Stantec

Final Report

Multi-Modal Transportation Master Plan

Town of Midland

November 2019

MOVING MIDLAND

Contributers

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.

Town of Midland Advisors:

Andy Campbell - Director of Engineering, Water & Wastewater

Mitch Sobil - Senior Project Manager, Engineering, Water & Wastewater

Medlaine Twitchin - Executive Assistant, Engineering Department

Zachary Fleras - GIS/IT Technician, Engineering Department

Randy Fee - Communications & Marketing Coordinator

Consulting Team:

Brandon Orr - Project Lead/Author - Stantec Consulting Ltd., Toronto, Canada

Rob Vastag - Senior Advisor - Stantec Consulting Ltd., Ottawa, Canada

Angelo Renon - Senior Advisor - Stantec Consulting Ltd., Ottawa, Canada

Irene Hauzar - Environmental Advisor - Stantec Consulting Ltd., Toronto, Canada

Brian Putre -Transit Advisor - Stantec Consulting Ltd., Toronto, Canada

Wilson Yip - Transportation Planner/Author - Stantec Consulting Ltd., Toronto, Canada

Martin Kaczmarek - Transportation Planner/Author - Stantec Consulting Ltd., Toronto, Canada

Bhargav Channa-Reddy - Transportation Planner/Author - Stantec Consulting Ltd., Toronto, Canada

Kristy Tu - Transportation Planner/Author - Stantec Consulting Ltd., Toronto, Canada

Andrew Larter - Co-op Student/Author - Stantec Consulting Ltd., Toronto, Canada

Jennie Cheung - Co-op Student/Researcher - Stantec Consulting Ltd., Toronto, Canada

Sadia Khan - Co-op Student/Researcher - Stantec Consulting Ltd., Toronto, Canada

Alina Ahmad - Co-op Student/Researcher - Stantec Consulting Ltd., Toronto, Canada

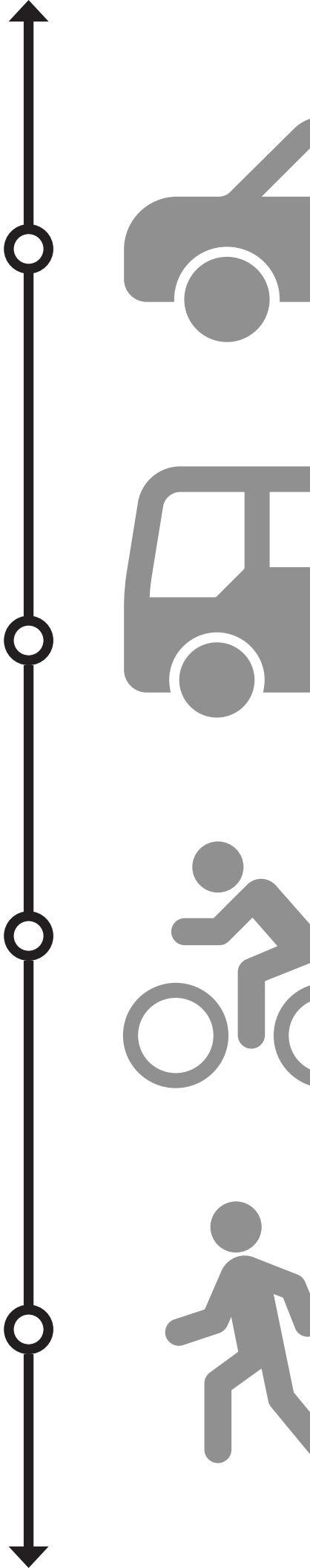
External Stakeholders:

Simcoe County

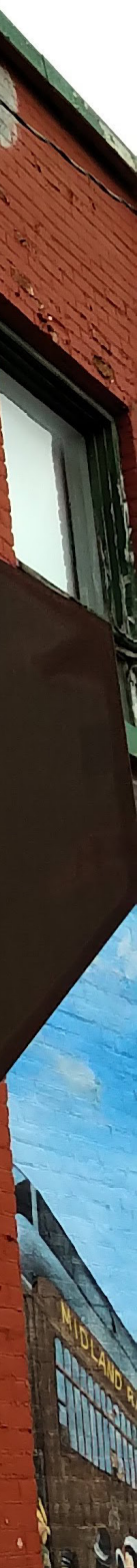
The Ministry of Transportation, Ontario

Midland Active Transportation Committee

François Tomeo - Advisor



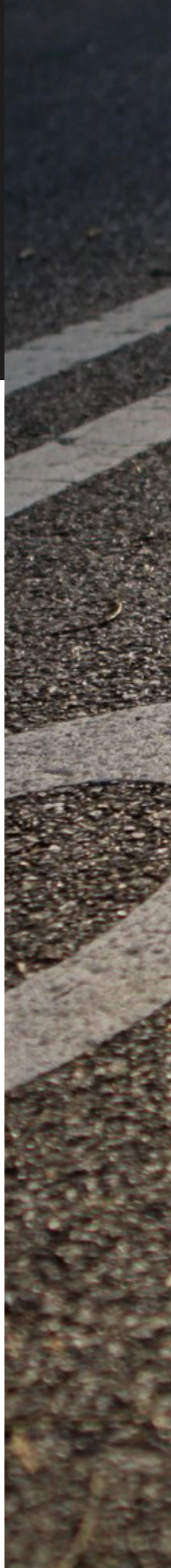

DOMINION
KING ST.
DOWNTOWN
MIDLAND
15



Contents

Contents

Appendix



1.0 Introduction

1.0 Introduction

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 Town'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 Midland'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 Midland 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 town-wide basis. A MTMP avoids the pitfalls of piece-meal planning and "band-aid" solutions and provides a vision for the Town 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 Town of Midland 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 2012 Transportation Master Plan, the draft 2017 Official Plan Review, the 2018 Transit Operational Review, and the Parks & Trails Master Plan to re-evaluate previously planned improvements, as well as consider and respond to changes in growth, both within the Town and in adjacent municipalities since that time. The purpose of this study is to create a town-wide multi-modal transportation plan that not only identifies improvements within the Town's urban areas, but also considers opportunities to integrate the Town's new and emerging areas within and beyond Midland 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 Town's transportation vision, goals, strategy and initiatives to help Midland 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 Town 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 us 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 Town as a whole.
- Town 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 Town's Official Plan.
- Town engineers, designers and capital delivery programs staff should scope transportation capital programs and plans to implement the MTMP.
- Town 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 Town 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 Town 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. This document is made available for public comment prior to being approved by the municipality.

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 consultions
*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 | December 12, 2018
- Online Engagement Survey | December 17, 2018 to January 18, 2019
- Public Information Centre | May 2, 2019
- Draft MTMP Council Meeting | September 4, 2019
- Notice of Completion (30-day Public review period) | September 5, 2019
- Public Information Centre | October 24, 2019

The MTMP study was initiated in December 2018 through a Notice of Commencement published on the Town's website and local newspaper. Three rounds of consultation were conducted including an online survey and two public information centres (PIC) along with stakeholder meetings culminating in approximately 259 people engaged and 67 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	221
Public Information Centres	30
Stakeholder Meetings	8
Total People Engaged	**259**
Written Comments Received	**67**

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 Town's website (www.midland.ca) and was also available at a public computer where a town 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**.

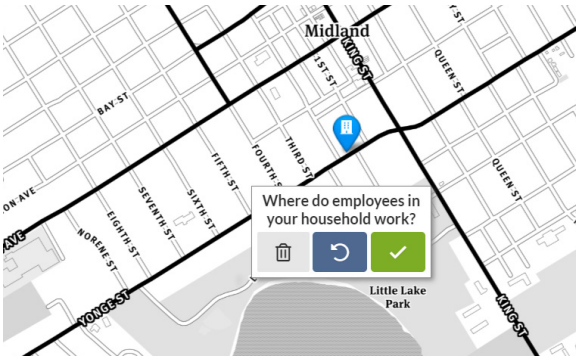


Figure 1.1 Example of the Online Survey between December 17, 2018 - January 18, 2019

Figure 1.2 Public Engaging during the Public Information Centre on May 2, 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 PICs were held on May 2 and October 24 of 2019 between 5 p.m. and 8 p.m. at the North Simcoe Sports and Recreation Centre 527 Len Self Boulevard. A notice of public consultation was released by the Town on the municipal website and as a local newspaper ad 4 weeks prior to the PIC and public display boards were presented and posted to the Town's website after the meeting. A council meeting to engage councillors was held on September 4, 2019 to present the overall findings and recommendations of the MTMP.

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

- Official Plan Review;
- Downtown Master Streetscape Plan;
- Parks & Trails Master Plan;
- Transit Operational Review; and
- Development Charges Background Report.

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.

"A community is the mental and spiritual condition of knowing that the place is shared, and that the people who share the place define and limit the possibilities of each other's lives. It is the knowledge that people have of each other, their concerns for each other, their trust in each other, the freedom with which they come and go among themselves."

- Wendell Berry - Novelist

2.0 Current Conditions

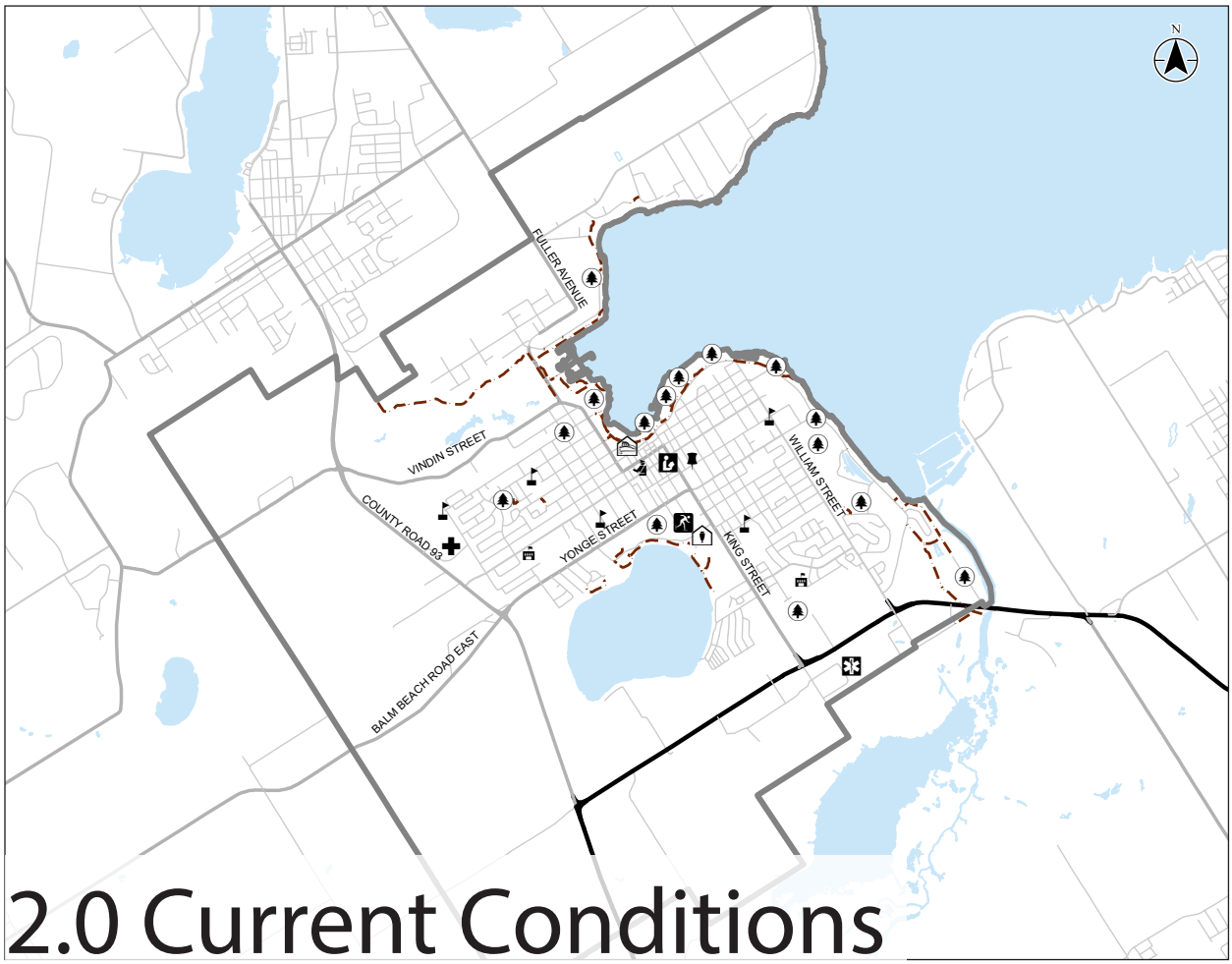


Figure 2.1
Existing Road network

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 Town moves in a particular way as well as understanding where residents and businesses will need to go in the future.

The Town of Midland 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 Midland accounting for 16,864 or 3% of the county's population. The Town of Midland is primarily urban in nature with the downtown centred along King Street extending from Bayshore Drive to Yonge Street with broader low-rise built form extending outward toward Provincial Highways 12 and County Road 93 (see **Figure 2.1**).

The largest age demographic within the Town of Midland are residents the age of 65 years and over that account for approximately 25% of the population as shown in **Figure 2.2** that illustrates the existing population pyramid of Midland. The aging population is likely due to the influx of "Baby Boomers" entering retirement age, with Midland's median age being 50 compared to the provincial median of 41 . The age group has increased by 16% since 2011 and is projected to continue growing in the future as outlined by broader regional trends within the Simcoe-Muskoka area. Despite a growing senior population, a younger cohort population between 14 years of age and younger are expected to enter the working-age bracket by 2036 presenting opportunities to guide and encourage transportation choices for the next-

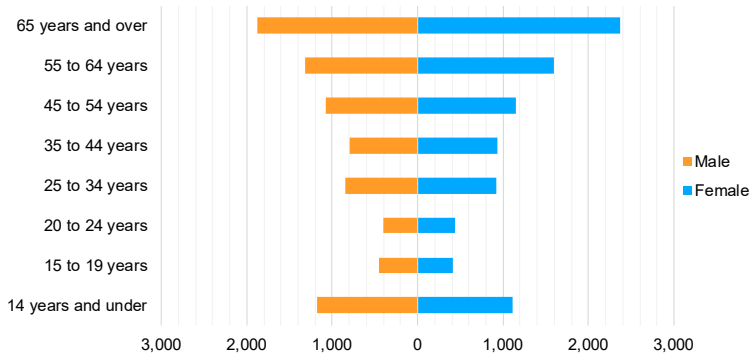


Figure 2.2 Population Pyramid | 2016
Source: Statistics Canada - Community Profile, 2016

generation of working-age residents. 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.

The Town of Midland is located on the southern shore of Midland Bay and functions as the centre of a broader community that is bounded by the Town of Penetanguishene to the north-east, the Township of Tiny to the north and south-east, and the Township of Tay to the south-west. The Town's land use encompasses a mixture of land uses throughout the municipal boundary, although the general built-form radiates outward from the Downtown core anchored by King Street north of Yonge Street. To the east of Downtown are employment lands focused around Wallace Street as well as employment areas in the south around Highway 12 east of King Street.

Radiating outward from the Downtown are three mixed-use corridors, as shown in **Figure 2.3**, including:

- King Street between Galloway Boulevard and Yonge Street;
- Yonge Street between the municipal boundary in the west and King Street in the east; and
- Vindin Street between County Road 93 and Fourth Street.

On the peripheries of the built-up area are two commercial corridors, as shown in **Figure 2.4**, including:

- County Road 93;
- Highway 12; and
- Some portions of King Street south of Galloway Boulevard.

Located on the periphery of neighbourhood residential and Downtown areas are natural heritage and rural areas which surround the Town's small urban area leading to an overall population density of 177 persons per square kilometres (based on the 2016 population of 16,864).

The Town of Midland was home to Huron and Ouendat Nations and was historically settled by farming families in the 1840s. Midland's proximity to the bay made it an obvious choice as the western port for the Midland Railway Corporation of Port Hope which further led to economic growth in the area. The railway was a stimulus to the logging industry, and shipbuilding became prominent within the town. This led to the development of the downtown core along King Street with ground-floor commercial units and residential apartments located on the upper floor. Today, retail on the County Road 93 corridor and the light industry of the Provincial Highway 12 as well as the growing presence of cottages in the area has contributed heavily to the Tourism industry of the Town that has attracted boating, recreational, historical, and cultural opportunities for visitors and residents. The preference for the private automobile within the Town has resulted in the growth of low-density residential development in recent years.

A look at Midland's historical residential construction shows an overall housing supply that is 75% low-density in the form of Singles & Semis, with the remaining 25% classified as higher density dwellings such as Rows or Apartments as summarised in **Table 2.1**.

Table 2.1 Historical Household Construction by Period

Period	Singles & Semis	Rows	Apartments	Total
1945-2011	4,990	340	1,690	7,020
%	71%	5%	24%	100%

Source: Town of Midland - Development Charges Background Study, 2014

Table 2.2 Municipal Occupation Split

Occupation	Employment	% Total
0 Management occupations	635	8%
1 Business, finance, and administration occupations	850	11%
2 Natural and applied sciences and related occupations	255	3%
3 Health occupations	710	9%
4 Education, Law and social, community and government services	850	11%
5 Art, culture, recreation, and sport	175	2%
6 Sales and service occupations	2,080	27%
7 Traces, transport and equipment operators and related occupations	1,195	15%
8 Natural resources, agriculture, and related production occupations	155	2%
9 Manufacturing and utilities	575	7%
Not Applicable	240	3%
Total	**7,720**	**100%**

Source: Statistics Canada - Commuter Profile, 2016

Employment distribution in the Town is similar to that of Simcoe County with a high proportion of sales and service, trades, transport, and equipment operators and related industries (as summarised in **Table 2.2**). A considerable percentage of the population is also employed in education, law, and social, community and government (11%) as well as business, finance, and administration occupations (11%). These directly correspond with the major employers of the Town which include:

- Elcan Optical Industries: 800 – 900 jobs;
- Georgian Bay General Hospital: 450 – 500 jobs;
- Educational Institutions: 400 – 500 jobs;
- TRW Vehicle Safety Systems: 400 – 450 jobs;
- New England Business Systems (NEBS) Business Forms Ltd: 200 – 250 jobs.

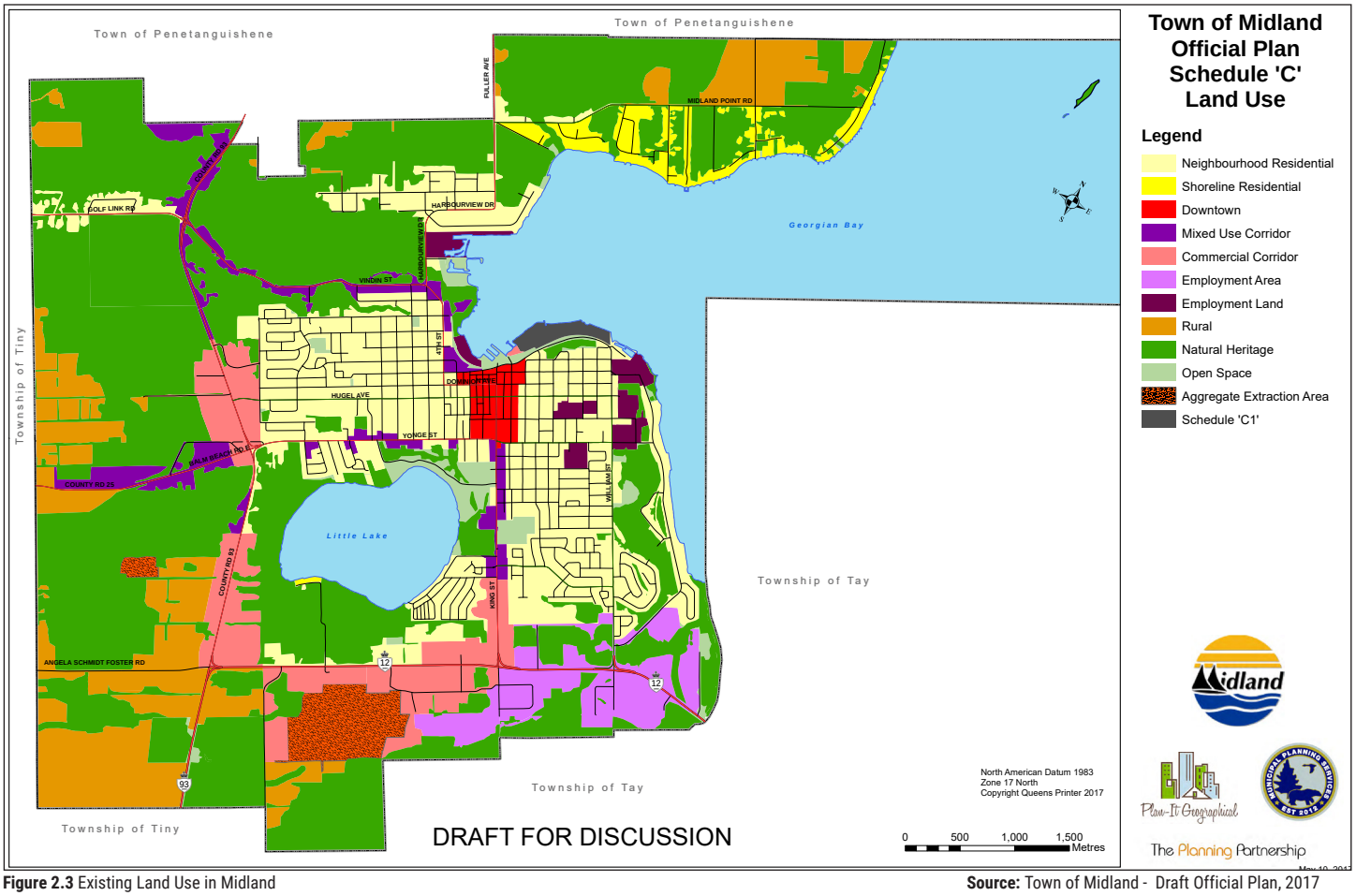


Figure 2.3 Existing Land Use in Midland

Source: Town of Midland - Draft Official Plan, 2017

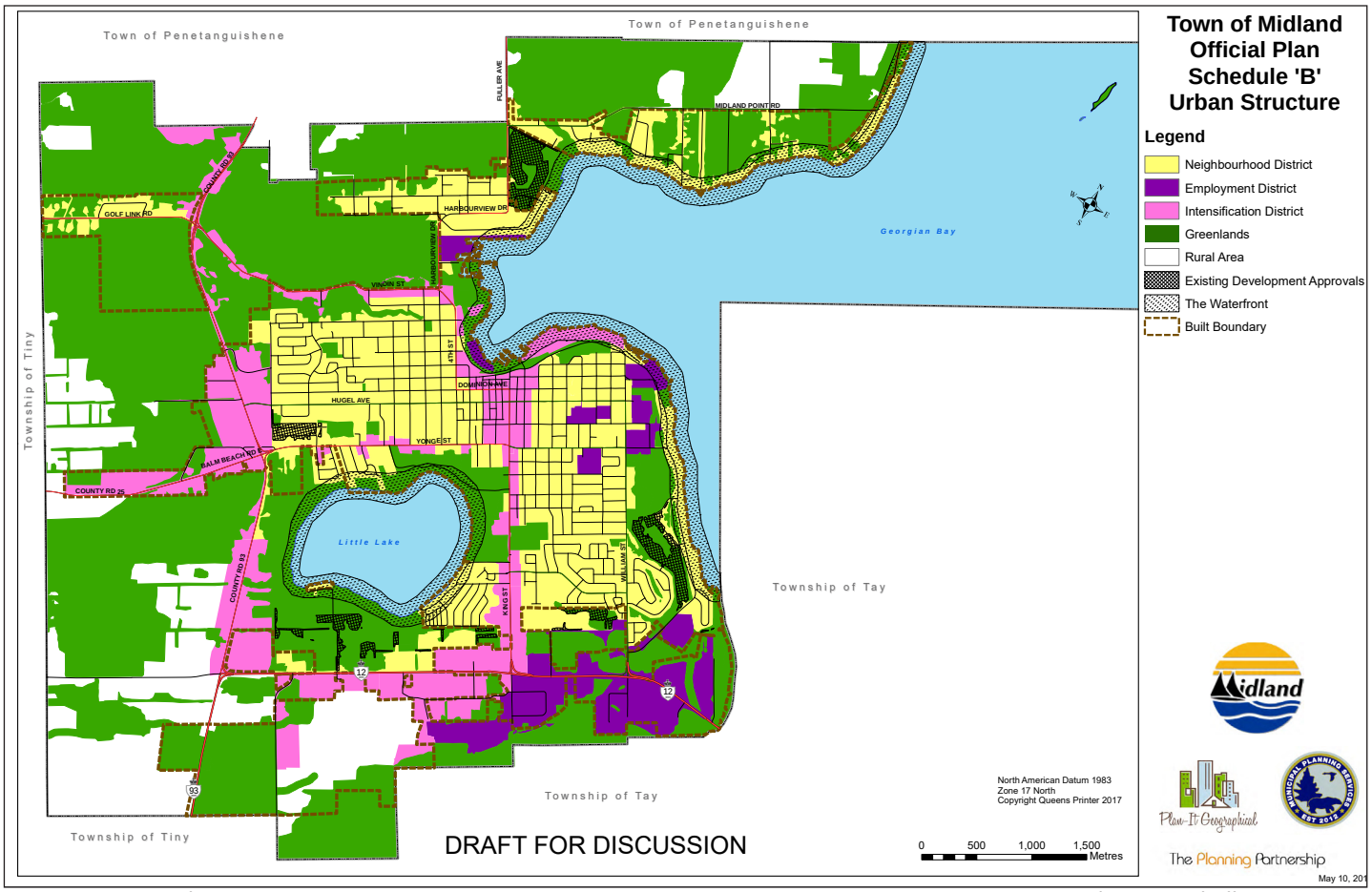


Figure 2.4 Existing Intensification Corridors in Midland

Source: Town of Midland - Draft Official Plan, 2017

2.2 Multi-Modal Network

2.2.1 Road Classification

Per the Town of Midland's 2019 Official Plan and the 2012 Transportation Master Plan, the transportation infrastructure network consists of several different road types which are intended to serve and meet different objectives. The town's road classification system is visualized in **Figure 2.5** and consists of the following:

- **Provincial Highways:** are under the jurisdiction of the Ministry of Transportation and have restricted or controlled access routes to permit through traffic to move quickly and safely. 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, however combined access from service roads and/or adjoining Arterial, Collector and/or Local Roads should be encouraged. Specific provincial regulations apply in the vicinity of these highways, as set out by the Ministry of Transportation.
- **Arterial Roads:** are primarily transportation facilities, providing through routes for vehicles, pedestrians and cyclists across the Town. 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. New residential access should be permitted only where traffic movement, volume, speed and safety are not compromised or no Local Road or Collector Road access is available. Except where existing development or circumstance precludes it Arterial Roads will generally have a minimum right-of-way width of 30.0 metres. Sidewalks, where possible and practical, are required on both sides of Arterial Roads. For planning purposes County Road 93 and Highway 12 are also considered Arterial Roads.
- **Collector Roads:** carry traffic between Arterial Roads and the Local Roads. Access to properties abutting these roadways will be permitted as through traffic is discouraged. Except where existing development or circumstance precludes it Collector Roads will generally have a minimum right-of-way width of 26.0 metres. 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. Sidewalks are generally required on at least one side of all Local Roads unless otherwise identified as a Key Pedestrian Link in which case they are required on both sides of the street.

2.2.2 Truck Network

Movement of freight across the multi-modal transportation network is an important component to employment and economic activity across Canada. However, the movement of commercial vehicles has presented safety and infrastructure concerns that limit the movement of trucks along the roadway system within the Town of Midland and periphery areas that are designated "employment lands" based on the Town's land use designations.

Truck and freight movement is generally not permitted on local roads within residential areas however it is permitted for deliveries and local access. Truck movement is largely limited to the Provincial highway system, County roads, and Town arterial and collector roads as summarized in **Table 2.3** and visualized in **Figure 2.6**.

Beyond these restrictions the Town of Midland currently implements an oversize load permit requirement for oversized loads that exceed the dimensions and/or weight prescribed in the Highway Traffic Act on County/Municipal Roads. This is in line with Simcoe County and the City of Barrie which both have permit requirements for oversized loads and 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
Bay Street	Between Fourth Street and Second Street	Designated Truck Route
Bayshore Drive	-	Designated Truck Route
Fuller Avenue	North of Brunelle Sideroad	Designated Truck Route
Golf Links Road	Wilson Road to County Road	Designated Truck Route
King Street	Yonge Street to Highway 12	Designated Truck Route
Vindin Street	Fourth Street to County Road 93	Designated Truck Route
William Street	Bayshore Drive to Highway 12	Designated Truck Route
Yonge Street	County Road 93 to King Street	Designated Truck Route
County Road 25	-	Reduced Load (March - April)
Highway 12	-	Trucks Permitted
All other roadways	Generally, not permitted unless travel is required for local access	

Source: Town of Midland Transportation Master Plan, 2012

Figure 2.5
Existing Road Classification according to the Official Plan

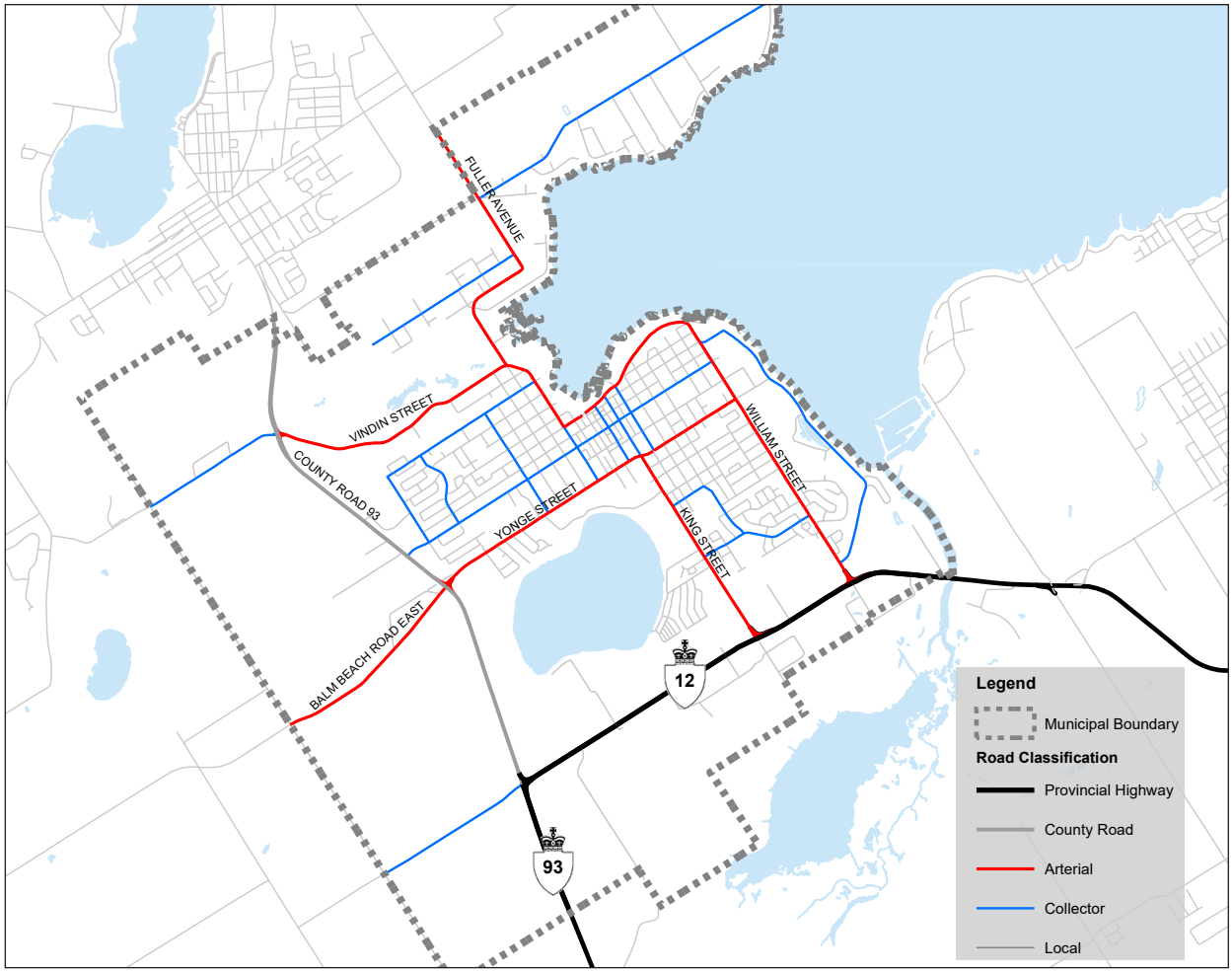
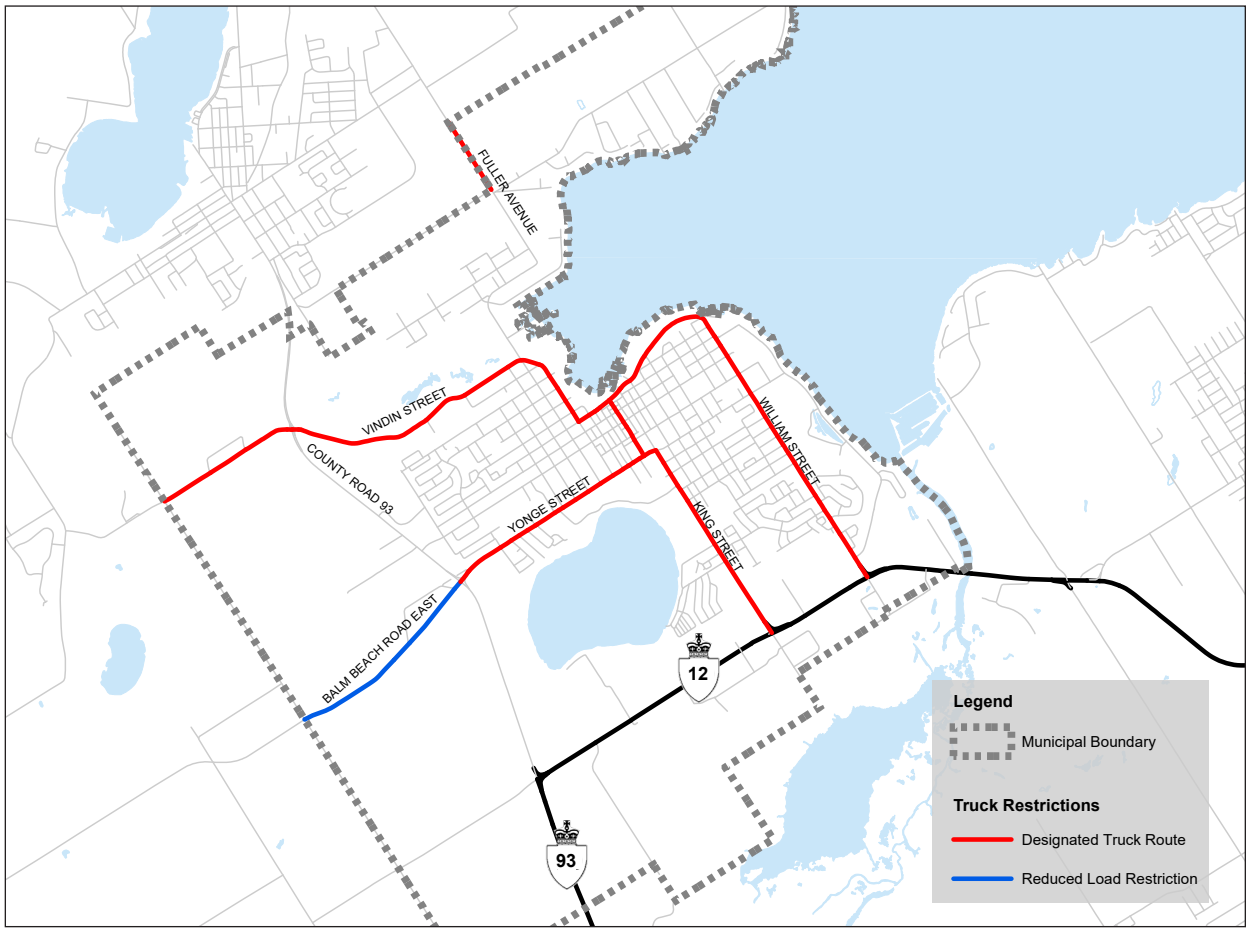


Figure 2.6
Existing Truck Restrictions



2.2.3 Transit Network

The Town of Midland operates a conventional and paratransit service throughout community. The conventional service can be characterized as a hub & spoke network that currently provides two (2) routes in Midland operating at 30-minute headways and one (1) route to/from Penetanguishene that operates at 60-minute headways. All routes operate in one-way circuitous loops out of the main transfer point (Town Hall) at King Street & Elizabeth Street in the Downtown as visualised in **Figure 2.7**. The service provides weekday service between 6:30 a.m. with final departures at 5:45 p.m., as well as weekend service on Saturdays with service starting at 8:30 a.m. with final departures at 4:45 p.m.

Exceptions to the one-way service nature of the network can be found along County Road 93 between Penetanguishene and Midland, as well as along King Street between Highway 12 and Robert Street where two-way service is provided.

The routes have designated bus stops and when traffic flow permits, Midland transit utilizes the "Hail Bus" method for areas in-between transit stops. Transit access was analyzed in Midland and Penetanguishene in terms of the percentage of population that resides within 400m (5-minute walk) of a physical transit stop as summarised in **Table 2.4** and visualised in **Figure 2.8**. This analysis identified that 44% of Midland's population and 65% of Penetanguishene's population reside within a five-minute walk to transit with some larger gaps within Midland around the residential areas east of King Street and north of Yonge Street.

These gaps have the ability to be served by Midland / Penetanguishene Transit's "Hail Bus" method for areas in-between transit stops, however it's important to know that this depends on when traffic flow permits, and there is a lack of permanency or reliability that may impact the perceived availability of Transit for residents. This is further compounded by operational impacts that have been highlighted in the Draft Transit Operational Review which identified that the "Hail Bus" method adds to the overall travel time as buses can end up stopping frequently based on passenger requests and can often slow down the system .

Since 2013, transit ridership has increased at a rate of approximately 6% annually culminating in a net gain of 14,550 riders or a 30% increase in ridership as summarised in **Table 2.5**. It must be noted, that, while ridership has increased, overall weekday peak period transit mode share has not which is further highlighted in section 2.3.3 of this chapter.

Similar to other small communities, improving transit's competitiveness with automobiles is a challenging prospect especially in light of good vehicular roadway operations which are further highlighted in section 2.3.4 of this chapter. Midland / Penetanguishene Transit serves a wide variety of demographics including seniors, youth & students, and others who may not be reflected in peak period mode splits. This combined with the introduction of an integrated service with Penetanguishene Transit in 2018 may also have added additional riders that would not have been reflected in the 2016 Transportation Tomorrow Survey data used to analyse existing peak period mode splits.

Overall, the most recent transit operational review identified five (5) priority service improvements that residents are demanding including:

- Increasing Service Frequency;
- Introduce Sunday Service;
- Later Weekday Service;
- Later Saturday Service; and
- Providing service to new areas of the Town.

In addition to local conventional service, 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.

Table 2.4 Percentage of Midland-Penetanguishene within 400m of a transit stop

Municipality	Total Population (2016)	Population within 400m	% Population within 400m
Town of Midland	16,864	7,469	44%
Penetanguishene	8,962	5,845	65%

Source: Calculated by Stantec using GIS

Table 2.5 Historical Ridership | 2013-2018

Year	Ridership	Difference
2013	49,149	-
2018	63,700	14,551 (+30%)

Source: CUTA Transit Factbook, 2015 | Draft Report - Phase 2: Proposed Transit Service Strategy, 2018

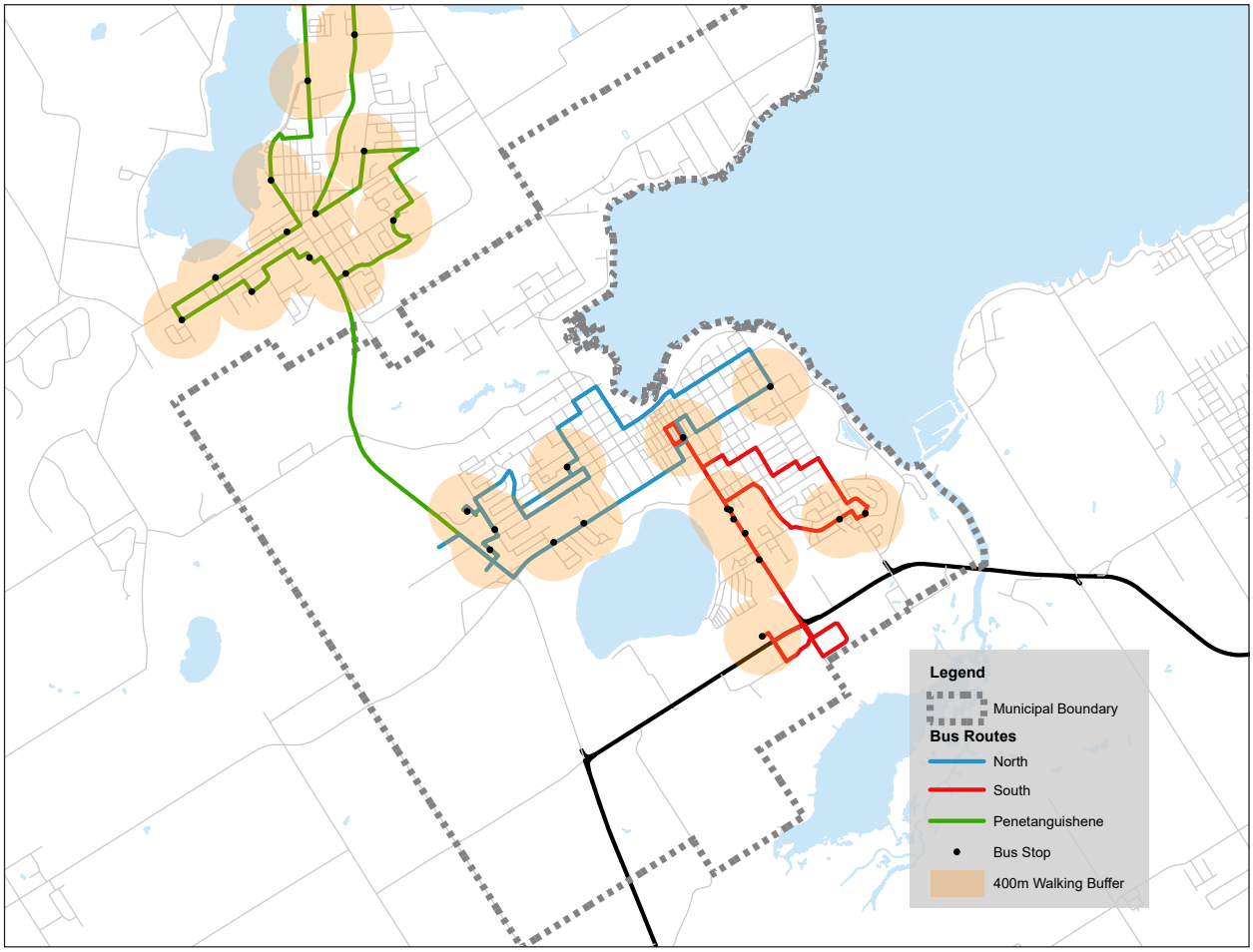


Figure 2.7
Existing Midland-Penetanguishene Transit Routes

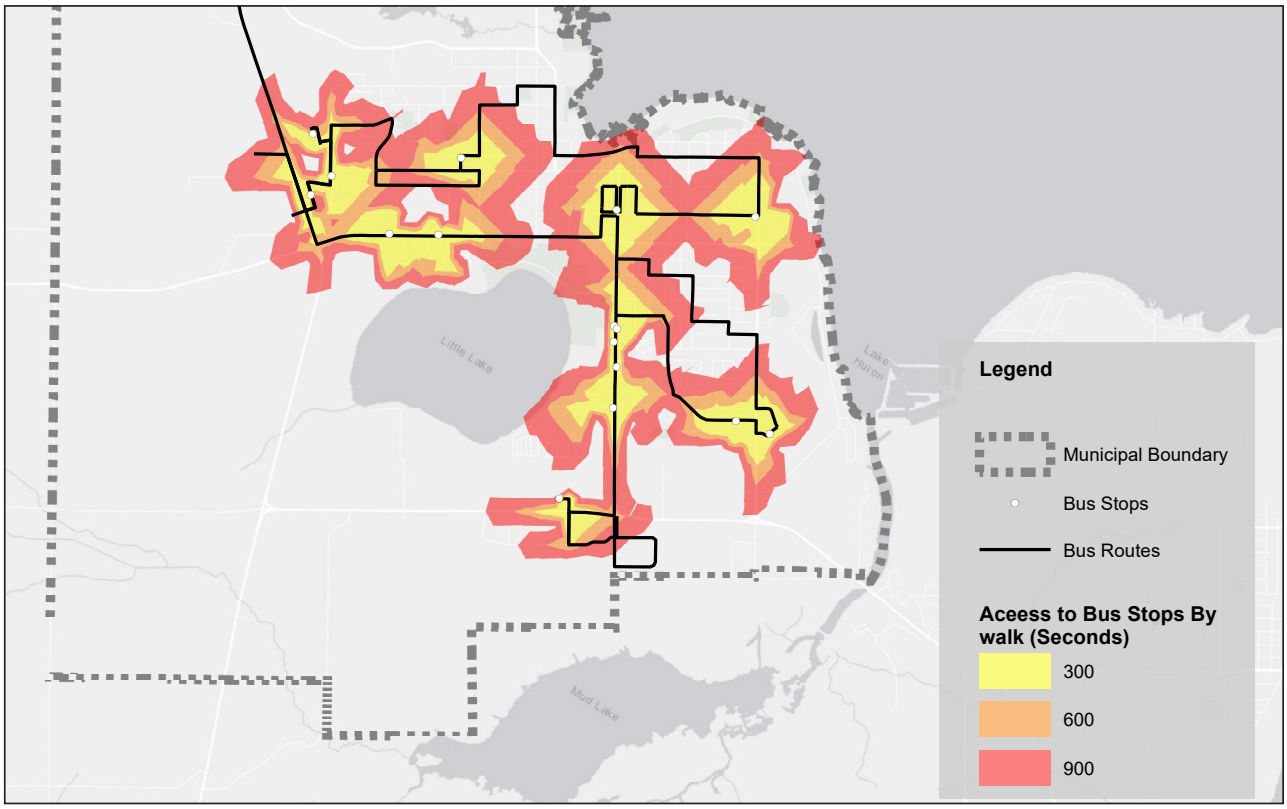


Figure 2.8
Existing transit service coverage based on walking distance to a stop

2.2.4 Active Transportation

Midland's cycling network infrastructure mostly comprises of Multi-Use trails, with some smaller portions of bike lanes, and sharrows primarily located along the Waterfront, Downtown, and green spaces as shown in **Figure 2.11**. These facilities provide approximately 24km of cycling infrastructure through Midland, however the network has a significant number of gaps and large areas that are disconnected.

