’s current winter maintenance standards.

5.3.4.6 Active Transportation Winter Maintenance Recommendations

Winter is an inevitable part of yearly life in Orillia. While active transportation certainly tends to drop during winter months, there are still residents who will need to walk to/from bus stops, retail stores, and other areas around the City. Furthermore, as more cycling facilities are implemented, there may be a winter demand for better maintenance of these facilities to allow cyclists to ride around the City safely.

The City of Orillia should identify a classification system for cycling facilities and an associated winter maintenance standard for each to continue to maintain the high-quality of life and safety that residents currently enjoy. The implications of this will require a re-evaluation of fleet requirements to service additional recommended infrastructure. Furthermore, while snow is typically the primary focus of winter maintenance, the City should consider and make recommendations with regards to sand clearing as the leftover sand that remains once snow melts also presents a safety concern.

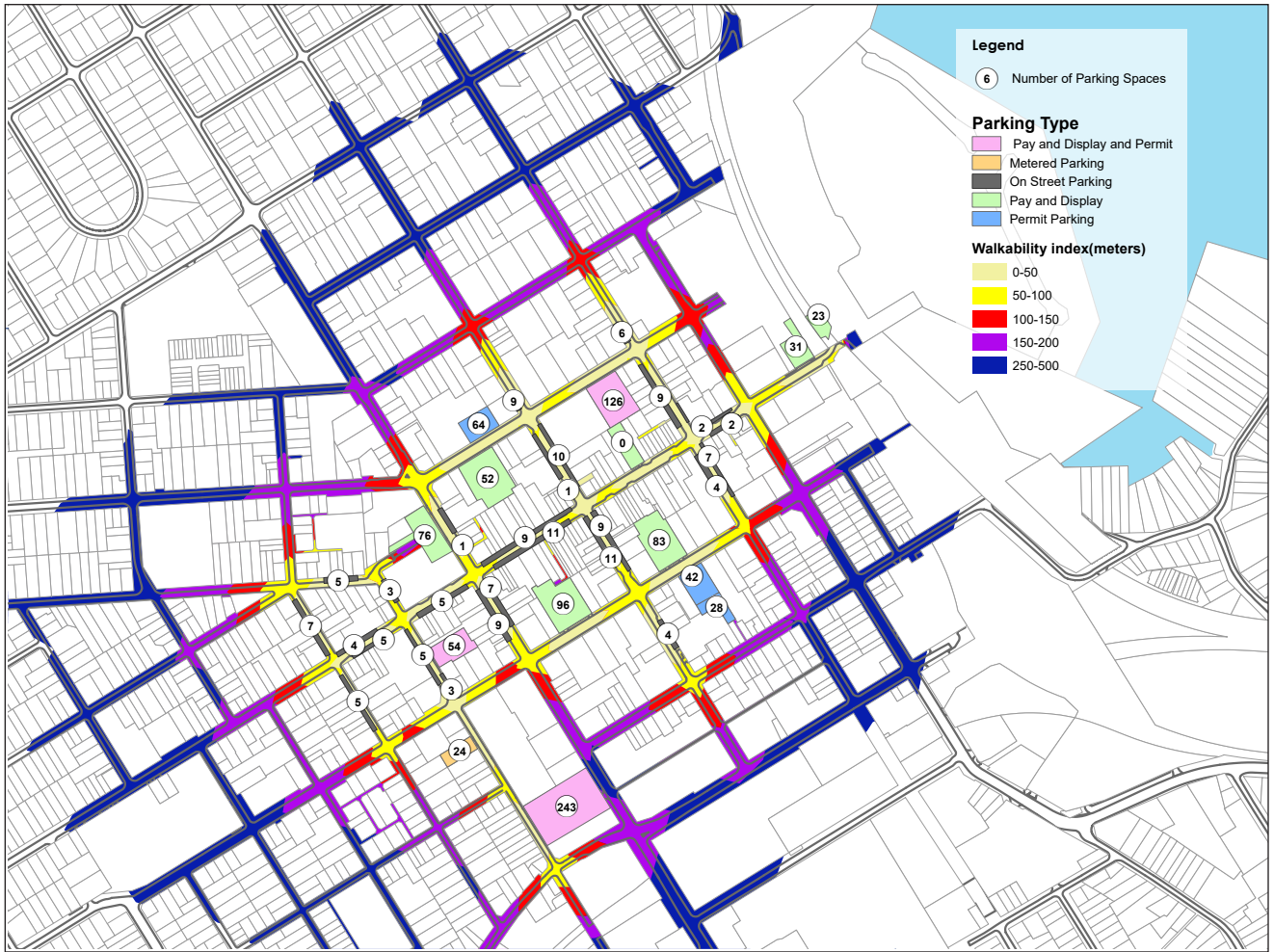
Recommended Policy Documents:

- Develop snow maintenance standards for the cycling network that include both snow and sand clearing and amend the changes to the existing Winter Control Policy;
- Re-evaluate the fleet requirements for maintaining additional active transportation infrastructure.

Table 5.18 Best Practices for Active Transportation Snow Clearing in Canada and Abroad

Municipality	Standards
Ottawa, ON	<ul style="list-style-type: none"> • Plowing: started after 2.5 to 5.0 cm of snow accumulation; • Snow Removal: 50% of snow bank encroachment into cycling facility.
Montreal, QC	<ul style="list-style-type: none"> • Sweeping: 3.0 to 5.0 cm of snow accumulation; • Plowing: more than 5.0 cm of snow accumulation.
Calgary, AB	<ul style="list-style-type: none"> • Priority 1 facilities: snow cleared within 24 hours of the start of snowfall; • Priority 2 facilities: snow cleared within 72 hours of the start of snowfall
Oulu, Finland	<ul style="list-style-type: none"> • Priority 1 facilities: snow clearing started after 3.0 cm snowfall, completed before 7 am the following day; • Priority 2 facilities: snow cleared after the Priority 1 network maintenance is completed, only after 5.0 cm snowfall.