During public consultation and the online survey several respondents identified that the recently implemented Yonge Street road diet and the associated bike lanes have few physical distinguishing features beyond signage that separate it from general vehicular traffic. This was further confirmed during site visits, particularly during and right after winter when paint markings are scraped off as a result of the mixture of salt, sand and plowing as shown in **Figure 2.9**.

Beyond the roadway cycling infrastructure the network of County and regional trails provides inter-community connections mostly free of high traffic volume. Some of these routes are on paved roads or shoulders and, at certain locations, gravel roads. These routes are also geared toward tourism rather than commuting.

Midland's existing pedestrian network consists of a mixture of sidewalks and multi-use trails that are focused on providing links between schools, local neighbourhoods, and connecting multi-use trails as shown in **Figure 2.12**. Pedestrian sidewalks are located throughout the Downtown and residential neighbourhoods with connections to bike routes and other active transportation facilities that culminate in 118 km of pathways.

Figure 2.12 shows that the pedestrian network is complimented by the Town's signalized intersections which provide protected crossing opportunities along most major corridors such as arterials and highways. While major roadways generally provide some form of pedestrian facility, there are few protected mid-block pedestrian crossings along Yonge Street, King Street, and William Street where pedestrians are required to deviate up to 650m to use a protected crossing facility. While courtesy crosswalks indicate to motorists the possibility of pedestrians crossing, they provide no legal protection for pedestrians, nor do they conform with best-practices and guidelines for pedestrian crossing facilities. For instance, the courtesy crosswalk at Mundy's Bay Elementary School has no signage or physical features that make it identifiable when the paint fades after a long winter as shown in **Figure 2.10**.

The urban form and layout of the road network within Midland's downtown core follows a traditional grid structure with 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. This can be seen in the wire diagrams accompanying **Figure 2.12** that show large impermeable blocks in West Midland.

Figure 2.9 The newly dedicated bike lanes on Yonge Street have no distinguishing design features from the adjacent general traffic lanes besides the signage, particularly in the winter when the paint markings disappear due to winter maintenance.

"I live on William Street and have a very dangerous issue with Courtesy Cross Walks at Donalda and one other street. They do not work and I have seen many times, kids and adults almost getting run over. It is a 3 lane road and extremely busy and no one stops because they know it is "courtesy" only."

- Anonymous survey respondent

Figure 2.10 The existing courtesy crossing in front ot Mundy's Bay Elementary School at Yonge Street & Sixth Street is unsignalized, and is often unmarked after the winter season.

Figure 2.11
Existing Cycling Network

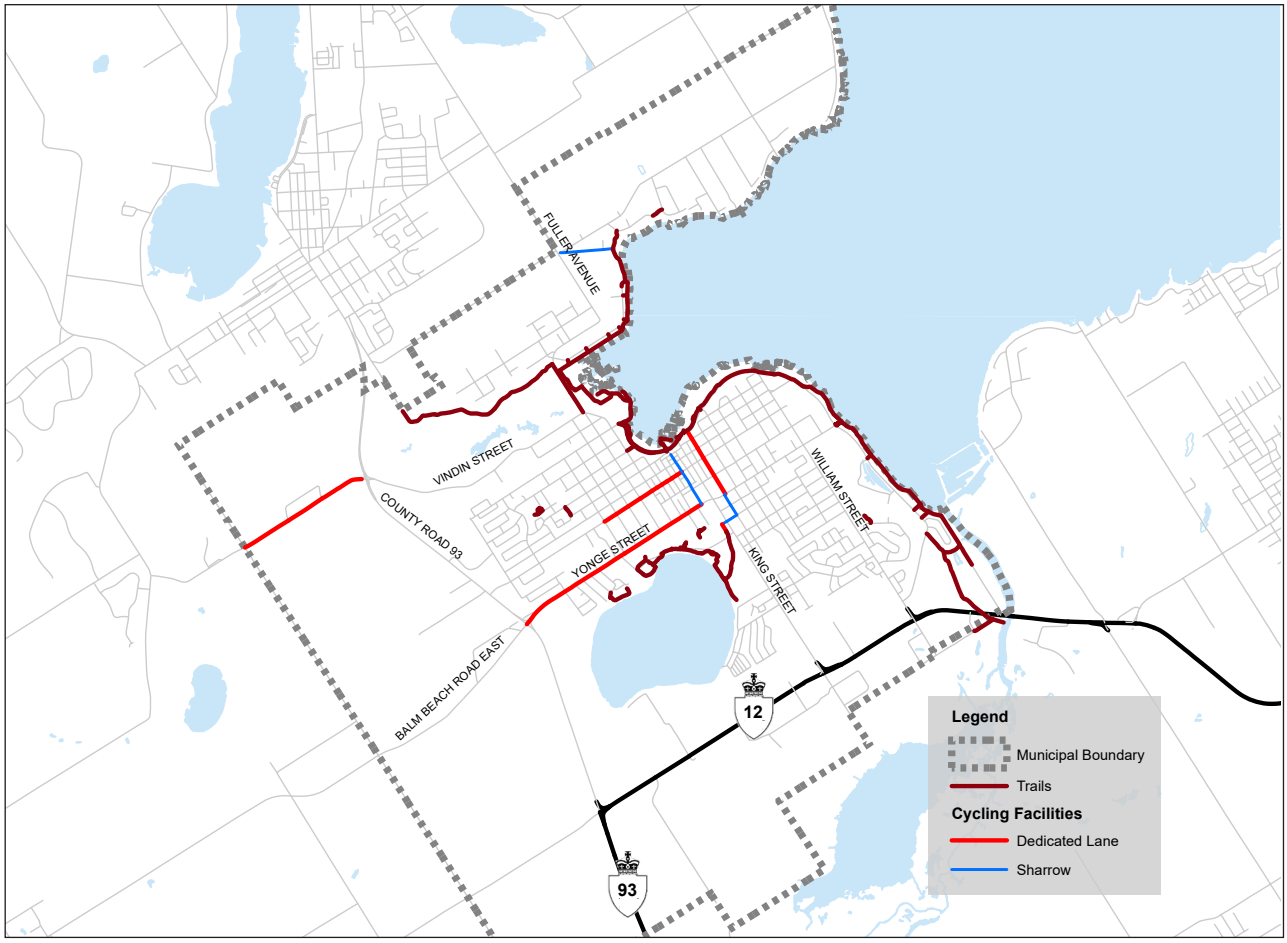
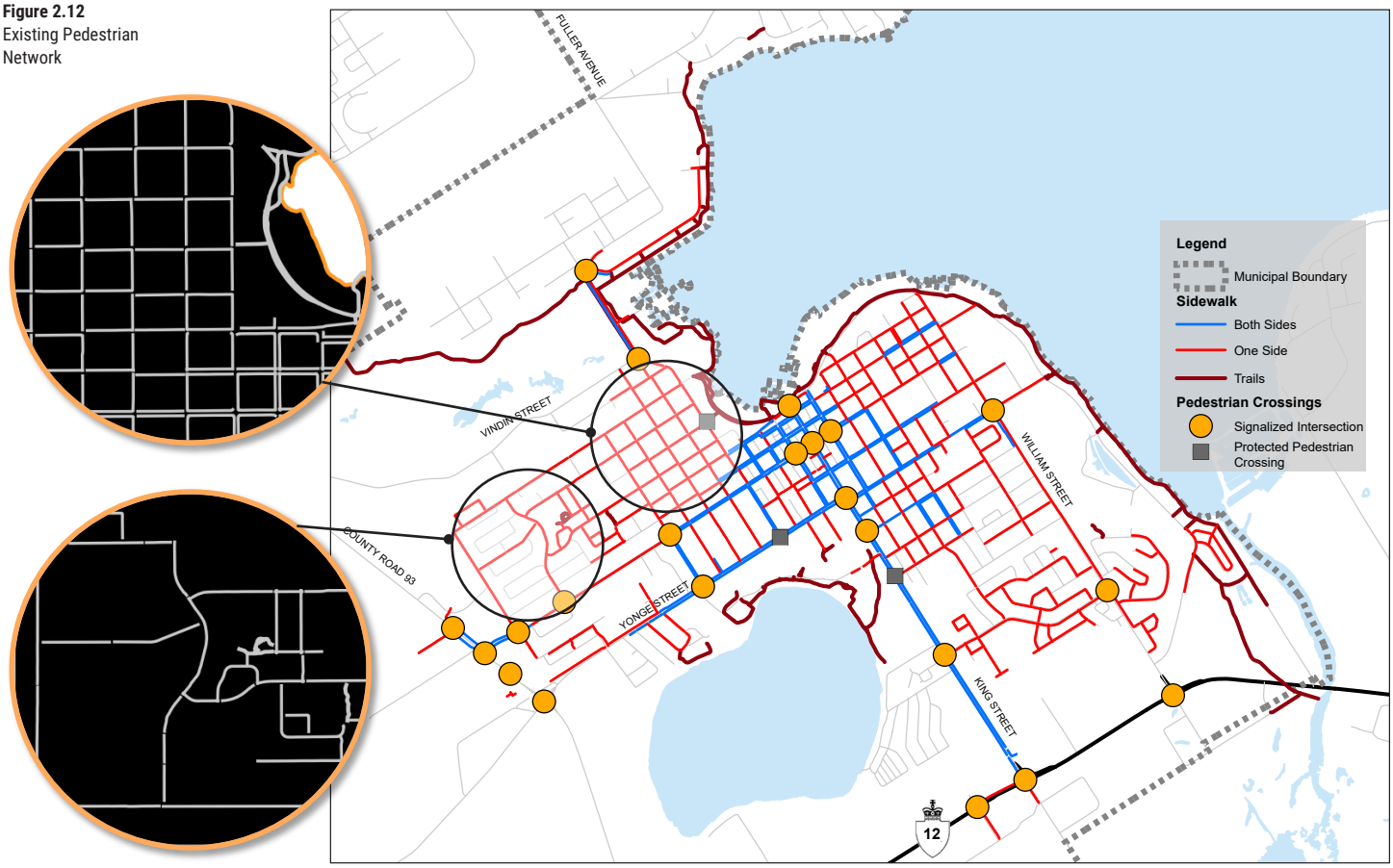


Figure 2.12
Existing Pedestrian Network



2.3 Travel Characteristics

2.3.1 Trip Distribution

Most peak period trips are external to Midland with 41-44% of trips starting and ending within the Town as summarised in **Table 2.8**. Generally, external trips have seen an increase of trips between 10-25% since 2011, while internal trips have remained somewhat stagnant.

The trip distribution dynamic is represented through the significant travel relationship that Midland has with other North Simcoe Municipalities such as Penetanguishene, Tiny, and Tay that are involved in 40% of all peak period trips to/from Midland culminating in approximately 5,500 - 6,200 trips. This represents a growth of 900 - 1,200 peak period trips since 2011 or 20-24% growth.

There is a clear trend of higher inbound trips in the morning from neighbouring municipalities with a reciprocal outbound trend in the afternoon. Meanwhile, Midland currently has a relatively equal relationship of inbound and outbound trips to other Simcoe County municipalities and other external municipalities during both peak periods. **Figure 2.13** and **2.14** show the AM and PM Peak period geographic distribution of trips to and from Midland with volumes summarised in **Table 2.8**.

The existing trip distribution shows three clear trends whereby:

- Midland acts as an employment hub for adjacent North Simcoe County Municipalities;
- North Simcoe represents a generally contained area of movement between municipalities including Midland; and
- Midland's trip distribution is shifting away from local internal trips toward more external trips.

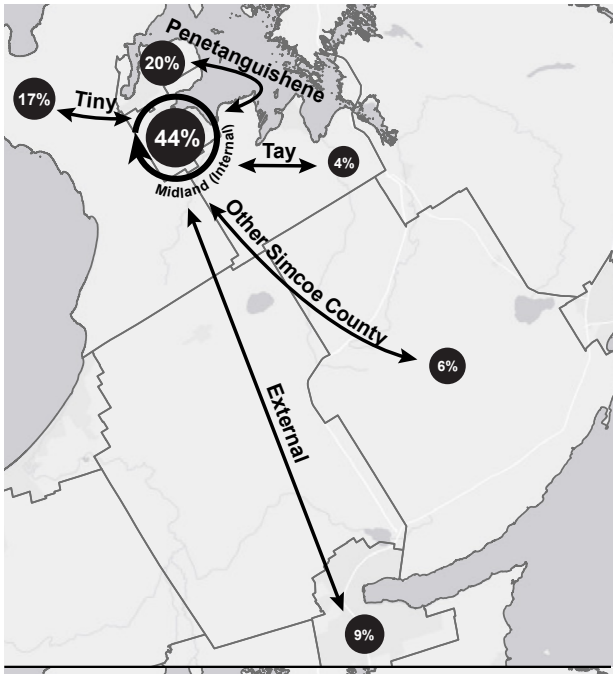


Figure 2.13 Existing (2016) AM Peak Period Trip Distribution

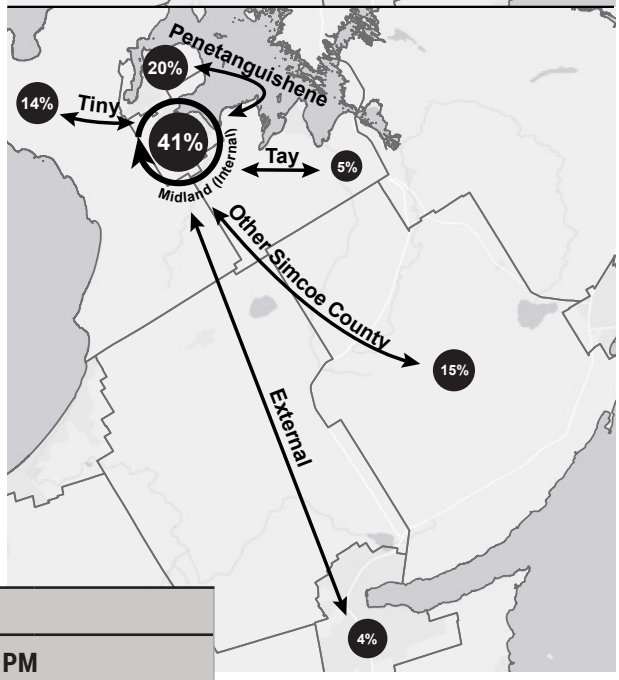


Figure 2.14 Existing (2016) PM Peak Period Trip Distribution

Table 2.8 Existing Trip Distribution | AM & PM Peak Periods

Distribution	2016					
	AM			PM		
	Volume	%	Change (2011-2016)	Volume	%	Change (2011-2016)
Internal	**6,080**	**44%**	**+388 (+7%)**	**6,542**	**41%**	**-300 (-4%)**
Internal->North Simcoe	1,687	12%	+166 (+11%)	4,011	25%	+859 (+27%)
Internal->Other Simcoe	790	6%	+117 (+17%)	1,276	8%	+40 (+3%)
Internal->Other External	220	2%	-40 (-15%)	285	2%	+227 (+391%)
Outbound Sub-total	**2,697**	**20%**	**+243 (+10%)**	**5,572**	**35%**	**+1,126 (+25%)**
North Simcoe->Internal	3,815	28%	+754 (+25%)	2,235	14%	+357 (+19%)
Other Simcoe->Internal	896	6%	-455 (-35%)	1,181	7%	-4 (0%)
Other External->Internal	317	2%	+106 (+50%)	394	2%	+23 (+6%)
Inbound Sub-total	**5,028**	**36%**	**+405 (+9%)**	**3,810**	**24%**	**+376 (+11%)**
Total	**13,805**	**100%**	**+1,036 (+8%)**	**15,924**	**100%**	**+1,202 (+8%)**

Source: Transportation Tomorrow Survey - University of Toronto, 2016

"Although the cycling lanes are intended to take you along the waterfront, it would be great if [external connections] carried on to Penetanguishene through Everton and Sunnyside or carried along Harbourview."

- Anonymous survey respondent

Looking at trip data at a more localized level within the Town of Midland shows internal trips have been generally stagnant since 2011. South Midland has seen a significant decline in trips, while the areas along Hugel Avenue and Yonge Street, including downtown have seen significant increases as summarised in **Table 2.9**. A visualization of the traffic area zones (TAZ) in Midland are shown in **Figure 2.15**.

The strongest internal origin-destination trip pairs involve travel to/from areas along Hugel Avenue (TAZ 4) including the downtown core where there are both strong internal trips within the zone as well as trips between it and other internal zones as summarized in **Table 2.9**. This is likely due to many employment and downtown commercial areas residing within the zone including the Georgian Bay Hospital which is a major employer in the area.

Overall, trips going to/from South Midland to other areas show some of the lowest number of trips compared to all of the more established areas in the Midland. However, it is important to consider that South Midland is not fully built-out and that much of the population and employment growth in the Town is anticipated to occur here as new residential and commercial subdivisions are built which will likely lead to higher internal trips from the area.

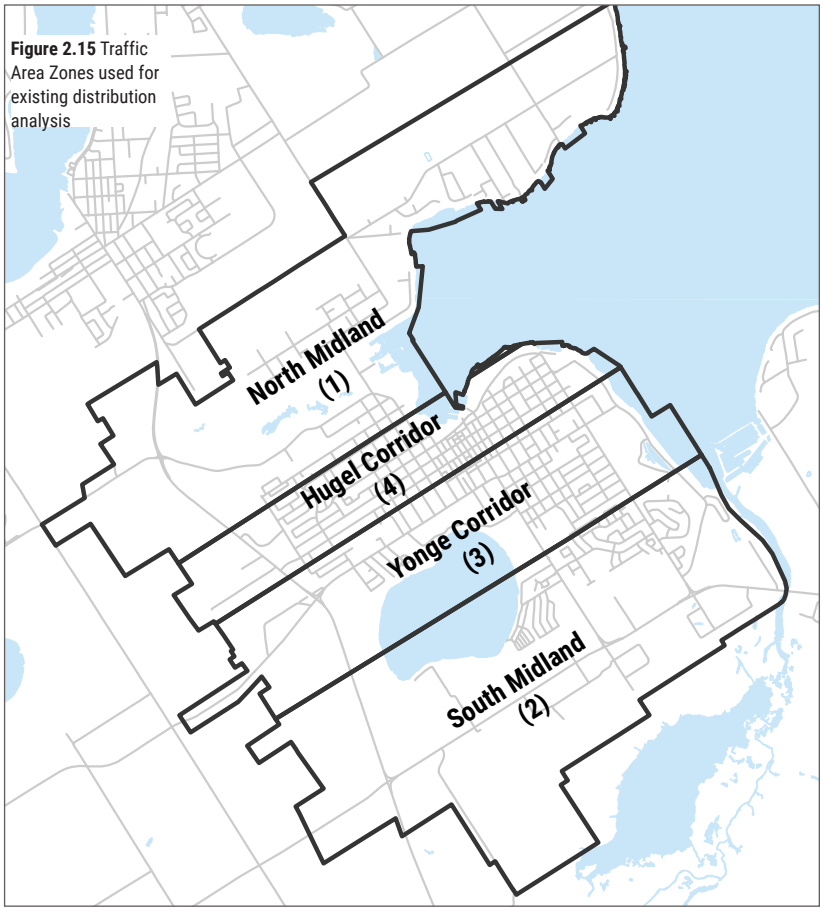


Figure 2.15 Traffic Area Zones used for existing distribution analysis

Table 2.9 Internal Trip Distribution in Midland 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				1	2	3	4	
Origin	1 - North Midland	69	58	164	275	**566**	Origin	1	+69	-136	-24	-53	**-144**
	2 - South Midland	12	424	398	325	**1,159**		2	-84	-99	-2	-69	**-254**
	3 - Yonge Corridor	157	399	618	681	**1,855**		3	+133	-56	-94	+125	**+108**
	4 - Hugel Corridor	47	93	880	1,477	**2,497**		4	-108	-505	+386	+902	**+675**
Total		**285**	**974**	**2,060**	**2,758**	**6,077**	**Total**		**+10**	**-796**	**+266**	**+905**	**+385**
PM Peak Period		Destination				Total	PM Peak Period		Destination				Total
		1	2	3	4				1	2	3	4	
Origin	1 - North Midland	120	29	74	251	**474**	Origin	1	+88	-14	-2	+86	**+158**
	2 - South Midland	164	344	520	240	**1,268**		2	+62	-134	-61	-281	**-414**
	3 - Yonge Corridor	183	675	1,480	508	**2,846**		3	-38	-80	+418	-170	**+130**
	4 - Hugel Corridor	79	376	827	673	**1,955**		4	-140	-92	+147	-87	**-172**
Total		**546**	**1,424**	**2,901**	**1,672**	**6,543**	**Total**		**-28**	**-320**	**+502**	**-452**	**-298**

Source: Transportation Tomorrow Survey - University of Toronto, 2016

2.3.2 Trip Volumes

Intersection Turning Movement Count (TMC) volumes, obtained from the Town of Midland, the Ontario Ministry of Transportation (MTO), and through counts conducted by Stantec, were analysed for the AM and PM peak hour for Arterial and Collector corridors within Midland. A summary of Traffic volumes at key locations are summarised in **Table 2.10** with the associated map of locations shown in **Figure 2.16**.

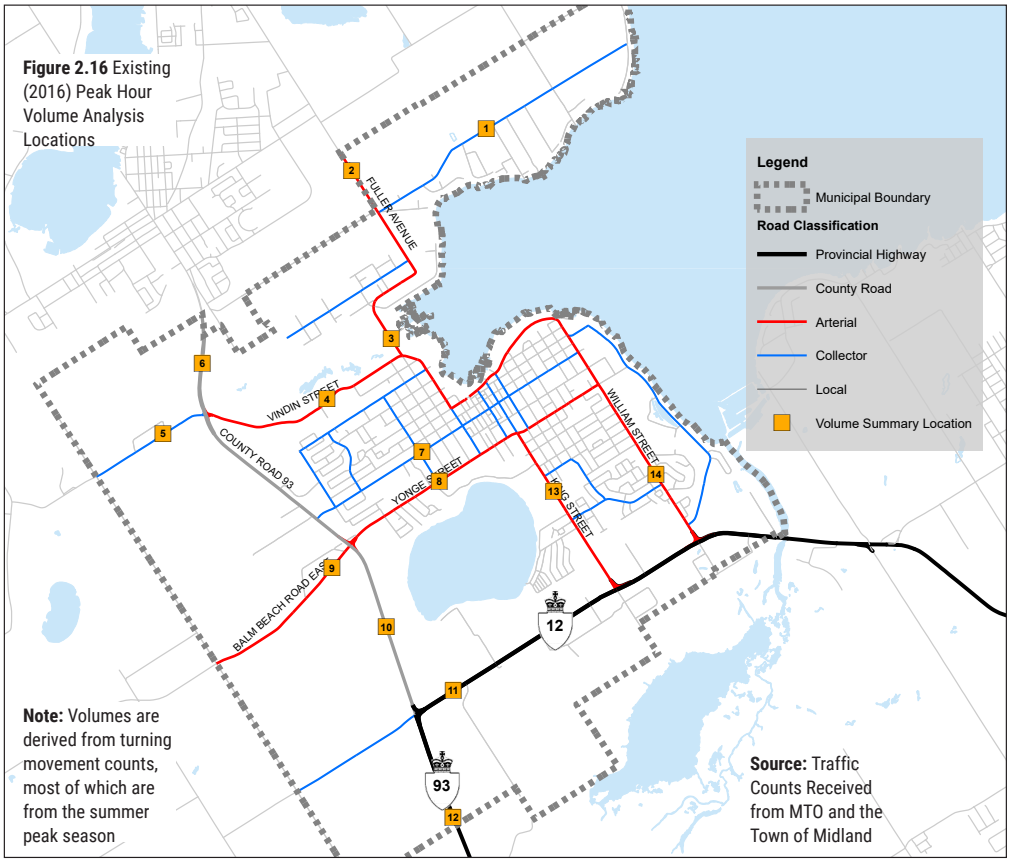


Figure 2.16 Existing (2016) Peak Hour Volume Analysis Locations

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 Town of Midland

The largest traffic volumes during the AM Peak Hour were observed on County Road 93 north of Vindin Street, King Street south of Yonge Street, and Yonge Street east of Eighth Street with volumes between 530-580 vehicles per hour in the peak direction. These roadways serve external trips and align with trip distribution data which shows that there are higher volumes of trips coming into Midland, rather than exiting, in the AM Peak period.

During the PM Peak Hour, the same roadways experience higher volumes between 740 and 840 vehicles in the peak direction. However, in the PM Highway 12 east of Highway 93 experiences significant traffic volumes likely due to the considerable amount of commercial retail on that stretch.

Generally, the volumes paint a more direct picture between trip distribution and how it interacts and conforms with Midland's road hierarchy in the sense that Provincial, County and Arterial Roads experience the highest volumes with subsequently lower volumes on Collectors and Local street. These volumes show the impact of trip generators like retail outlets along the mixed-use corridors of Yonge Street and King Street, as well as the commercial corridors along County Road 93 and Highway 12.

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	Midland Point Road- North Town Limits	Eastbound	39	93	1 lane
		Westbound	92	52	1 lane
2	Fuller Avenue - West of Midland Point Road	Northbound	295	372	1 lane
		Southbound	393	440	1 lane
3	Harbourview Road - West of Marina Park Avenue	Northbound	300	524	1 lane
		Southbound	436	502	1 lane
4	Vindin Street - North of eleventh street	Eastbound	243	310	1 lane
		Westbound	216	350	2 lane
5	Golf Link Road - West of Country Road 93	Eastbound	245	281	1 lane
		Westbound	140	312	1 lane
6	Country Road 93 - North of Vindin Street	Northbound	437	839	2 lane
		Southbound	584	778	2 lane
7	Hugel Avenue - East of Eighth street	Eastbound	227	330	1 lane
		Westbound	275	438	1 lane
8	Yonge Street - East of Eighth street	Eastbound	534	567	2 lane
		Westbound	407	643	2 lane
9	Balm Beach Road East - West of Country Road 93	Eastbound	318	373	1 lane
		Westbound	218	461	1 lane
10	Country Road 93 - North of Highway 12	Northbound	519	625	2 lane
		Southbound	465	705	2 lane
11	Highway 12 - East of Highway 93	Eastbound	468	661	1 lane
		Westbound	464	799	1 lane
12	Highway 93 - South of Foster road	Northbound	327	404	1 lane
		Southbound	347	447	1 lane
13	King Street - South of Yonge street	Northbound	574	653	1 lane
		Southbound	454	743	1 lane
14	William Street - North of Gallowayboulevard	Northbound	312	368	1 lane
		Southbound	270	498	2 lane

Source: Traffic Counts Received from MTO and the Town of Midland

2.3.3 Mode Split & Trip Purpose

Midland's transportation network is impacted by the choices residents make every day in relation to moving around the Town. 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 town so as to add important context to the transportation network.

Currently, the majority of trips in Midland are done by automobile accounting for 87-94% of Peak Period trips as visualized in **Figures 2.17** and **2.18**. 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.

Midland's peak period trip purpose is typical of a town 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 (~80%) 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 2.19**. School-related trips show a significant proportion of other modes, which correspond with school buses showing a clear trend where approximately half of children access school via either an automobile or a school-bus.

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:

- Shorter trips are more conducive to alternatives to the auto;
- Cycling demand is split into two groups: 1) long-distance recreational riders using inter-regional trails, and 2) medium-distance commuters travelling between 2-4km.
- Walking and Cycling shares were the highest for work-related commutes; and
- Transit is most amenable to servicing moderate to longer distance trips.

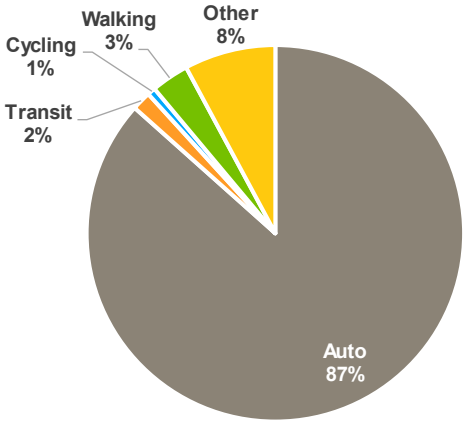


Figure 2.17 Existing (2016) AM Peak Period Mode Shares

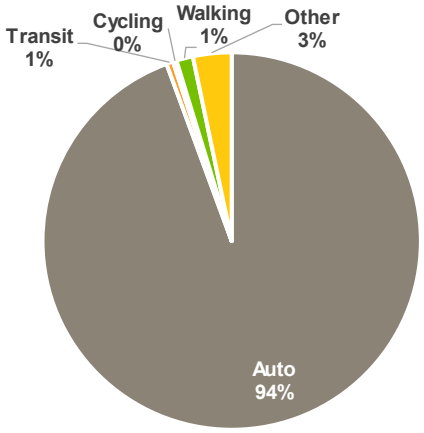


Figure 2.18 Existing (2016) PM Peak Period Mode Shares

Source: Transportation Tomorrow Survey - University of Toronto, 2016

***: 2011** Transportation Tomorrow Survey Data used for Transit and Cycling Modes due to low sample size in the 2016 survey.

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

Currently 87% of walk/biking trips are made at distances of 3Km or less, while transit is more amenable to medium-distance trips between 2-6 Km and long-distance trips of greater than 10 km. Despite this, over 40% of car-related trips are made for trips under 3 Km as summarised in **Figure 2.21**.

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 only a quarter (25%) of peak period active transportation trips are school related as shown in **Figure 2.20**. There are opportunities to carve out a larger slice for these trips considering that over 50% of school-related auto trips are completed for distances under 3km.

These comparisons help to identify appropriate markets for alternatives to driving alone and appropriate future 25-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 Midland | AM & PM Peak Period

AM Peak Period								
Trip Purpose	**Internal**		**From Midland**		**To Midland**		**Total**	
	Volume	**%**	**Volume**	**%**	**Volume**	**%**	**Volume**	**%**
Work-Related	2,064	34%	1,222	45%	2,622	52%	5,908	43%
School-Related	778	13%	406	15%	1,077	21%	2,261	16%
Discretionary	2,149	35%	765	28%	1,121	22%	4,035	29%
Non Home-Based	1,089	18%	304	11%	208	4%	1,601	12%
Total	**6,080**	**100%**	**2,697**	**100%**	**5,028**	**100%**	**13,805**	**100%**
PM Peak Period								
Trip Purpose	**Internal**		**From Midland**		**To Midland**		**Total**	
	Volume	**%**	**Volume**	**%**	**Volume**	**%**	**Volume**	**%**
Work-Related	1,623	25%	2,461	44%	1,151	30%	5,235	33%
School-Related	23	0%	477	9%	163	4%	663	4%
Discretionary	3,167	48%	2,037	37%	2,002	53%	7,206	45%
Non Home-Based	1,729	26%	597	11%	494	13%	2,820	18%
Total	**6,542**	**100%**	**5,572**	**100%**	**3,810**	**100%**	**15,924**	**100%**

Source: Transportation Tomorrow Survey - University of Toronto, 2016

Figure 2.19 Midland's Existing Trip Purpose by Mode | AM Peak Period

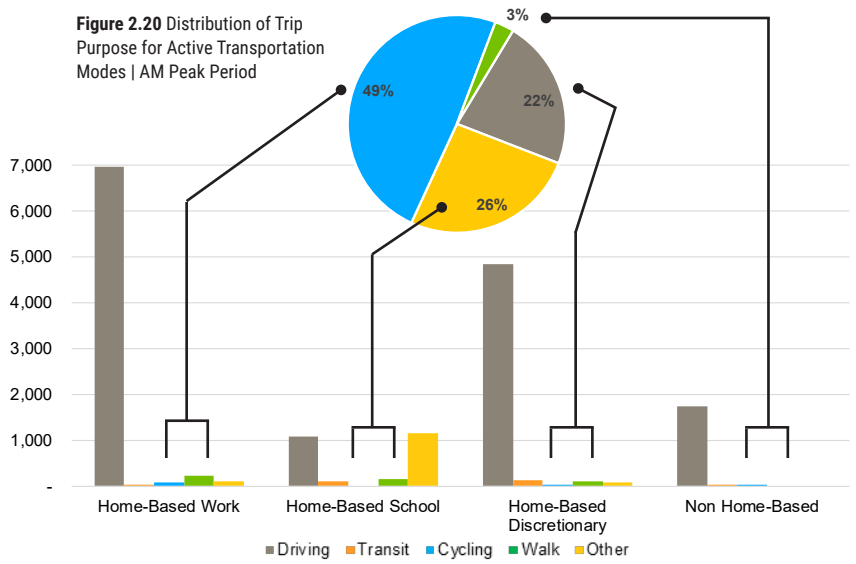
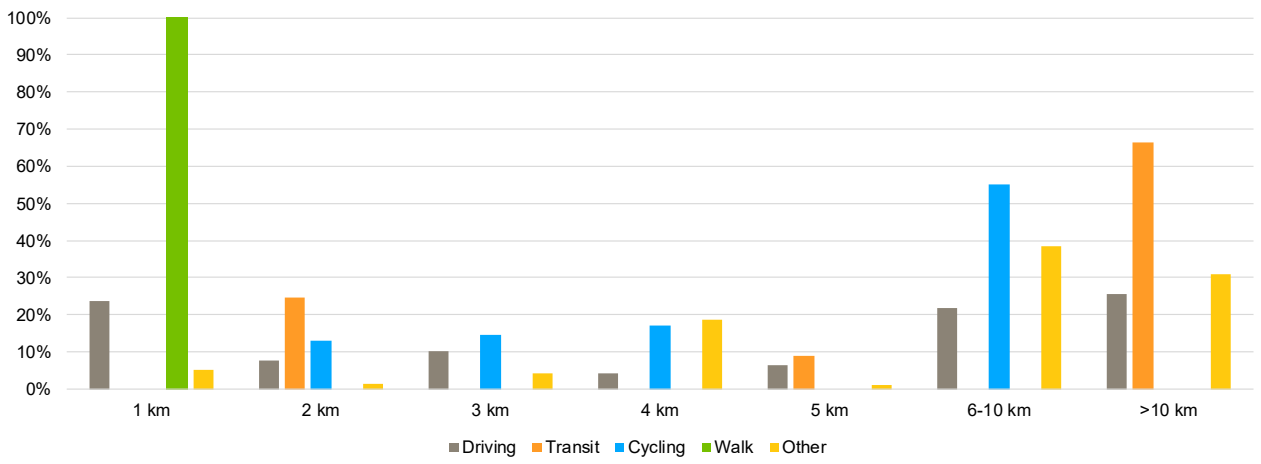


Figure 2.21 Midland's Existing Distribution of trips by mode and by trip length | AM Peak Period



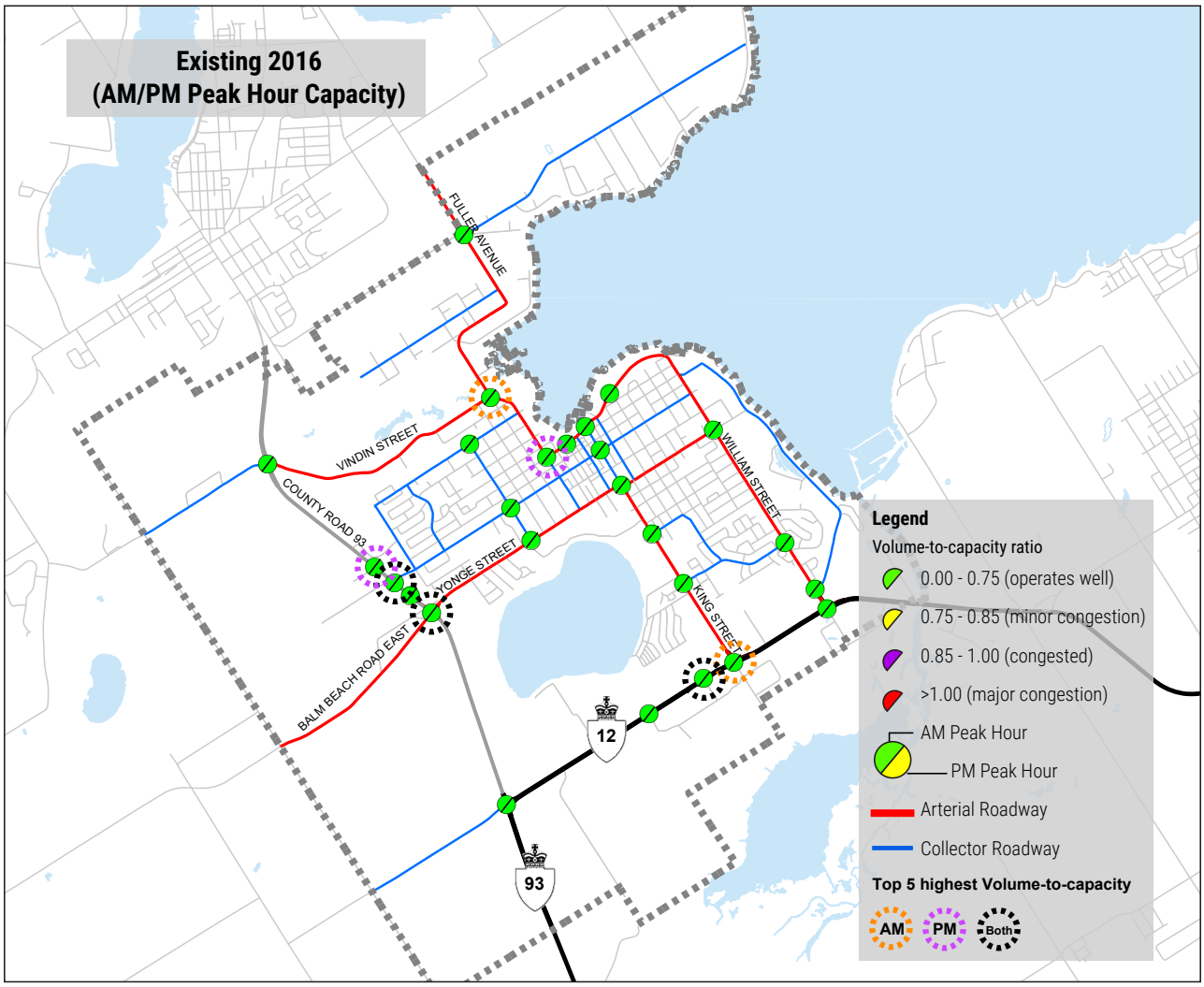


Figure 2.22 Existing Intersection volume-to-capacity | AM & PM Peak Hour

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 Town of Midland

2.3.4 Intersection Operations

Operations at signalized intersections in Midland 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 calls, 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 vphphl);
- ***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 and PM Peak hour traffic conditions all intersections operate within capacity as visualised in **Figure 2.22**. The resulting operational analysis is summarised in **Table 2.13**.

The five (5) intersections with the highest volume-to-capacity ratios in the AM Peak Hour are:

- Harbourview Rd / Fifth St / Vindin St;
- County Road 93 / Yonge St / Balm Beach Road;
- Hwy 12 / Jones Rd;
- County Road 93 / Hugel Ave; and
- Hwy 12 / King St.

In the PM Peak Hour, the intersections with the five (5) highest volume-to-capacity ratios include:

- County Road 93 / Hugel Ave;
- County Road 93 / Lanigan Dr / Canadian Tire;
- County Road 93 / Yonge St / Balm Beach Road;
- Hwy 12 / Jones Rd; and
- Bay St / Fourth St.

Table 2.13 Existing Intersection Peak Hour Volume-to-Capacity Ratios

Intersections	Control Type	Volume-to-Capacity Ratio	
		AM Peak Hour	PM Peak Hour
Fuller Ave / Midland Point Rd	Unsignalized	0.20	0.11
County Road 93 / Vindin St / Golf Link Rd	Signalized	0.36	0.52
County Road 93 / Hugel Ave	Signalized	0.40	0.71
County Road 93 / Huronia Mall / Mountainview Mall	Signalized	0.24	0.41
County Road 93 / Yonge St / Balm Beach Rd	Signalized	0.45	0.68
County Road 93 / Lanigan Dr / Canadian Tire	Signalized	0.31	0.71
Harbourview Rd / Fifth St / Vindin St	Signalized	0.47	0.53
Victoria St / Eighth St	Unsignalized	0.09	0.14
Bay St / Fourth St	Unsignalized	0.37	0.59
Bayshore Dr / Bay St / Second St	Unsignalized	0.04	0.12
Bayshore Dr / King St	Signalized	0.18	0.23
Bayshore Dr / Manly St	Unsignalized	0.02	0.02
King St / Hugel Ave	Signalized	0.21	0.29
Hugel Ave / Eighth St	Signalized	0.29	0.48
King St / Robert St	Signalized	0.25	0.30
King St / Galloway Blvd	Signalized	0.34	0.39
Yonge St / Eighth St	Signalized	0.26	0.31
Yonge St / King St	Signalized	0.39	0.55
Yonge St / William St	Signalized	0.29	0.48
William St / Galloway Blvd	Signalized	0.30	0.34
William St / Pillsbury Dr	Unsignalized	0.09	0.30
Hwy 12 / William St	Signalized	0.32	0.58
Hwy 12 / King St	Signalized	0.38	0.55
Hwy 12 / Jones Rd	Signalized	0.44	0.60
Hwy 12 / Beamish Rd	Unsignalized	0.07	0.20
Hwy 12 / County Road 93 / Angela Schmidt Foster Rd	Signalized	0.37	0.57

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 environmental impacts, health benefits, and availability of transport were identified as having the least influence as shown in **Figure 2.23**.

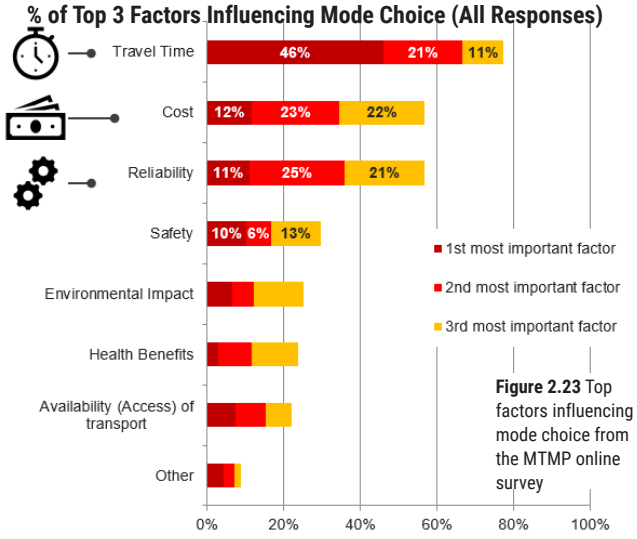


Figure 2.23 Top factors influencing mode choice from the MTMP online survey

Issues

Residents identified traffic congestion as the biggest mobility issue in the town, particularly within the Downtown, along Yonge Street, and at key commercial plazas along County Road 93 and Highway 12 as shown in **Figure 2.24**. Congestion accounted for 24% 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 35% 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 town as well as along high-volume corridors that had fewer crossing opportunities creating network barriers along Yonge Street, King Street, and William Street. Vehicular safety was also a concern at high-volume commercial entrances along County Road 93 and Highway 12. 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 identified 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 signalized 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**. Respondents praised the Yonge Street road diet for reducing vehicular speeds and improving roadway safety, while the new bike lanes now 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 along with enhanced intersection operations at King Street/Hugel Avenue. Additionally, enhanced transit connections to LINX and Penetanguishene transit were identified as positive components of the transportation network.

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

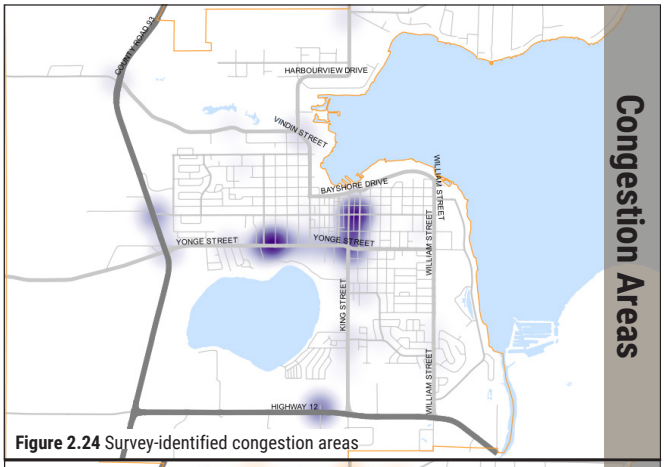


Figure 2.24 Survey-identified congestion areas

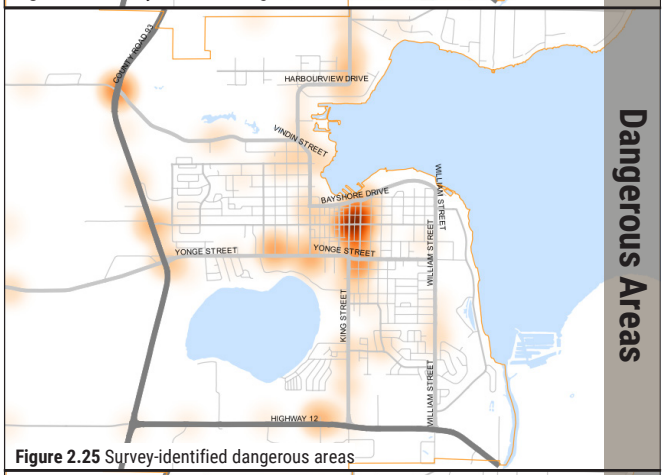


Figure 2.25 Survey-identified dangerous areas

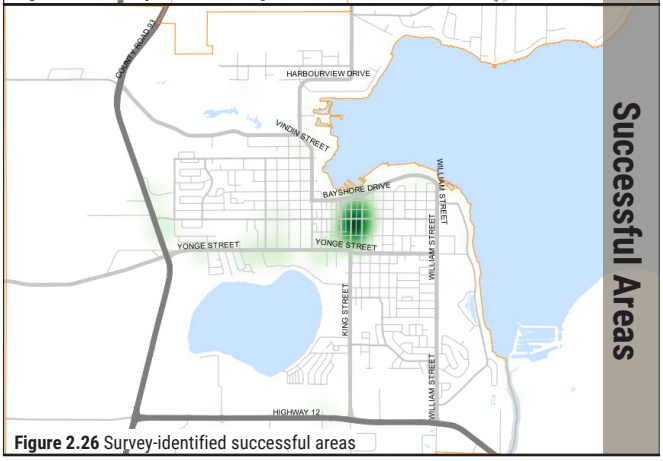


Figure 2.26 Survey-identified successful areas

3.0 Future Conditions

3.0 Future Conditions

3.1 Historical & Future Growth

In the ten-year period between 2006 and 2016, the population of Midland increased by 600, which represents an 0.3% annual growth rate; lower than Simcoe County and neighbouring Tiny, however it is higher than Penetanguishene which experienced a decline in population during this same time period. Overall Midland has experienced growth that is lower than the provincial average. **Table 3.1** shows the historic growth in population in Midland and the peer municipalities within Simcoe County.

Most of this growth has occurred along King and Yonge Streets for residential developments, as well as along County Road 93 and Highway 12 for commercial development. One of the main reasons for this growth is likely the area's easy access to/from neighbouring North Simcoe municipalities acting as a sort of commercial retail/employment hub for the region.

Provincial growth projections for Midland over the next 20 years forecast a 59% increase in population and a 54% increase in employment by the year 2041, which would yield a population of around 26,900, or 10,000 new residents, and an additional 5,800 jobs as summarised in **Table 3.2**.

Similar to historical growth, the majority of new residents are anticipated to be accommodated along Midland's Arterial roadways, as well as along the waterfront. The most prominent development that is planned is the vacant land south of Highway 12 which is identified as a strategic growth area in **Figure 3.1**, and may even one day accommodate a conference centre serving North Simcoe.

Based on splitting the future growth areas by Traffic Area Zone (TAZ), South Midland is anticipated to account for over 40% of population and employment growth by 2041 as summarised in **Table 3.3**.

Table 3.1 Historical Population Growth | 2006-2016

Jurisdiction	2006	2011	2016	Annual Growth (%)
Midland	16,330	16,572	16,864	0.3%
Penetanguishene	9,354	9,111	8,962	-0.4%
Tay	9,748	9,736	10,033	0.3%
Tiny	10,754	11,232	11,787	1.0%
Barrie	128,430	136,063	141,434	1.0%
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

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

- Anonymous survey respondent

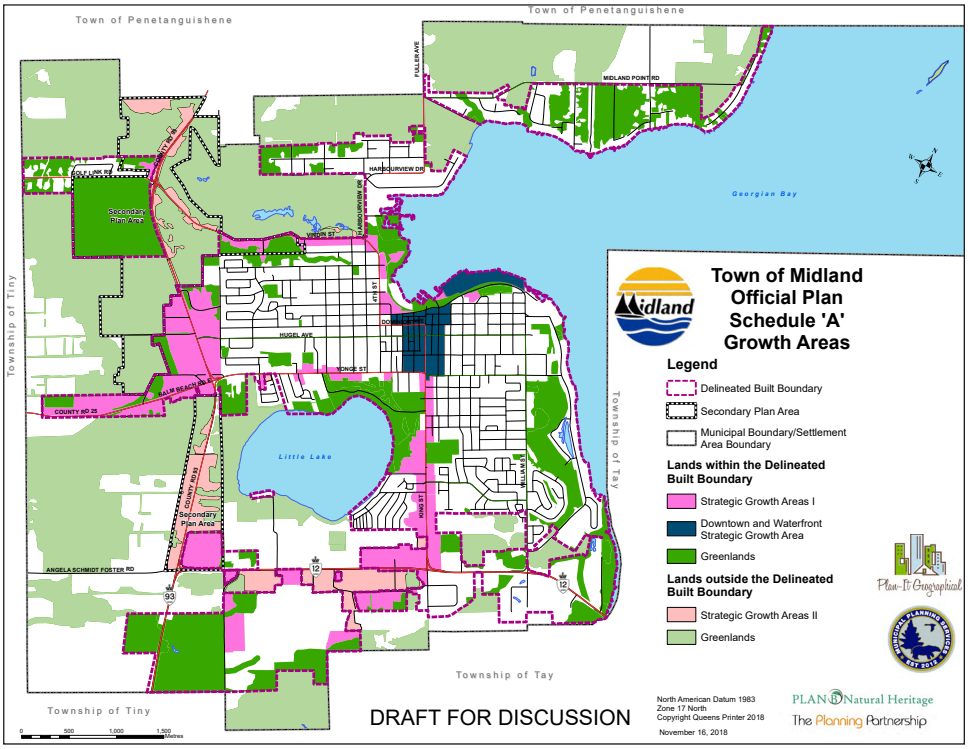


Figure 3.1 Planned Growth Areas in Midland

Source: Town of Midland- Draft Official Plan, March 2019

Additionally, North Midland is anticipated to grow significantly as new residential developments are built around Harbourview Drive/ Fuller Avenue as well via infill development in the Downtown and Waterfront Strategic Growth Area.

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, transit-oriented, active transportation, 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, over half of population & employment growth in North Simcoe is anticipated to occur in the adjacent municipalities of Penetanguishene, Tay, and Tiny, with the other half being accommodated within the Town of Midland. This will result in approximately 5,850 new jobs being created in North Simcoe creating a significant draw and opportunity for Midland's working-age population to seek employment opportunities both within and beyond Midland. 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 | 2016-2041

Demographic	2016	2031	2041
Population	16,864	22,500	26,881
Employment	10,700	13,800	16,487

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

Table 3.3 Future Population and Employment Forecasts by Area | 2016-2041

Area	Area Available for Future Development (1,000m²)	Population Growth	Employment Growth
North Midland	3,398	+3,706	+994
South Midland	3,774	+4,117	+1,104
Yonge Corridor	1,544	+1,683	+451
Hugel Corridor	463	+501	+134
Town of Midland	**9,179**	**+10,007**	**+2,684**

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

Table 3.4 Future Forecasted Developments in Midland | 2016-2031

Year	Singles & Semis	Rows	Apts	Total
2016-2023	869	268	273	1,410
2024-2031	2,478	1756	972	5,206
Total	3,347	2024	1,245	6,616
%	50%	31%	19%	**100%**

Source: Development Charges Background Study, 2014

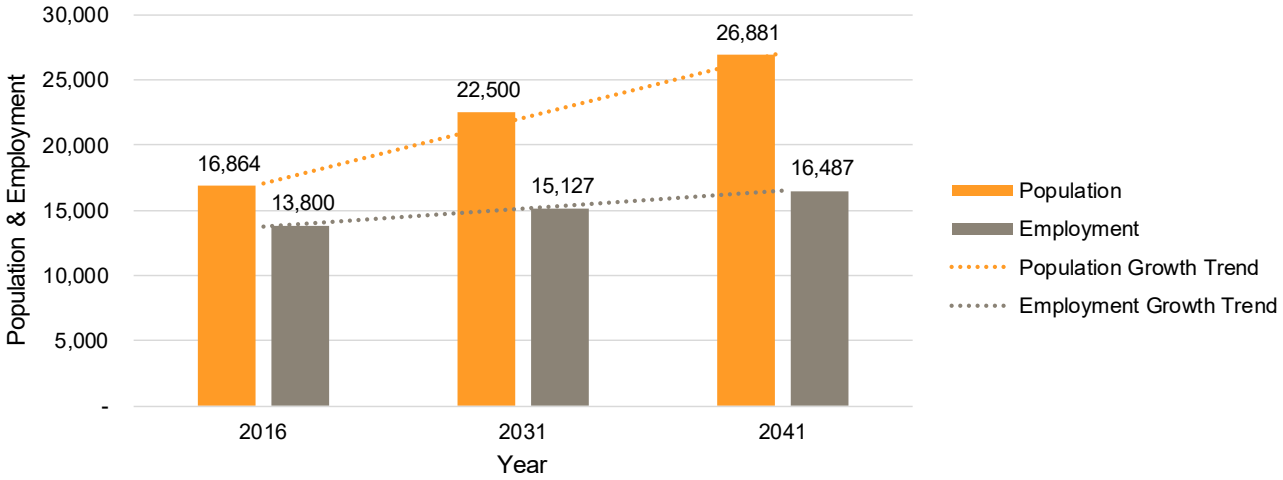


Figure 3.2 Projected Population & Employment forecasts in Midland by 2041

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 Midland, population and employment growth forecasts were disaggregated and distributed between five Transportation Tomorrow Survey (TTS) Traffic Area Zones (TAZ) that comprise the Town's boundaries (see **Figure 3.3**).

The Town of Midland's Development Draft Plan summary and Official Plan Land Use were used to identify the distribution of population & employment growth based on currently planned residential, and commercial/institutional areas by TAZ. Residential and employment growth for the Town 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 and employment growth will occur in South Midland along Highway 12 and King Street. while lower levels of growth will occur in the Downtown, Waterfront and County Road 93 areas. This broadly conforms with planned land uses and growth areas identified in the Town'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 2041 forecasts. Overall it is anticipated that external population and employment will grow by up to 46% and 27%, respectively by 2041 as summarised in **Table 3.5**.

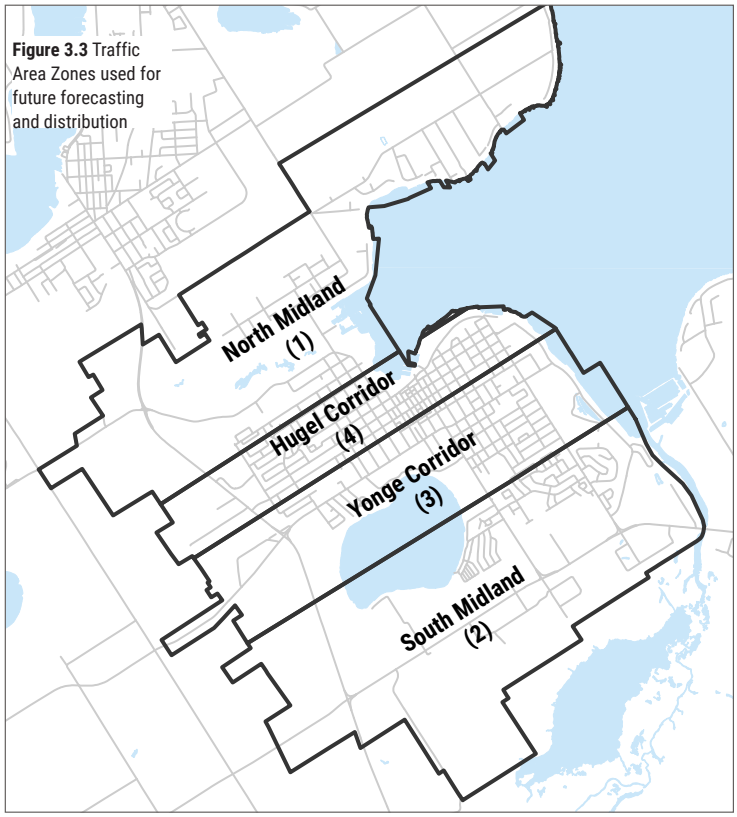


Figure 3.3 Traffic Area Zones used for future forecasting and distribution

Table 3.5 Aggregated Future Forecasted Population & Employment by internal and external traffic area zone | 2016-2041

TAZ	Description	Population			Employment		
		2016	2041	Growth	2016*	2041	Growth
1	North Midland	6,240	9,946	+3,706 (+59%)	5,106	6,100	+994 (+19%)
2	South Midland	6,931	11,021	+4,107 (+59%)	5,672	6,760	+1,102 (+19%)
3	Yonge Corridor	2,833	4,570	+1,703 (+59%)	2,318	2,803	+457 (+19%)
4	Hugel Corridor	843	1,344	+501 (+59%)	690	824	+134 (+19%)
Sub-Total Town of Midland		**16,847**	**26,881**	**+10,017 (+59%)**	**13,786**	**16,487**	**+2,687 (+19%)**
	Penetanguishene	8,962	13,142	+4,180 (+47%)	5,042	7,168	+2,126 (+42%)
	Tiny	11,787	14,934	+3,147 (+27%)	1,429	1,928	+499 (+35%)
	Tay	10,033	13,620	+3,587 (+36%)	1,513	2,042	+529 (+35%)
	Rest of Simcoe	276,849	455,304	+178,455 (+64%)	85,763	140,862	+55,099 (+64%)
	York Region	1,109,909	1,790,000	+680,091 (+61%)	612,318	900,000	+287,682 (+47%)
	Durham Region	645,862	1,190,000	+544,138 (+84%)	257,228	390,000	+132,772 (+52%)
	Peel Region	1,381,739	1,970,000	+588,261 (+43%)	733,093	920,000	+186,907 (+25%)
	Toronto	2,731,571	3,400,000	+668,429 (+24%)	1,581,805	1,680,000	+98,195 (+6%)
	Other External Areas (GTHA)	2,786,920	4,269,000	+1,482,080 (+53%)	1,319,606	1,814,000	+494,394 (+37%)
	Sub-Total External	**8,963,632**	**13,116,000**	**+4,152,368 (+46%)**	**4,597,796**	**5,856,000**	**+1,258,204 (+27%)**

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

* Present value calculation for 2016 employment based on linear growth between 2031 and 2041

With a direct highway connection to adjacent neighbourhoods that are anticipated to match Midland's growth, it is likely that Penetanguishene, Tay, Tiny and other Simcoe County municipalities would present enticing areas for future residents to work with easy access via County Road 93 and Highway 12.

Future transportation network trip growth was estimated by applying 2041 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,

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

Results

The Town of Midland's relatively small growth of 2% per year for population & employment until 2041 points to a municipality that is growing within its own right but is forecasted to experience external demand due to greater growth beyond the Town's boundaries. Over the next 25 years it is anticipated that this growth will add an average of 2,660 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 the broader North Simcoe area and other Simcoe County municipalities 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 decreases in internal trips as future residents look to access employment opportunities in areas beyond Midland as a result of internal population growth outpacing employment growth. However, the bulk of these external trips will remain within North Simcoe.

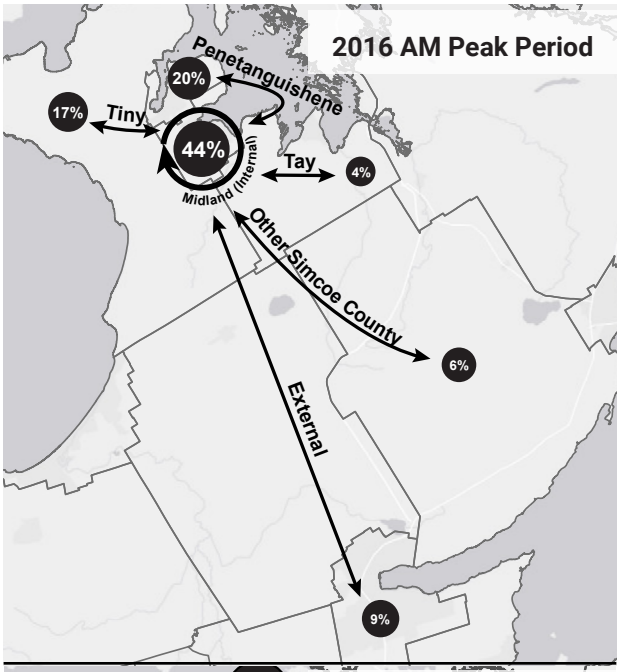


Figure 3.4 Forecasted Trip Distribution to/ from Midland | 2016 - AM Peak Period

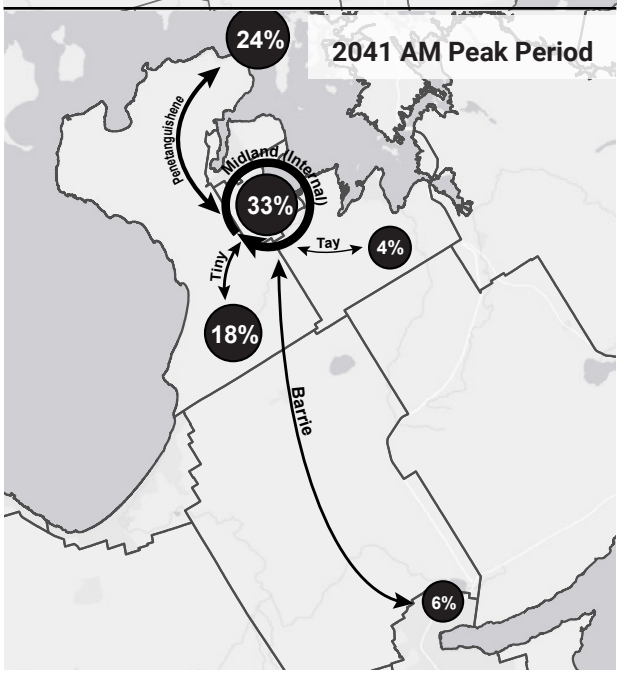


Figure 3.5 Forecasted Trip Distribution to/ from Midland | 2041 - AM Peak Period

Table 3.6 Forecasted Trip Distribution | 2016 vs 2041 - AM & PM Peak Periods

Distribution	2016		2041	
	AM	PM	AM	PM
Internal	**6,080**	**6,542**	**5,379 (-12%)**	**5,537 (-15%)**
Internal->North Simcoe	1,687	4,011	2,491 (+48%)	5,583 (+39%)
Internal->Other Simcoe	790	1,276	1,202 (+52%)	1,964 (+54%)
Internal->Other External	220	285	273 (+24%)	319 (+12%)
Outbound Sub-total	**2,697**	**5,572**	**3,966 (+47%)**	**7,866 (+41%)**
North Simcoe->Internal	3,815	2,235	4,902 (+29%)	3,062 (+37%)
Other Simcoe->Internal	896	1,181	1,413 (+58%)	1,935 (+64%)
Other External->Internal	317	394	448 (+41%)	549 (+39%)
Inbound Sub-total	**5,028**	**3,810**	**6,764 (+35%)**	**5,547 (+46%)**
Total	**13,805**	**15,924**	**16,109 (+17%)**	**18,949 (+19%)**

3.3 Future Operations

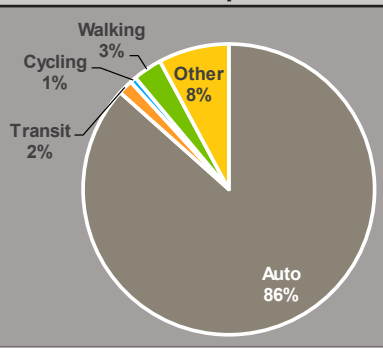
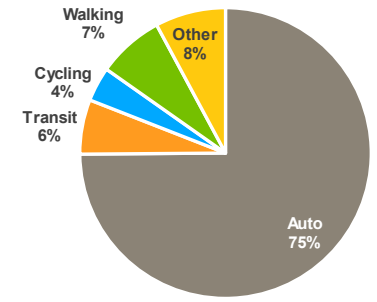
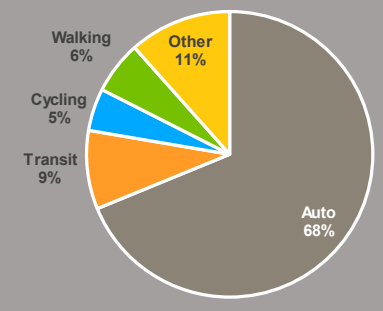
3.3.1 Potential Mode Splits

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 Midland'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 Midland as a municipality 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 Midland's Official Plan.

Table 3.7 Potential Mode Split Scenarios for future operational analysis

Scenario	Description	Mode Split
1 - Status Quo	This scenario maintains the existing mode splits as they are, likely requiring minor adjustments 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.	
2 - Partial Change	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 2041 resulting in a mode split of 75% for automobile, 4% for cycling, 7% for walking, 6% for transit, and 8% for other emerging solutions as visualized in the figure to the right. This scenario would likely involve several roadway improvements to enhance auto movement throughout the town, along with filling in key active transportation gaps in the existing network with connections to transit stops and facilities. This may involve micro-mobility/on-demand solutions in specific areas of the town such as North Midland, or other sparsely populated areas of the town.	
3 - Aggressive Change	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 1.5% per year until 2041 resulting in a mode split of 68% for automobile, 5% for cycling, 6% for walking, 9% for transit, and 11% 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 town such as bike sharing, micro-mobility, ridesharing, and autonomous vehicles.	

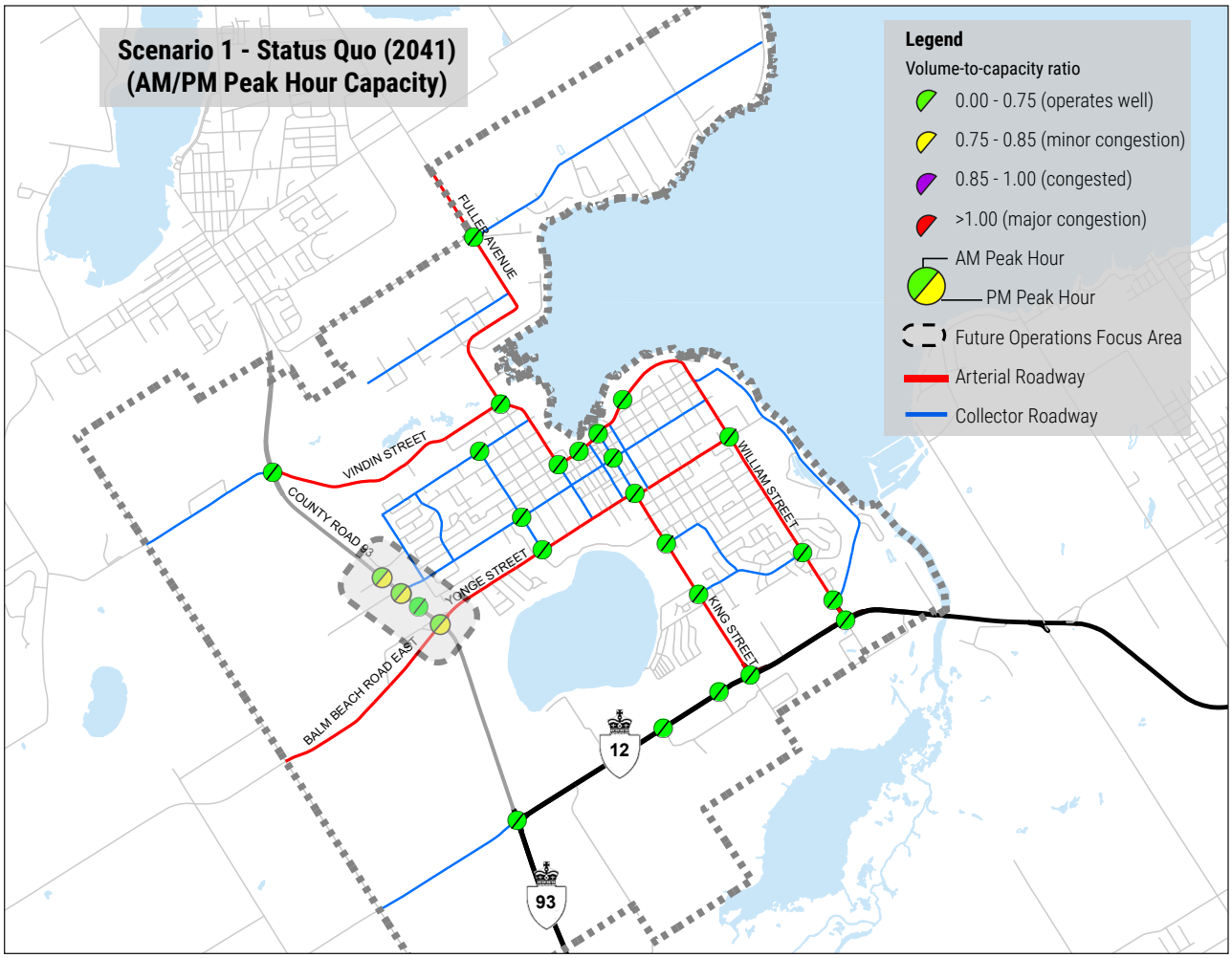


Figure 3.6 Future 2041 Peak Hour Capacity under Scenario 1 - Status Quo conditions

3.3.2 Status Quo

Future 20-year (2041) 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 2041 AM Peak hour traffic conditions all intersections are anticipated to operate within capacity as visualised in **Figure 3.6**.

Under Future 2041 PM Peak Hour traffic conditions most intersections operate within capacity with three intersections experiencing some minor congestion. These intersections are: County Road 93 at Lanigan Drive, County Road 93 at Hugel Avenue, and County Road 93 at Yonge Street. These intersections operate well within capacity under existing conditions, however future forecasted vehicular volumes are anticipated to lead to some minor congestion during the PM Peak hour as visualised in **Figure 3.6**.

It is important to note that this is based on a macro-level of analysis that quantifies broad capacity needs on a town-wide basis but does not mean that some intersections won't have poorly operating movements. Micro-level analysis of each intersection is beyond the scope of this study and is assumed to be conducted gradually as new development site applications are made and traffic impact studies are prepared.

Overall, at a macro-level of analysis the major anticipated pinch-points on the future road network revolve around commercial property accesses along County Road 93. Beyond this, key intersections identified in the 2012 TMP, as well as through public consultation are noted as intersections that warranted further evaluation despite favourable future volume-to-capacity ratios projected and shown in **Figure 3.6**. As a result, future operations focus areas include:

- **The County Road 93 commercial retail area**, serving as a commercial hub for North Simcoe, this area will drive inbound/outbound external trip demand from adjacent municipalities;
- **Focus Intersections:** As highlighted in **Figure 3.9** in the following section, Intersections identified as needing improvements in the 2012 TMP, as well as intersections identified through stakeholder engagement / public consultation. Previous TMP intersection recommendations are summarised in Section 3.3.4, while the intersection First Street / Yonge Street was identified as an area of concern due to Commercial Vehicle movement between Yonge Street and Bayshore Drive.

The commercial area along County Road 93 was further evaluated in terms of mode splits to determine a recommended target mode split for Midland and whether operations can be mitigated through mode shifting, whereas Focus Intersections primarily revolve around safety and connectivity enhancements that are evaluated and solutions are recommended in Chapter 5.

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 2041. 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 broad capacity constraints on the transportation network, 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. The layout of land uses in Midland primarily comprises residential land uses surrounding the Downtown core, with big box retail on the periphery of the Town. On average, the maximum one-way distance a resident within Midland would need to travel to access Focus Area 1 is ~4km which is within a reasonably distance for walking, cycling, or transit usage. Shifting drivers toward alternative sustainable modes of transportation at a rate of 1% per year until 2041 can reduce vehicular volumes along County Road 93 enough, particularly for entering and exiting commercial retail plazas., to mitigate intersection capacity constraints.

Recommended Mode Split Target

As a result, it is recommended that Scenario 2 – Partial Change be the target mode split for the Town of Midland as shown in **Figure 3.8**. The recommended future roadway, transit, and active transportation improvements to support Scenario 2 are detailed in Chapter 5.

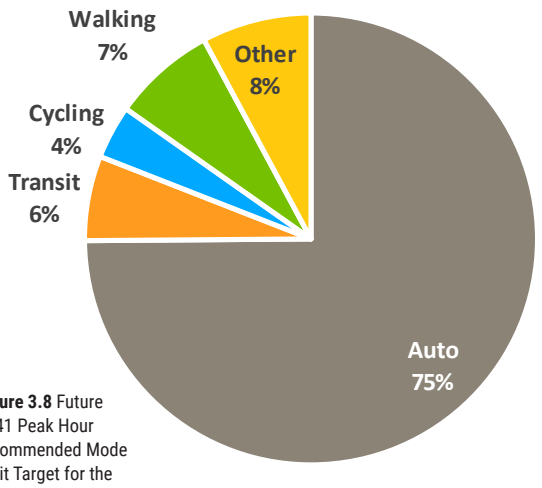


Figure 3.8 Future 2041 Peak Hour recommended Mode Split Target for the Town of Midland

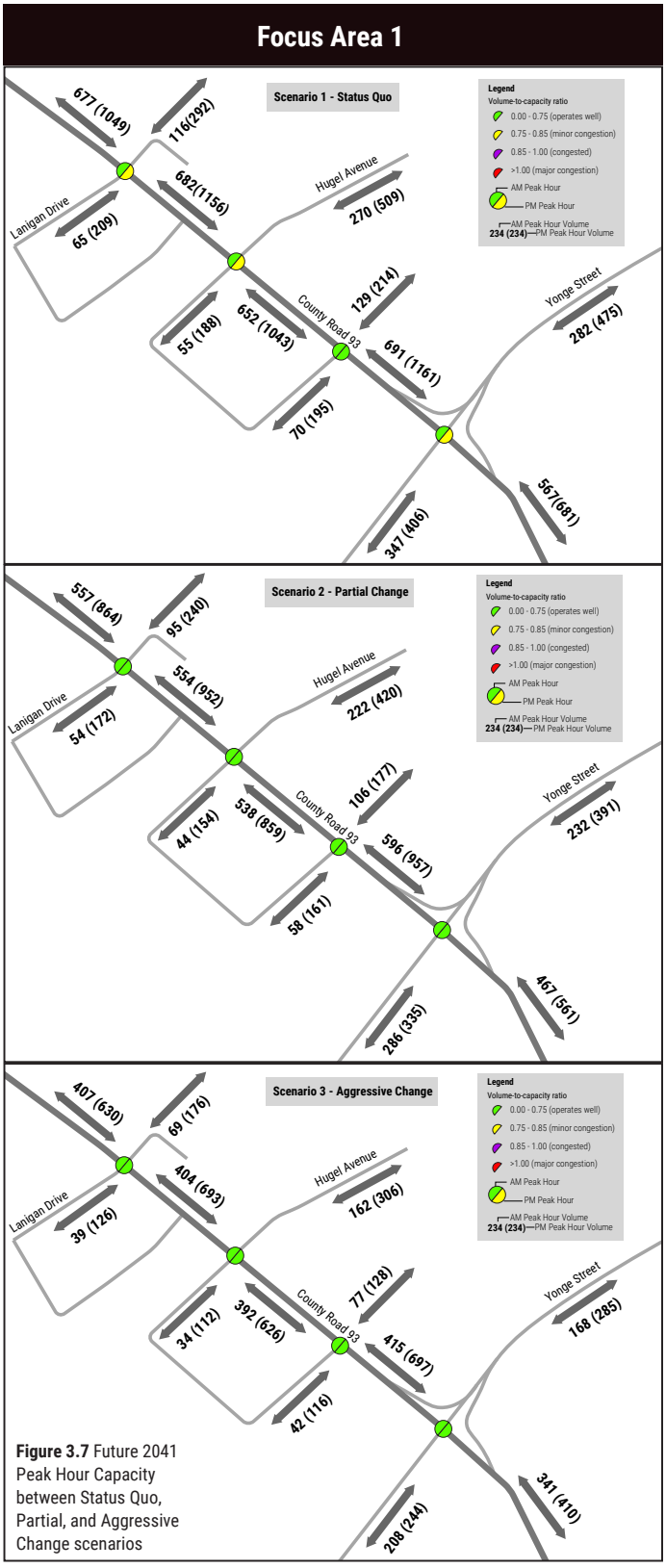


Figure 3.7 Future 2041 Peak Hour Capacity between Status Quo, Partial, and Aggressive Change scenarios

3.4 Previously Planned Improvements

Roadway Plans

The previous Transportation Master Plan completed in 2012 identified several major roadway improvements that have yet to be constructed as summarized in **Table 3.8** and visualized in **Figure 3.9**.

Future 2041 forecasts highlight that the existing road network provides adequate capacity for future traffic growth. As a result of this, previously planned road improvements focus more on micro-level improvements that enhance specific intersection operations and safety to support growth areas such as the re-alignment of the existing roadway curves at Fuller Avenue/Harbourview Drive, as well as at William Street/Bayshore Drive to improve driving sightlines and safety for vehicles moving through these areas.

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 2012 Transportation Master Plan | Yet to be completed

ID	Location	Description	Timeline (From 2012)	Status
1	County Road 93	• Paved shoulders between Highway 12 and Yonge Street with provisions for a centre turn lane. Between Yonge Street and St. Andrews Drive will have multi-use paths on both sides of the road. Between St Andrews Drive and Thompsons Road will have a multi-use path on the east side of the road. This will also coincide with intersection improvements at County Road 93 and Vindin Street.	2019-2021	Not completed
2	William Street	• Convert 3-lane sections to 1 lane per direction + centre turn lane (except from Yonge Street to north of Chain Gate Drive, where 2 SB lanes should be maintained to accommodate truck traffic and address operational impacts associated with the vertical grade); • Widen 2-lane section to 3 lanes to construct a centre turn lane.	Construction in 2019	Not completed
3	William Street and Bay Street (Intersection)	• Reconfigure east leg of Bay Street to intersect opposite west leg at 70° and increase approach width to accommodate truck movements from William Street	0 – 5 years	Not completed
4	William Street and Bayshore Drive	• Increase the radius of the horizontal curve to improve safety; • Reconfigure Frank Street approach to improve sight lines and permit all moves	0 – 5 years	Not completed
5	Bay Street, Aberdeen Boulevard & TRW Access (Intersection)	• Increase the radius of the horizontal curve and reinstate Bay Street-Aberdeen Boulevard as the through road.; • Reconfigure the TRW access as a proper driveway access (reduce the access width, construct a drop-curb at Aberdeen Boulevard & extend the concrete sidewalk/trail through the access).	0 – 5 years	Not completed
6	Fuller Avenue and Harbourview Drive	• Increase the radius of the horizontal curve to improve safety • Realign the Fuller Avenue approach as per the Class EA recommendation • Consider modifications to the alignment to avoid impacts to the Drummond wall (which would warrant an update to the Class EA)	0 – 5 years	Not completed
7	Truck Route Network	• Designate Yonge Street from King Street to William Street a truck route.	0 – 5 years	Not completed
8	King Street and Street F (Intersection)	• Construct new intersection to support Hanson Development.	5 – 10 years	Not completed
9	Yonge Street and Eighth Street (Intersection)	• Realign access to Little Lake Park opposite Eight Street and create 4th leg to the intersection and provide 2nd point of access to Arch Restaurant from realigned road.	5 – 10 years	Not completed
10	Bay Street and Fourth Street (Intersection)	• Reconfigure intersection and implement NB & SB left turn lanes; • Reconfigure such that Fourth Street/Bay Street East is the major corridor with Fourth Street intersecting at T-intersection and Bay Street West intersecting Fourth Street prior to the intersection.	10+ years	Not completed

ID	Location	Description	Timeline (From 2012)	Status
11	Fuller Avenue and Brunelle Sideroad/Midland Point Road (Intersection)	• Reconfigure the intersection to eliminate the offset intersections.	10+ years	Not completed
12	King Street and Robert Street (Intersection)	• Convert intersection pedestrian signal to full signal.	10+ years	Not completed
13	Vindin Street and Harbourview Drive (Intersection)	• Convert the existing WB left-through lane to an exclusive WB left turn lane • Provide an exclusive EB left turn lane • Construct a 2nd NB receiving lane on Harbourview Drive to allow the westbound right turn movement to operate exclusive of the signal • Reconfigure intersection such that Harbourview Drive/Fourth Street is the major corridor with Vindin Street intersecting at T-intersection and Fifth Street terminated prior to the intersection (long-term, beyond 2030)	10+ years	Not completed
14	William Street and Highway 12 (Intersection)	• Convert SB through lane to shared left-through lane to increase left turn capacity • Convert WB right channel to standard right turn lane • Provide 2 NB receiving lanes on William Street	10+ years	Not completed
15	William Street and Pillsbury Drive (Intersection)	• Implement traffic signals in response to Tiffin by the Bay development traffic • Construct NB, SB and WB left turn lanes & NB right turn lane • Relocate commercial access on west side of William Street opposite Pillsbury Drive • Timing to be confirmed based on phasing of Tiffin by the Bay development	As required by future development	Not completed

Source: Midland Transportation Master Plan, 2012

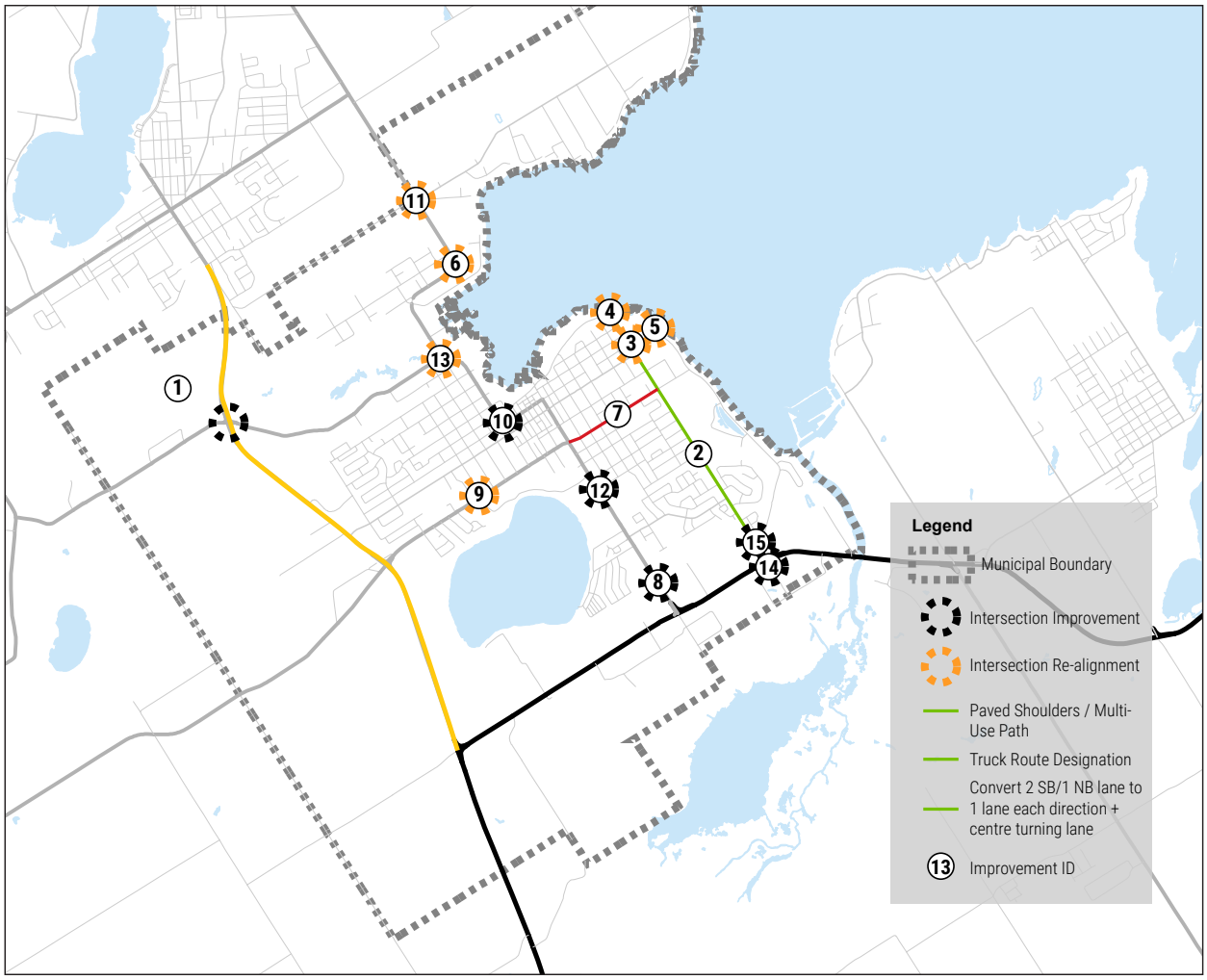


Figure 3.9
Recommended Improvements from the 2012 Transportation Master Plan yet to be built

Active Transportation Plans

Since the development of the Town's Transportation Master Plan in 2012, the Town of Midland's Official Plan Review proposes an inter-connected trail route that connects North Midland and South Midland to the downtown core and the surrounding Town of Penetanguishene and the Township of Tay. The Plan also aims to integrate bicycles into the route network by proposing dedicated lanes and sharrows within the Town area. Despite identified corridors and facilities, no implementation, funding, or phasing plan was prepared as part of that work, rather it was a blueprint for future considerations to be built as development occurs. In addition to identified corridors within the Official Plan, the Town has recently prepared a Parks & Trails Master Plan that also identifies trail improvements.