Figure 5.29
Downtown
Parking
Accessibility



5.3.5 Downtown Parking Management

Parking management involves the application of various specific strategies in an integrated program. Not every strategy is appropriate in every situation. Actual impacts vary depending on geography, demography, implementation and other factors.

5.3.5.1 Context

The City of Orillia has an extensive parking program, with close to 1,161 parking spaces located in the downtown core as Municipal off street and on street parking most of which is within a 150m walk as visualized in **Figure 5.29**.

The downtown core on-street parking is regulated by parking meters with a two-hour limit and off street lots have a pay and display systems with longer limits of five to eight hours. The city also maintains 387 permit parking spots within the downtown district and sells parking permits on a monthly basis that allow vehicles to park all day, as long as the permit is displayed.

The 2011 Downtown Orillia Parking study revealed the average parking utilization in the downtown core as 61% or less. The surplus parking in the commercial

core if managed properly, could effectively serve the increased future demand caused by the growing demand and any new developments without the need for expanding the existing parking infrastructure.

5.3.5.2 Parking Management Measures

There are several parking measures that could be further explored to accommodate greater parking demand in the Downtown over time so that the City of Orillia can support the downtown revitalization while balancing land use objectives. These measures include:

Demand Priced Parking

A system could be developed whereby the city compares the actual parking occupancy with the desired on/off-street parking occupancy and every few weeks nudge prices up or down accordingly based on demand. Prices can be set by block and time of day to produce one or two open spaces on every block and thus reduce demand and shift motorists to other modes of transportation.

Increase capacity of Existing facilities

Existing facilities could be optimized by using spaces that are currently wasted areas such as corners, edges, and undeveloped land to increase the parking supply. This can be particularly appropriate for compact car, motorcycle, and bicycle parking. Another method is to reduce parking stall widths from 9 feet wide to 8 feet wide in order to create compact car parking. One additional parking space for every eight can be created

Remote Parking

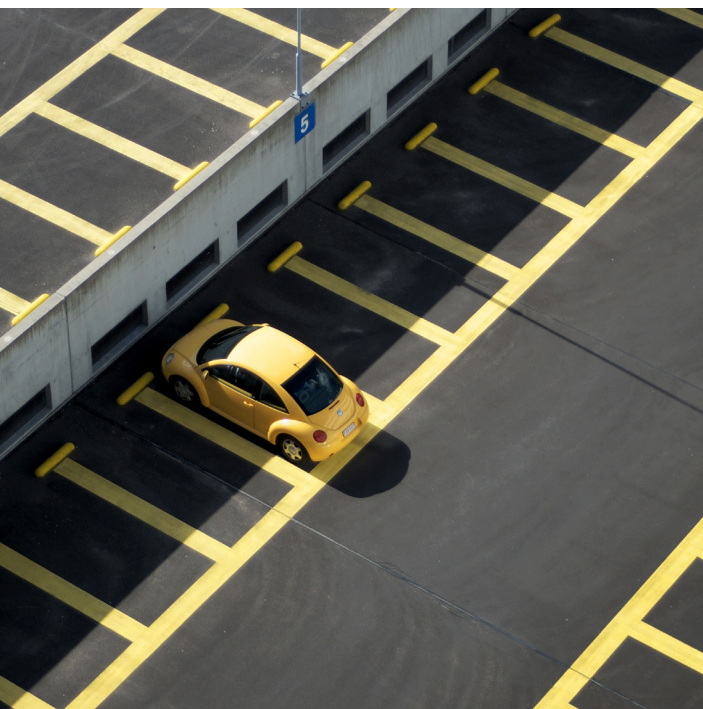
Remote parking, also called satellite parking, typically involves the use of parking facilities located at the periphery of a business district or other activity centers. Special shuttle buses, or free transit service, may be provided to connect destinations with remote parking facilities, which would allow them to be farther apart than would otherwise be acceptable.

Parking Space Sales and Leasing

Create or market a website which allows residents or workers to look for parking to rent on a daily, weekly, or monthly basis. Facilities or businesses with excess parking capacity can lease or trade it to others.

Transferable Parking Rights

Developers can choose between constructing required parking spaces or transferring parking spaces to another development. This works best in areas where parking maximums limit the amount of parking that can be built. A transfer program could allow historic properties, low income housing, and senior housing projects, where parking demand is lower, to transfer parking spaces to another development that would like additional spaces above the maximum allowed.



Mechanical Stackers

Stackers and mechanical garages can significantly increase the number of vehicles that can be stored in an area. Various types of lifts and elevators can be used to increase the number of vehicles that can fit in a parking structure or on a surface level parking lot.

They are a flexible way to address growing demand for parking spaces at relatively low construction cost and no additional land requirements.

Unbundled Parking

Parking facilities and infrastructure can be unbundled from the rent or purchase price of residential and commercial units and sold or rented out as a premium add on service. Including the costs of parking in rents or purchases encourages automobile ownership and is a disincentive to active modes. Unbundling also allows a more equitable allocation of costs by allowing tenants and owners to pay only if they use the parking infrastructure. Unused parking spaces could be used for public parking at an hourly rate.