A list of the major active transportation network recommendations from the Official Plan and Parks & Trails Master Plan are summarised in **Table 3.9**. Since the 2012 Transportation Master Plan a few notable active transportation have been built including:

- Road Diet Bike lanes along Yonge Street - between County Road 93 and King Street;
- Hugel Avenue Bike Lanes - between Eighth Street and First Street;
- Midland Avenue Bike Lanes - between Yonge Street and Bayshore Drive; and
- Golf Link Road Bike Lanes - between County Road 93 and Wilson Road.

A map of the existing and previously recommended active transportation networks are shown in **Figures 3.10** and **3.11**.

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.

Midland's Official 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. This is an important consideration for high-volume corridors such as Arterial Roadways, or roads prone to speeding. New data and new realities within Midland present an opportunity to recommend updates and changes to the previously planned active transportation network to enhance safety and support future mode split targets.

Table 3.9 Identified Cycling Improvements within the Official Plan | Yet to be completed

Location	Description	Facility	Km
Fuller Avenue	Midland Point Road to Harbourview Drive	Dedicated Lane	3.7
Harbourview Drive	Fuller Avenue to Victoria Steet	Dedicated Lane	1.3
Vindin Street	Harbourview to County Road 93	Dedicated Lane	2.5
Victoria Street	4th Street to Pennetanguishene Road	Dedicated Lane	1.8
Eighth Street	Victoria Street to Yonge	Dedicated Lane	1.1
Hugel Avenue	Eighth St to Penetanguishene Road/Mountainview Plaza Midland	Dedicated Lane	2.7
Manly Street	Yonge Street to St. Theresa's Catholic High School	Dedicated Lane	1.5
Galloway Boulevard	William Street to King Street	Dedicated Lane	1.1
Galloway Park Trail	Pratt Avenue to beyond Sumac Lane	Dedicated Lane	0.9
Beamish Road	Hanson Development Road to Prospect Boulevard/Mcdonald Road	Dedicated Lane	0.8
Midland Point Road	Lakewood Drive to Fuller Avenue	Sharrow	3.3
Everton Road	Bayport Boulevard to end of street	Sharrow	1.7
Manly Street	Yonge Street to Bayshore Drive	Sharrow	0.8
Scott Street	William Street to Johnson Street	Sharrow	0.5
Robert Street	Johnson Street to King Street	Sharrow	0.6
Little Lake Park Road	King Street to Yonge Street	Sharrow	1.2
Mountain View Plaza Trail	Mountain View Plaza to Balm Beach Road East	Sharrow	0.6
County Road 93	Yonge street to Highway 12	Paved shoulder	2.1

Source: Town of Midland - Draft Official Plan, 2017

Figure 3.10
Existing Cycling Network

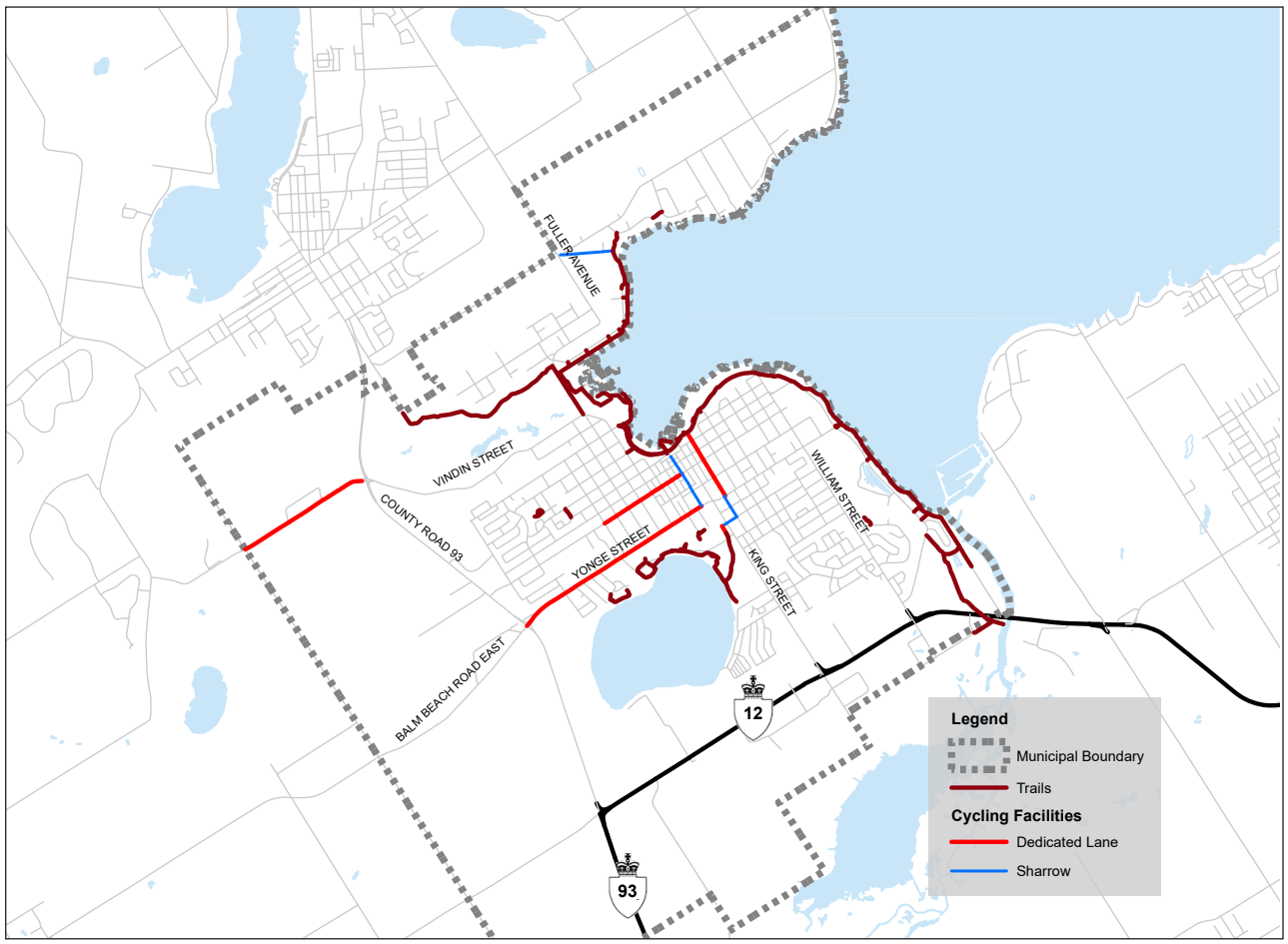
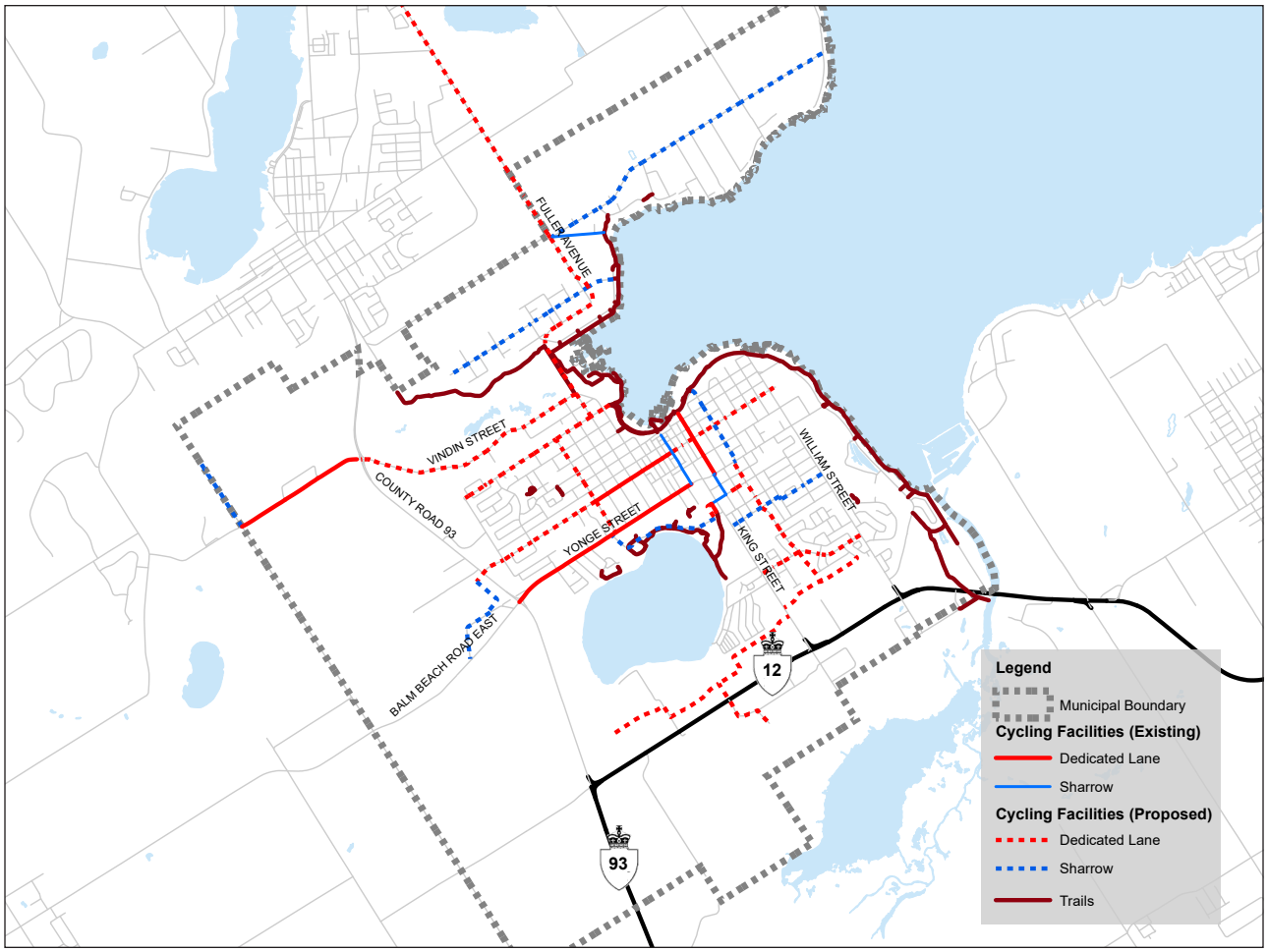


Figure 3.11
Previously Planned Cycling Network



Source: Midland Draft Official Plan, 2019

Transit Plans

Local Transit

The Town of Midland conducted an operational review of Midland Transit service in 2018 which identified a five-year transit service plan culminating in an increase in service including:

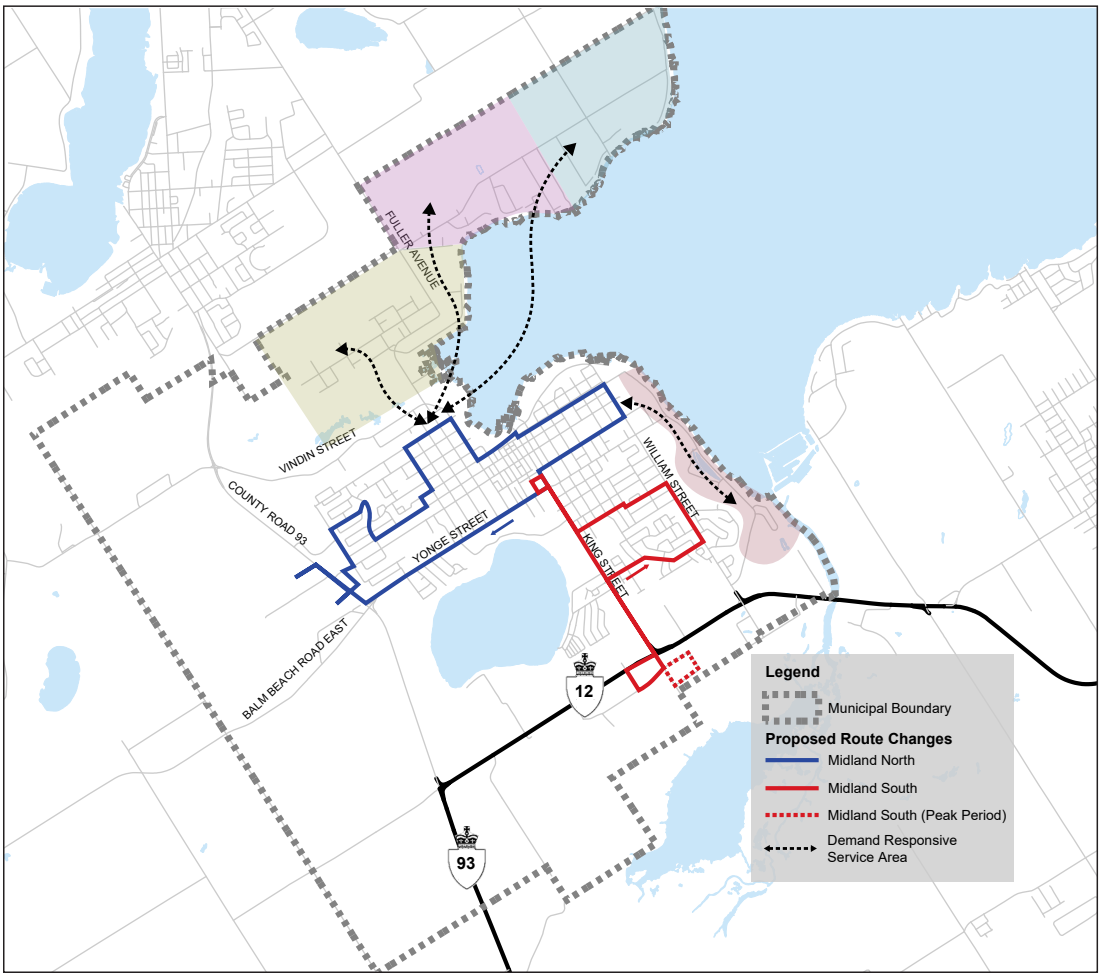
- Service Reliability;
- Extended Hours of Operation; and
- Improving Accessibility.

Table 3.10 summarises the five-year operational recommendations of the transit review, and **Figure 3.12** visualizes the proposed future route network concept including the addition demand-responsive service zones.

Table 3.10 Operational Recommendations of the Transit Review

Proposed TImeline	Recommendations
Quick-Wins	• Modify route structure to improve adherence to schedule due to high passenger volumes, congestion, and seasonal construction by relocating on-street passenger amenities and aligning route schedules to connect with the Simcoe service. • Program additional stops into the Passenger Information System along collector and arterial roads where accessible features are in place.
Short-Term Recommendations	• Begin Sunday service to accommodate high forecasted ridership. • Add demand-responsive service to new residential developments as visualized in **Figure 3.12**.
Long-Term Recommendations	• Add weekday evening service to accommodate late work-related trips. • Increase frequency during the mid-day period. • Increase frequency all day.
On-going Recommendations	• Implement the proposed fare structure in phases. • Explore additional funding opportunities. • Explore an on-line electronic fare loading system. • Explore development of transit app for desktop and mobile devices. • Coordinate regularly with Simcoe County. • Develop a communication and marketing strategy to promote the introduction of new service and service expansions.

Source: Operational Review of Midland Transit Service, 2018



Source: Operational Review of Midland Transit Service, 2018

Figure 3.12
Previously Planned Transit Route Network Concept

"Changing buses between Midland & Penetanguishene and the new Linx Bus has improved my commute."

- Anonymous survey respondent

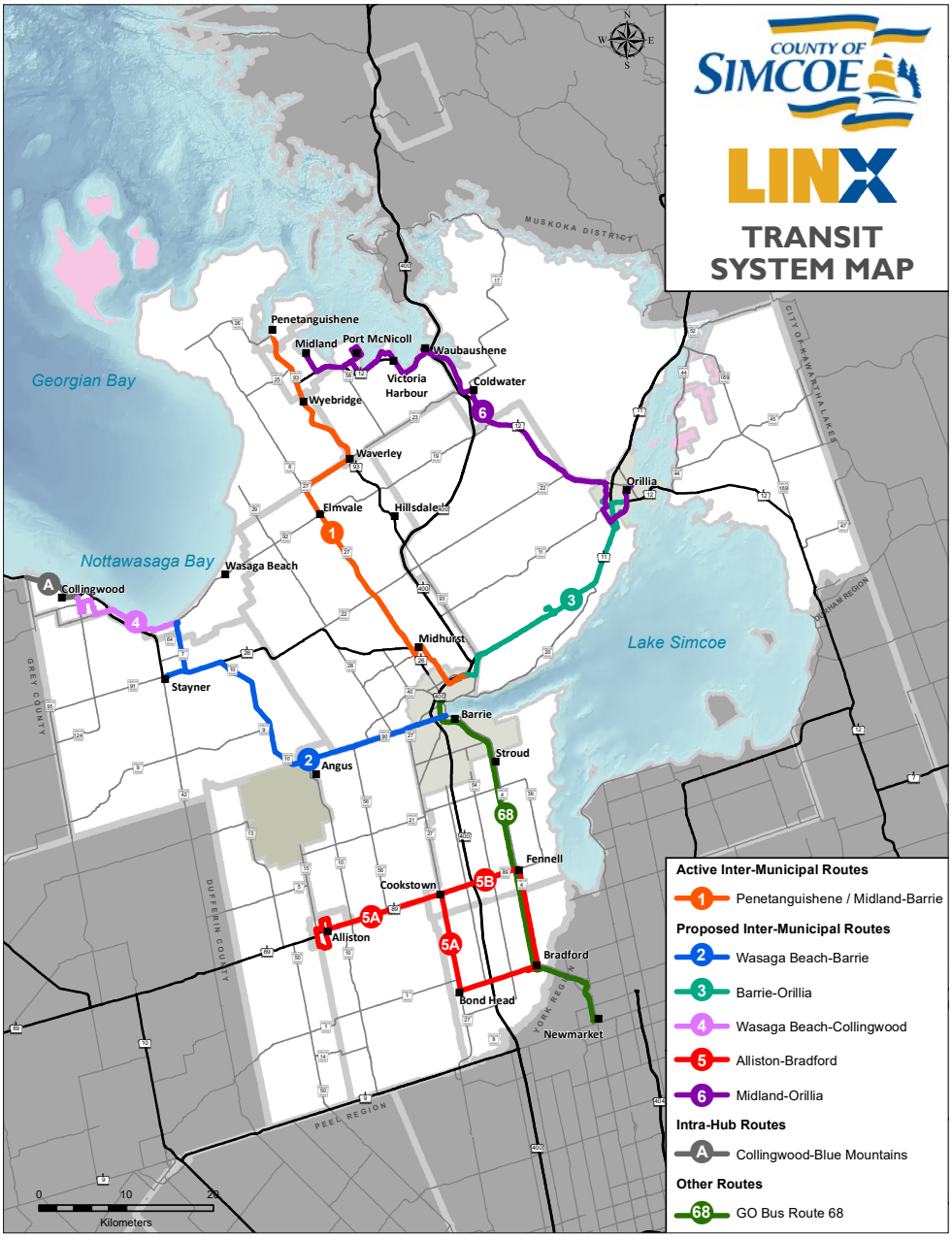


Figure 3.13
Proposed Simcoe County LINX Transit network

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

Regional Transit

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 (at the Huronia Mall stop) 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 3.13** including:

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

3.5 What we heard

Priorities

Residents identified a future need to continue to plan for automobiles, however on average respondents identified that 60% 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 working-aged respondents while alternative modes of transportation (primarily transit) are preferred by younger and older respondents as summarised in **Figure 3.14**. As residents age a preference for the automobile emerges likely as a result of employment opportunities beyond Midland's borders in North Simcoe that would typically require a car to access.

Another consideration is the aging demographic in Midland that is moving to the Town 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.

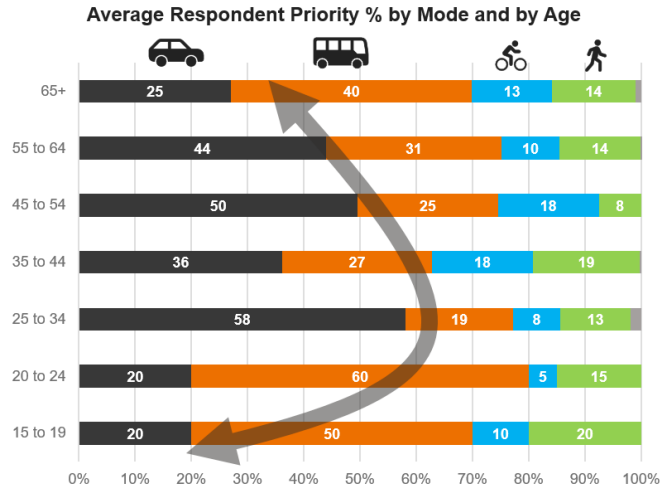


Figure 3.14 Survey Respondent mode priority by age group

Future Corridors

Through the online survey residents were able to identify corridors to be explored for automobile (**Figure 3.15**), transit (**Figure 3.16**), cycling (**Figure 3.17**), and walking (**Figure 3.18**).

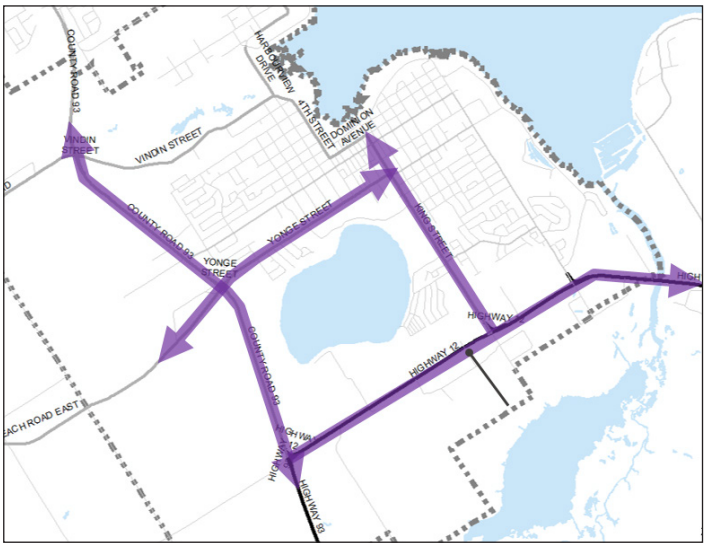


Figure 3.15 Survey identified automobile desire corridors

Automobile: Generally, survey-respondents did not identify any additional corridors that needed to be built, but rather focused on improving operations along existing corridors such as County Road 93, Highway 12, Yonge Street, and King Street. With Little Lake in the middle of the Town, it naturally funnels traffic in a square around the lake adding volume to the four corridors identified. Response to the Yonge Street road diet was mixed with a portion of respondents praising its success in reducing vehicular speeds and safety, while others had concerns about the reduced vehicular capacity.

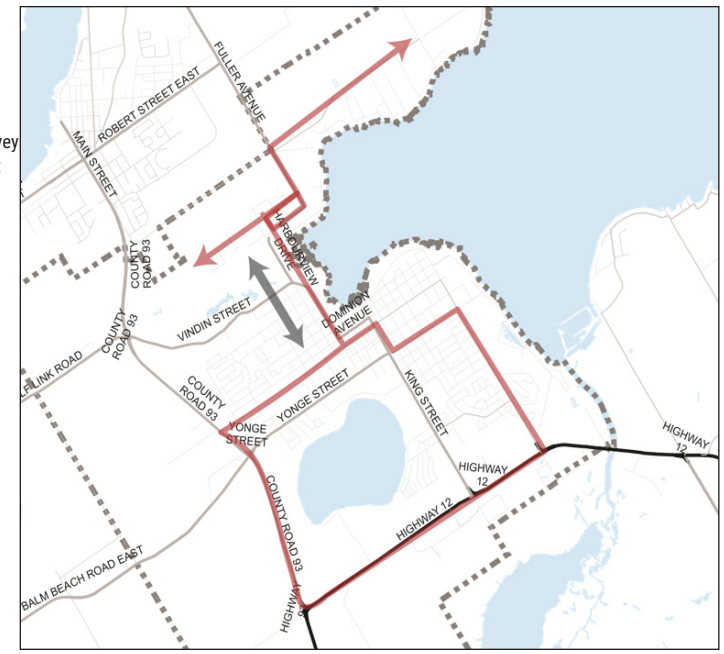


Figure 3.16 Survey identified transit desire corridors

Transit: Respondents identified a need to have a larger service areas coverage, along with a desire to improve the existing reliability of the service. The complexities with transit operations is that most of the highest utilized transit stops are on the periphery of Midland to access the retail areas on County Road 93 and Highway 12 with few direct connections between major nodes. Most trips currently require riders to make a circuitous indirect route to access the opposite side of town, and currently there is no transit connection to areas in North Midland around the Harbourview Drive and Fuller Avenue area.

Cycling: Residents identified a need for future cycling connections to fill in the gaps between the existing disconnected network, particularly for connecting to Penetanguishene, and Tiny. Major connecting roadways such as Harbourview Drive, Golf Link Road, Vindin Street, Balm Beach Road, and County Road 93 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 inter-regional trail system, town 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.

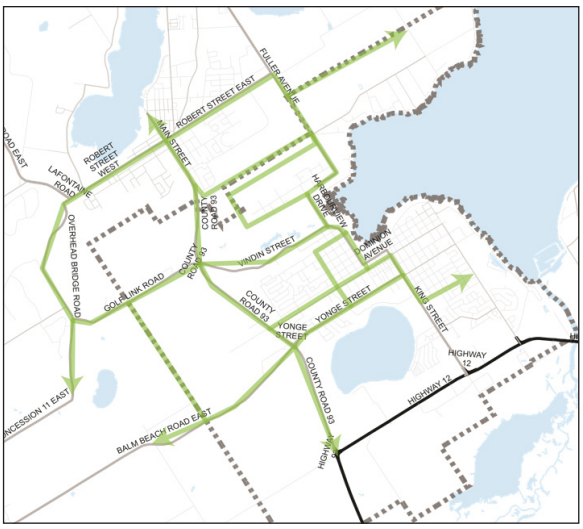


Figure 3.17 Survey identified cycling desire corridors

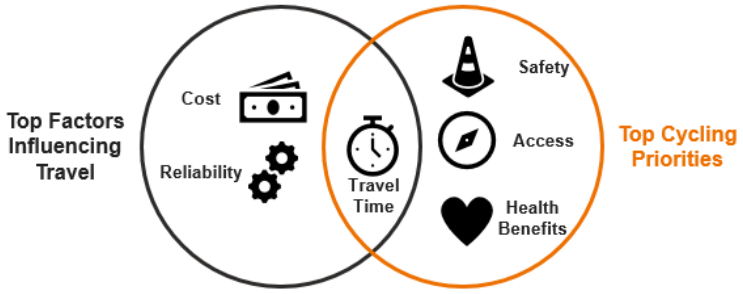


Figure 3.19 Ven Diagram of factors influencing mode choice and cycling priorities

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. Survey-respondents identified and opportunity to expand the existing trail facilities in Little Lake park to expand around the Lake. Additionally, creating better crossing opportunities along King Street, William Street, and Bayshore Drive were identified. Similar to the cycling feedback, respondents identified the opportunity for recreational pedestrian facilities and connections.

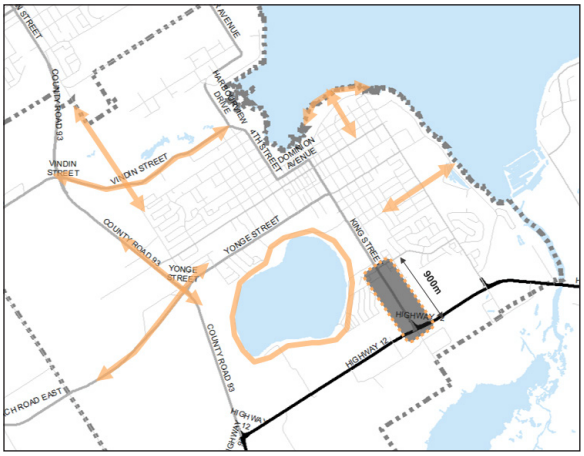


Figure 3.18 Survey identified walking desire corridors

Vision

Overall, residents want an MTMP with a vision focused on 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**.

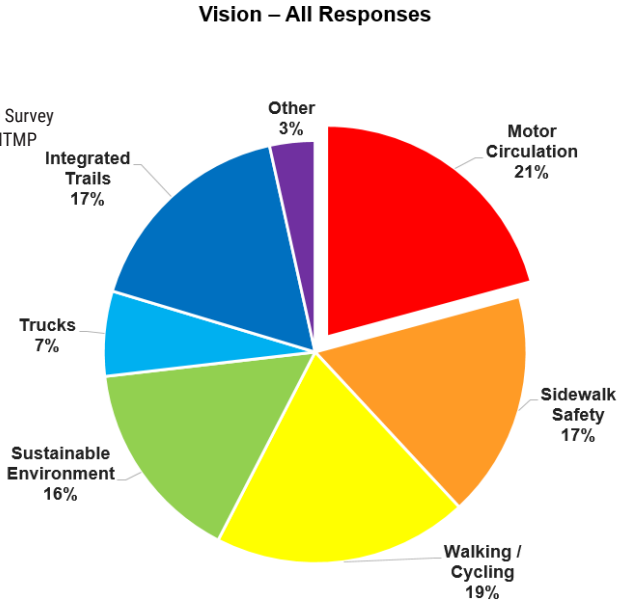


Figure 3.20 Survey identified MTMP vision

3.6 Needs & Opportunities

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

Most of Midland's Residential Development is Low-Density

Currently:

- Midland's overall housing supply is 75% low-density, and 25% are classified as higher density dwellings.

In the **future:**

- 80% of the growth in Midland is planned to be accomodated through low-rise developments through 2031, while 19% of planned developments will be high-density dwellings. Most of the growth will occur along intensification districts located along the Waterfront and Midland's arterial roadways such as, Highway 12, and County Road 93.

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

- Promote higher-density developments in Midland.
- Improving corridors to provide multi-modal functions, options and connections to provide residents mobility choices.

The **opportunities for improvement** are:

- Develop complete streets and parking strategies to promote a more compact built-form that can support sustainable modes of transportation such as transit, cycling, and walking, and equitably share and utilize roadway infrastructure.
- Amend Midland's road classification and design standards to reflect a changing transportation network that is inclusive of active transportation and transit to foster inter-modal connections.

Midland's Cycling & Pedestrian Networks are Disconnected

Currently:

- Midland's cycling & pedestrian network is primarily comprised of multi-use trails, bike lanes, sidewalks, and sharrows. However, both networks are disconnected throughout some areas in Midland. There is also limited cycling facilities in place, only 24 km of cycling infrastructure exists in the town.

In the **future:**

- The City of Midland's Active Transportation Plan identifies up to 31.6 km of additional cycling infrastructure to be built over the long term. Midland's Official Plan also proposes an interconnected trail route to connect North and South Midland to the Downtown core and the surrounding areas.

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

Prioritize the development of a bicycle/pedestrian network based on:
- Needs (Safety, connection to points of interests etc.)
- Available Right-of-Way;
- Increasing tourism opportunities;
- Connectivity to Existing and Future Trip Generators.

The **opportunities for improvement** are:

- The development of a cycling & pedestrian network by implementing facilities that connect to trip generators, residential and employment areas and provides options for safe and efficient movement across the Town.

-Improve large impermeable blocks on the peripheries and develop a complete streets strategy to improve Active Transportation connectivity in Midland hollistically over time.

Internal Population Growth Outpacing Employment Growth

Currently:

- The Town of Midland is experiencing growth of 2% per year for population and employment purposes, and this growth is expected to continue until 2041.
- Half of Midland's Peak Period trips are internal to the Town with 44% of AM Peak Period trips starting and ending within Midland.
- In total around 5,500 trips are made between Midland and North Simcoe Municipalities such as, Penetanguishene, Tiny, and Tay.

In the **future:**

- Population is anticipated to outpace employment growth through the 2041 horizon. As internal trips are anticipated to decrease while external trips are forecasted to increase. This will impact travel demand trends and available options for residents to make these trips.

The **opportunities for improvement** are:

- Introduce more sustainable modes of transportation and Transit Oriented Developments (TOD) as well as leverage connections to the County's LINX transit system as well as Midland's transit network for external trips.

Increase in Congestion & Dangerous Conditions around Key Areas

Currently:

- Residents identified a few areas as problems for **congestion** is high around Retail Areas such as: Smart Centers, Walmart Plaza (Heritage Dr/Jones Rd), Downtown Midland, Yonge Street between Eigth Street & Sixth Street, and Canadian Tire Plaza
- Areas identified as **dangerous** often coincided with areas identified as congested and primarily focused on the following:
  - Lack of bicycle/pedestrian facilities for safe crossing in Downtown and along County Rd 93/Highway 12
  - Poor parking compliance in "no-parking" zones, particularly around Schools
  - Speeding, poor intersection sightlines and poor roadway conditions

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

- Reduce congestion around Retail Areas.
- Promote the use of alternative modes of transportation on the corridor and enhance overall operations and road safety.

The **opportunities for improvement** are:

- Identify policies and a framework for implementing traffic calming where it is warranted to enhance roadway safety.
- Provide safe and appropriate pedestrian and cycling connections.
- Improve roadway infrastructure/maintenance, particularly in the winter.
- Equitably balance vehicular operations for accessing key areas. Transportation Demand Measurements can provide an opportunity to lincrease car occupancy and reduce congestion.

Transit Mode Share in Midland has Declined

Currently:

- Since 2013, transit ridership has increased by 30%. However, overall weekday peak period transit mode share has seen little improvement. Large gaps also still exist around residential areas that are served by Midland / Penetanguishene Transit's "Hail Bus" .

In the **future:**

- More connections will be needed along the periphery of Town.
- Modified route structure and reduce congestion on buses by introducing larger sized busses to accomodate high volumes of passengers

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

- Provide more integrated multi-modal network to support and promote transit services so it can be a viable option for residents.

The **opportunities for improvement** are:

- Provide proper connections and amentities at transit terminals/stops between Active Transportation.

4.0 Foundations

4.0 Foundations

4.1 Planning Context

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. Midland 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 2041. 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 10,000 people within the Town of Midland and

requires the establishment of a minimum density target for all Town 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

Town of Midland Transportation Master Plan, 2012: The Transportation Master Plan for the Town of Midland was introduced in 2012 with the objective of providing an assessment of existing conditions, identifying future travel demands through anticipated development growth, and providing supporting documentation for the Town's Official Plan and Development Charges Study. The Plan identifies fifteen key intersections and provides recommendations for the existing transportation network including road realignment, changes to signalization, and implementing traffic control, and reconstruction. Stakeholder consultation was implemented through public information centres and Town Councils that resulted in a detailed Schedule of Works outlining associated costs and timelines for construction requiring completion. The Transportation Master Plan is to be reviewed on a five-year basis to meet transportation needs of the Town.

Town of Midland Development Charge Transportation Review, 2014: The Town of Midland conducted a transportation review in support of the Town's updated Development Charge Study to assist with the identification of road improvements to be considered for an area specific development charge for improvements within the Highway 12 road corridor, extending from King Street to Highway 93.

The Town of Midland Development Charges Background Study, 2014: The Development Charges Background Study was completed by Hemson Consulting in 2014 on behalf of the Town of Midland under the provisions of the provincial Development Charges Act. The Study analyzes costs of maintaining and expanding services provided by the Town between 2014 and 2023 in accordance to average capital service levels, future capital projects, and long-term capital and operating costs for capital infrastructure. Development charge rates are calculated and recommended in accordance with the requirements and limitations of the Development Charges Act.

The Town of Midland Downtown Master Plan and Community Improvement Plan, 2015: The Town of Midland established its Downtown Master Plan and Community Improvement Plan in accordance to the County of Simcoe Official Plan and the Town of Midland Official Plan to maximize the potential of the downtown as a walkable live-work community and identifies areas for improvement. The Plan, undertaken by Urban Strategies Inc., approved by Council in June 2015 with an emphasis on the revitalization of King Street and the Waterfront area. The Plan incorporates goals for community improvement with a focus on pedestrian and neighborhood connectivity to the downtown till 2035.

Yonge Street Road Diet, 2017: The Yonge Street Road Diet aims to convert a four-lane section (two lanes in each direction) of Yonge Street between First and Eighth Street into a two-lane section with a common centre turn lane and one bicycle lane in each direction. The objective of this traffic calming measure is to increase safety, walkability and accessibility to implement a multi-modal framework.

Town of Midland Parks and Trails Master Plan, 2018: The Town of Midland Official Plan Review provides a planning policy framework that provides strategies to direct future growth within the town over a 14 year period to be consistent with the Provincial Policy Statement, the Planning Act, and the County of Simcoe Official Plan. The Official Plan Review introduces a vision for Midland, community guiding principles, and growth management strategies to evolve and adapt to growth and development. The Official Plan provides approaches in achieving a cost-effective, transit-supportive system focused on the Downtown area and mixed-use corridors that satisfies the needs of the existing population and businesses as well as housing an environment for economic growth. The vision for the Town of Midland aims to preserve the historic downtown and retain the small town feel whilst integrating environmental sustainability, economic growth, and accessibility.

Midland Transit Operational Review, 2018: The Town of Midland conducted an operational review of Midland Transit service in 2018 which identified a five-year transit service plan culminating in an increase in service including:

- Service Reliability;
- Extended Hours of Operation; and
- Improving Accessibility.

The review included quick-win, short-term, and long-term operational recommendations to guide Midland transit over the next five-years.

Town of Midland Official Plan Review, 2019: The Town of Midland Official Plan Review provides a planning policy framework that provides strategies to direct future growth within the town over a 14 year period to be consistent with the Provincial Policy Statement, the Planning Act, and the County of Simcoe Official Plan. The Official Plan Review introduces a vision for Midland, community guiding principles, and growth management strategies to evolve and adapt to growth and development. The Official Plan provides approaches in achieving a cost-effective, transit-supportive system focused on the Downtown area and mixed-use corridors that satisfies the needs of the existing population and businesses as well as housing an environment for economic growth. The vision for the Town of Midland aims to preserve the historic downtown and retain the small town feel whilst integrating environmental sustainability, economic growth, and accessibility.

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. Midland is a modern municipality that elegantly balances its rural charm with urban vitality. It is also a diverse town comprised of several unique neighbourhoods and communities. The Town's transportation and active transportation systems must reflect the Town's vision to foster multi-modal transportation options that address the needs of people of all ages and abilities.

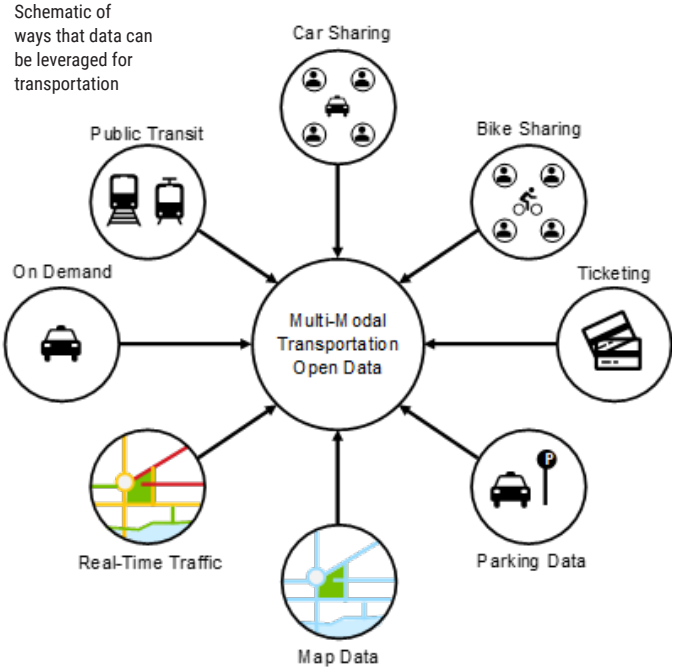
Not every trip can or should be served by alternative modes of transportation, but it must be recognized that private vehicles, transit, and active transportation are part of a larger multi-modal mobility network that works together to provide transportation for the community as a cohesive system. To that effect, it is important that the planning of multi-modal transportation services acknowledge the Town'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 Town'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

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 4.1**, 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 4.1
Schematic of ways that data can be leveraged for transportation



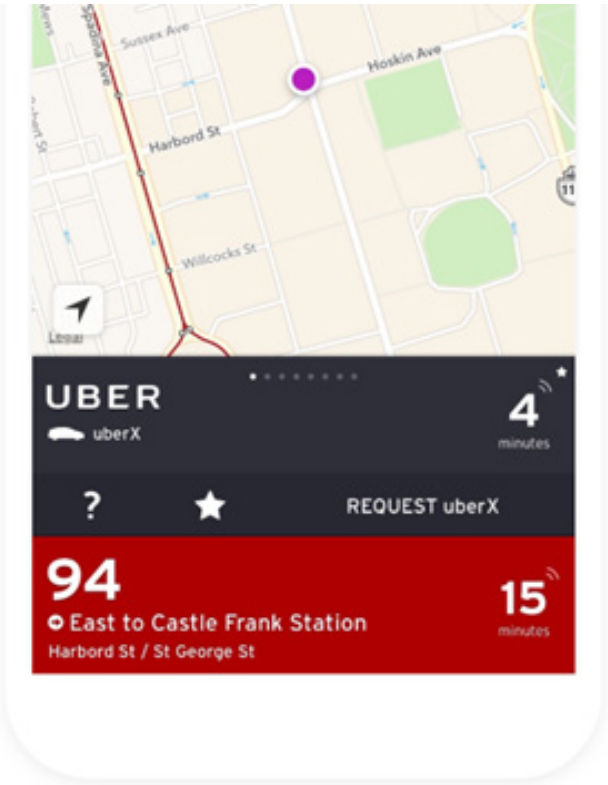
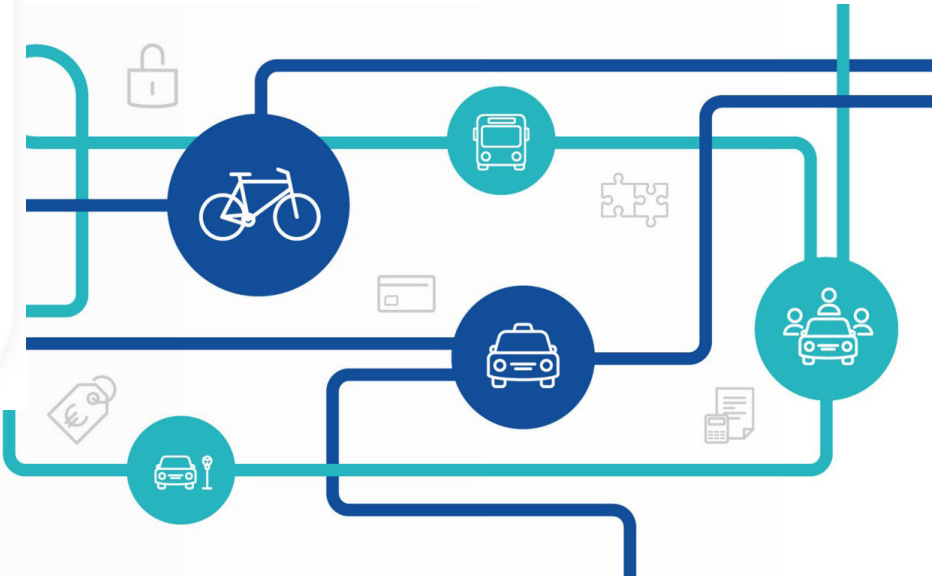


Figure 4.2 Screen of the Transit app and the integration it has with other modes

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 4.2**. 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 Town of Midland 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 Town of Midland.

4.2.3 Complete Streets

Streets are vital places within the Town of Midland. They are the common spaces where the town 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 town 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 4.3**. 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).

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 4.4**.

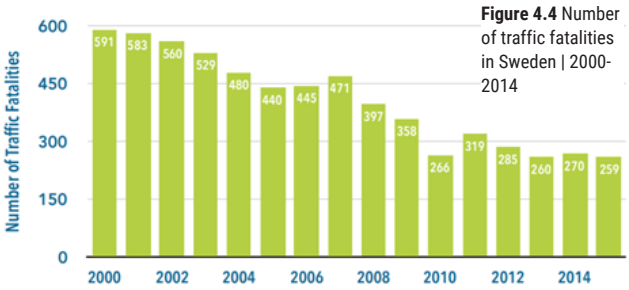


Figure 4.4 Number of traffic fatalities in Sweden | 2000-2014

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.

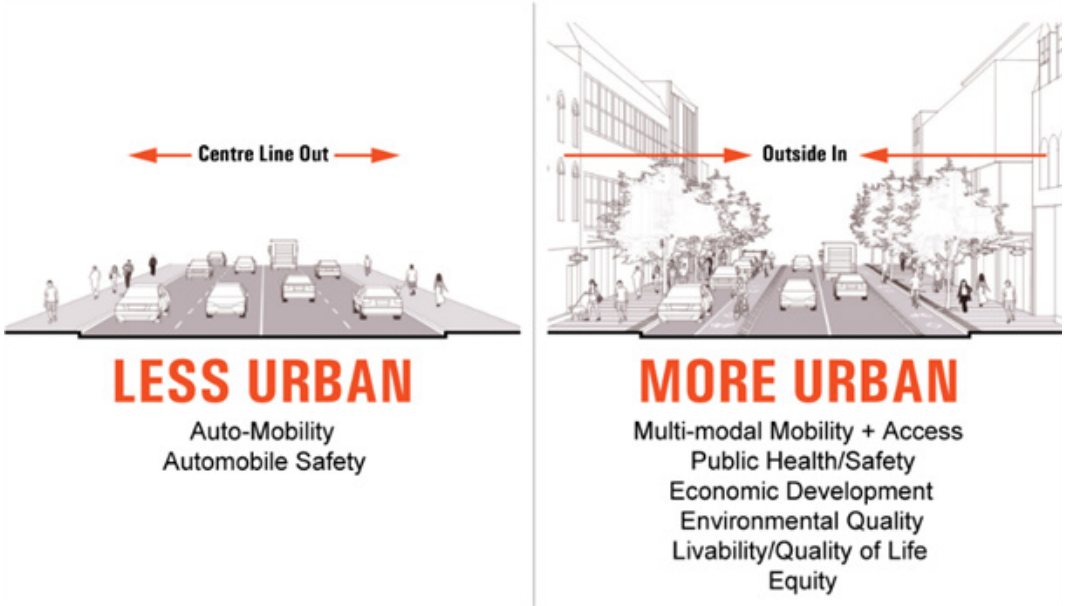


Figure 4.3 Complete Streets philosophy between planning complete streets in urban and less urban environments

Source: Toronto Complete Streets Guidelines, 2017

4.3 Strategic Priorities

The Town of Midland is committed to the provision of municipal services in a sustainable manner to meet the present and future needs of the community. In 2018 a Strategic Plan to guide the Town through to 2022 was created focusing on three strategic pillars including:

Accountable, Responsive & Innovative Governance:

- Modernizing Government-Enhancing access and capability for on-line municipal services and information;
- Develop sustainable and responsible financial strategies that balance demands for asset renewal, evolving service demands and revenue/funding capacity (including investigating new revenue streams);
- Explore and implement new service delivery models and community engagement/partnerships; and
- Review Council composition in time for the 2022 municipal election.

Economic & Community Development:

- Attract, support and retain business enterprises and evolve towards a 4-season festival events community;
- Accelerate and encourage the planned vision for Midland's waterfront;
- Complete infrastructure and public realm improvement in the downtown and leverage public assets; and
- Advocate for the implementation of high-speed broadband and wireless connectivity throughout the Town.

Safe, Sustainable, Healthy Community:

- Implement a Safe Streets plan;
- Encourage new accessible and affordable housing;
- Empower a Youth Council for Midland;
- Facilitate intergenerational initiatives to build inclusiveness;
- Target and measure achievement of a liveable sustainable and fully accessible community;
- Promote sustainable and active transportation; and
- Develop vibrant public spaces and celebrate a beautiful Midland.

While not every aspect of these three strategic pillars fit perfectly into the context of this MTMP, they provide an over-arching municipal strategy upon which this document's vision & objectives can link to. These three strategic pillars and their relation to the MTMP vision & objectives are summarised on the following page.

4.4 Vision & Objectives

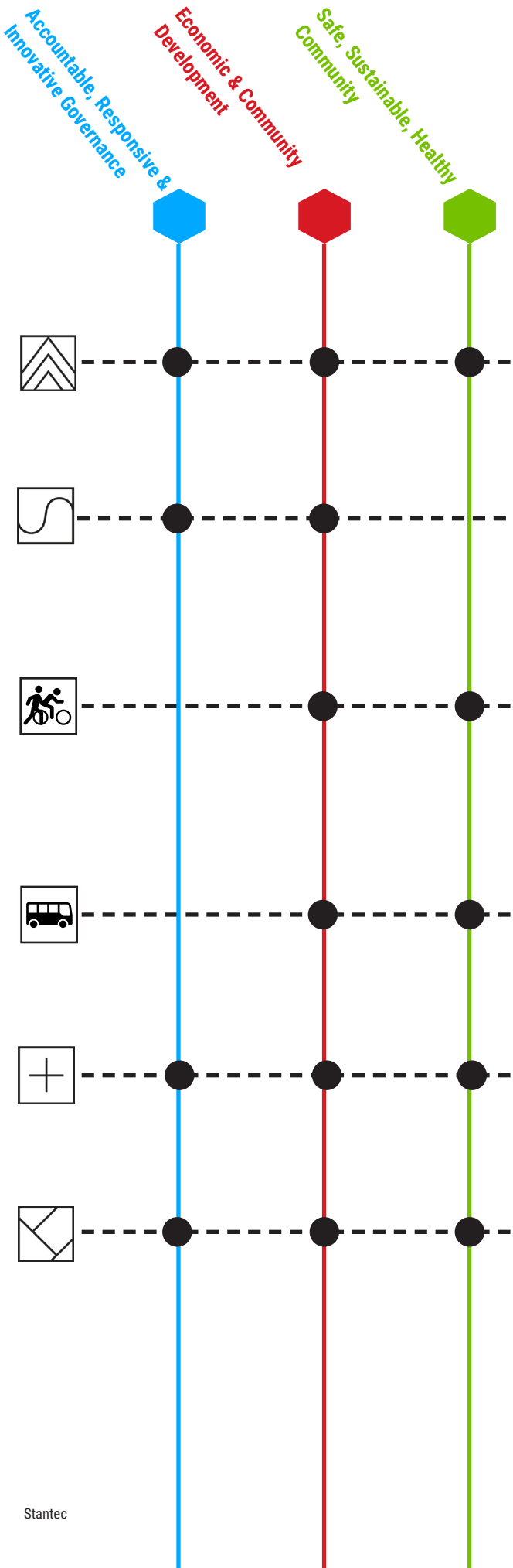
A well-designed multi-modal transportation network can be a strong contributor to achieving the local goals that are articulated in various plans. Simplicity in design and functionality usually means establishing a **simple and effective multi-modal transportation network** that everyone can understand 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 multi-modal transportation network that integrates a mixture of infrastructure and options for residents to jobs, services, and recreation providing options for travelling within and beyond the Town safely and efficiently.

It is important to note that the emphasis of the vision statement is on what the end will be like, and less on what Midland 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 six (6) 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 25 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 Midland.

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.

5.0 A Plan for the Future

5.0 A plan for the future

5.1 Active Transportation Evaluation

The Town of Midland 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 Midland, 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.

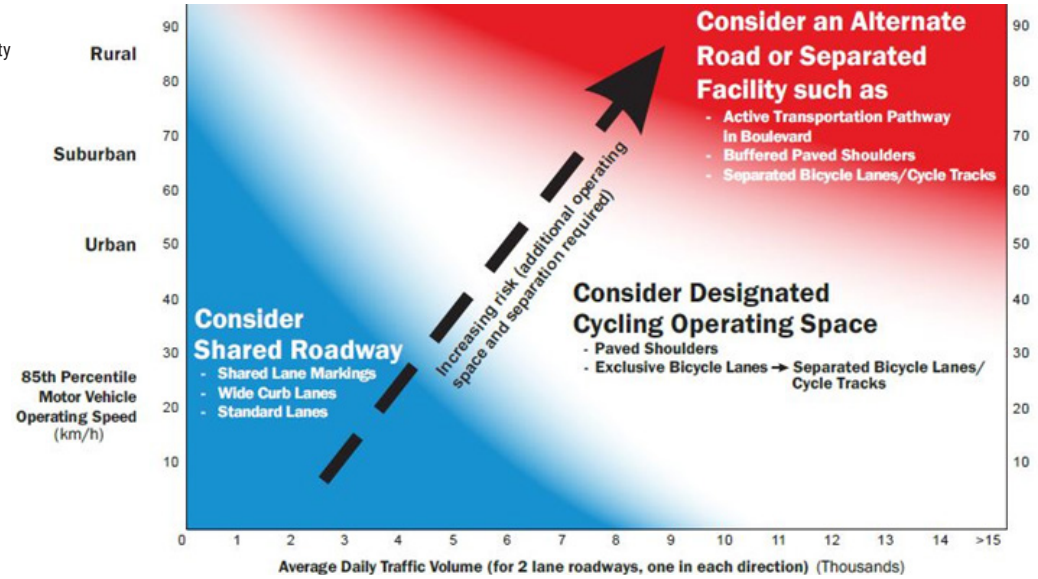


Figure 5.1 Cycling Facility Selection Nomograph from OTM Book 18

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	• 2.0m lane • 1.2m buffer	• 1.5m lane • 0.5m buffer
Painted Bike Lane		• 1.8m lane • 1.2m buffer (if on-street parking)	• 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		• 2.0m lane • up to 1.0m curb	• 1.5m lane • up to 1.0m curb
Multi-Use Path	In-Boulevard Facilities	• 4.0m two-way operation • up to 1.0m curb	• 3.0m two-way operations • up to 1.0m curb

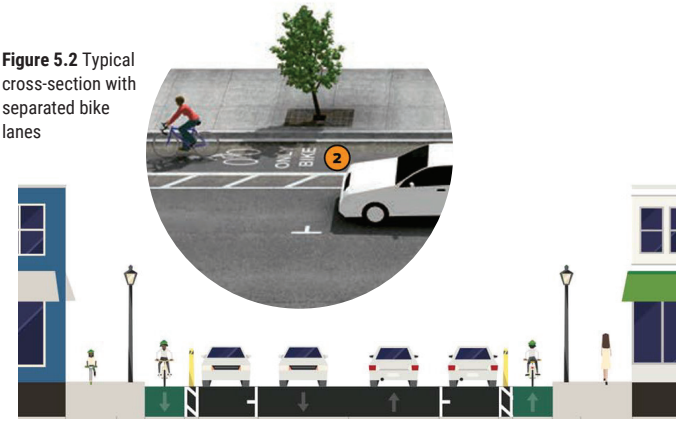


Figure 5.2 Typical cross-section with separated bike lanes

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.

Signed Routes

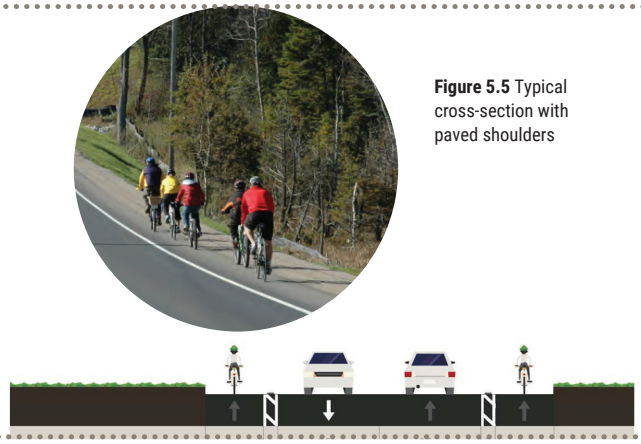


Figure 5.5 Typical cross-section with paved shoulders

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 Midland to neighbouring municipalities or rural areas by cycling.

Paved Shoulders

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.

Multi-Use Paths

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

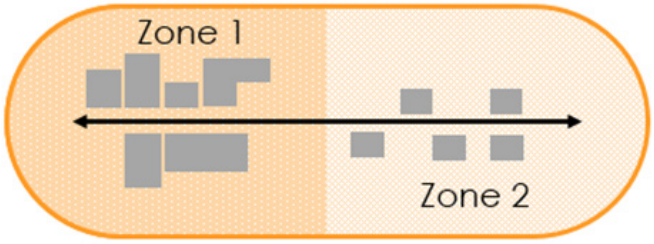


Table 5.2 Evaluation Criteria for Population Density

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

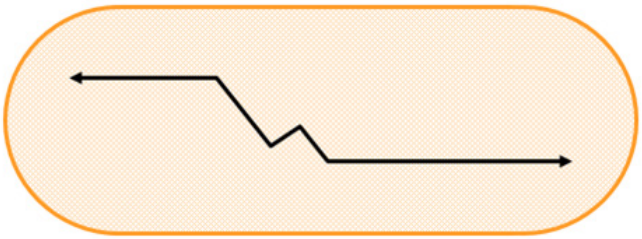


Table 5.3 Evaluation Criteria for Incline

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

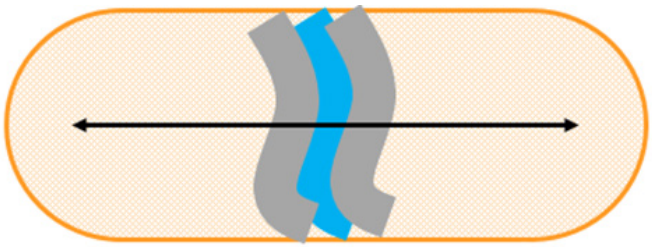


Table 5.4 Evaluation Criteria for Crossing Barriers

Criteria	Points
Crosses William Street	15
Crosses Yonge Street	15
Maximum Points:	**30**

Rationale: Resident survey response identified William Street and Yonge Street as barriers between East-West and North-South travel, respectively. Providing linkages across these barriers can present vital connections to areas of the Town that may feel isolated. For instance, it is currently difficult to get to the Tiffin Bay development area from west of William Street due to the geography, limited crossing opportunities, and high volumes of traffic making it intimidating for active transportation users. Similarly, due to the high volume of traffic on the Yonge Street there are limited crossing opportunities between County Road 93 and William Street triggering calls from the public to explore crossing opportunities on this street.

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

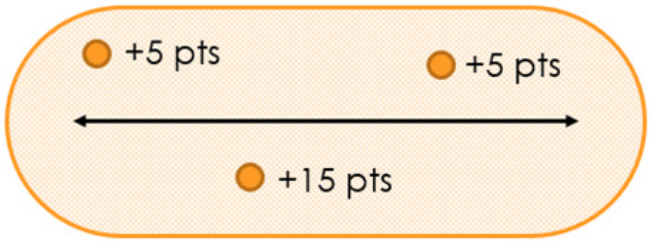


Table 5.5 Evaluation Criteria for Major Destinations

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 Midland 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

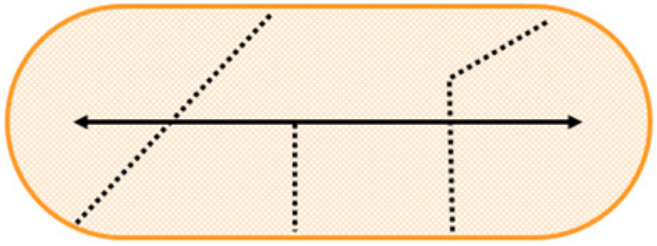


Table 5.6 Evaluation Criteria for Network Connectivity

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 King Street where the sidewalks support and provide a connection to retail.

The recommended network was planned based on limited information of what the completely built-out network in Hanson and Tiffin by the Bay development areas will be. Despite this, pedestrian connections in all future development areas should be planned and made as development occurs in the future.

The long-term pedestrian network incrementally expands upon the existing network that is already extensive in the older core of Midland to fill in gaps and create connections to schools, transit stops, and several other community amenities.

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 (0-5 years) pedestrian network fills-in several of these gaps (as visualized in **Figure 5.8**) particularly in neighbourhoods on the periphery of Midland's core in the west (between Yonge Street and Vindin Street) and south (between King Street and Aberdeen Boulevard), while the subsequent horizon years (**Figures 5.9** and **5.10**) incrementally expand toward new development and employment areas to culminate in an additional 50 km of pedestrian facilities across Midland as summarised in **Table 5.7** by the 2041 horizon year.

Many communities struggle with expanding the sidewalk network due to the high cost of concrete. It is currently estimated that 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.

The pedestrian network links are accompanied by several intersection / crossing improvements, particularly along Midland's Arterial Roads such as William Street, King Street, Yonge Street, and the Fuller-Harbourview-Fourth Street corridor.

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

Pedestrian Facility	Existing	Kilometres Added			Total	Change
		2026	2031	2041+		
Sidewalks	99.9	16.3	6.4	-	122.7	+ 22.7
Multi-Use Paths	17.7	8.0	10.5	9.1	45.3	+ 27.6
Total	**117.6**	**24.3**	**16.9**	**9.1**	**167.9**	**+ 50.3**

Figure 5.7 shows the difference between the existing and future recommended distances between protected pedestrian crossings on Midland's major roadways. For our purposes the existing courtesy crosswalks are not considered protected crosswalks on account of their legal standing under the Highway Traffic Act (HTA) whereby a courtesy crosswalk does not afford pedestrians legal right-of-way while crossing, even if they do work toward alerting motorists of pedestrians.

On William Street, the additional protected pedestrian crossings will reduce the average protected crossing distance between Bay Street and Galloway Boulevard from 1,040 m to 345 m, on King Street the average crossing distance is reduced from 520 m to 415 m, on Yonge Street the average crossing distance is reduced from 660 m to 470 m, and on the Fuller-Harbourview-Fourth Street corridor crossing distances are reduced from 525 m to 350 m. All of these improvements overlap with crossing improvements from the recommended cycling network as defined in Section 5.2.2 of this document.

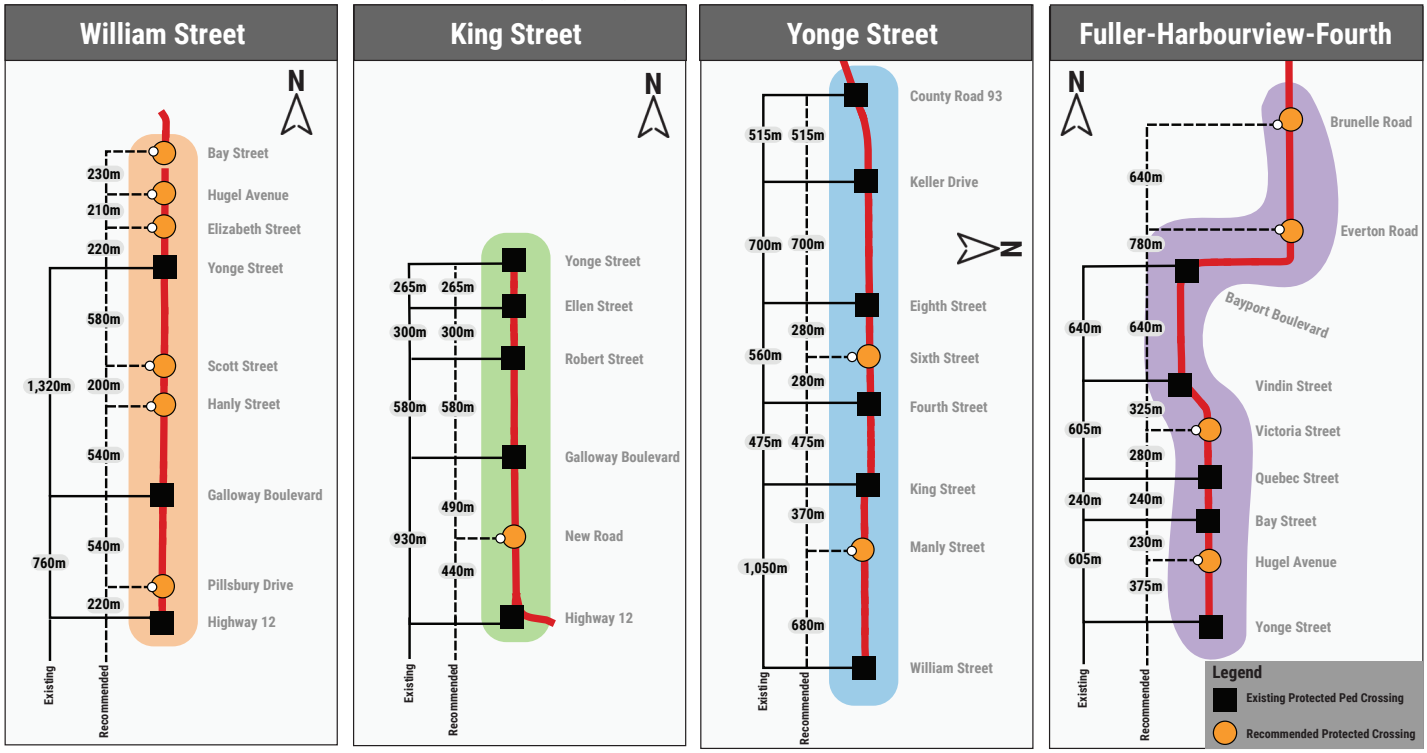
A summary of pedestrian crossing improvements are summarised in **Table 5.8**. Distinctions between different pedestrian crossover facilities are summarised under Section 5.3.3 - Pedestrian Safety Plan. Most of the recommended crossing improvements are pedestrian crossovers which are triggered immediately when a pedestrian presses the signal button. This was chosen because of the anticipated increased convenience for pedestrians with the trade-off being minor inconveniences to motorists based on anticipated pedestrian volumes. If pedestrian crossovers are found to have significant impacts to automobile travel, crossovers may be converted to signalized crossings (same as what is currently found at the intersection of Fourth Street / Yonge Street) that can be timed to vehicular flow.

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

Table 5.8 Recommended Pedestrian Crossing Improvements

Location	Improvement	Phasing
Penetanguishene Road / Hugel Avenue	Hybrid Crossing	Short-Term
Fourth Street / Hugel Avenue	Pedestrian Crossover	Short-Term
Fourth Street / Victoria Street	Pedestrian Crossover	Short-Term
First Street / Elizabeth Street	Pedestrian Crossover	Short-Term
Manly Street / Hugel Avenue	Pedestrian Crossover	Short-Term
Manly Street / Bayshore Drive	Pedestrian Crossover	Short-Term
Manly Street / Yonge Street	Pedestrian Crossover	Short-Term
William Street / Bay Street	Hybrid Beacon	Short-Term
William Street / Hugel Avenue	Hybrid Beacon	Short-Term
William Street / Elizabeth Street	Crossing Guard during school hours	Short-Term
William Street / Scott Street	Pedestrian Crossover	Short-Term
William Street / Hanly Street	Pedestrian Crossover	Short-Term
Beamish Road / Highway 12	Signalized Intersection	Medium-Term
Harbourview Drive / Vindin Street	Re-aligned Intersection with Improved pedestrian facilities	Medium-Term
Fuller Avenue / Harbourview Drive	Signalized Intersection	Medium-Term
King Street / New Road 1	Signalized Intersection	Medium-Term
Fuller Avenue / Midland Point Road - Brunelle Side Road	Roundabout with pedestrian crosswalks	Long-Term

Figure 5.7 Recommended Protected Pedestrian Crossing Distance on Major Roadways | Existing vs. Recommended



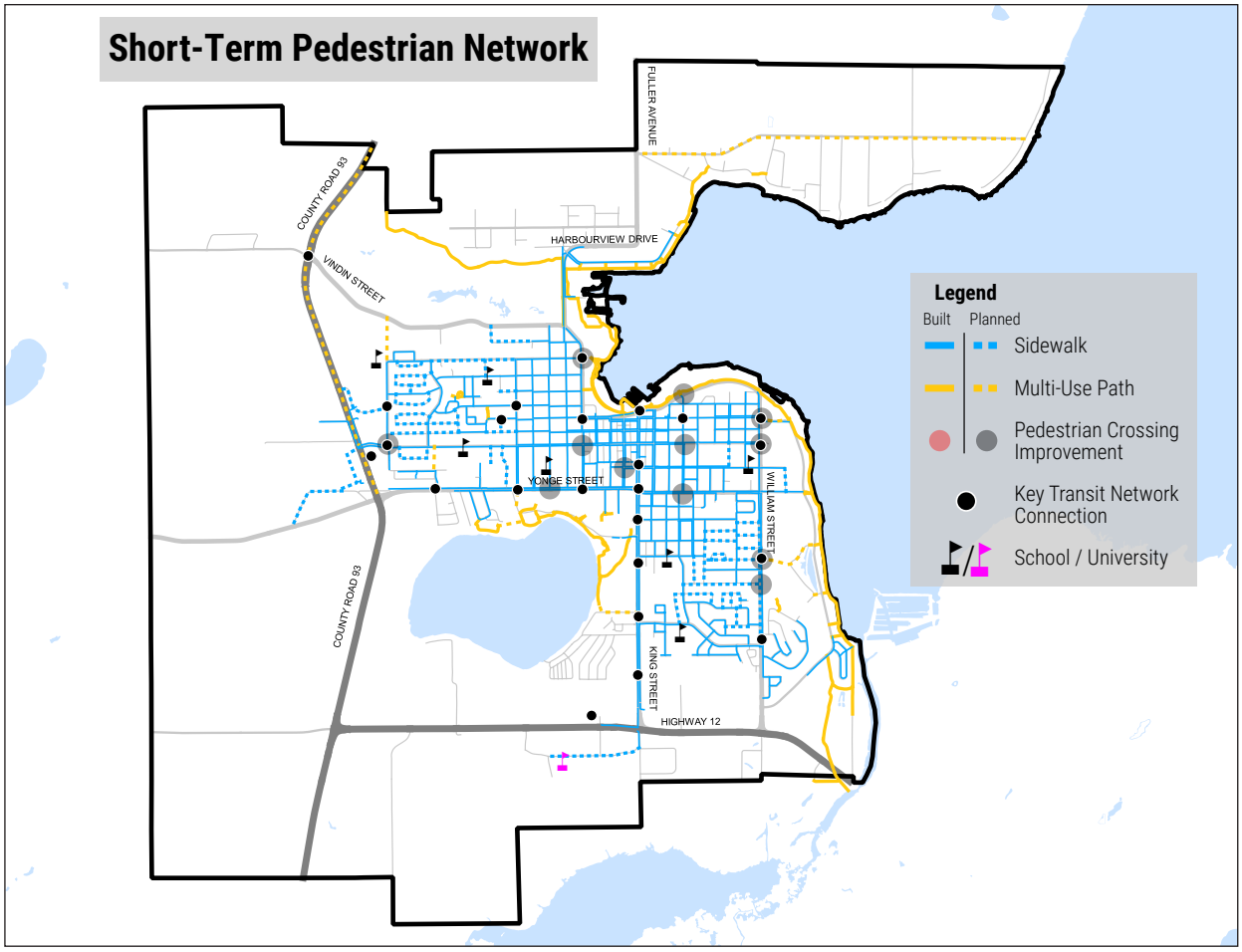


Figure 5.8
Recommended Short-Term Pedestrian Improvements

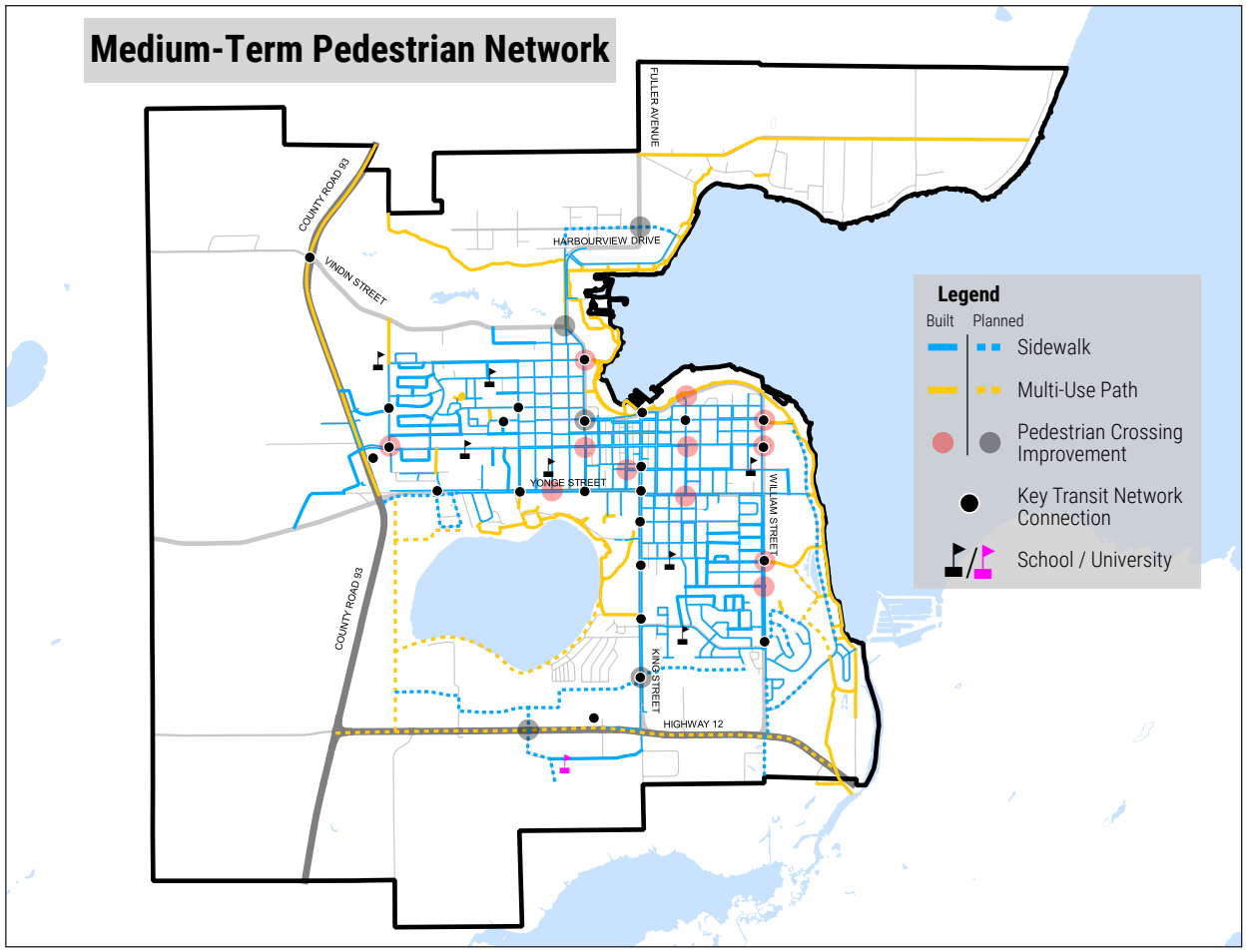
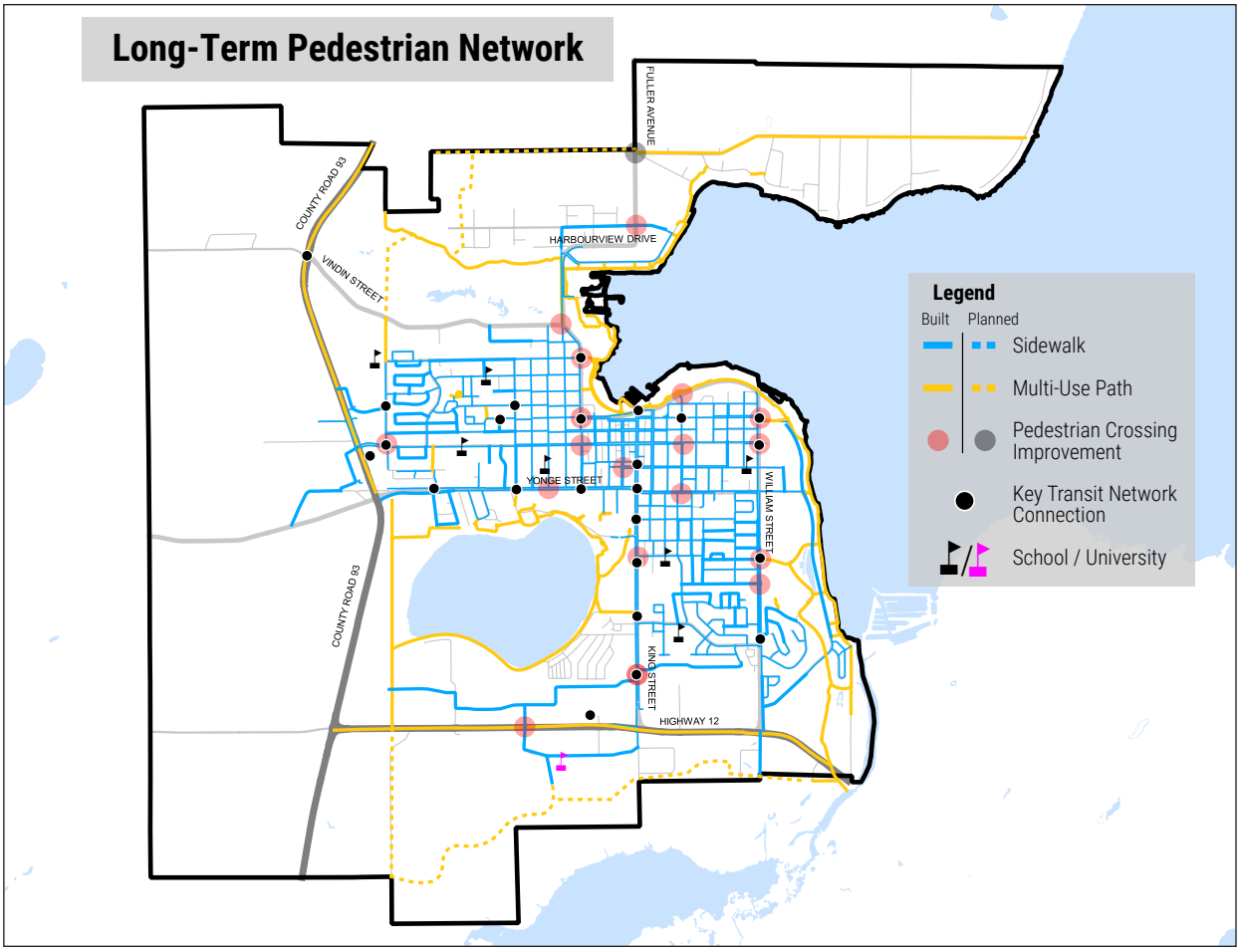
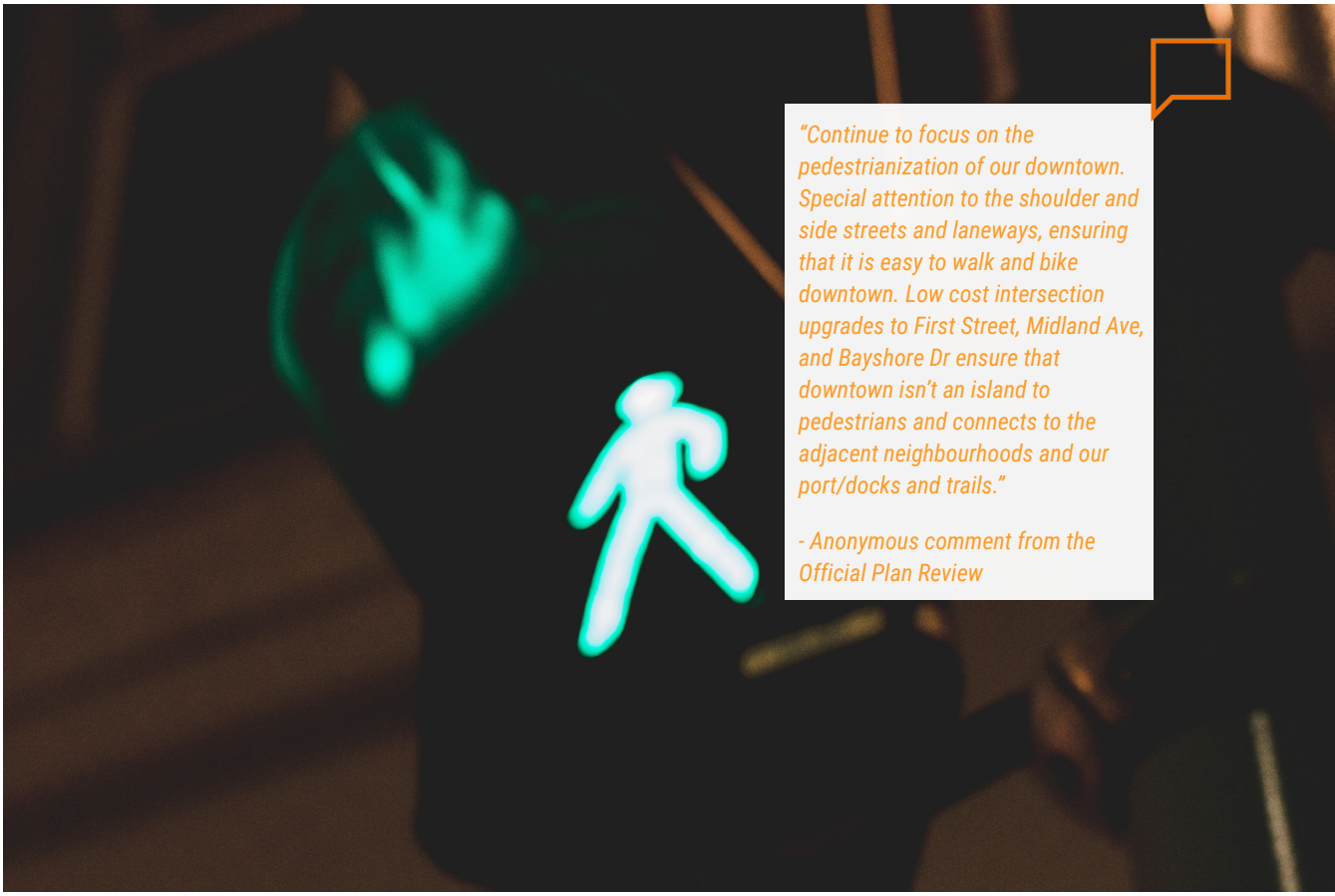


Figure 5.9
Recommended Medium-Term Pedestrian Improvements

Figure 5.10
Recommended Long-Term Pedestrian Improvements





"Continue to focus on the pedestrianization of our downtown. Special attention to the shoulder and side streets and laneways, ensuring that it is easy to walk and bike downtown. Low cost intersection upgrades to First Street, Midland Ave, and Bayshore Dr ensure that downtown isn't an island to pedestrians and connects to the adjacent neighbourhoods and our port/docks and trails."

- Anonymous comment from the Official Plan Review

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 3 Km or less, whereas most walking is typically done for distances of 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 102 km of cycling routes that are recommended to be added incrementally through the 2041 horizon as visualized in **Figures 5.14** to **5.16** and summarised in **Table 5.10** by horizon year. These improvements are anticipated to bring some form of cycling facility within 100m of 85% of the Town within the next 20 years compared with only 9% today. Additionally, the MTMP recommended network provides a 33% greater coverage than the previously planned cycling network.

Recommended Changes

Recommended improvements and changes to the existing active transportation plans in the official plan are visualized in **Figure 5.13** and summarised in **Table 5.11**. 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.

The backbone of the system will focus around the Protected and Painted bike lanes that are primarily placed along Arterial and Collector roadways to provide high-quality cycling infrastructure connections across the broader town. 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.

Analysis in Chapter 3 of this MTMP document sugests that Midland's road network has significant capacity even through 2041 horizon year projections. There are opportunities to expand upon the Road Diet work done on Yonge Street, along other Arterial Corridors to provide space for cyclists, as well as parking to support special events and tourism in the town.

Midland's road network is a complex one where there are few cross-town corridors that continue uninterrupted between north/south and east/west. Through an evaluation of the network, Yonge Street, King Street, and William Street were identified as the three major active transportation corridors needed in Midland.