Land Banking

Land banking addresses the uncertainty of future parking demand. The strategy reserves unpaved space for anticipated future parking demands if they arise. Meanwhile, the space can be used for amenities such as playgrounds or parks. Land banking can be a useful tool for developments that occur in phases - since developers may be holding the land for future parking demand that will only be fulfilled when a project is complete. Land banking is best for low- to medium-density areas where land for future development is likely to remain fallow for some time.

Wayfinding and Signage

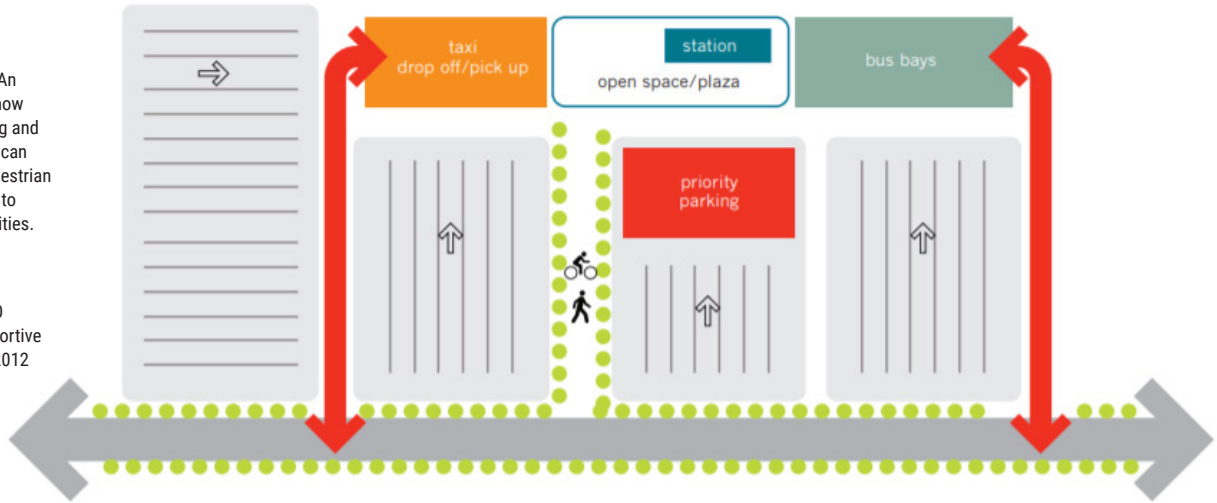
A comprehensive and uniform wayfinding and signage program for the City's parking system can help guide drivers of parking options and reduce confusion about payment and restrictions. Improved signage can alleviate demand by providing directions to nearby destinations and other peripheral lots. Information can also be used to clearly identify lots that are available to the general public and those that are restricted to monthly pass-holders, providing information on fines and discouraging noncompliance.

Streetscaping and Landscaping

Making outer city parking lots more appealing with shading (natural or artificial) and promoting cleanliness will encourage people to want to park there. In addition, making walks from distant parking lots desirable and shaded, will help people enjoy their walk to work. Improving walkability (the quality of walking conditions) expands the range of parking facilities that serve a destination. It increases the feasibility of sharing parking facilities and use of

Figure 5.30 An example of how streetscaping and landscaping can enhance pedestrian connections to parking facilities.

Source: MTO
Transit-Supportive
Guidelines, 2012



remote parking facilities. Improving walkability also increases “park once” trips, that is, parking in one location and walking, rather than driving to other destinations, which reduces vehicle trips and the amount of parking required at each destination. In addition, walking and cycling improvements encourage transit use – since most transit trips involve walking or cycling links. An example of such a parking lot is shown in **Figure 5.30**.

5.3.5.3 Curbside Demand Management

As the downtown core continues to intensify and grow, new developments would add considerable demand on the road network, existing parking facilities and curbside space. The public curbside—the space along the street between travel lanes and sidewalk—is precious real estate. The growth of transportation network companies (TNCs) like Lyft and Uber, as well as online shopping and associated deliveries has led to an increased demand for curbside pickups, drop-offs and dwell times. Potential users of the curbside include residents, workers, visitors, patrons, deliveries, transit users and travelers of all other modes. The needs and peak demands for curbside use are not uniform and can vary within the District.

The average dwell time for a vehicle picking up and dropping off a person is approximately 2:45 minutes,

meaning a designated pick-up & drop-off spaces has a theoretical capacity of being able to serve 22 vehicles per hour. Commercial vehicle dwell times are closer to 10-15 minutes meaning curbside capacity for deliveries can only serve approximately 4-6 delivery vehicles per hour.

To maintain an equitable balance between competing users, the cities would have to take steps to shift from curbsides dominated by “on-street parking” to reliable bus lanes, safe bikeways, freight loading, and public space. **Figure 5.31** shows an example of what a managed curbside looks like.

5.3.5.4 Downtown Parking Management Recommendations

It is recommended that the City of Orillia be proactive and prepare a Downtown Parking Plan that considers the on and off-street parking needs into the future, with a more detailed consideration for new infill development opportunities, as well as future curbside demand usage. This should also consider the impacts of transit and active transportation investments, as well as the potential impacts of emerging technology.

Recommended Policy Documents:

- Develop a Downtown Parking Plan that considers future parking and curbside demand needs.

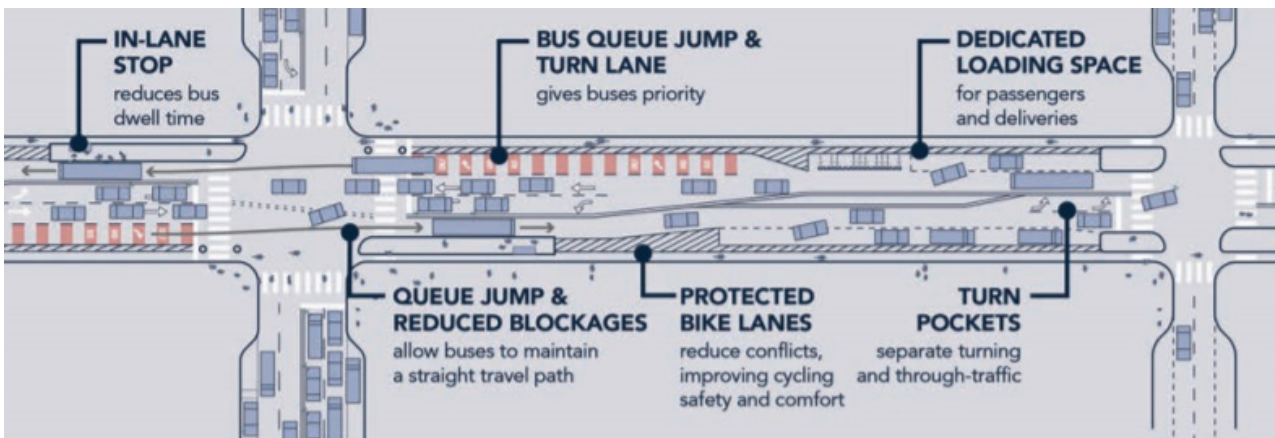


Figure 5.31 An example of what a managed curbside looks like.

Source: NACTO
Curb Appeal, 2017

5.3.6 Commercial Goods Movement

As new businesses are created and existing businesses grow, it is important to consider goods movement needs to support Orillia's economic activity. The transportation impacts of goods movement impact municipal transportation networks in a variety of ways ranging from the high-level distribution of truck traffic along Orillia's roadways via truck routes, all the way down to the detailed design and configuration of roadways to accommodate truck traffic. All of these not only have impacts on automobile drivers, but active transportation, and transit riders as well.

5.3.6.1 Ministry of Transportation Freight Supportive Guidelines

As communities grow and change it has become increasingly important to understand, plan and design for the movement of freight in order to maintain goods movement efficiency and the economic competitiveness of communities. The freight transportation system relies on the same infrastructure that is used for moving people, and it is important to balance these competing interests when planning communities and transportation systems. Ontario's Freight-Supportive Guidelines help municipalities better understand and plan for the vehicles that transport goods through their communities. The Guidelines have been developed to support recent provincial initiatives aimed at managing growth, curbing urban sprawl, and supporting goods movement.

The guidelines are intended to:

- Provide direction for land use planning, site design practices and operational procedures that help with the movement of freight;
- Assist municipalities in understanding and planning for the various modes and types of vehicles used in the movement of freight; and
- Support the overall economic health and competitiveness of Ontario's municipalities.

The guidelines address how municipalities can become more freight-supportive through these planning processes and balance the needs of freight movement with other municipal objectives. They describe good practices for incorporating goods movement into policy documents such as official plans and zoning by-laws, as well as site-development needs. In specific, the following elements are addressed:

- Land use and transportation planning, with strategies for incorporating goods movement considerations into the municipal planning process in balance with other objectives. The Guidelines also describe the "freight audit," a process to inform planning decisions to enable the safe and efficient movement of goods;
- Site design, with a range of general measures that can be applied to site plans and specific initiatives that are tailored to different land uses. The approach addresses how site design for goods movement can be coordinated with the design for active transportation and transit; and

- Road design and operations, which incorporates goods movement into the design and operation of municipal roads.

An efficient and effective freight movement network, integrated with developments that are supportive of freight, will help ensure that the residents of Orillia have access to the goods and services that they rely on and will help support the community's economy. Efficient freight movement with appropriate facilities and infrastructure is a critical factor for Orillia to help attract new development and compete effectively with other jurisdictions.

5.3.6.2 Oversize Load Permits

As identified in Chapter 2 of this MTMP, the City of Orillia does not currently implement an oversize load permit, but rather defers to the Highway Traffic Act in relation to provincial roadways and municipal roadways that have an indicated reduced load. It is important to note that municipal roads that do not have any restrictions within Orillia currently permit oversized/overweight loads to be transported on the network.

Simcoe County and the City of Barrie both have a permit requirement for oversized loads that exceed the dimensions and/or weight prescribed in the Highway Traffic Act on County/Municipal Roads. The permits cost between \$50 to \$370 and require a private escort to lead and follow vehicles. Oversize loads put physical strain on bridge and roadway infrastructure and require routes that can physically accommodate them. Several studies have been conducted across North America, including a study by the University of Texas that have found that most oversize/overweight permit fee structures are an important tool for maximizing infrastructure lifespan and for recovering costs associated with the impacts of oversize/overweight vehicles.

5.3.6.3 Commercial Goods Movement Recommendations

While this MTMP considered the City of Orillia's truck routes in relation to the development of active transportation solutions, it did not include a comprehensive review of goods movement within and beyond the City. There is an opportunity to further develop a goods movement strategy that is integrated with the City's Official Plan to integrate both the commercial good movement network with on-site measures. This goods movement strategy should also consider whether the City should implement an oversize load permit system.

Online shopping has increased significantly over the past decade, resulting in more delivery vehicles and goods movement vehicles on Ontario roads. It will be important to consider both the broader regional goods movement connections to/from Orillia, as well as more detailed considerations for curbside management and on-site loading requirements for developments. This will also support the build-out and development of future business parks on the periphery of the city.