Yonge Street/King Street/William Street: were identified as a key corridors on account of several characteristics that include:

- A defined travel corridor for transit and automobile usage. Many residents in Midland need to access vital services and employment opportunities along these three corridors including Downtown, Huronia Mall, Industrial Employment, and Commercial retail;
- They are the most direct routes between north, south, east, and west Midland with direct connections to the broader county trail network;
- They each intersect more than three existing/future cycling routes within the network; and
- Although average annual daily traffic (AADT) volumes are significant with commercial vehicle activity, 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.

Table 5.9 Previously recommended Linear Kilometres of Cycling Facilities added by Horizon year

Previously Planned Improvements from Official Plan				
Cycling Facility Type	Existing	Kilometres Added	Total	Change
		Long-Term		
Protected Bike Lanes	-	-	-	-
Painted Bike Lanes	5.2	17.4	22.6	+ 17.4
Signed Route	1.6	8.7	10.3	+ 8.7
Paved Shoulders	-	2.1	2.1	+ 2.1
Multi-Use Paths	17.7	11.7	29.4	+ 11.7
Total	**24.5**	**39.9**	**64.4**	**+ 39.9**

Table 5.10 Recommended Linear Kilometres of Cycling Facilities added by Horizon year

Recommended MTMP Improvements						
Cycling Facility Type	Existing	Kilometres Added			Total	Change
		2026	2031	2041+		
Protected Bike Lanes	-	5.8	3.7	-	9.5	+ 9.5
Painted Bike Lanes	5.2	13.7	9.0	-	27.9	+ 22.7
Signed Route	1.6	10.2	1.6	-	13.4	+ 11.8
Paved Shoulders	-	2.1	4.2	-	6.3	+ 6.3
Multi-Use Paths	17.7	8.0	10.5	9.1	45.3	+ 27.6
Total	**24.5**	**39.8**	**29.0**	**9.1**	**102.4**	**+ 77.9**

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**. This comparison takes into account varying speed assumptions by cycling facility type to reflect the impacts that a sense of protection on the network would have on speed and usage. Generally, the recommended network's more permeable network of cycling facilities through the Town combined with upgraded protection measures is estimated to allow residents to reach approximately 24% more of Midland within a 15 minute bike ride than the previously planned network.

Within new emerging subdivisions, multi-use paths are planned to provide a flexible solution to addressing combined pedestrian and cycling needs, while also promoting recreational usage via new pathways along the Waterfront and through greenfield areas on the peripheries of the Town.

Additionally, Midland'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 town's hills. For instance, the elevation between parts of William Street can be a difference of up to almost 40m 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.

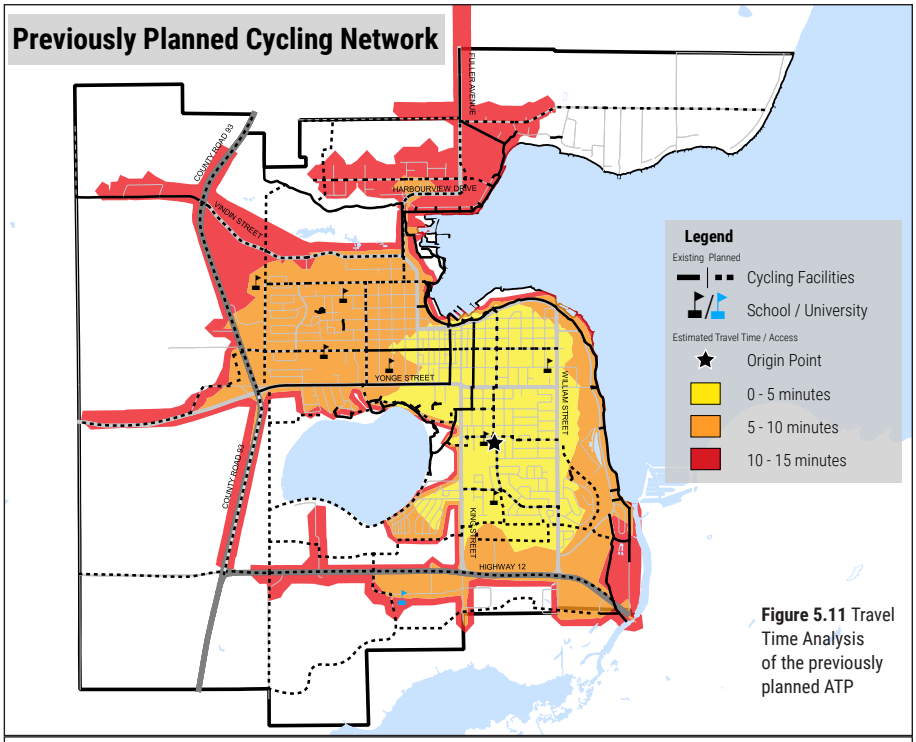


Figure 5.11 Travel Time Analysis of the previously planned ATP

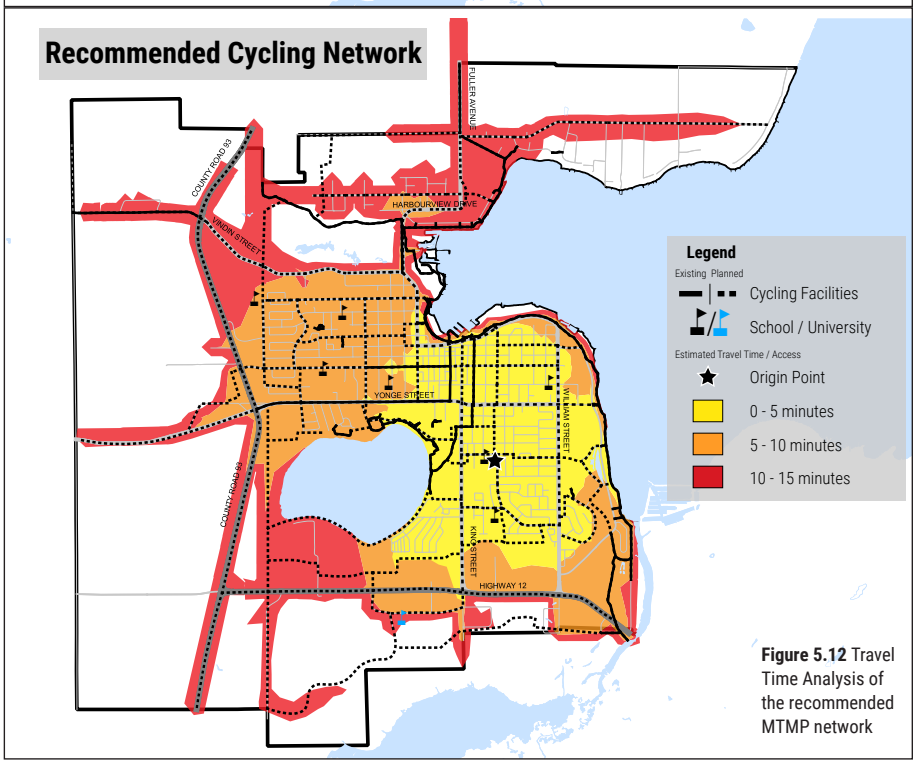


Figure 5.12 Travel Time Analysis of the recommended MTMP network

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 in North Simcoe such as Penetanguishene, Tiny, and Tay.

A summary of recommended changes and new cycling/multi-use routes is provided in **Table 5.11** on the following pages. A detailed line-by-line summary of each individual improvement along with their associated costs are provided in **Appendix B** of this MTMP document.

"The road diet was one of the best things Midland has done. Yes it is busy in the mornings and after school but traffic continues to flow in an orderly fashion. Drivers are now driving closer to the speed limit rather than at 60 to 70 km/hr. It is now much safer."

- Anonymous survey respondent

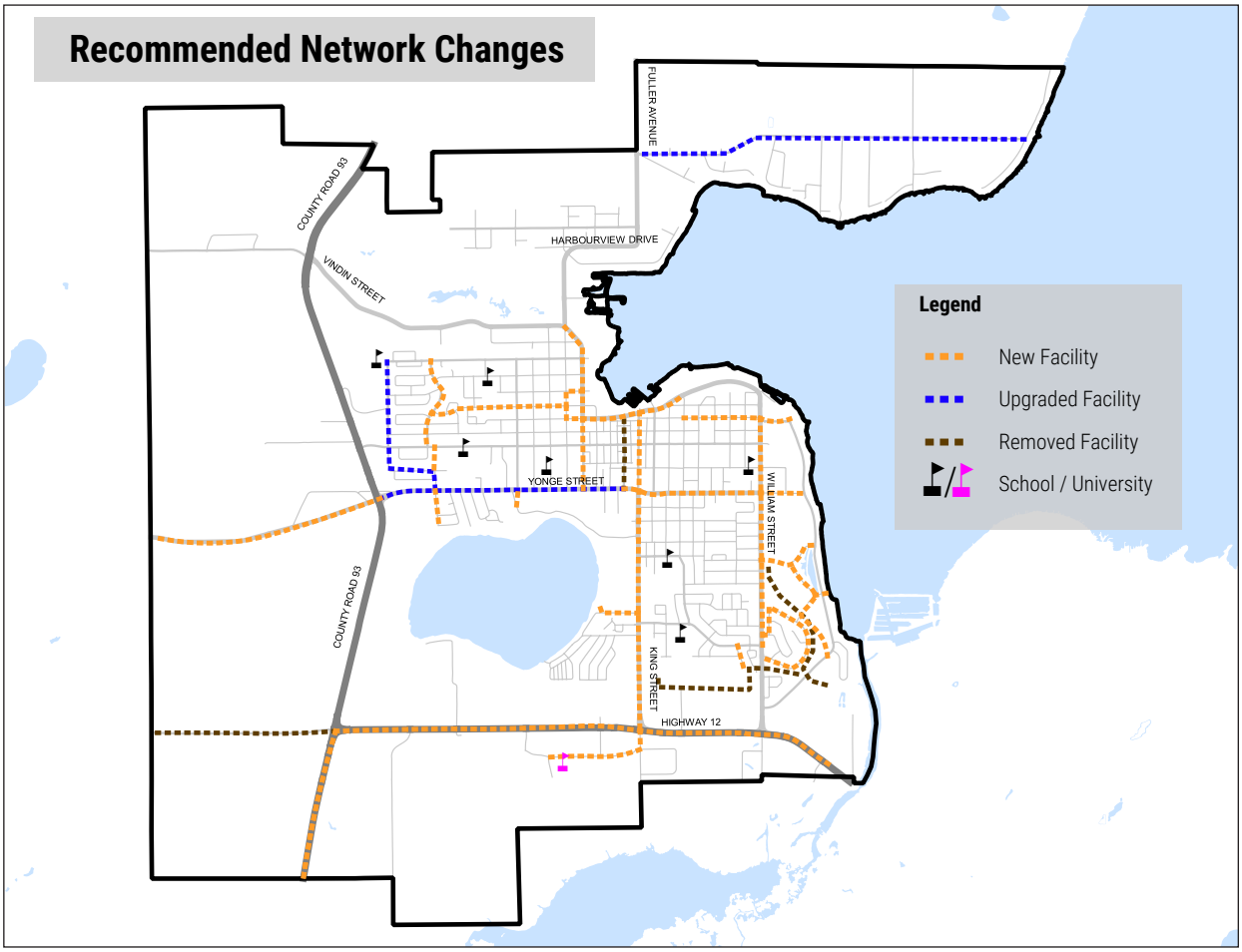


Figure 5.13
Recommended MTMP Cycling Improvement changes to the 2012 Active Transportation Plan

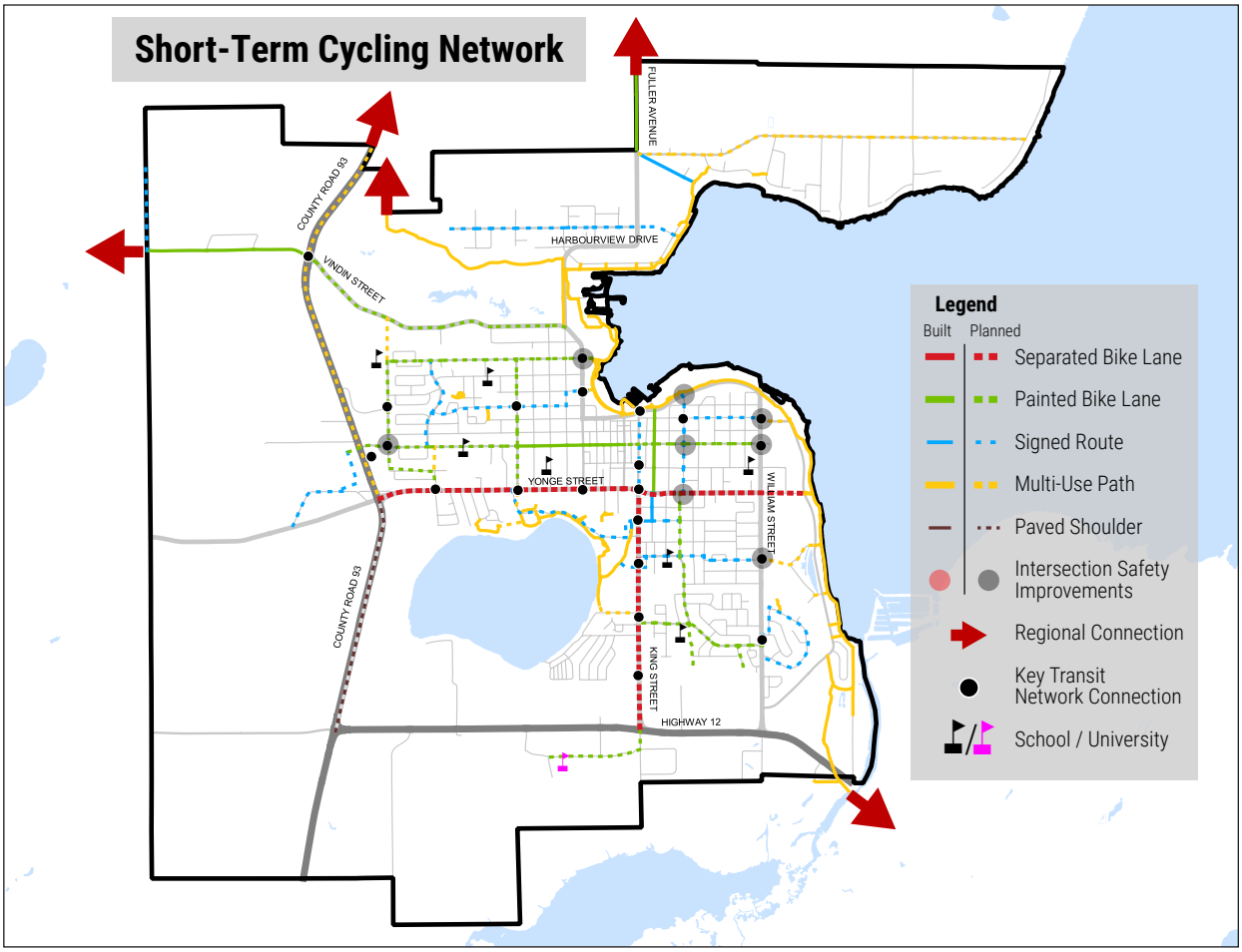


Figure 5.14
Recommended Short-Term Cycling Improvements

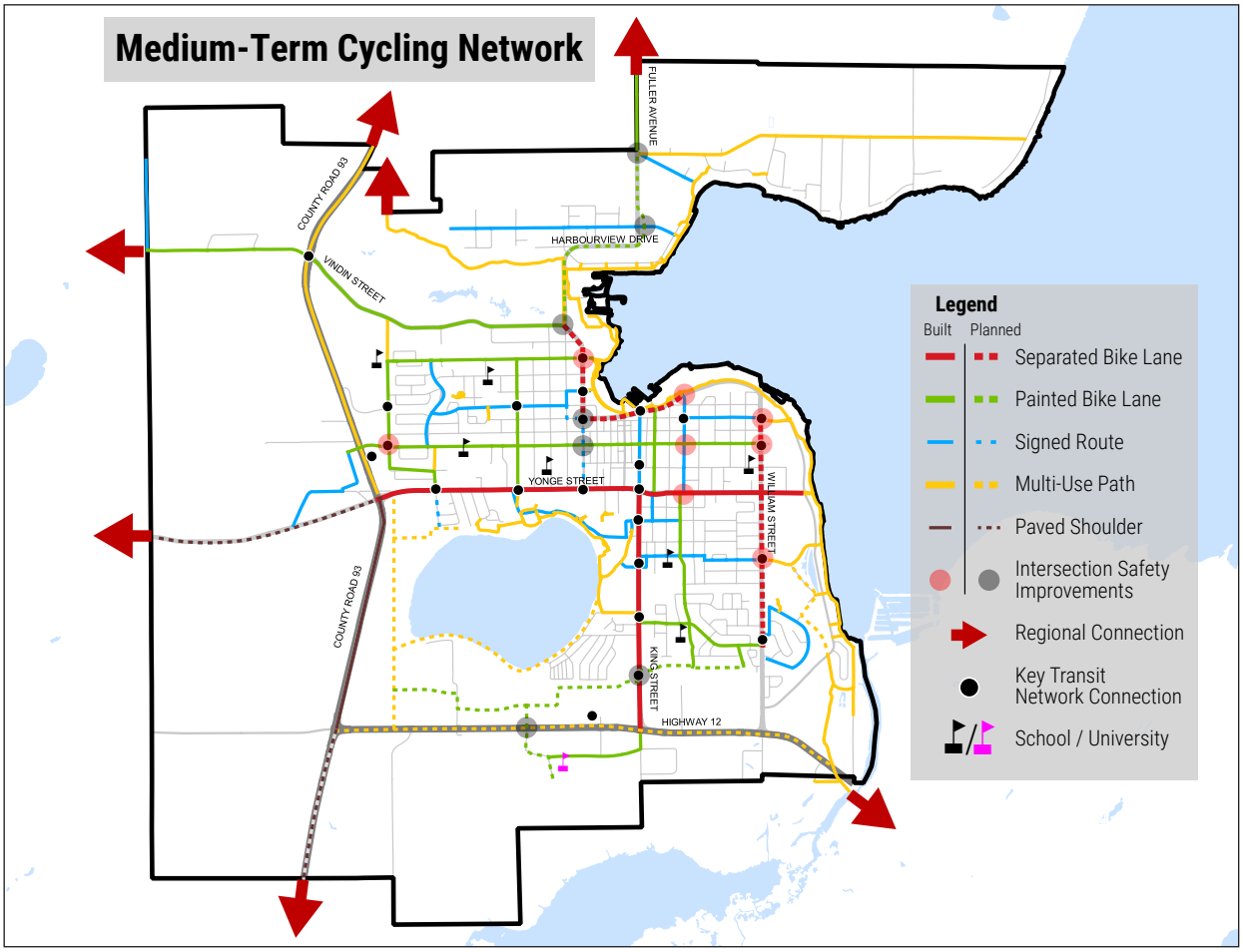


Figure 5.15
Recommended Medium-Term Cycling Improvements

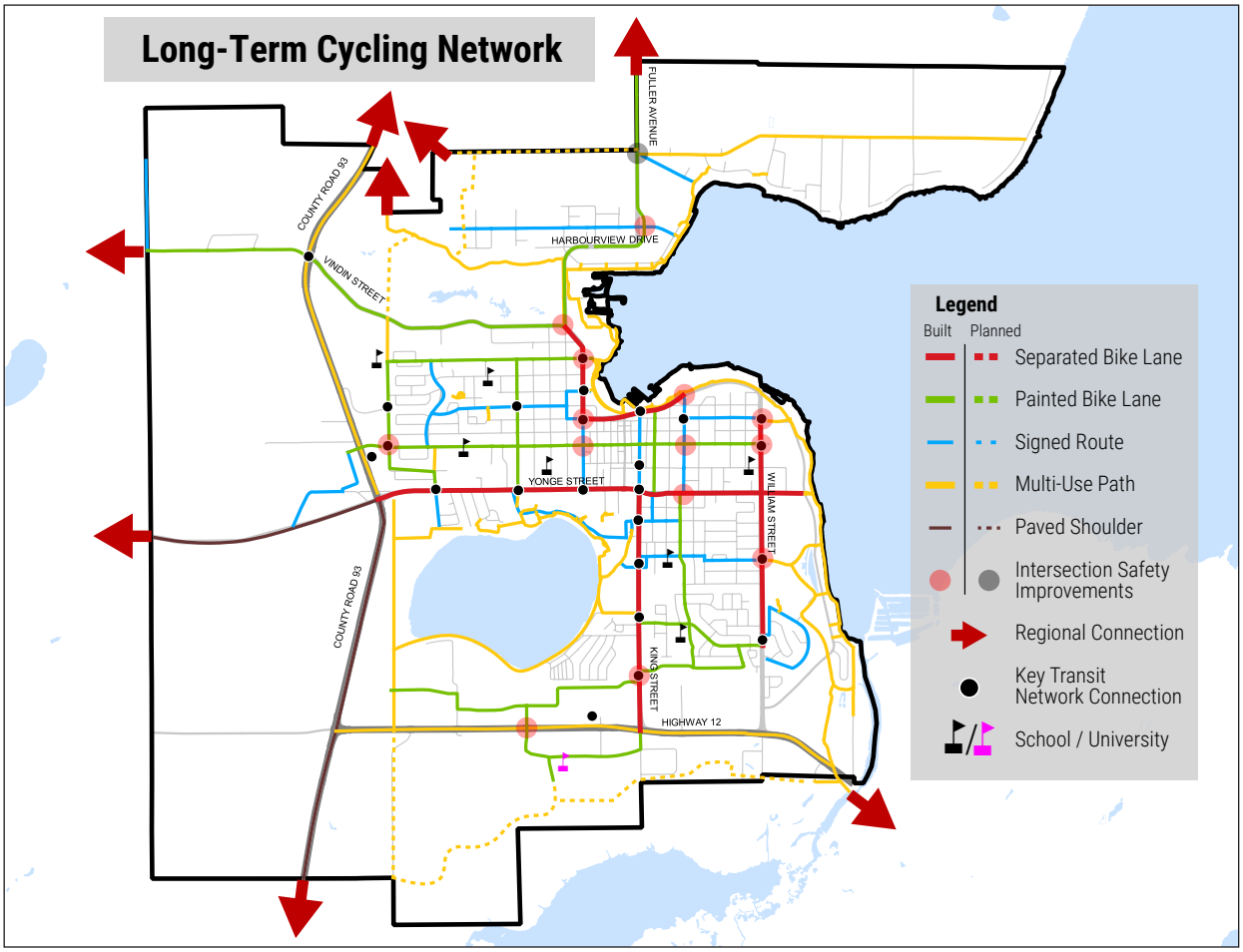


Figure 5.16
Recommended Long-Term Cycling Improvements

Table 5.11 Summary of recommended cycling network changes

Description	Change	Facility	Description	KM	Phasing
Short-Term					
Midland Point Road	Modified	Multi-Use Path	Build a multi-use pathway on one side of the roadway between Fuller Avenue in the west and Lakewood Drive in the east. This can be used by both pedestrians and cyclists.	3.3	Short-Term
King Street	New Recommendation	Signed Route	Add sharrow pavement markings and associated signage in both directions between Bayshore Drive to Yonge street. This work should be coordinated with the planned Downtown streetscape improvements.	0.7	Short-Term
Woodland Drive	New Recommendation	Signed Route	Add sharrow pavement markings and associated signage in both directions between Victoria street and Hugel Avenue.	0.8	Short-Term
Montreal Street	New Recommendation	Signed Route	Add sharrow pavement markings and associated signage in both directions between Woodland Drive and Fourth Street.	1.4	Short-Term
Bay Street	New Recommendation	Signed Route	Add sharrow pavement markings and associated signage in both directions between Manly Street and William street. This work should be coordinated with Project No. 22 - the William Street / Bay Street pedestrian crossover implementation.	0.7	Short-Term
Birchwood Drive	New Recommendation	Signed Route	Add sharrow pavement markings and associated signage in both directions between William Street and Bayview Drive.	1.2	Short-Term
Penetanguishene road	New Recommendation	Painted Bike Lane	Build on-road painted bike lanes on both sides of the road in both directions with appropriate lane markings and signage between Victoria Street and Yonge street. This work should be coordinated with Project No. 15 - the Penetanguishene Road / Hugel Avenue pedestrian crossover implementation.	1.5	Short-Term
Prospect Boulevard	New Recommendation	Painted Bike Lane	Build on-road painted bike lanes on both sides of the road in both directions with appropriate lane markings and signage between Highway 12 and Macdonald Road.	1.0	Short-Term
Pratt Avenue	New Recommendation	Painted Bike Lane	Build on-road painted bike lanes on both sides of the road in both directions with appropriate lane markings and signage between Galloway Boulevard to New Road 2.	0.5	Short-Term
Yonge Street	Upgraded Facility	Separated Bike Lane	Upgrade existing painted bike lanes to separated ones with flex bollards and extend separated bike lanes from King Street to Aberdeen Boulevard.	3.7	Short-Term
King Street	New Recommendation	Separated Bike Lane	Build separated bike lanes in both directions on both sides of the road with associated lane markings and signage between Yonge street and Highway 12.	2.1	Short-Term
New Multi-Use path	New Recommendation	Multi-Use Path	Build a bi-directional multi-use path between Hugel Avenue and Cook Drive. This will provide a key pedestrian/cyclist connection between Georgian Bay District Secondary School and Yonge Street.	0.2	Short-Term
McMurtry Road	New Recommendation	Multi-Use Path	Build a bi-directional multi-use path between the existing Little lake trails and king street on the north side of the road.	0.3	Short-Term
Bay Street	New Recommendation	Multi-Use Path	Build a bi-directional multi-use path between William Street and Aberdeen Boulevard on the north side of the road. This work should be coordinated with Project No. 22 - the Bay Street / William Street pedestrian crossover implementation.	0.2	Short-Term
Penetanguishene Road Multi-Use Path	New Recommendation	Multi-Use Path	Build a bi-directional multi-use path between Vindin Street and Penetanguishene Road directly straight from Penetanguishene Road's existing northern terminus.	0.4	Short-Term

Description	Change	Facility	Description	KM	Phasing
Medium-Term					
Fourth Street	New Recommendation	Signed Route	Add sharrow pavement markings and associated signage in both directions between Bay Street and Yonge Street. This work should be coordinated between Project No. 5 - the Bay Street / Fourth Street signalized intersection implementation, as well as Project No. 16 - the Fourth Street / Hugel Avenue pedestrian crossover implementation.	0.6	Mid-Term
Keller Drive	New Recommendation	Signed Route	Add sharrow pavement markings and associated signage in both directions between Yonge Street and Russ Howard Drive.	1.0	Mid-Term
Fourth Street	New Recommendation	Separated Bike Lane	Build separated bike lanes in both directions on both sides of the road with associated lane markings and signage between Vindin Street and Bay street. This work should be coordinated with Project No. 5 - the Bay Street / Fourth Street signalized intersection implementation, as well as Project No. 7 - the Vindin Street / Harbourview Drive intersection re-alignment.	0.8	Mid-Term
Bay Street	New Recommendation	Separated Bike Lane	Build separated bike lanes in both directions on both sides of the road with associated lane markings and signage between Fourth Street and Manly Street. This work should be coordinated with Project No. 5 - the Bay Street / Fourth Street signalized Intersection Implementation, as well as Project No. 20 - the Manly Street / Bayshore Drive pedestrian crossover implementation.	0.9	Mid-Term
William Street	New Recommendation	Separated Bike Lane	Build separated bike lanes in both directions on both sides of the road with associated lane markings and signage between Bay Street and Galloway Boulevard. This work should be coordinated with Project No. 6 - the William Street Cross-Section change, as well as coordinated with Project No. 22-25 which identify pedestrian crossover improvements along William Street at Bay Street, Hugel Avenue, Scott Street, and Hanly Street.	2.0	Mid-Term
Yonge Street	New Recommendation	Paved shoulder	Add a buffered paved shoulder with associated signage on both sides of the road in both directions between the west town limits and County Road 93.	2.0	Mid-Term
Country Road 93	New Recommendation	Paved shoulder	Add a buffered paved shoulder with associated signage on both sides of the road in both directions between Highway 12 and the south town limits.	2.2	Mid-Term
Highway 12	New Recommendation	Multi-Use Path	Build a bi-directional multi-use path between Country Road 93 and the East city limits on both sides of the road with connections to the existing Midland Rotary Waterfront Trail. Project No. 13 - the Highway 12 / Beamish Road signalized intersection implementation.	4.7	Mid-Term
Taylor Drive Trail	Modified	Multi-Use Path	Build a bi-directional multi-use path off-road between Aberdeen Boulevard and Pillsbury Drive through Quota Park to connect to the existing mid peninsula trail just south of Riverwalk Place.	1.2	Mid-Term
New Multi-Use Path	New Recommendation	Multi-Use Path	Build a bi-directional multi-use path off-road between Taylor Drive and William Street / Scott Street. This work should be coordinated with Project No. 24 - the William Street / Scott Street pedestrian crossover implementation.	0.2	Mid-Term
Long-Term					
Mid-Pen Multi-Use Path Connection	New Recommendation	Multi-Use Path	Build a bi-directional multi-use path off-road between the existing Mid-Pen Link trail and Vindin Street.	1.1	Long-Term
New Multi-Use Path Connection	New Recommendation	Multi-Use Path	Build a bi-directional multi-use path off-road between the existing Mid-Pen Link trail and Brunelle Side Road.	0.9	Long-Term
Brunelle Side Road	New Recommendation	Multi-Use Path	Build a bi-directional multi-use path within the road right-of-way between Murray Road and Fuller Avenue.	2.2	Long-Term

5.2.3 Vehicular Network

The recommended vehicular network comprises a mixture of new roadways, cross-section changes, re-alignments and signal optimizations to primarily accommodate new growth areas and increase capacity on existing corridors. The recommended improvements are summarised in **Table 5.12** and visualized in **Figures 5.17**, **5.20**, and **5.25** by recommended horizon year implementation. A detailed line-by-line summary of each individual improvement along with their associated costs are provided in **Appendix B** of this MTMP document. It is noted that although the following are recommended improvements, several would require additional analysis through an Environmental Assessment prior to being implemented. This would allow for further consultation and input into the final design prior to construction.

Short-Term

In the short-term several previously planned improvements are needed to accommodate growth to and from Penetanguishene as well as growth along the Waterfront to enhance the Downtown core and attract new investment.

(1) County Road 93 / Vindin Street Intersection:

Simcoe County has planned to convert the existing signalized intersection of County Road 93 / Vindin Street to a roundabout within the short-term as per the recommendation of the County Road 93 Municipal Class EA report completed in 2018. This is anticipated to enhance safety along the corridor as well as facilitate east-west movement between Golf Links Road/Vindin Street to/from Midland.

(2) William Street / Bayshore Drive Re-alignment:

The intersection of William Street and Bayshore Drive is located on a horizontal curve with a centre radius of approximately 85 metres. In accordance with the posted speed of 50 km/h (and hence a design speed of 60 km/h - posted speed + 10 km/h), the minimum radius as per the MTO design guidelines is 130 metres. During stakeholder engagement this area was identified as an area of concern for vehicular, pedestrian, and cyclist safety.

In addition to the deficient horizontal alignment, there are also 2 intersections located along the curve - Frank Street and a residential access road. Given the location of the Frank Street intersection on the inside of the curve, and the limited sight lines to/from the south that result, the following movements are not permitted: northbound left turns from William Street to Frank Street (restricted by intersection geometry); and eastbound left turns from Frank Street to William Street (restricted by signage).

Previous Recommendation: The 2012 TMP recommended increasing the horizontal alignment through the William Street intersection with Bayshore Drive to 130 metres and re-align the approach of Frank Street to improve the intersection approach, geometry and sightlines. This recommendation, however, would have required the Town of Midland to acquire additional properties to construct the recommended solution.

Updated Recommendation: A review of the recommended solution identified an opportunity to re-align the Bayshore Drive/ William Street curve while mitigating the amount of land needed

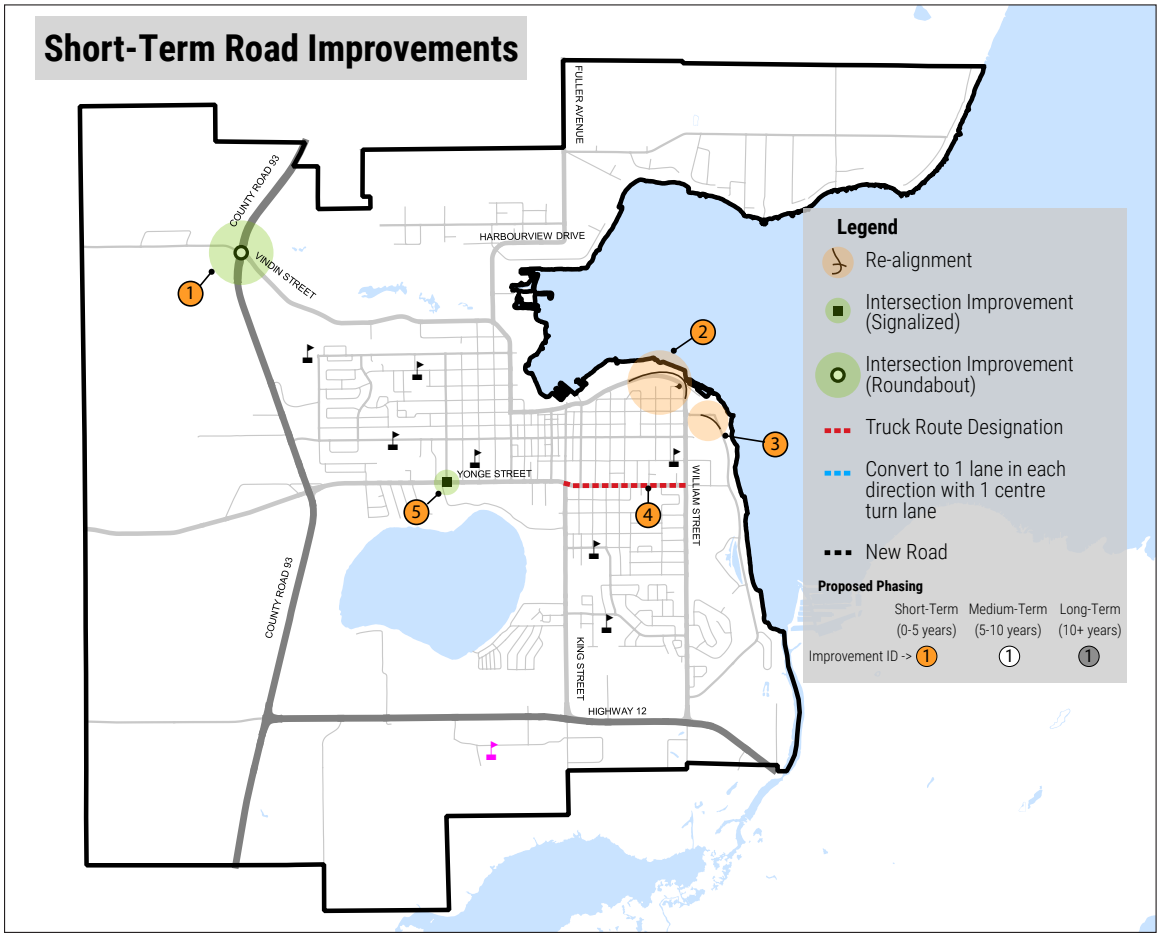


Figure 5.17
Recommended Short-Term Roadway Improvements and phasing

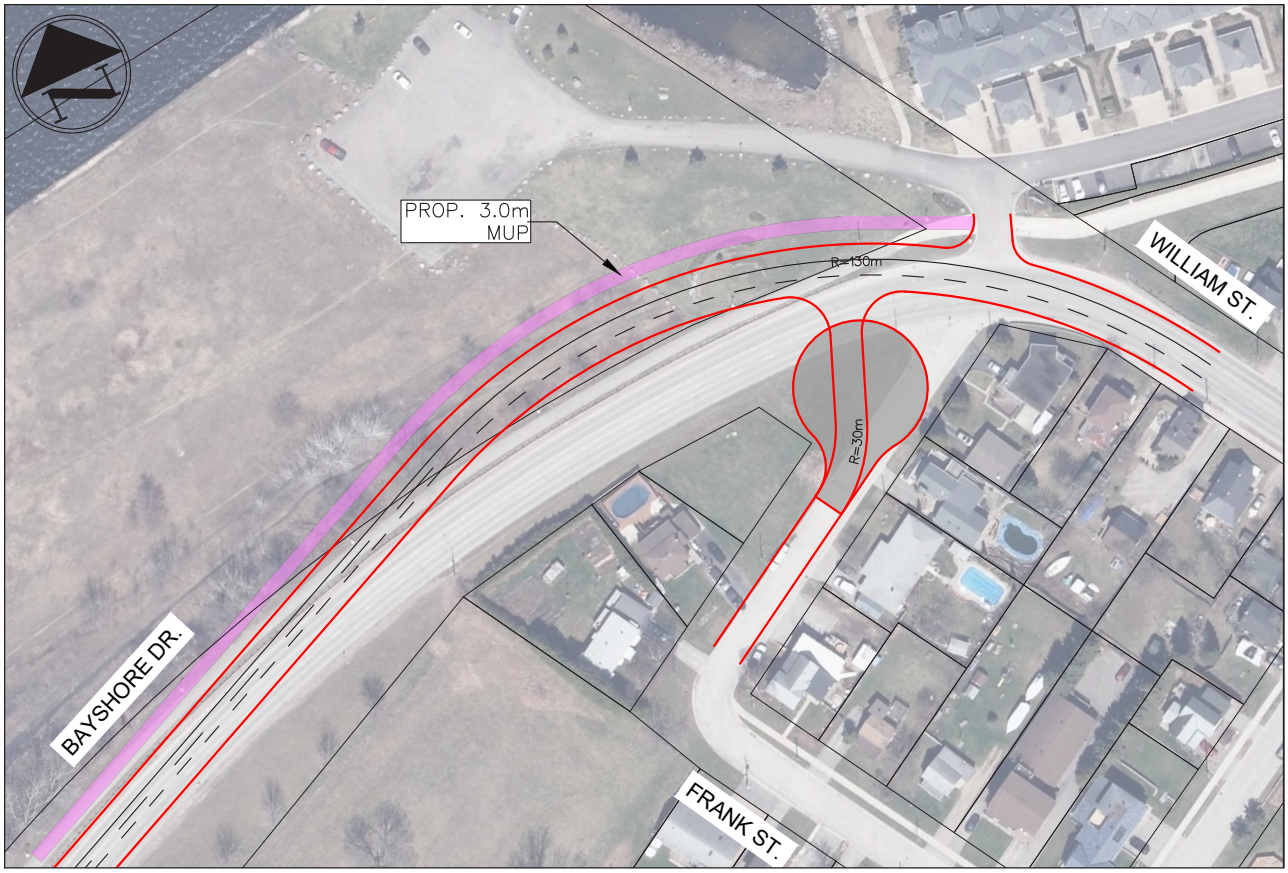


Figure 5.18
Conceptual design of the recommended re-alignment at William Street / Bayshore Drive

to be expropriated if access to Frank Street were closed by converting it to a cul-de-sac. This solution would eliminate the existing dangerous right-in/right-out access with Frank Street while improving roadway sightlines and allow for the construction of a wider sidewalk through the area on both sides of the street as shown in the conceptual design in **Figure 5.18**. There is currently a narrow sidewalk on the west side of William Street that ends at Frank Street that was identified in the PIC as a dangerous area for pedestrians. It is anticipated that the closure of Frank Street will have minor impacts on the vehicular network whereby existing vehicles using the right-in/right-out will be re-distributed to Gloucester Street with minor impacts to operations.

(3) Bay Street, Aberdeen Boulevard & TRW Access Re-alignment:

The intersection of Bay Street and Aberdeen Boulevard is configured as a T-intersection, with an angle of approach of approximately 115°. Immediately opposite Bay Street to the east, is the TRW Canada Plant access, which forms the east leg of the intersection. Northbound vehicles on Aberdeen Boulevard are subject to a stop condition whereas eastbound vehicles on Bay Street can proceed through the intersection without stopping and turn south on Aberdeen Boulevard or continue easterly into the TRW plant.

Vehicles exiting the TRW facility are also subject to stop control (albeit the stop control is on private property and hence not enforceable under the Highway Traffic Act).

Without the stop control on Aberdeen Boulevard, there would be obvious conflicts between the northbound left and eastbound through moves, given the current configuration. There is also a 4.5 metre concrete trail/sidewalk which stops at the TRW access and continues beyond it as a standard sidewalk along the east side of Aberdeen Boulevard. In consideration of the crossing geometry, the trail is stop controlled in the southbound direction and several bollards are placed on the trail to ensure trail users (particularly cyclists) slow and/or dismount before crossing the TRW access. Under the current configuration, road users have priority over the sidewalk/trail users.

Previous Recommendation: The 2012 TMP recommended to re-align the corner of Bay Street and Aberdeen Boulevard and reconfigure the TRW access as a standard driveway (with drop curb and sidewalk/trail crossing) to differentiate the road from the access and provide the right-of-way to road traffic.

Updated Recommendation: Based on forecasted volumes, it is anticipated that this re-alignment would work favourably for future vehicular operations. However, the re-alignment of the intersection will present dangerous conditions for pedestrians crossing at the curb where the existing stop-control and pedestrian crossing opportunity exists today. As a result, additional considerations for pedestrian and cyclist movement through the area are recommended including:

- The addition of a multi-use path on the north side of

Bay Street to directly connect with the existing multi-use trail that runs parallel to Aberdeen Boulevard;
- Shrubbery and other landscaping at the curve to discourage pedestrians from crossing; and
- A pedestrian crosswalk on Aberdeen Boulevard south of the curve where sightlines permit.

It is also recommended that the TRW access be reconfigured, as per the 2012 TMP, to a proper driveway access by reducing the access width, constructing a drop-curb at Aberdeen Boulevard and extend the concrete sidewalk/trail through the access. This will both improve active transportation sightlines at the access as well as discourage commercial vehicles from entering the site off of Aberdeen Boulevard due through the design so as to encourage commercial vehicles to access the site via William Street and Bay Street. A conceptual design of the preferred solution is shown in **Figure 5.19**.

(4) Yonge Street Truck Route Designation (King Street to William Street:

The efficient movement of goods and services, which is an important element of an economically viable region, is an objective of the Town of Midland. The existing truck routes funnel commercial vehicle traffic along First Street between Yonge Street and Bayshore Drive. As a result, during the MTMP Public Information Centre residents raised concerns about pedestrian and cyclist safety on First Street as a result of commercial vehicles.

Previous Recommendation: The 2012 TMP recommended that the Town of Midland consider designating Yonge Street, between King Street and William Street, as a truck route to provide connectivity between existing truck routes and complete the 'grid system' otherwise employed.