Recommended Policy Documents:

- Develop a Goods Movement Strategy and integrate it with this MTMP and the City's Official Plan.

5.3.7 Smart Mobility

Transportation and mobility are changing every day as new technological advances are being made at a rapid pace. New technologies have the potential to transform the way that people move around, though all come with their own set of impacts, which can be positive and negative.

The adoption of the 'sharing economy' has enabled a variety of new business models to proliferate. These business models have generally been enabled by technology, namely, app-based platforms, which have become increasingly accessible as 89% of Ontarians now own a smartphone according to the Consumer Technology Association (CTA).

The purpose of this section is to provide an overview of the dominant trends in the current mobility landscape to lay the groundwork for appropriate actions and provisions for these technologies in the future

5.3.7.1 Future Mobility Considerations

Ride-Hailing Services

Transportation network companies (TNCs) or mobility service providers (MSPs) are companies that match passengers with drivers through a digital platform, usually a smartphone or a website. Drivers are typically registered to drive their own vehicles, and as such TNCs do not own vehicle fleets. Users use apps to hail their rides to a certain destination, as opposed to traditional taxis which can be hailed from the street.

With the rise of the sharing economy, TNCs have gained popularity in various jurisdictions around the world. TNCs have served as an alternative to traditional taxi services and provide coverage in many areas that traditional taxi services have not served. TNCs often charge lower rates than traditional taxi services and use pre-determined pricing and live location tracking which can create appealing value to the user.

As a local example, the Town of Innisfil collaborated with Uber to provide subsidized rides as a replacement for transit. The results were bittersweet leading to significant ridership growth, however due to the nature of how these services operate increasing ridership led to increasing costs.

While passenger fares almost never cover the full cost of transit service, more passengers riding fixed-route buses and trains should shrink the per-capita public subsidy, at least until additional routes are added. On a well-designed mass transit system, the more people using it, the "cheaper" it gets. But the opposite is happening in Innisfil. Only so many passengers can fit

in the backseat of an Uber, and the ride-hailing company, not the town, is pocketing most of the revenue. With per-capita costs essentially fixed, the town is forced to hike rates and cap trips as adoption grows. But this can create a perverse incentive: Fare bumps and ridership drops tend to go hand-in-hand on traditional systems. As a result, the town is now exploring options for a fixed transit system that will be complimented by Uber.

In general, TNCs have signaled their intentions to decrease fees per trip by operating fleets of autonomous vehicles. At the time of writing, several TNCs are still developing autonomous vehicle technology and legislation surrounding autonomous vehicles in Canada is pending.

Key considerations surrounding ride hailing services include competition with taxi companies and public transit ridership, congestion caused by additional curbside pick-up and drop-off activity, safety, and the traffic impact of additional vehicles circulating around streets.

Car-Sharing

Car-sharing companies aim to own and operate fleets of vehicles for users to locate and drive themselves. Car-sharing services became popularized in the early 2010's, in particular in urban cores, as a viable supplement for car ownership. These car-sharing services typically own fleets of vehicles are located in dedicated parking spaces in either private or public lots. These cars can be booked using an app and located by the user. Some car-sharing models require the user to return the vehicle to the same spot (ie. a round-trip booking), while some car-sharing models allow the user to park at a different location than their origin (ie. a one-way booking).

In addition to models where car-sharing companies own fleets of vehicles, peer-to-peer (P2P) car sharing has emerged in many markets. P2P car sharing allows existing car owners to make their vehicles for others to rent for periods of time. Similar to other methods, users can then find available vehicles to rent using an app, which they can then pick up or have it delivered to them. P2P car sharing is an alternative to fleet-based car sharing platforms as well as conventional car rental agencies. In some markets, P2P car sharing has emerged as a popular way for users to gain short-term access to luxury vehicles that are typically not offered by conventional car rental agencies.

Key considerations surrounding fleet-based car-sharing generally revolve around the allocation of car-sharing parking spaces. Some car-sharing companies operate from private parking lots, though in some municipalities car-sharing companies also use public parking lots, and on-street parking spaces.



Figure 5.32
An example of autonomous microtransit being used at California's GoMomentum Station.

Residential buildings and new developments can incorporate car-sharing spaces on their properties in order to act as a transportation demand management measure, as car-sharing can help offset the demand for car ownership and additional car trips.

P2P car sharing services typically do not raise concerns about parking spaces as cars are typically kept in the car owner's space, however in situations where cars are being delivered to the user, curbside space will be occupied.

Microtransit

Microtransit is a form of transit that is intended to be demand-responsive to schedule and routing demands from end users. Microtransit vehicles are intended to provide a more flexible and accessible form of transit service as pick-up and drop-off requests can deviate transit vehicle stops and locations from traditional fixed route transit. This is known as 'on-call' service, and modern systems use apps for users to request the service and use real-time requests and live traffic conditions to schedule and determine routes.

Generally, there is a geographic or temporal range that user requests cannot exceed, in order to keep services generally reliable within a certain area or time range, and as such user requests may be 'rejected' if they are outside of this boundary. Such styles are known as 'flex service routes' and can substitute in for fixed service routes.

Flex routes have a high potential to serve as a solution to the 'first-mile, last-mile' problem that is particularly significant in areas such as residential neighbourhoods that cover larger areas with sporadic demand. As

these vehicles need to keep more frequent and flexible schedules, vehicles used for microtransit service are generally smaller than conventional transit vehicles (ie. public transit buses). Systems are currently evolving and being piloted in many jurisdictions across North America.

Mobility-as-a-Service (MaaS)

Mobility-as-a-Service (MaaS) is the concept of mobility being provided in the form of services to be consumed by the user as opposed to modes that are owned by the user, which is enabled through digital platforms. With MaaS, users can use apps to enter a destination, select their preferred mode (or multiple modes if necessary) to arrive at the destination, and be given directions to complete their journey using their selected mode(s). Depending on what services are available to the user, these modes can include public transit, carsharing, ridesharing, bikesharing, or e-scootering. With MaaS, users can either pre-pay for a service or subscribe to a mobility service package plan, similar to the pricing method for mobile phone plans.

The goal of MaaS is to integrate various modes of transportation and to eliminate the logistics of locating, booking and paying for each mode of transportation, with the objective of making mobility so convenient that the user does not opt to own a car, as the alternatives are more attractive. MaaS has the potential to greatly reduce the demand for car ownership, particularly in urban areas where costs associated with car ownership are high and travel by car is not convenient due to congestion and the difficulty and expense of parking is high. MaaS also

has high potential to help solve the ‘first-mile, last-mile’ problem between transit services and user destinations, as it aims to make the integration between modes much more accessible and flexible.

MaaS technologies have been piloted in cities such as Helsinki, Finland, and Gothenburg, Sweden. Various organizations and companies are looking to expand into the MaaS market, including public transit operators, roadway authorities/municipalities, auto manufacturers, technology companies, and transportation network companies.

Autonomous and Connected Vehicles

Autonomous vehicle (AV) technology refers to vehicles which are capable of operating without human assistance. There are several levels of automation which describe the degree of autonomy that a vehicle has. There are standard levels that are established by SAE International (Society of Automotive Engineers). These levels are summarized in Table 1 and described in the following section.

- **Level 0:** Automated system issues warnings and may momentarily intervene but has no sustained vehicle control.
- **Level 1 (“hands on”):** The driver and the automated system share control of the vehicle. Examples are systems where the driver controls steering and the automated system controls engine power to maintain a set speed or engine and brake power to maintain and vary speed, where steering is automated while speed is under manual control. The driver must be ready to retake full control at any time. Lake Keeping Assistance, Adaptive Cruise Control, and Parking Assistance are examples of SAE Level 1 autonomy.
- **Level 2 (“hands off”):** The automated system takes full control of the vehicle (accelerating, braking, and steering). The driver must monitor the driving and be prepared to intervene immediately at any time if the automated system fails to respond properly. The shorthand “hands off” is not meant to be taken literally. In fact, contact between hand and wheel is often mandatory during SAE 2 driving, to confirm that the driver is ready to intervene.
- **Level 3 (“eyes off”):** The driver can safely turn their attention away from the driving tasks, e.g. the driver can text or watch a movie. The vehicle will handle situations that call for an immediate response, like emergency braking. The driver must

The 5 levels of driving automation

For on-road vehicles



Figure 5.33

The 5 levels of autonomous driving.

		Steering and acceleration/ deceleration	Monitoring of driving environment	Fallback when automation fails	Automated system is in control
Human driver monitors the road	0 NO AUTOMATION				N/A
	1 DRIVER ASSISTANCE				SOME DRIVING MODES
	2 PARTIAL AUTOMATION				SOME DRIVING MODES
Automated driving system monitors the road	3 CONDITIONAL AUTOMATION				SOME DRIVING MODES
	4 HIGH AUTOMATION				SOME DRIVING MODES
	5 FULL AUTOMATION				

Source: SAE International



still be prepared to intervene within some limited time, specified by the manufacturer, when called upon by the vehicle to do so.

- **Level 4 (“mind off”):** As level 3, but no driver attention is ever required for safety, e.g. the driver may safely go to sleep or leave the driver’s seat. Self-driving is supported only in limited spatial areas or under special circumstances, like traffic jams. Outside of these areas or circumstances, the vehicle must be able to safely abort the trip, e.g. park the car, if the driver does not retake control.
- **Level 5 (“steering wheel optional”):** No human intervention is required at all. An example would be a robotic taxi.

The Ontario Government has funded the Autonomous Vehicle Innovation Network (AVIN) which is intended to advance research and development of autonomous vehicle technology in the province. At the time of writing, most of the commercially available autonomous vehicle technologies are at a level 1 or level 2.

Benefits of autonomous vehicle technology include improved safety from a reduction in human error-caused collisions, accessibility to users who currently cannot or have difficulty operating motor vehicles such



Figure 5.34 An example E-scooters operating in Nashville, TN.

as seniors and people with disabilities, and easier access to rural areas that require long and tiring drives. It is also possible that autonomous vehicles can decrease headways between vehicles and as such make more efficient usage of existing roadways and increase vehicle throughput, reducing the need to build new roadways and new road lanes.

Connected vehicles (CVs) feature different functionalities that 'connect' the vehicle with other vehicles, transportation infrastructure such as traffic lights and roadways, central networks, its occupants, or any combination of the aforementioned. Connected vehicles may have certain degrees of autonomy incorporated, but all connected vehicles do not necessarily have to operate autonomously. CVs may interact with its users via smartphone app or other means, such as voice detection. Connected vehicles also may be connected to other vehicles which allow them to 'communicate' with each other, for example, if a vehicle brakes in front of them, the vehicle can communicate this to the driver or its own internal system. CVs can communicate with infrastructure, for example, if a vehicle is approaching a traffic light that is about to turn red, that can notify the vehicle and/or the driver.

Intelligent Transportation Systems (ITS) and Smart Infrastructure

Intelligent transportation systems (ITS) technology has existed in the field of transportation and traffic management for several decades. ITS has traditionally referred to technologies such as electronic lane management, vehicle detection (using loop detectors, Bluetooth, cameras, etc), signal pre-emption, and adaptive signal controllers.