Updated Recommendation: An evaluation of the existing truck route network came to similar conclusions as the 2012 TMP. Potential alternative parallel routes have undesirable geometric conditions for commercial vehicle movement, as well as additional impacts to residential neighbourhoods. The designation of Yonge Street between King Street and William Street would re-distribute a portion of trucks away from First Street. Yonge Street is already classified as an Arterial road and thus is intended to serve all traffic volumes and vehicle types. Designating Yonge Street, between King Street and William Street, as a truck route should be accompanied with additional pedestrian, and cyclist safety enhancements on both First Street and Yonge Street to mitigate commercial vehicle conflicts with vulnerable road users. These improvements are detailed under the pedestrian and cyclist improvements in Section 5.2.1 and 5.2.2 and include:

- Signalized Pedestrian Crosswalk at First Street / Elizabeth Street;
- Signalized Pedestrian/Cyclist crossing at Midland Avenue / Yonge Street; and
- Signalized Pedestrian/Cyclist crossing at Queen Street / Yonge Street

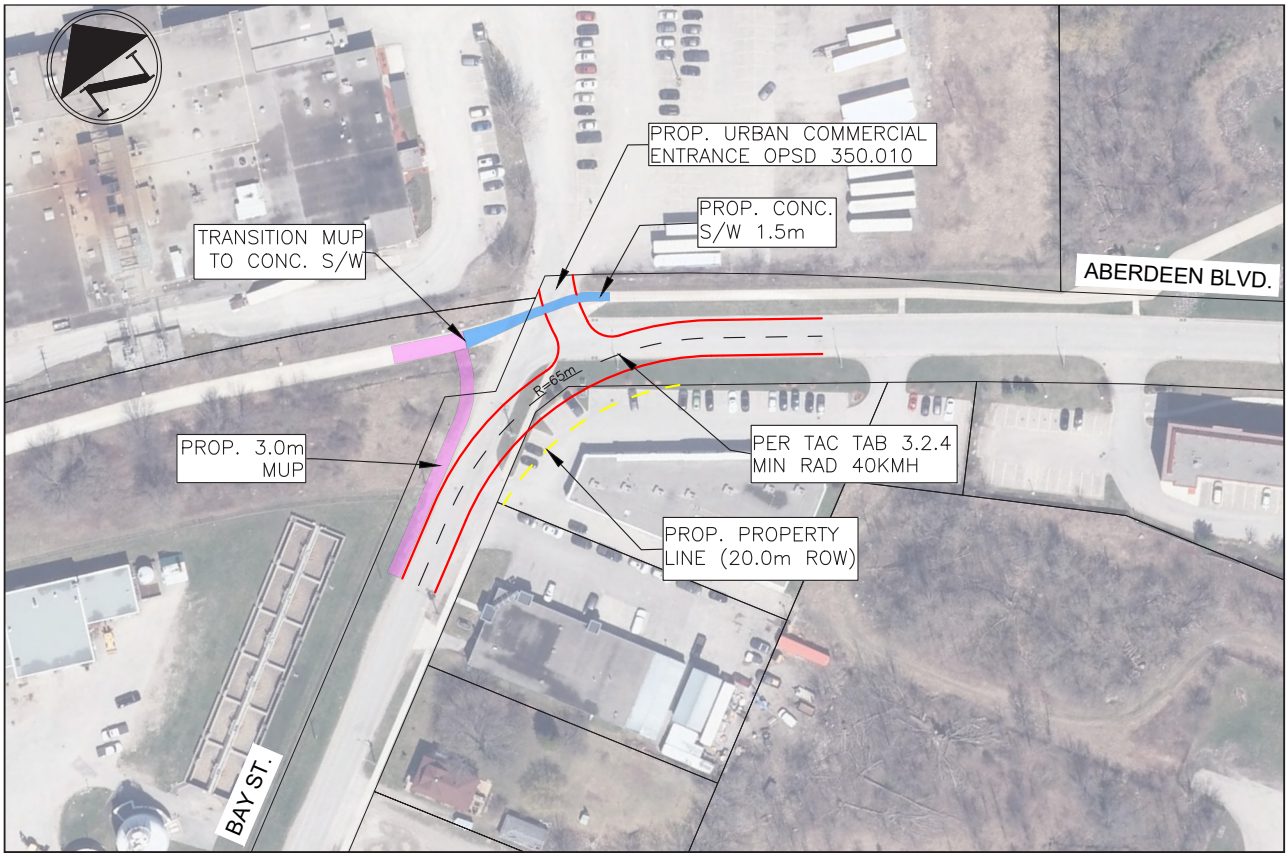


Figure 5.19 Conceptual design of the recommended re-alignment at Bay Street, Aberdeen Boulevard & TRW Access

(5) Yonge Street & Eighth Street Intersection:

The intersection of Yonge Street and Eighth Street is a signal controlled T-intersection, with no municipal road access on the south leg. The north leg (Eighth Street) has a lane for right and left-turns, whereas both the west and east legs (Yonge Street) have one lane per direction with centre turning lane. The Arch Restaurant is located on the south side of the intersection and has frontage through the intersection to approximately 20 metres east of the intersection. Across the frontage, there is a drop curb and 5 perpendicular parking spaces along the building (access to the parking spaces is direct off Yonge Street). The west access to the restaurant is located within the intersection, which requires motorists to travel through the crosswalk on Yonge Street to access/egress the restaurant parking area.

Additional public comments received highlighted operational concerns with vehicle queues onto Eighth and Yonge Streets during peak hours causing driver frustration and several cases of drivers cutting through adjacent properties to avoid the intersection has been noted.

Previous Recommendation: The 2012 TMP recommended that the restaurant parking across the front of the site be eliminated to mitigate conflicts between pedestrians and vehicles resulting in the loss of 5 spaces. Additionally, it was also recommended that the west access be closed. The report also provided optional re-alignment solutions for the intersection so that Little Lake Road directly connected to the intersection while also providing a secondary access to the restaurant site.

Updated Recommendation: This MTMP maintains the recommendation to eliminate the restaurant parking across the front of the site as well as the closure of the west access. It is not recommended that the intersection be re-aligned due to the potential vehicular re-distribution that could result in a significant number of vehicles being added to Little Lake Road as a shortcut to get to King Street.

Additionally, to address queueing concerns, it is recommended that an advanced eastbound left-turning phase be added to the signal phasing, as well as delaying the west pedestrian crossing to allow for higher southbound right-turn throughput. This will alleviate queueing upstream on Eighth Street and mitigate impacts to residential properties.

Medium-Term

Medium-Term improvements revolve around roadway capacity in south Midland, as shown in **Figure 5.20**,, particularly with regards to new roadways to service growth lands parallel to Highway 12 to mitigate impacts to provincial roadway operations and accommodate growth. Similarly, intersection re-alignments at Fourth Street / Vindin Street, and at Fuller Avenue / Harbourview Drive will streamline a key external north-south connection to Penetanguishene and the correctional facility (which is one of the major employers in the area) and improve roadway safety by improving sightlines and curves for motorists, as well as including active transportation enhancements.

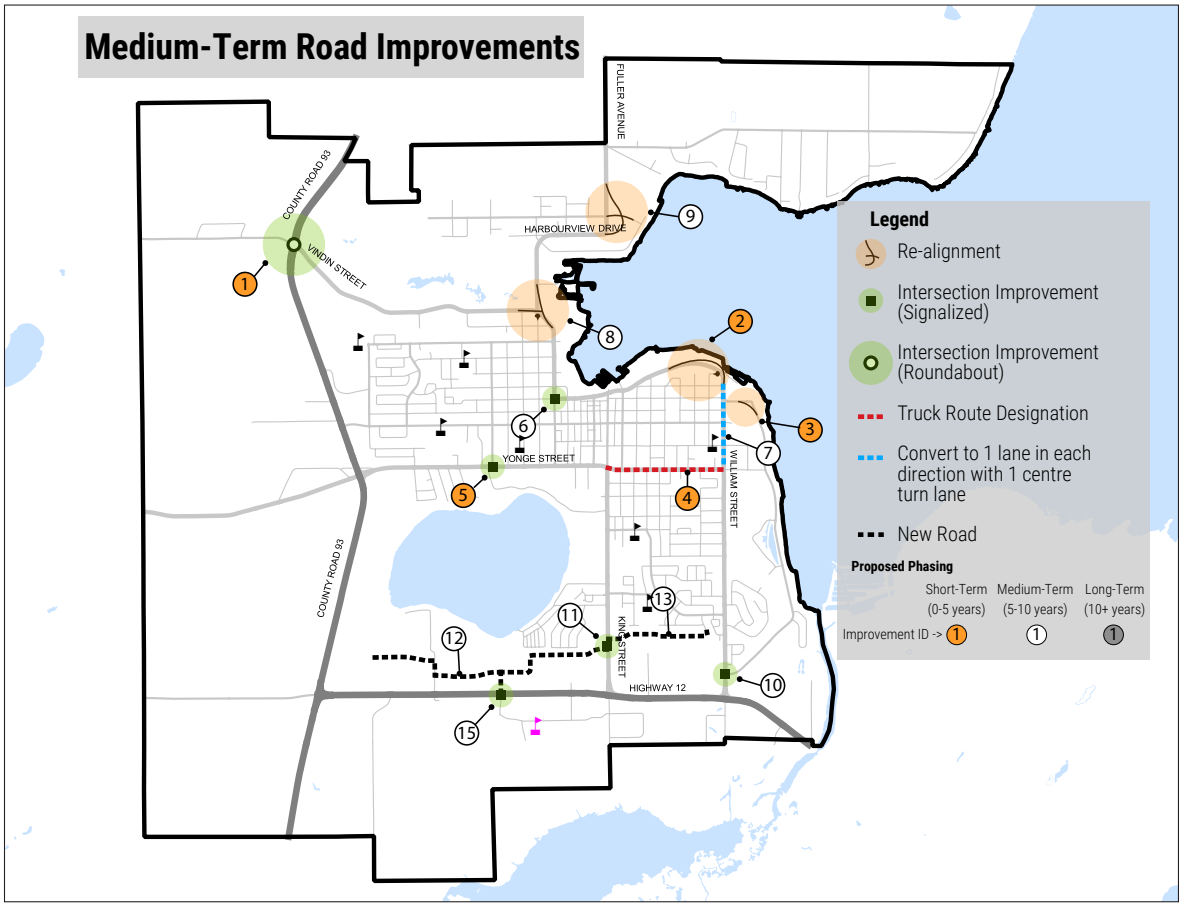


Figure 5.20
Recommended Medium-Term Roadway Improvements and phasing

(6) Fourth Street / Bay Street Intersection:

While macro-level capacity analysis revealed that the intersection of Fourth Street and Bay Street is forecasted to have adequate capacity as a whole, more detailed micro-analysis of the intersection revealed that currently the westbound left/through and eastbound left-through-right movements already operate poorly resulting in up to 60 seconds of delay during the AM and PM Peak Hours. Despite this, the dominant volume movements of the westbound right-turn, and the southbound left-turn both operate well. With 2041 horizon year volume projections it is anticipated that dominant movements at this intersection are anticipated to continue to operate at good levels of service, although the westbound through-left and eastbound left-through-right movements are anticipated to further deteriorate. This is largely in part due to the significant volume of southbound left turn movements, which operate under free-flow control, and the lack of gaps in the traffic stream to accommodate the eastbound movement.

Previous Recommendation: The 2012 TMP recommended gradually upgrading the intersection including the implementation of a traffic signal control in the short-term, followed by the inclusion of auxiliary left-turn lanes at the southbound and northbound approaches in the medium-term. The long-term recommendation included re-aligning the intersection to configure the southbound to eastbound and westbound to northbound as the primary movements, maintaining signal control.

Updated Recommendation: Micro-analysis of the intersection with projected 2041 horizon year traffic volumes identifies that the intersection will operate at acceptable levels of service with the implementation of a signalized intersection and auxiliary southbound and northbound left-turn lanes. Although re-aligning the intersection will enhance vehicular operations, it is a much costlier solution requiring significant amounts of land acquisition that also presents a less permeable pedestrian and cyclist network for moving east-west between the residential neighbourhoods to the west and the downtown in the east. Furthermore, a re-alignment is anticipated to only offer minor improvements to intersection operations over upgrading the existing intersection. This should be coupled with traffic calming improvements to Fourth Street south of Bay Street to discourage speeding and traffic re-distribution.

While the previous improvements considered the needs of vehicular operations, this MTMP recommends the inclusion of separated bike lanes along Fourth Street and along Bay Street which were not considered in the 2012 TMP. As a result, the signalized intersection design should provide for separated bike facilities including a left turn box for southbound left-turning cyclists. Due to added complexity of active transportation facilities it is recommended that improvements to the intersection be done once within the 5 to 10-year horizon instead of the gradual implementation of signalization and auxiliary turn lanes that was previously recommended in the 2012 TMP. A conceptual design of the recommended solution is shown in **Figure 5.21**.

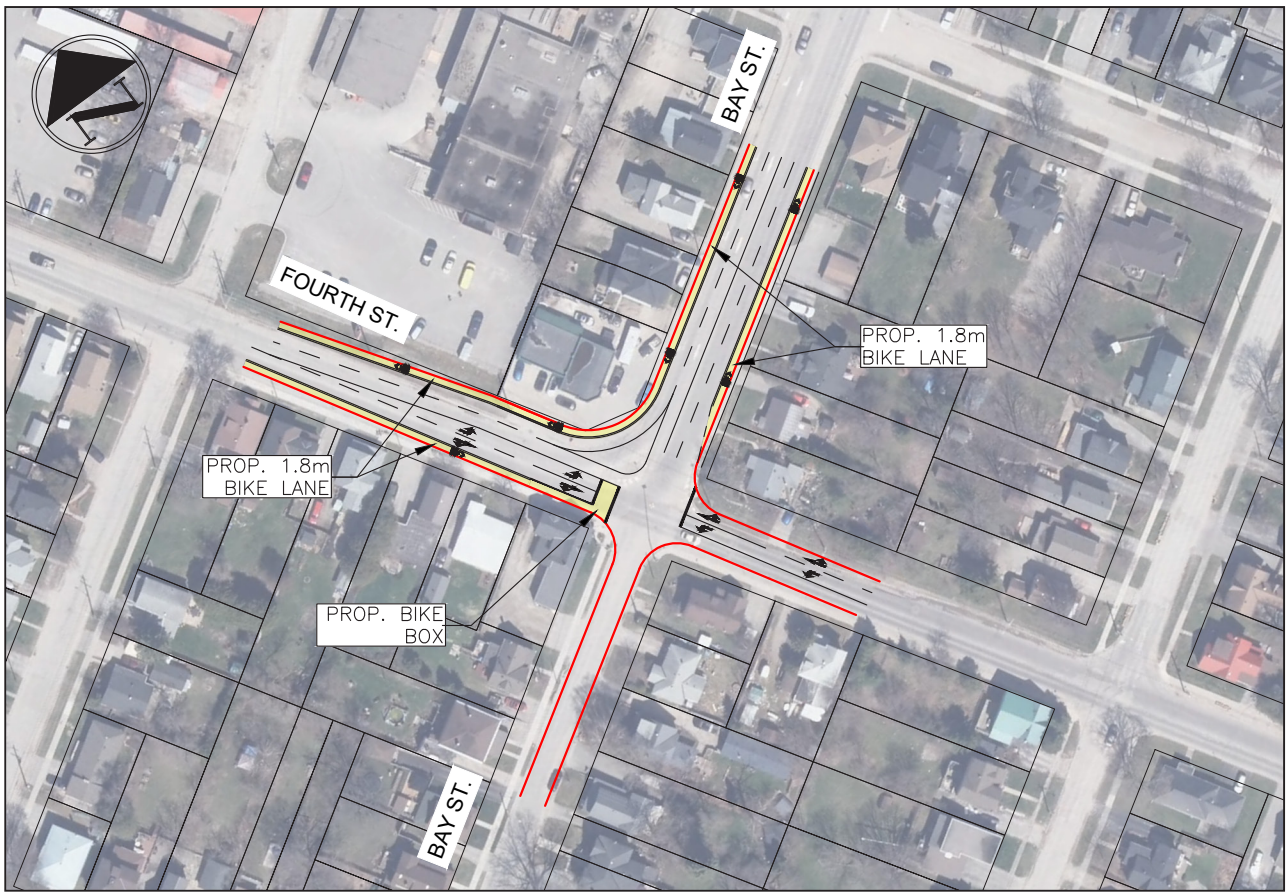


Figure 5.21 Conceptual design of the recommended signalized intersection layout at Bay Street / Fourth Street with auxiliary turn lanes and cycling facilities

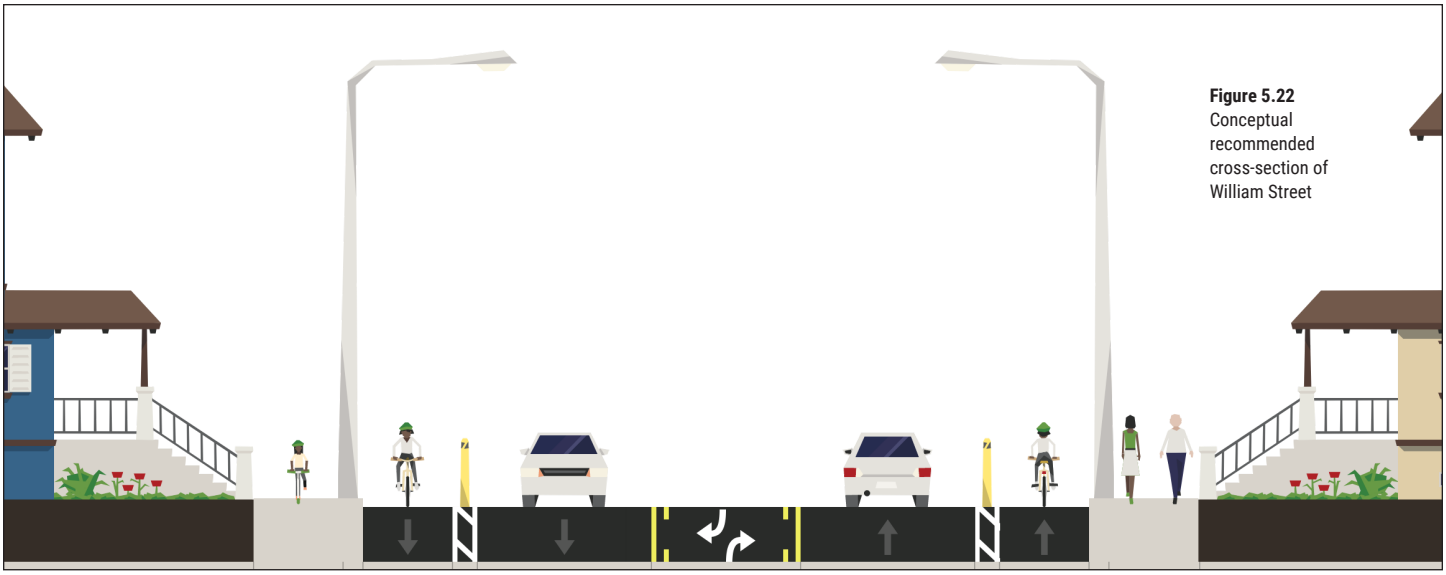


Figure 5.22
Conceptual recommended cross-section of William Street

(7) William Street Cross-Section Changes:

William Street, which extends from Bayshore Drive to Highway 12 has varying lane configurations throughout the corridor switching between 2 southbound lanes + 1 northbound lane, and 1 southbound lane + 1 northbound lane.

The corridor is unique in the sense that it has significant uphill/downhill grades between 3-4% between Yonge Street to Highway 12. Historically, the addition of a second vehicular lane was added to assist commercial vehicles in climbing these uphill grades. As per MTO standards, a truck climbing lane should be provided if all of the following criteria are satisfied:

1. the prevailing uphill section (combination of grade and length) results in a 15 km/h or greater reduction in speed for a typical heavy truck;

2. the upgrade traffic flow is greater than 200 vph; and

3. the upgrade truck flow is greater than 20 vph.

Based on published truck operating speed charts and following observations of actual truck operations through the uphill grades, speed reductions of 15 km/h or greater are expected. Existing peak hour traffic volumes on this corridor are between 300 and 500 vehicles per hour in the peak direction of which up to 40 are trucks. This is anticipated to increase to approximately 740 to 1,100 vehicles per hour by the 2041 horizon year with truck volumes of up to 63 vph.

Previous Recommendation: Convert the existing lane configuration on William Street to provide for one travel lane per direction (3.5 metres) in addition to a continuous centre turn lane (4.0 to 5.0 metres) from Bayshore Drive to Highway 12 as shown in **Figure 5.22**. Maintain a southbound truck lane from Yonge Street to mid-way between Hanly Street and Chain Gate Drive (in lieu of the centre turn lane) should truck volumes warrant. At the time of the 2012 TMP it was projected that truck volumes would not trigger the need for maintaining a southbound truck lane.

Updated Recommendation: Based on updated truck forecasts that project over 60 trucks in the peak hour / peak direction by 2041 along William Street it is recommended that William Street be converted to a three-lane cross-section between just north of Frank Street and Yonge Street. This will include a two-way centre turning lane with one lane in each direction.

South of Yonge Street the existing cross-section of two southbound lanes and one northbound lane should be maintained mid-way between Hanly Street and Chain Gate Drive.

South of Chain Gate Drive to south of Coral Springs Lane convert William Street to a three-lane cross-section including a centre two-way left-turn and one lane in each direction. South of Pillsbury Drive maintain the existing cross-section.

This work should be coordinated with pedestrian and cycling improvements recommended for the corridor including the inclusion of protected bike lanes in each direction between Bay Street in the north and Galloway Boulevard in the south, as well as a pedestrian sidewalk on the west side of William Street between Jeanne Street in the north and Galloway Boulevard in the south, as well as the extension of the existing sidewalk on the east side of William Street from Southwinds Crescent in the north to Highway 12 in the south.

(8) Harbourview Drive / Vindin Street Re-alignment:

The current intersection of Harbourview Drive and Vindin Street has poor sightlines due the angled approach at which the east leg of the intersection meets Harbourview Drive. While at a macro-level of analysis the intersection operates within capacity, micro-analysis of the existing conditions identify that the southbound left-turn

movement is constrained and approaches capacity during the weekday peak hours.

Previous Recommendation:

The 2012 TMP recommended the following:

- Convert the existing shared westbound left-through lane to an exclusive left-turn lane;
- Provide and exclusive eastbound left-turn lane;
- Construct a 2nd northbound receiving lane on Harbourview Drive to allow the westbound right-turn movement to operate exclusive of the signal.

Beyond these improvements further long-term recommendations included:

- Implement eastbound and westbound left-turn lanes and provide an additional northbound receiving lane on Harbourview Drive to receive the existing right-turn channelized lane; and
- Consider re-aligning the intersection to better accommodate the primary travel directions - westbound to northbound and southbound to eastbound, maintaining signal control. In conjunction with this, create a cul-de-sac at the end of Fifth Street to restrict access to the intersection.

Updated Recommendation: It is recommended that the intersection be re-aligned so that it forms a three-way T-intersection with a north-south dominant direction, along with protected cycling facilities on Vindin Street and Harbourview Drive with bicycle turning boxes to facilitate northbound and eastbound left-turns as shown in **Figure 5.23**. The intersection should include auxiliary northbound and eastbound left-turn lanes. The re-aligned intersection would result in Fifth Street being converted into a cul-de-sac with a big enough radius to allow municipal service vehicles to continue to efficiently and safely service it.

Before implementing this improvement, it is recommended that further operational analysis be conducted to identify potential impacts on upstream and downstream intersections due to the re-distribution of vehicles currently going north-south from Fifth Street.

It is not anticipated that projected 2041 peak hour vehicular operations will be the trigger for the complete re-alignment of the intersection, rather it is triggered by a combination of anticipated of volumes in conjunction with the unsafe angles and sightlines at the intersection. Given the angle at which Vindin Street approaches the east approach, there are several safety concerns with the layout of the existing intersection. Currently, less than 60 vehicles go north-south to/from Fifth Street in the peak hours with little additional growth projected by 2041. Conversely, it is anticipated that traffic at all other approaches are anticipated to grow between 200-300 vehicles in the peak hour. The re-alignment will enhance operations for the dominant direction movements, while also creating an easier curve for commercial vehicles to navigate along Vindin Street between the north and west approach of the intersection. Furthermore, the re-aligned intersection will allow eastbound right-turning vehicles to

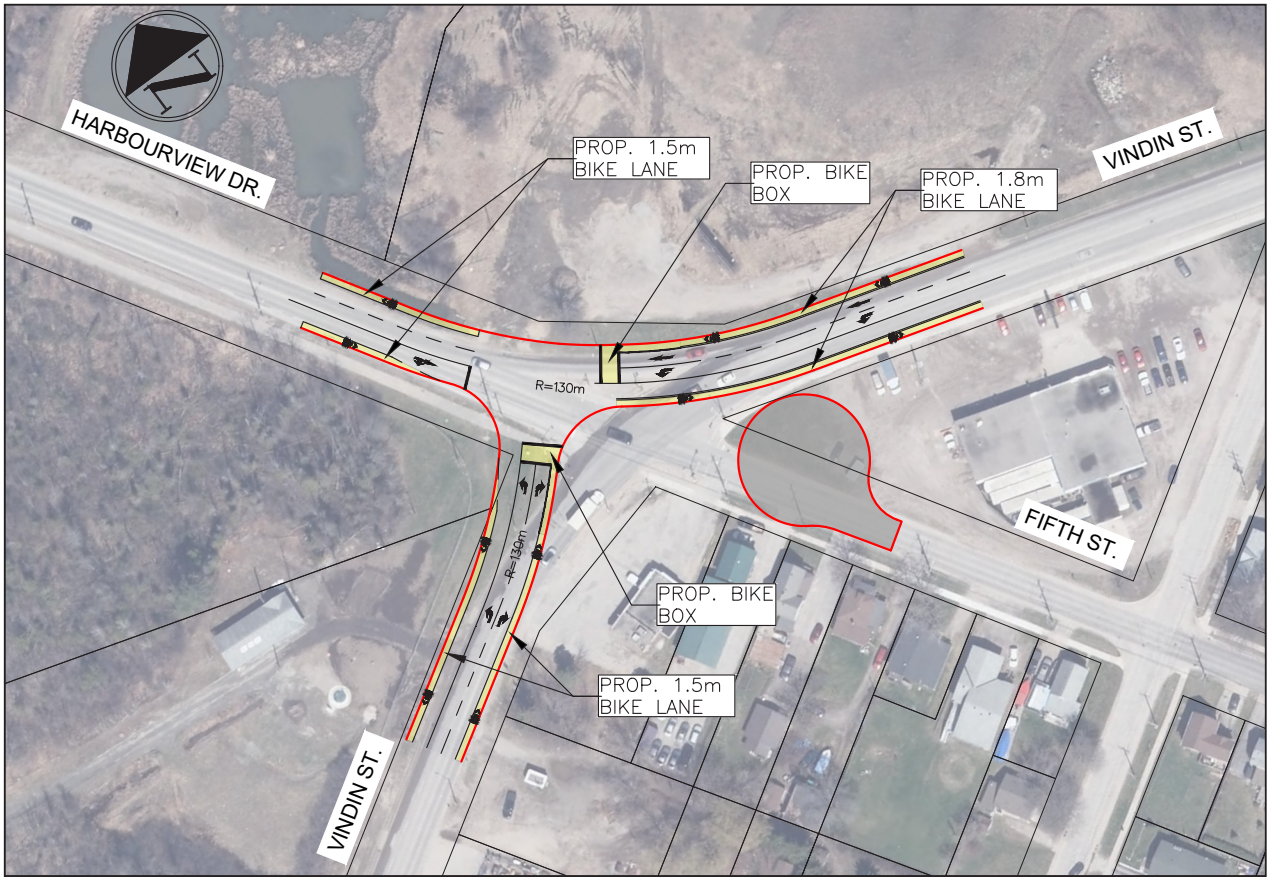


Figure 5.23
Conceptual design of the recommended re-alignment of the Vindin Street / Harbourview Drive intersection with cycling facilities

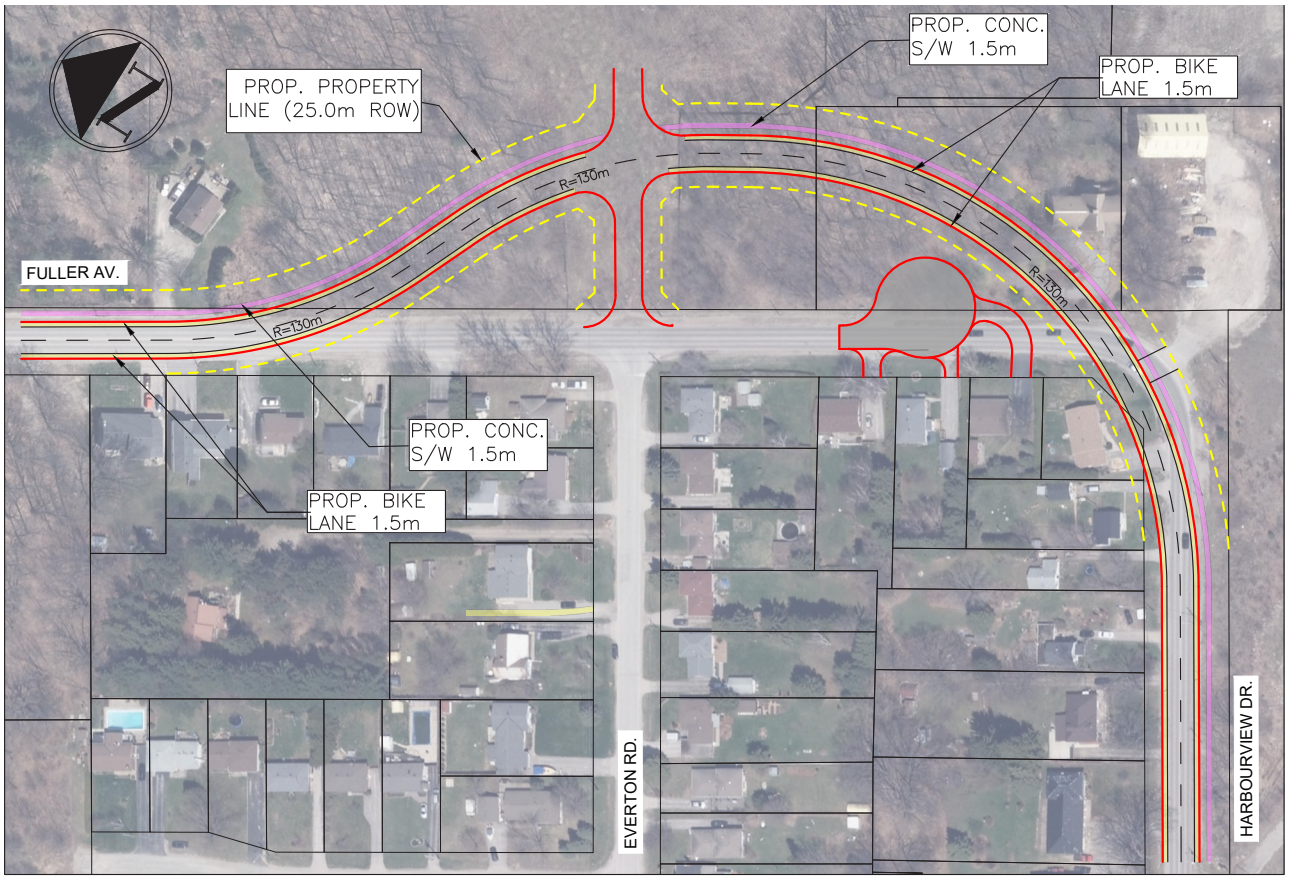


Figure 5.24
Conceptual design of the recommended re-alignment of the Fuller Street / Harbourview Drive curve with cycling facilities

make a right-turn during red-lights to proceed through to Vindin Street / Fourth Street compared to the existing layout which currently precludes this movement to Fifth Street and through the residential neighbourhood.

The re-alignment will further enhance safety by creating clearer sightlines and angles for vehicles making eastbound left-turns. Given this MTMP's recommendation to include bike lanes along Harbourview Drive, Vindin Street and Fourth Street, the existing intersection would not only continue to present a danger to motorists, but pedestrians and cyclists as well.

(9) Fuller Avenue / Harbourview Drive Re-alignment:

The curve at Fuller Avenue and Harbourview Drive was addressed in the Sunnyside Drive / Harbourview Drive / Fuller Avenue Corridor Environmental Assessment Project File and recommendation provided for its realignment. The realignment introduces a greater horizontal radius through the curve and realigns the approach of Fuller Avenue to facilitate such and improve the overall vertical alignment along Fuller Avenue. The existing section of Fuller Avenue will remain to serve the existing residences along it - possible end treatments are shown (hammerhead to the north and cul-de-sac to the south), which are to be confirmed. This improvement was approved, subject to design and implementation.

Following the completion of the initial Sunnyside Drive / Harbourview Drive / Fuller Avenue Corridor Environmental Assessment Project File, the Drummond Wall was designated as a Midland Heritage Site under the Ontario Heritage Act. The Class EA realignment would result in impacts to approximately 75 metres of the wall.

In consideration of the Drummond Wall impacts and the comments received at the Public Information Centre in support of such, an alternative road alignment was developed whereby the road would be shifted to avoid the south end of the wall. This alternative alignment is illustrated in **Figure 5.24**. The realignment has the following implications:

- the angle of intersection at Everton Road is not ideal at 77° (90° is preferred);
- The intersection is located on a curve (intersections on tangents are preferred to improve sightlines); and
- Changes would be required to the approved Midland Bay Estates plan of subdivision to accommodate the shift in the alignment.

Previous Recommendation: The 2012 TMP recommended realigning Harbourview Drive and Fuller Avenue through the existing 90° curve to improve traffic operations and safety, as well as improve the vertical alignment of Fuller Avenue north of Harbourview Drive to improve traffic operations and safety. Additionally, it was recommended to consider modifications to the road improvement designs as developed in the Sunnyside Drive / Harbourview Drive / Fuller Avenue Corridor Environmental Assessment to avoid impacts to the Drummond Wall given its heritage status.

Updated Recommendation: Maintain the previous recommendation from the 2012 TMP with modifications

to include dedicated bike lanes in both directions on both sides of the re-aligned roadway on Fuller Avenue and Harbourview Drive. This is to align with the proposed cycling improvements identified in this MTMP in Section 5.2.2.

(10) William Street / Pillsbury Drive Intersection:

The Pillsbury Drive-Aberdeen Boulevard combination only has three vehicular access points to the broader road network through the William Street / Bay Street intersection, the William Street / Yonge Street intersection, and the William Street / Pillsbury Drive intersection.

The William Street / Pillsbury Drive intersection provides the main connection between the future buildout of the Tiffin by the Bay development and Highway 12 / County Road 93. Future travel demand projections identified an increase in travel demand to/from external areas beyond Midland's borders that are anticipated to add additional vehicular volumes at this intersection.

Previous Recommendation: The 2012 TMP recommended implementing traffic signal control inclusive of the re-alignment of the commercial access opposite Pillsbury Drive as well as northbound, southbound, and westbound left-turn lanes. A northbound right-turn lane was also identified.

Updated Recommendation: Maintain recommendations outlined in the 2012 TMP and implement the signalized intersection as development occurs. This should be further determined based on site applications and traffic impacts studies in the area. Additional considerations for the inclusion of a pedestrian sidewalk on the east side of William Street should be included in the design to conform with pedestrian network improvement recommendations outlined in this MTMP in Section 5.2.1. For planning purposes, it is assumed that development triggers for this intersection will occur within the 5 to 10-year horizon.

(11) King Street / New Road 1 Intersection:

The Hanson development which is located on the north side of Highway 12, immediately adjacent to and behind the Smart Centre commercial development is expected to be built with a roadway intersecting King Street approximately 425 metres north of Highway 12. For our purposes this road will be defined as New Road 1.

The traffic impact study for the Hanson development identified the need for a traffic signal at King Street / New Road 1.

Currently, the stretch of King Street between Galloway Drive and Highway 12 has no protected crossing facilities for pedestrians. This represents a distance of nearly one Km whereby pedestrians have been found to often run across traffic to access restaurants and other services because there is no other reasonable alternative for crossing King Street.

Stakeholder engagement and public consultation identified this area as a safety concern citing several high school students from St. Theresa crossing the street to access restaurants for lunch.

Previous Recommendation: Implement a new intersection to serve the Hanson Development and consider traffic signal control as warranted.

Updated Recommendation: Maintain the 2012 TMP recommendation for the implementation of a new intersection to serve the Hanson Development and consider traffic signal control as warranted. It is recommended that even if traffic signals are not warranted, some form of pedestrian crossing should be included here. Designs should also provide for the inclusion of separated bike lanes in both directions along King Street to conform with the cycling network recommendations made within this MTMP in Section 5.2.2.

(12) New Road 1 (east-west Collector road):

A new east-west collector road between King Street in the east and Sumac Lane in the west is identified in the Town's Official Plan to be built north of Highway 12 to support growth areas. This road is planned to have a connecting link to Highway 12 at Beamish Road forming a signalized intersection.

Recommendation: it is recommended that the roadway be built with dedicated cycling and pedestrian facilities on both sides of the road as development occurs to conform with the cycling network recommendations made within this MTMP in Section 5.2.2. For planning purposes, it is anticipated that this roadway will be built within the medium-term.

(13) New Road 2 (east-west Local road):

A new east-west local road between Pratt Avenue in the east and King Street in the west is identified in the Town's Official Plan to be built north of Highway 12 to support growth areas.

Recommendation: it is recommended that the roadway be built with dedicated cycling and pedestrian facilities on both sides of the road as development occurs to conform with the cycling network recommendations made within this MTMP in Section 5.2.2. For planning purposes, it is anticipated that this roadway will be built within the medium-term.

(14) Highway 12 / Beamish Road Intersection:

New Road 1 will be built with a connection to Highway 12 at Beamish Road forming a signalized intersection.

Recommendation: it is recommended that the intersection be built with dedicated cycling and pedestrian facilities as development occurs. Intersection layout and design should be studies prior to implementation to ensure that adequate vehicular operations can be achieved. For planning purposes, it is anticipated that this roadway will be built within the medium-term.

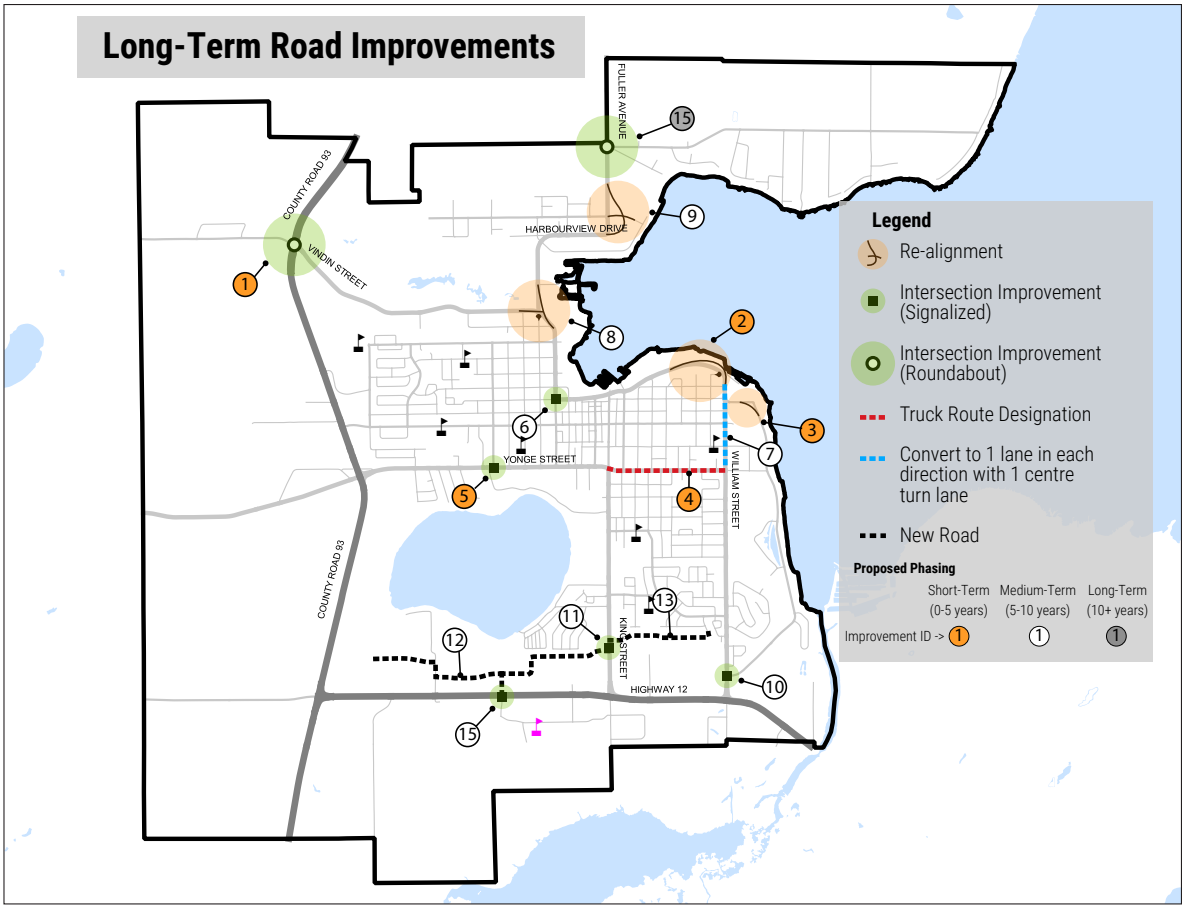


Figure 5.25
Recommended Long-Term Roadway Improvements and phasing

Long-Term

The recommended long-term, as shown in **Figure 5.25,** improvement focuses on improving the Fuller Avenue / Brunelle Sideroad-Midland Point intersection which is currently two intersections that are offset from one another. Improving this intersection will both enhance roadway safety by eliminating several conflict points as well as calm traffic in the area and facilitate access to Portage Park and Midland Point.

(15) Fuller Avenue / Brunelle Sideroad-Midland Point Intersection:

As detailed in the Sunnyside Drive / Harbourview Drive / Fuller Avenue Corridor Environmental Assessment the intersection of Fuller Avenue and Brunelle Sideroad/ Midland Point Road has a jogged configuration, requiring east-west through moves to complete a number of turns. Brunelle Sideroad, the west approach, is approximately 35 metres north of Midland Point Road, the east approach. All approaches are single lane, serving both turning and through moves (where applicable). In addition to the jog at Brunelle/Fuller/Midland Point Roads, the intersection of Midland Bay Road and Gawley Road, is of concern given its angle and proximity to the Fuller Avenue intersection. It is understood that this intersection is to be relocated as part of the proposed Midland Bay Heights subdivision.

Furthermore, during public consultation speed compliance and conflicting movements were identified as issues.

Previous Recommendation: The 2012 TMP supported the recommendations made within the Sunnyside Drive / Harbourview Drive / Fuller Avenue Corridor Environmental Assessment. This included recommending the realignment of the intersection on account of safety reasons, as well as to improve the overall intersection operations. The preferred realignment solution was recommended to result in an unsignalized four-way intersection at Fuller Avenue / Brunelle Sideroad-Midland Point.

Updated Recommendation: While the previous recommendation of re-aligning the intersection would improve vehicular operations, there are opportunities to further enhance the intersection to improve safety. For instance, the previous recommendation would have resulted in an unsignalized intersection with stop controls for the east and west approaches allowing unimpeded north-south travel along Fuller Avenue. Furthermore, this design would still present dangerous conditions for pedestrians crossing Fuller Avenue without any protected pedestrian crossing features.

This MTMP recommends implementing a multi-use path along Brunelle Sideroad, along with cycling facilities on Midland Point Road and Fuller Avenue. The advent of an increase in vulnerable road users presents an opportunity to enhance vehicular, pedestrian and cycling operations while, also simultaneously enhancing safety.

Generally, roundabouts are safer for motorists as they expose drivers to fewer conflict points, as well as exposing motorists to conflict points that result in less severe collision types such as angled or rear-end collisions as opposed to head-on or T-bone collisions that are possible in a signalized intersection. Overall a typical four-leg signalized, or stop-controlled intersection has 32 conflict points, whereas a four-leg roundabout has 8 conflict points as visualized in **Figure 5.26**.