New advancements such as artificial intelligence (AI) and deep learning/machine learning are also being applied to transportation infrastructure systems. Much of this technology is related to CVs, for example, 'smart' traffic signals, where cars can 'speak' to the signals to for example, extend green times to allow for traffic platoons to pass through or modify cycle lengths to allow for more cohesive traffic signal coordination. Smart traffic signal applications also are not necessarily limited to vehicles; smart traffic signals also may have functionalities to detect pedestrians and bicycles, for example, to extend pedestrian walk times for pedestrians moving at slower speeds (ie. seniors, or children) or to coordinate green 'waves' for bicycles moving through intersections upon detection.

Privacy considerations are currently a significant topic surrounding smart infrastructure that contain embedded cameras and sensors.

5.3.7.2 Micromobility

E-Scooters

Electric scooters (e-scooters) are scooters that are motorized with a small electric motor. Recently, dockless e-scooters have grown in popularity as app-based ride share companies have introduced them in various cities across North America. The scooters are generally unlocked using a smartphone app, and users are charged an unlocking fee as well as a usage fee by the minute.

E-scooters have gained popularity in many cities as trips can even be faster than car-based trips, the cost of scooters is relatively low, and they are perceived by many to be intuitive to use.

Issues currently surrounding e-scooters include placement and space allocation, as without docks, e-scooters can be left anywhere on the street, safety concerns, and legal use of streets, bike lanes and sidewalks.

In Ontario, e-scooters do not currently comply with the requirements for motor vehicles under the Ontario Highway Traffic Act and are not captured by the definitions for electric bicycles provided under the Act. As such, electric scooters in Ontario are currently only permitted on private property that does not have public vehicle access, and if allowed by municipal bylaws, on sidewalks and pathways.

Bike-Sharing and E-Bikes

Bicycle sharing services have been implemented in many cities globally in recent decades. Bicycle sharing services, like car sharing services, allow for users to rent bicycles for a short period of time at a cost per minute. Most bicycle sharing services operate with docking stations, where the user can either pay to unlock a bike at the station or use a mobile app to unlock a bike, but there are also dockless bicycle sharing services that are unlocked using mobile apps exclusively.

Bicycle sharing systems can offer an alternative mode choice for both users who do not own bicycles and also for users who do own bicycles but find themselves at a location where they did not ride their bike, for example, at the grocery store, but need a faster or easier way to be transported home. Since bicycle sharing systems are generally one-way and do not require bicycles to be returned to their original locations, this can create convenient connections to and from destinations such as transit hubs/stations and workplaces.

Considerations surrounding the implementation of docked bicycle sharing systems generally surround the allocation of space, cost of implementing and maintaining docking stations, and safety, as most bicycle sharing systems require users to bring their own helmets. Distribution of bicycles and inadequacy of docking stations can also be an issue at locations where demand is one-directional during certain times of the way, for example for rush hour commuters. Dockless bike sharing systems can also create concerns regarding space allocation, as they can be left obstructing sidewalks and roadways.

Electric bikes (e-bikes) are conventional bicycles that have a motor assisted pedaling function. E-bikes are currently being offered by bike-sharing services or TNCs and are unlocked by a smartphone app. E-bikes require less effort to pedal by the user, and as such are especially attractive for uphill areas or long-distance journeys.

5.3.7.3 Smart Mobility Recommendations

It is recommended that the City of Orillia be proactive and prepare for emerging technology to leverage their benefits. Often, this requires a municipality to do some leg-work and enhance their data collection, monitoring, and public datasets so that TNCs or other third-parties can analyze and develop solutions tailored to the local context. As a result it is recommended that the City of Orillia develop a robust transportation data monitoring framework that links through to an opensource data platform to assist and encourage the development of emerging solutions.

Recommended Policy Documents:

- Evaluate the feasibility of a Bikeshare/E-scooter system within Orillia;
- Develop a comprehensive transportation data monitoring plan including intersection counts, downtown curbside demand usage, parking utilization, and corridor volumes;
- Upload and continually maintain transportation data on the city's upcoming open data portal at regular intervals.

Figure 5.35
An example of a bike share dock in Charleston, SC



Source:
Dustin Waters

5.4 Implementation & Costs

5.4.1 The Concept

Through the development of alternative transportation solutions, several roadway, active transportation, and policy-related improvements have been recommended.

With the significant shift towards complete streets captured in the vision for the current Multi-Modal Transportation Plan, there is an opportunity to expand the scope of infrastructure implementation to target strategic corridors of the automobile, cycling, and pedestrian networks through the road capital and rehab programs. The following concept outlines the approach developed to identify, prioritize and implement recommended improvements to create a connected network over the plan's horizon years. Each of the implementation categories involved a review of each recommended improvement to identify the most appropriate method for implementing it.

Recommended improvements are split into three categories:

Minor Additions:

Several active transportation improvements can be added to existing roadways without altering the roadway infrastructure or geometry. Examples of these types of improvements include painted markings, signage, or the addition of flex bollards on existing bike lanes.

Rehab Additions:

The road maintenance plan provides an opportunity to provide active transportation facilities as roads are reconstructed / rehabilitated. This is a cost-effective method of implementing active transportation facilities with savings realized through already planned reconstruction. Planned Rehab Additions include active transportation facilities that would require physical changes to the existing roadway infrastructure such as minor roadway widening for accommodating bike lanes or adding pedestrian sidewalks/multi-use paths within the right-of-way.

Capital Investments:

Planned Capital Investments include improvements that would require new infrastructure or major alterations to existing infrastructure. Examples of these types of improvements include road widening, roadway extensions, new roads, or new multi-use paths that are not tied within a larger road project

5.4.2 Costs of the Plan

The capital cost of the recommended transportation strategy over the next 20 years, inclusive of new road construction, intersection improvements, sidewalk extensions, pedestrian routes, multi-use, and off-road trails, pedestrian crosswalks, and cycling facilities and will total approximately \$80,248,918 (not including improvements and costs to be incurred by the Province).

Of the total capital costs, \$38,984,274 is needed for short-term improvements (<5 years), \$27,393,389 for medium term (5-10 years), and \$13,871,255 for long-term (10-20 years). Approximately 55% of the costs are associated with sustainable modes of transportation with the remaining 45% dedicated to roadway improvements. This aligns well with stakeholder engagement which identified a desire for 58% of this MTMP to be dedicated to sustainable modes of transportation other than automobiles as summarised in **Table 5.19**.

Certain transportation improvements will benefit current residents and would comprise the non-growth component of the Development Charges (non-DC). The improvements required to accommodate higher volumes of traffic and increased demand on the existing infrastructure directly attributable to new developments are eligible for funding through Development Charges (DC).

Based on our analysis, the bulk of short and medium-term improvements will be triggered by development, particularly within West Orillia. Generally, transportation improvements triggered or required to accommodate development are eligible to be paid for through development charges (DC). Some of the most costly improvements such as the future Murphy Road extensions, and the Highway 11 active transportation overpass and associated connections and upgrades are required to accommodate the influx of new residents.

Approximately 56% of the capital improvement costs will be eligible for cost recovery through DC mechanisms. The remaining 44%, primarily pedestrian and cycling improvements could be financed from the residential tax base. A summary of the costs by timing and by DC or non-DC chargeable is provided below in **Table 5.20**.

A detailed line-by-line summary of each improvement is provided in **Appendix B** including details on:

- Improvement Description;
- Cost;
- Length (in Km);
- Implementation Category (i.e. Minor Addition, Rehab Addition, or Capital Investment);
- Percent split between DC and Non-DC charges; and
- Environmental Assessment Requirements and Cost.

Table 5.19 Estimated Capital Programming Costs by Horizon and by Jurisdiction

Phasing	City of Orillia			Province of Ontario (MTO)
	Total Cost (DC + Non-DC)	DC	Non-DC	Total Cost
Short-Term (<5 years)	\$38,984,274	\$16,559,245	\$22,425,029	\$31,050,000
Cycling	\$8,887,686	\$2,940,901	\$5,946,785	-
Pedestrian	\$2,192,003	\$408,320	\$1,783,683	-
Multi-Use	\$1,051,598	\$241,162	\$810,436	-
Roadway	\$25,012,988	\$11,473,863	\$13,539,125	\$31,050,000
Intersections	\$1,840,000	\$1,495,000	\$345,000	-
Medium-Term (5-10 years)	\$27,393,389	\$15,937,201	\$11,456,188	\$6,141,000
Cycling	\$3,590,096	\$1,398,374	\$2,191,721	-
Pedestrian	\$5,134,031	\$1,752,815	\$3,381,216	-
Multi-Use	\$14,149,118	\$9,050,904	\$5,098,215	-
Roadway	\$3,140,144	\$2,355,108	\$785,036	\$5,681,000
Intersections	\$1,380,000	\$1,380,000	-	\$460,000
Long-Term (10-20 years)	\$13,871,255	\$12,725,196	\$1,146,058	\$36,225,000
Cycling	\$3,031,782	\$2,147,795	\$883,987	-
Pedestrian	-	-	-	-
Multi-Use	\$6,127,021	\$5,864,950	\$262,071	-
Roadway	\$4,712,452	\$4,712,452	-	\$36,225,000
Intersections	-	-	-	-
Total	\$80,248,918	\$45,221,642	\$35,027,275	\$73,416,000

NOTE: All figures in 2019 dollars (\$), rounded to the nearest hundredth, and include a 15% contingency. Preliminary estimate only unless otherwise noted – subject to further review at preliminary/detailed design stage

Table 5.20 Breakdown of municipal costs by mode

Mode	Municipal Cost	% of total	Survey focus %
Cycling	\$15,509,563	19%	58%
Pedestrian	\$7,326,033	9%	
Multi-Use	\$21,327,738	27%	42%
Roadway	\$32,865,583	41%	
Intersections	\$3,220,000	4%	
Total	\$80,248,918	100%	100%

5.4.2.1 Funding Mechanisms for Active Transportation

Financing implementation of the active transportation improvements could be supported by a variety of provincial and federal financing programs. One of the most widely used programs is the Gas Tax Fund (New Deal for Cities and Communities) initiative which consists of an ongoing transfer of funds from the federal government to municipalities. The funds are generally allocated to municipalities on a per capita basis and are to be used for “environmentally sustainable municipal infrastructure.” Eligible expenditures include public transit, water, wastewater, solid waste, community energy systems, as well as local roads, bridges and tunnels, and active transportation infrastructure (e.g. bike lanes) that enhance sustainability outcomes. Funds must result in

net incremental capital spending on public transit infrastructure. There cannot be any reduction in capital funding provided by the municipality and the funds must be used within three years of receipt.

A similar program to the Federal Gas Tax Fund is offered by the province of Ontario. The Ontario Gasoline Tax is an ongoing transfer of funds to municipalities exclusively for public transit. The Provincial Gas Tax has reached 14.7 cents per litre in 2017. The existing allocation is based upon each municipality’s proportionate share of the province’s population. The funds can be used for either operating or capital costs.

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