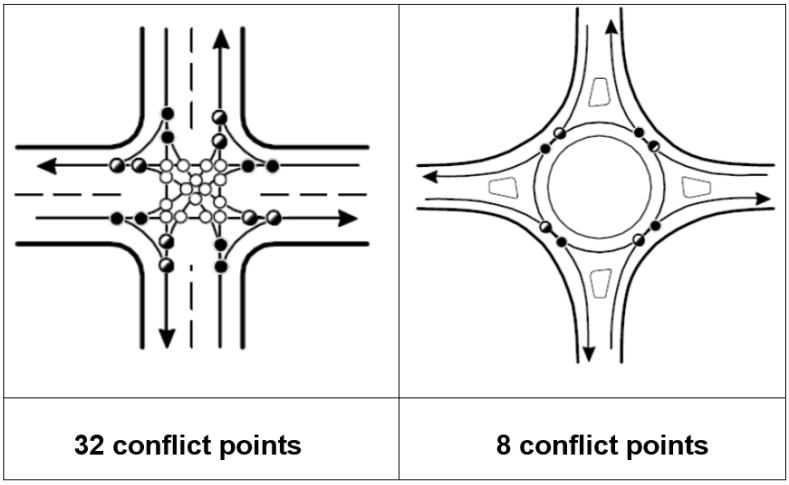


Figure 5.26 Intersection conflict point comparison between signalized intersection and roundabout

Source: Transportation Association of Canada Geometric Design Guidelines, 2017

As with any form of intersection control, roundabouts should consider impacts to all users such as pedestrians, cyclists, and transit users. Several objectives within this MTMP revolve around encouraging active transportation and transit usage. The design of intersections and their associated controls have varying impacts to accessibility for these road users that should be considered.

Generally, roundabouts provide a safer environment for pedestrians, cyclists and transit users. For motorists and cyclists, single-lane roundabouts provide a traffic calming measure that reduces vehicular speeds and reduces the number of conflict points at the intersection compared to a signalized intersection. For pedestrians, roundabouts reduce the crossing distance for pedestrians as they can cross each lane individually with the provided refuge island minimizing the amount of time exposed to traffic.

Roundabouts may require pedestrians and cyclists to walk or bike further around the intersection as opposed to directly across in a signalized intersection presenting some minor inconveniences to active transportation users. These inconveniences can be mitigated through design to facilitate pedestrian and cyclist movement through roundabout intersections to clearly mark appropriate pathways for navigating the intersection by each mode.

According to the Transportation Association of Canada (TAC), there are situations where roundabouts are typically more suitable such as intersections where approaches are offset, and where higher-order traffic controls such as signalization are not warranted.

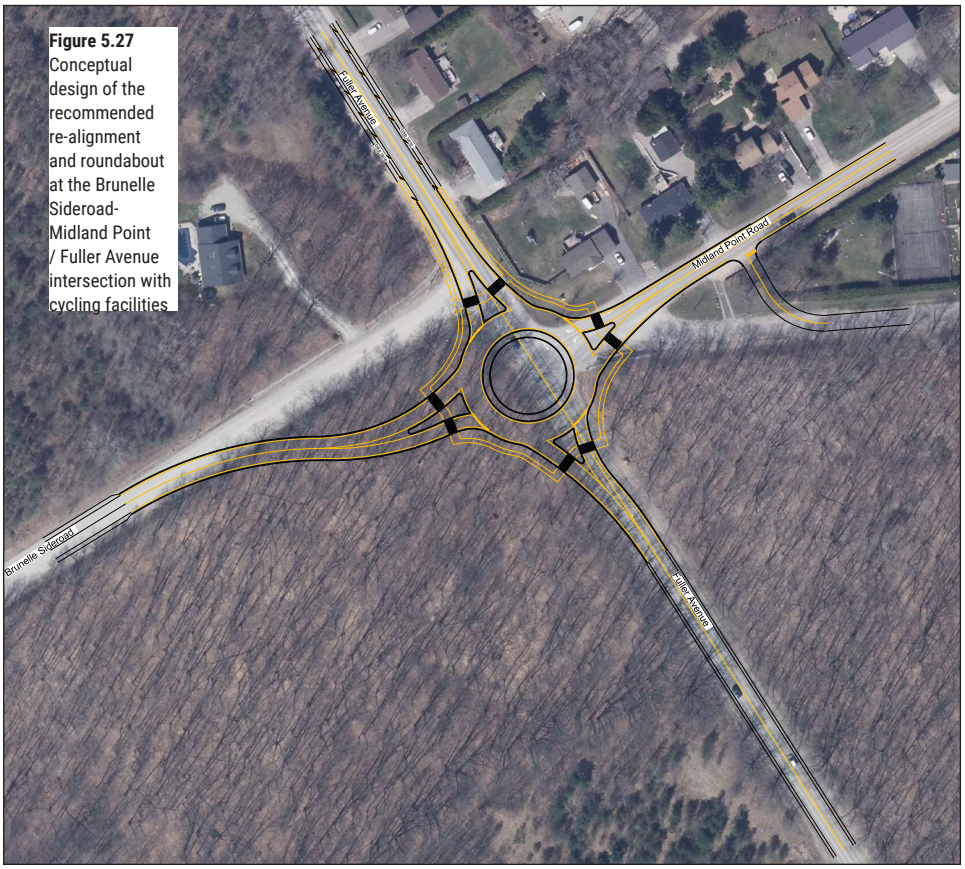


Figure 5.27 Conceptual design of the recommended re-alignment and roundabout at the Brunelle Sideroad-Midland Point / Fuller Avenue intersection with cycling facilities

When all of these considerations are combined, it is recommended that the intersection be re-aligned and converted to a single-lane roundabout, as shown in **Figure 5.27**. This will be combined with re-aligning Gawley Drive to connect with Midland Point Road east of the intersection to avoid the need for a five-legged roundabout.

The design of the roundabout should include design considerations that allow transit and commercial vehicles to pass through the intersection, as well as pedestrian and cyclist facilities that connect to planned dedicated bike lanes on Fuller Avenue, the planned multi-use path on Brunelle Sideroad, and the signed bike route on Midland Point Road.

The recommended improvements are summarised in **Table 5.12** and 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 5.12 Recommended Roadway Improvements through 2041

ID	Improvement	Description	Phasing	Jurisdiction
1	County Road 93	Paved shoulders between Highway 12 and Yonge Street with provisions for a centre turn lane. Between Yonge Street and St. Andrews Drive will have multi-use paths on both sides of the road. Between St Andrews Drive and Thompsons Road will have a multi-use path on the east side of the road. This will also coincide with intersection improvements at County Road 93 and Vindin Street.	Short-Term	County/MTO
2	William Street / Bayshore Drive (Intersection)	Reconfigure the intersection on the north side of Bayshore Drive, within lands that are part of the Midland Bay Landing Park. Realign the existing trail along the new alignment. Close Frank Street to Bayshore Drive and make it a Cul-de-sac.	Short-Term	Town
3	Bay Street, Aberdeen Boulevard & TRW Access	Increase the radius of the horizontal curve and reinstate Bay Street-Aberdeen Boulevard as the through road. Reconfigure the TRW access as a proper driveway access (reduce the access width, construct a drop-curb at Aberdeen Boulevard & extend the concrete sidewalk/trail through the access). Add shrubbery and other landscaping to discourage pedestrian crossing at the curb where sightlines are poor. Add a multiuse path on the north side of Bay Street, and add a pedestrian cross-walk on Aberdeen south of the curb where sightlines permit.	Short-Term	Town
4	Yonge Street Truck Designation	Designate Yonge Street between King Street and William Street as a truck route to mitigate commercial vehicle travel on First Street.	Short-Term	Town
5	Yonge Street / Eighth Street (Intersection)	Add an eastbound left-turn signal phase along with modified pedestrian crossings to facilitate southbound vehicular throughput.	Short-Term	Town
6	Bay Street / Fourth Street (Intersection)	Implement Signalized Intersection with provisions for auxiliary northbound and southbound left-turning lanes. Update intersection design to include pedestrian cross-walks (either painted, or brick-layered). Include provisions for dedicated cycling facilities through the intersection, linking with TMPU recommendations for active transportation that recommends a corridor on Fourth Street and Bay street. Separated bike lane North leg on Fourth Street, East leg on Bay street. Sharrow: South leg on Fourth Street, West leg on Bay street.	Mid-Term	Town
7	William Street	Convert 3-lane sections to 1 lane per direction + centre turn lane (except from Yonge Street to north of Chain Gate Drive, where 2 SB lanes should be maintained to accommodate truck traffic and address operational impacts associated with the vertical grade). Widen 2-lane section to 3 lanes to construct a centre turn lane. Provisions for separated bike lanes and sidewalks on both sides of the road should be made.	Mid-Term	Town
8	Vindin Street / Harbourview Drive (Intersection)	Convert the shared Westbound left-through lane to an exclusive left lane. Provide an exclusive Northbound left lane. Construct 2nd Northbound receiving lane on Harbourview Drive. Create a Cul-de-sac at the end of Fifth Street to restrict access to the intersection .(Try to fit Cul-de-sac within town ROW). Include provisions for dedicated cycling facilities through the intersection, linking with TMPU recommendations for active transportation that recommends a corridor on Vindin, Fifth Street and Harbourview Drive. Separated bike lanes on East leg of Vindin Street. Painted bike lanes on Harbourview Drive, Vindin Street (West leg)and Fifth St.	Mid-Term	Town
9	Fuller Avenue / Harbourview Drive (Intersection)	Increase the radius of the horizontal curve to improve safety. Realign the Fuller Avenue approach as per the Class EA recommendation. Consider modifications to the alignment to avoid impacts to the Drummond wall (which would warrant an update to the Class EA).	Mid-Term	Town
10	Pillsbury Road / William Street (Intersection)	Implement a signalized intersection where Pillsbury Drive meets William Street to provide protected movements from the Tiffin Pier neighbourhood onto William Street. Intersection layout and design to be determined at the site development application stage.	Mid-Term	Town
11	New Road 1 / King Street (Intersection)	Implement a signalized intersection at King Street at the new collector residential road that will serve new residential areas north of Highway 12 and south of Little Lake. Intersection layout and design to be determined at the site development application stage.	Mid-Term	Town
12	New Road 1	New east-west collector roadway between King Street in the east and development limits in the west to serve new residential growth areas. Provisions for dedicated bike lanes and pedestrian sidewalks on both sides of the road should be included.	Mid-Term	Town
13	New Road 2	New east-west local road going from King Street in the west and connecting with the existing southern extend of Pratt Avenue in the east. Provisions for dedicated bike lanes and sidewalks on both sides of the road should be included.	Mid-Term	Town
14	Highway 12 / Beamish Road (Intersection)	Implement a signalized intersection to connect the new residential development north of Highway 12 with commercial/employment areas south of the highway. Intersection layout and design to be determined at the site development application stage but should include provisions for dedicated bike lanes and pedestrian facilities.	Mid-Term	Town
15	Fuller Avenue / Brunelle Sideroad / Midland Point Road (Intersection)	Implement a single-lane roundabout to convert the existing offset intersection into one roundabout intersection. Provisions for dedicated bike lanes on both sides of the road along Fuller Avenue, multi-use path connections along Brunelle Sideroad, and Sharrows on Midland Point Road should be made. The roundabout design should allow for the movement of transit and commercial vehicles through the intersection.	Long-Term	Town

5.3 Policies & Strategies

A successful multi-modal transportation network relies on a mixture of physical infrastructure and policies that regulate and guide the town toward a vision for the future. The Town'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 Town's multi-modal mobility needs.

For instance, as new cycling routes are built across the town, 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. Updating and leveraging the Town's traffic calming policy will be important so that the Town 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 roads users through design in a way that is amenable to encouraging safe movements of all modes of transportation through Complete Streets.

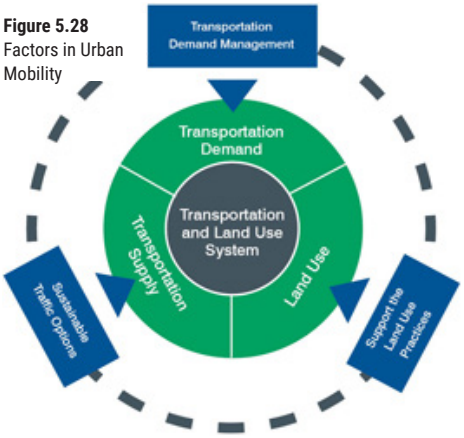


Figure 5.28
Factors in Urban Mobility

All of this is impacted by the environmental reality that faces Midland 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;
- Traffic Calming;
- Pedestrian Safety Plan;
- Complete Streets;
- Active Transportation Winter Maintenance;
- Downtown Parking Management; and
- Smart Mobility.

5.3.1 Transportation Demand Management

Currently the Town of Midland 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 Town of Midland 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)

TDM plays a vital role in the design of urban environments and its influence on travel choices. Some of the outcomes that the Town 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 Town 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 5.13** 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 5.13 Transportation Demand Management Measure Matrix by Land Use and Urban Context

Measaure	Land Uses			Urban Context		
	Residential	Commerical	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 Midland 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 be 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 5.29**.

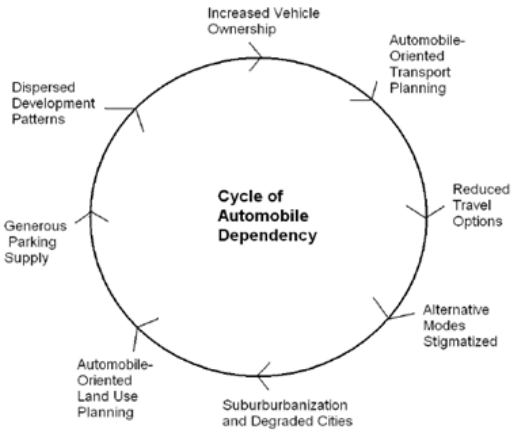


Figure 5.29 Cycle of Automobile Dependancy

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 Town of Midland applies blanket parking rates across most of the municipality based on land use with the exception of the Downtown Core Zone (DC-F2), where no minimum number of parking spaces are required.

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 5.30**.

Considering the Town'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.

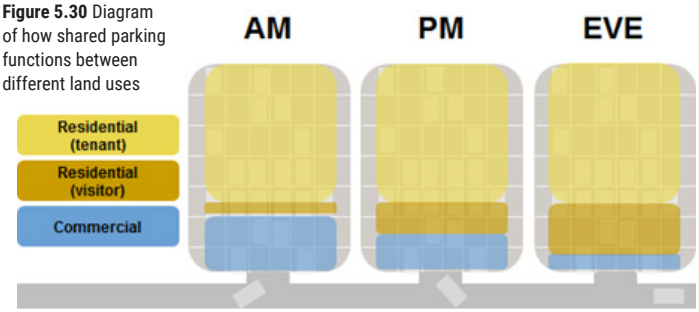


Figure 5.30 Diagram of how shared parking functions between different land uses

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 provided 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.

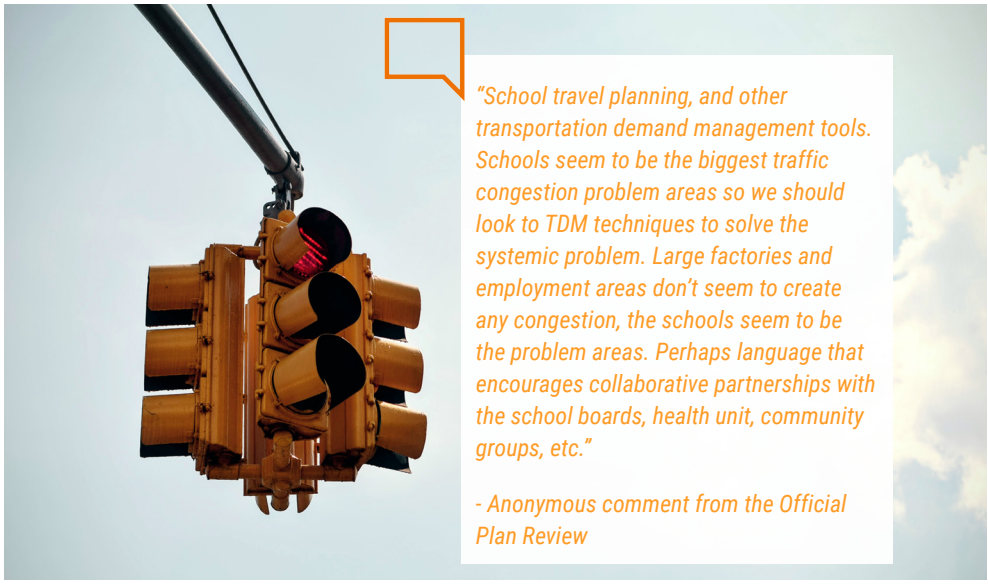
Priced Parking- Increased Parking Fees

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 Town'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 town 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.



"School travel planning, and other transportation demand management tools. Schools seem to be the biggest traffic congestion problem areas so we should look to TDM techniques to solve the systemic problem. Large factories and employment areas don't seem to create any congestion, the schools seem to be the problem areas. Perhaps language that encourages collaborative partnerships with the school boards, health unit, community groups, etc."

- Anonymous comment from the Official Plan Review

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 Town of Midland 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 Town of Midland should develop context specific TDM policies, including associated zoning by-law updates for parking policies. This will provide a mechanism by which the Town 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.

5.3.2 Traffic Calming

The Town of Midland's existing and draft traffic calming policy have been reviewed as part of this MTMP as a result of Council's identified need to establish a more robust traffic calming policy that is appropriately scaled and tailored for Midland.

Traffic calming policies and guidelines are important tools within a municipality's repertoire in terms of implementing safety improvements or addressing safety concerns form residents. As part of the Town of Midland's mandate to build and maintain a safe and efficient road system for all road users, it is necessary that Midland has updated policies that reflect best-practices for effective safety measures.

The following objectives of this MTMP are directly related to traffic calming including:

- Objective 3: Prioritize and Encourage Active Transportation;
- Objective 5: Improve Safety for All Road Users; and
- Objective 6: Enhance Multi-Modal Connections.

5.3.2.1 What is traffic calming?

Traffic calming is a term commonly associated with physical features such as: speed humps, pinch-points, and chicanes. They are installed on a road to reduce the speeds at which vehicles travel, to discourage through traffic, to improve traffic safety, and to improve comfort levels for all road users.

Traffic calming is intended to improve the quality of life for residents on traffic calmed streets, achieve slower speeds for motor vehicles, and increase the safety for non-motorized users of the street. Traffic calming solutions should be looked at as a community-wide strategy (as opposed to on a street by street basis) to ensure that volume and speed concerns are not transferred to adjacent streets.

5.3.2.2 Review of Midland's Draft Traffic Calming Policy

A draft Traffic Calming Policy was considered by the Town of Midland in during a Town Council meeting on December 12, 2016 (ENG-2016-28). Council reviewed the report dated November 28, 2016 and directed to proceed with a Public Information Session to solicit input and comments with a report being brought forward to a future meeting regarding the public engagement process. This section summarises a review of this draft policy as well as identifies deficiencies. Additionally, a copy of the draft traffic calming policy and assessment criteria can be viewed on the Town of Midland's website.

5.3.2.2.1 Initiation of a Traffic Calming Project

The proposed traffic calming policy identifies three (3) warrants where at least one needs to be satisfied prior to assessing specific safety criteria for traffic calming. The three warrants include:

- Warrant 1: Petition
- Warrant 2: Safety Requirements; and
- Warrant 3: Minimum and Maximum Traffic Volume.

Warrant 1, Petition, is required in order to consider Warrant 2 and 3. The Petition requires that the consideration for physical traffic calming is initiated by the local Councillor following a public meeting, or upon receipt of petition signed by at least 25% of affected households (or 10% in the case of multiple family rental dwellings), or by a survey conducted by the Ward Councillor. This indicates that the process for traffic calming must generally be initiated by the local Councillor, though members of the public can raise issues through their local Councillor.

It is recommended that there also be consideration for Town staff to initiate a traffic calming review in events where there are opportunities to implement traffic calming measures. Important opportunities to include traffic calming measures and other related roadway improvements can come about as part of broader transportation work such as an engineering study or road reconstruction opportunities, or could be desirable if the Town decides to conduct road safety audits. Town staff could proactively identify opportunities to implement traffic safety improvements through the completion of ongoing studies rather than having to wait for and receive a petition.

5.3.2.2.2 Proposed Point Assessment Criteria

The Draft Traffic Calming Assessment Chart provides a framework to assign points according to various warranting criteria for traffic calming measures. The minimum point threshold must be met in order to meet requirements for traffic calming measures. The minimum point threshold is 35 points for local roads, and 52 points for collector roads. Arterial roads are not candidates for traffic calming under this assessment method. The following warrant criteria are included in the draft assessment chart:

- **Traffic Volume per Day** – according to road classification (local street, rural collector street, urban collector street) and average daily traffic
- **Speed** – each km/h that the 85th percentile speed exceeds the posted speed and number of 'high end speeders'
- **Collisions** recorded by police (preventable collisions)

- **Schools** – number of schools located on the street or with a marked walking route on the street
- **Pedestrian Activity** – number of directly connected pedestrian-oriented trip generator (i.e. park, community centre, library)
- **Sidewalks** – areas with no sidewalks with evidence of pedestrian activity
- **Driveway Density**
- **Bicycling** – Areas that are identified as part of a signed bicycle route

The specific criteria are discussed on the following pages.

Traffic Volumes

Daily traffic volumes are the first criteria to be considered in the traffic calming assessment. The assessment chart assigns points to traffic volumes according to the method summarized in **Table 5.14**.

This method shows that if a local street does not meet 1,000 vehicles/day, a rural collector street does not meet 2,000 vehicles/day, and an urban collector street does not meet 3,000 vehicles/day, it would not be assigned any points at all. As these thresholds generally fall within the acceptable daily traffic volumes for their respective roadway typologies this method is generally acceptable and would help control the requests that are received due to perceived roadway 'short-cutting' or 'through traffic' volume problems (but likely do not actually have these problems manifest).

It is noted that in order to achieve the maximum 20 point threshold for a local street, the street would need to see 3,000 vehicles per day. This would trigger the maximum point allocation but would not necessarily trigger traffic calming measures when combined with all the other criteria. This volume is well above generally advised industry maximums of 2,000-2,500 vehicles per day for a local street. It is suggested that a separate consideration for traffic calming local streets would be undertaken if 3,000 vehicles were using a local street. This may need to be considered on a case by case basis.

Table 5.14 Draft Traffic Calming Points Assessment for Speed

Posted Speed	Points
40 km/h Posted Speed	
85th percentile speed - 1 point for every Km/h over the psoted speed High end speeds - 1 point for every high end speeder	0-10
50 and 60 km/h Posted Speeds	
85th percentile speed - 1 point for every Km/h greater than 10 km/h over the posted speed High end speeds - 1 point for every high end speeder	0-10

Source: Town of Midland Draft Traffic Calming Policy, 2016

Additional considerations involving traffic volume include peak hour traffic volumes; some roadways experience considerable traffic for only a few hours per day, for example workplaces and schools that experience significant pick-up and drop-off activity. It is recommended that a peak hour traffic volume warrant criteria is also considered if the roadway section is located adjacent to a peak hour generator such as a school.

Speed

The proposed traffic calming policy assigns points according to the degree of which the recorded 85th percentile speed observed on the road exceeds the posted speed limit as summarised in **Table 5.14**. For roadways with posted speeds of 40 km/hr, one point is assigned for every kilometer/hour that the 85th percentile speed exceeds the posted speed. For roadways with posted speeds of 50 or 60 km/hr, 1 point is assigned for every km/h greater than 10km/h over the posted speed limit. Additional points are assigned for every "high end speeder". The maximum number of points allocated to speed is 10.

Table 5.14 Draft Traffic Calming Points Assessment for Traffic Volumes

Local Street	Rural Collector Street	Urban Collector Street	Points
<1,000	<2,000	<3,000	0
1,000-1,100	2,000-2,150	3,000-3,250	1
1 point for every additional 100 vehicles	1 point for every additional 150 vehicles	1 point for every additional 250 vehicles	20 max.

Source: Town of Midland Draft Traffic Calming Policy, 2016

It should be noted that this approach does identify locations where speeding above the posted speed limit is a problem, however, would not identify areas where the posted speed already exceeds the recommended speed limit in this area. For example, if the posted speed limit on a roadway is 50 km/h, points would not be assigned until the 85th percentile speed were observed to be 60 km/hr or greater. This does not consider the fact that perhaps the speed of the roadway should not be posted at 50 km/hr in the first place. As such, it is recommended that a separate assessment of the speed limit itself is incorporated into the traffic calming review process; a separate "speed limit reduction warrant" would need to be in place.

If a reduction in speed limits were to be warranted, appropriate traffic calming measures such as lane width narrowing, curb extensions, etc. could be suggested in order to reduce the design speed, as simply posting a lower speed limit is shown to be ineffective in decreasing operating speeds.

Conventional practice designates a design speed higher than the posted speed limit to accommodate driver error. However, this practice only encourages speeding and increases the likelihood of traffic crashes, fatalities, and injuries. A proactive approach selects the appropriate target speed and uses design elements to achieve the appropriate speed by influencing driver behavior.

NACTO recommends a maximum design speed of 40 km/hr for urban areas, and consideration of safety, health, mobility, economic and environmental goals in mind when determining different speed limits. The City of Toronto reduces the speed limit to 30 km/hr on streets where all of the traffic calming warrants are met, in conjunction with the installation of traffic calming measures. Speed is one of the leading contributors to traffic safety – it is recommended that the speed warrant is given equal weight to factors such as traffic volumes.

It is also noted that the definition of a "high end speeder" was not provided in the documentation that was available at the time of this review, and the definition of a "high end speeder" should be explicitly provided, and the time interval during which the number of "high end speeders" are counted (i.e. per day, per hour) should also be defined in the assessment chart. To capture the intention behind quantifying "high end speeders" in a clearer manner, the criteria could also be changed to maximum speed, or a higher percentile speed such as 95th percentile speed.

Collisions

The collision history is weighted up to 25 points out of 100 points. 5 points are assigned if there is 1 preventable collision recorded by police in the past 3 years, 10 points are assigned if there are 2 or more preventable collisions recorded in the past 3 years, and 10 points are given if there are 1 or more preventable collisions recorded resulting in personal injury in the past 3 years. A summary of the collision assessment points are shown in **Table 5.16**.

Under the proposed framework, there is no differentiation between injury-causing collisions and fatal injuries. It is recommended that if a fatal injury occurs, a separate process is considered to implement traffic calming and safety measures.

It is also unclear under the proposed framework if points are to be cumulative from each of the three categories described, or if they are not cumulative – for example, if there are 2 or more preventable collisions recorded in the past 3 years, it is unclear if there are 5 or 15 points to be assigned. As the collisions take up a significant proportion of the assessment criteria (25%), it is critical that it is clear how points are assigned.

Table 5.16 Draft Traffic Calming Points Assessment for Collisions

Local and Collector Streets	Points
For 1 preventable collisions recorded by police in the past 3 years.	5
For 2 or more preventable collisions recorded in the past 3 years.	10
For 1 or more preventable collisions recorded resulting in personal injury in the past 3 years.	10
NOTE: Preventable collisions are defined as those that are considered preventable through the use of traffic calming measures.	

Source: Town of Midland Draft Traffic Calming Policy, 2016

Schools

For each private or public elementary or secondary school on the subject street section or section part of a school's marked walking route, 5 points can be assigned per school up to a maximum of 10 points. This is generally acceptable criteria, but consideration may be given to consolidate this criteria with the Pedestrian Activity criteria discussed below and giving the two criteria a greater weight.

Pedestrian Activity

The pedestrian activity is accounted for in the assessment criteria by assigning 5 points per pedestrian oriented facility, up to a maximum of 15 points, for each pedestrian facility such as "elderly housing, park, community or retail centre, church, playground, libraries, etc.". The assessment chart explicitly says that the use must have a direct connection to the subject roadway, and does not include residential dwellings. This is a generally acceptable way of accounting for key pedestrian destinations along a corridor and pedestrian activity should be a key consideration when determining the need for traffic calming measures.

Sidewalks

For blocks with "no sidewalks with evidence of pedestrian activity", 5 out of 100 points can be assigned.

This criteria does not specify the number of points that should apply to a roadway with no sidewalks on one side, or partial sidewalks. It is recommended that this criteria is modified to account for the difference in sidewalk presence on one side compared to no sidewalk presence at all.

It is also recommended that consideration for additional criteria is added; simply the presence of sidewalks is not a significant factor that would suggest that traffic calming measures are necessary. Realistically, if there are no sidewalks or no pedestrian activity, this is often because the pedestrian level of comfort is poor. Many factors can contribute to a pedestrian's level of comfort, including the speed of

the adjacent roadway, width of the sidewalk, buffer between pedestrians and live traffic, and public realm elements such as the presence of street trees and furniture. It is recommended that this criteria is modified in order to account for the general quality of pedestrian service as opposed to only the presence of sidewalks.

Driveway Density

5 points out of 100 points are assigned to driveway density if the density exceeds 5 driveways per 100 metres. Increased driveway densities may increase pedestrian-vehicle interaction along sidewalks but can also reduce roadway operating speeds.

It is recommended that driveway densities are considered when determining whether to reduce the speed limit on roads as opposed to implementing traffic calming devices.

Bicycling

As it stands in the proposed assessment chart, 10% of the criteria involve the presence of a signed bicycle route or presence of a signed bicycle route on the 1st or 2nd intersecting street with the subject study block. The signed bicycle route means that the bicycle route has been identified in the Town's Bicycle Route Map. It is our understanding that the Bicycle Route Map is to be included in the Town's Official Plan update.

This policy implies that 10% of warrant criteria is dependent on whether or not there is a signed bicycle route present. Given the relative lack of signed bicycle routes in the Town of Midland,

It is recommended that the bicycling criteria is either more clearly defined or removed from the assessment process altogether. It could be considered as a "bonus" point criteria or other.

5.3.2.3 Additional Considerations

The following were identified as additional areas that should be considered within Midland's Traffic Calming Policy based on a review of the draft traffic calming policy and industry best-practices:

- **Road Grades and Curvature:** The current warrant criteria is unclear whether or not traffic calming measures are to be considered in relation to the roadway grade and curvature. Jurisdictions such as the Town of Innisfil recommend that traffic calming measures are implemented on roadways with no more than 5% grade, while the City of Toronto includes locations with grades greater than 5% and horizontal curves when considering a posted speed limit reduction.
- **Near Miss Reporting:** Generally, traffic calming policy leans on reported collision history for justification for implementing traffic calming measures. The common issues with using reported collisions are that firstly, not all collisions may be reported to police, and second, using historic collisions is a very reactive way of implementing traffic safety measures. In order to take a more proactive approach to traffic calming, residents can be encouraged to report "near misses" (i.e. situations where they narrowly missed a collision or felt that they were in danger of a collision). The locations of these reports can then be tracked and trends can be identified to proactively recommend traffic safety measures before someone is injured.
- **Emergency Response Impact:** The emergency response vehicle impact should be considered. It is noted that generally traffic calming measures can be designed to allow for minimal impact on emergency response vehicles, but all physical traffic calming measures increase the response time for all emergency vehicles, so incorporating this criteria should also take the overall context into consideration.
- **Transit Impact:** The current proposed guidelines do not consider transit impacts as part of the traffic calming warrants. While Midland currently has a relatively limited transit system, the impacts to transit should be considered if they are present. As with emergency response vehicles, traffic calming measures can generally be designed to minimize the impact on transit vehicles (i.e. vertical deflection devices such as speed humps would typically not be recommended on transit routes).
- **Maintenance and snow removal needs:** An important criteria when considering the type of traffic calming measure is the impact on road maintenance, and specifically winter maintenance and snow removal. Some physical traffic calming measures may cause inconvenience for snow removal vehicles.

- **Connection between criteria and specific traffic calming measures:** Currently, there is no connection between the assessment criteria and the type of traffic calming measure that should be undertaken. It is recommended that the mitigating measures are specifically designed to address the concerns that are highlighted in the assessment criteria. For example, if the assessment criteria is almost all speed related, the primary focus on the traffic calming measures should be ones that aim to address speed concerns.
- **Ranking and Prioritization:** The Traffic Calming Policy should also consider a ranking tool to prioritize projects such that budgetary limitations are respected.

5.3.2.3.1 Solution Identification

When determining which traffic calming measure is to be implemented to address the confirmed issue, consideration should be given to whether a physical measure or a social / cultural traffic calming measure is preferred:

- **Physical measure:** Attempts to improve conditions through physical alterations to the roadway. Physical measures come with benefits such as reduced volume, speed, noise, and pollution, but can also include detrimental impacts such as traffic diversion, reduced connectivity and access for emergency vehicles, and difficulty with snow removal.
- **Social & Cultural Measure:** Attempts to increase road safety by psychological measures which lead to reduced automobile usage and safer driving habits (newspaper ads, brochures, speed watch programs, educational programs).

A summary of potential physical measures is provided in **Table 5.17** on the pages following this section, highlighting what the subject traffic measure is, what problems the measure aims to solve, where the measures would be applicable, and an example of the implemented measure. The Town should consider all measures that solve a particular problem while having regard for the nearby land uses and local context.

5.3.2.4 Town-Wide Speed Limit Reduction

Across the world, communities are implementing reduced speed limits on local streets. In Ontario, according to the Highway Traffic Act (HTA), the statutory speed limit in urban areas is 50km/h when there is no posted speed limit. Many communities across Ontario typically lower speed limits down to 40 km/h on local streets, however there is a further push by transportation and health officials to reduce speed limits on local streets down to 30 km/h. The rationale behind this is that research suggests that vehicle/ pedestrian collisions begin to result in significantly more injuries or fatalities when they involve speeds above 30 km/h as visualised in **Figure 5.31**.

Research compiled by The Centre for Active Transportation (TCAT) in Toronto provides case studies both within Canada and abroad that suggest implementing lower speed limits on local streets can yield reductions in roadway injuries and fatalities. For instance, the City of Calgary found an average speed of 32 km/h in 30 km/h school zones, and an 85th percentile speed of 38.8 km/h. While 54% of vehicles drove at speeds higher than 30 km/h, only 10% drove at speeds more than 10 km/h over the speed limit. Another example from the City of London (UK) identified a reported reduction of road casualties by 41.9% in 20 mph (32 km/h) traffic speed zones compared to adjacent areas without lowered speed limits.

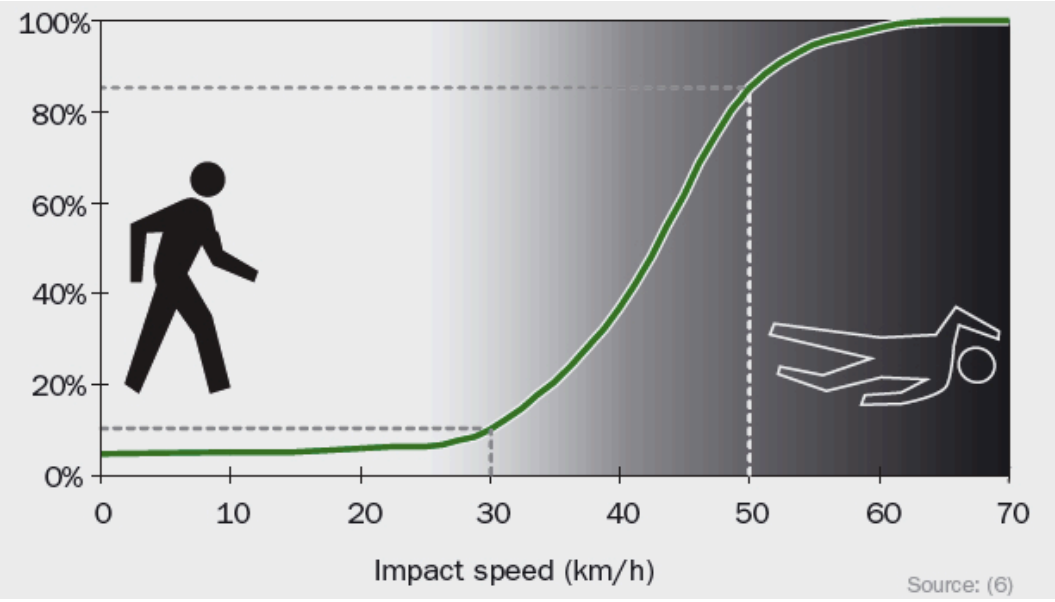


Figure 5.31 Likeliehood of pedestrian injury based on vehicular impact speed

Source: The Centre for Active Transportation (TCAT) - Guide to Safer Streets Near Schools (https://www.tcat.ca/project/saferstreetsnearschools-getting-started/speed-limit-measures/)

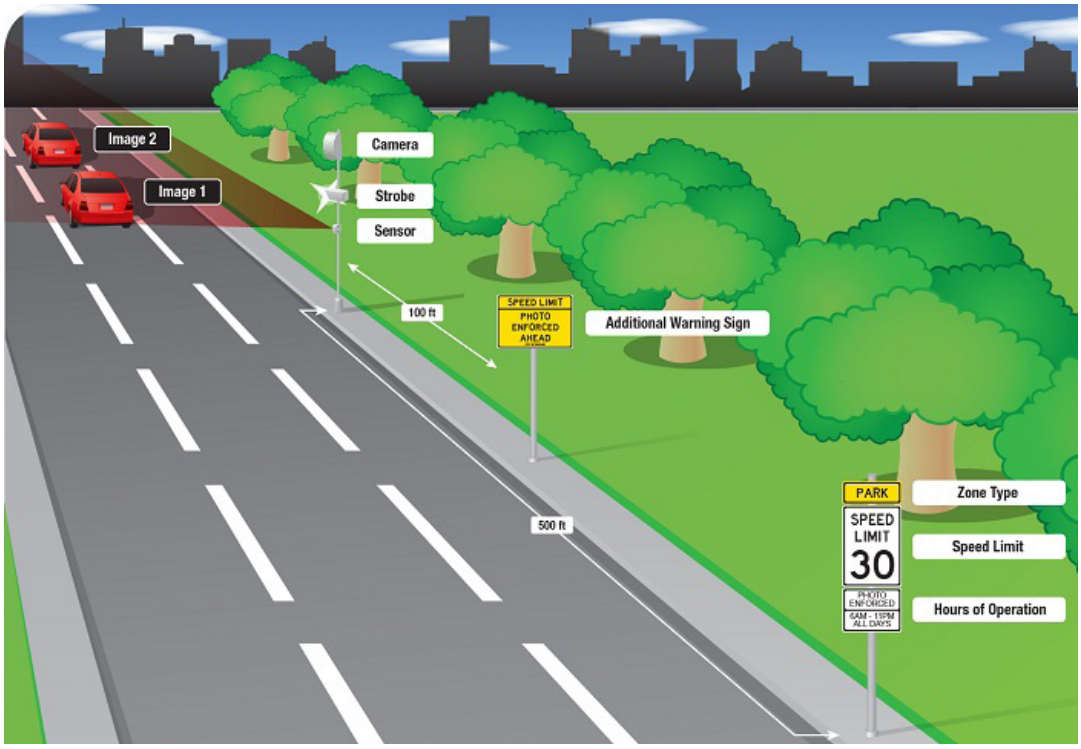


Figure 5.32 Concept of how ASE systems function

Source: City of Chicago, 2013 (https://www.chicago.gov/city/en/depts/cdot/provdrs/traffic_signals_andstreetlights/news/2013/aug/automated_speed_enforcementcamerasbeginwarningperiod.html)

The overall objective of town-wide local street reductions to 30 km/h is to encourage walking and biking by enhancing roadway safety and reducing roadway-related injuries. While this MTMP study did not evaluate town-wide collision statistics and cannot make a definitive recommendation on its suitability for the Town of Midland. There are opportunities to review roadway collision statistics as a separate study beyond this MTMP document to further evaluate whether implementing a 30 km/h speed limit reduction on local streets is warranted.

5.3.2.5 Photo-Radar (Automated Speed Enforcement)

On May 30, 2017, the Province of Ontario passed the Safer School Zones Act, 2017 to facilitate the municipal adoption of automated speed enforcement (ASE) technology on roads with speed limits under 80 km/h in school and community safety zones.

Automated speed enforcement is a safety technique that reduces excessive speeding and improves roadway safety by using fixed or mobile cameras and other equipment to detect and capture images of vehicles traveling at dangerous speeds (as visualised in **Figure 5.32**).

In connection with this, the ministry of transportation is also proposing to make supporting amendments to Ontario Regulation 277/99 to streamline the regulatory approval process for accepting municipalities into Ontario's Red Light Camera Program (RLC).

To support legislative changes passed under Bill 65, The Safer School Zones Act, 2017, the ministry plans to bring forward supporting ASE regulations to outline various operational, procedural and evidentiary requirements for the ASE program. These programs may include such things as a description of how photographs are to be used as evidence, the types of ASE system technology that may be used by municipalities, and a description of enforcement procedures for any resulting Provincial Offences Act charges.

With respect to Ontario's Red Light Camera program, the ministry is proposing changes to Ontario Regulation 277/99 in support of amendments made under the Safer School Zone Act, 2017, to streamline municipal authorization to use RLCs.

ASE systems have shown to be particularly effective in School Zones. New York City, which has one of the most extensive and robust ASE programs in North America reported that traffic fatalities near schools with ASE sites were reduced by more than half, and speeding was reduced by more than 60 percent. The City of Edmonton, together with the University of Alberta has also conducted a number of studies on the effectiveness of their ASE program in and have found that severe collisions (fatal and injury) have been reduced by 32% and speed related collisions have been reduced by 27%. In addition to these jurisdictions the cities of Washington D.C., Portland, Seattle, and Chicago have all experienced reductions in relation to the implementation of ASE systems.

Locally, the City of Toronto conducted an ASE study pilot between September and December 2018 which included the installation of signage and speed

measuring / camera devices around 8 schools. Despite not being able to ticket speed offenders, the pilot identified that all of the school zones experienced significant non-compliance with posted speed limits presenting an opportunity to improve safety through the implementation of ASE in the future.

While this MTMP did not have the necessary traffic, collision, and speed data necessary to evaluate the applicability of ASE systems in Midland, there is an opportunity for the Town to engage the ministry of transportation and monitor for provincial guidelines that will be coming in the next few years.

5.3.2.6 Community Identified Areas for further safety evaluation

The nature of this MTMP is focused on high-level town-wide transportation needs and opportunities. While we've identified opportunities to enhance roadway safety at a policy and framework level throughout this plan, the detailed safety evaluation of specific intersections or roadway links were not within the scope of this study. However, through the development of this plan, several residents submitted comments in relation to areas that they believed to present a safety concern on the transportation network. These areas included:

- **(1) Fourth Street (Street) - between Yonge Street and Bay Street:** Concerns about speeding and poor sightlines along the corridor, coupled with commercial vehicles using the street.
- **(2) County Road 93 /Georgian Bay General Hospital Entrance (intersection):** Concerns about southbound left-turns into the access holding up traffic due to the lack of a dedicated turning lane.
- **(3) Harbourview Drive / Sunnyside Drive-Bayport Boulevard (Intersection):** Concerns about poor red light compliance and issues with the north-south left-turn lanes being covered in snow leading to issues regarding left-turning vehicle queues around the Harbourview Drive bend.
- **(4) King Street / Yonge Street (Intersection):** Concerns about the safety of the westbound left-turn due to vehicular volume and sightlines.

These areas, as visualised in **Figure 5.33**, and the associated concerns have been forwarded to Town staff and are meant to serve as a starting point for a working list of areas for roadway safety concerns to further evaluate as they arise through the Traffic Calming Policy framework.

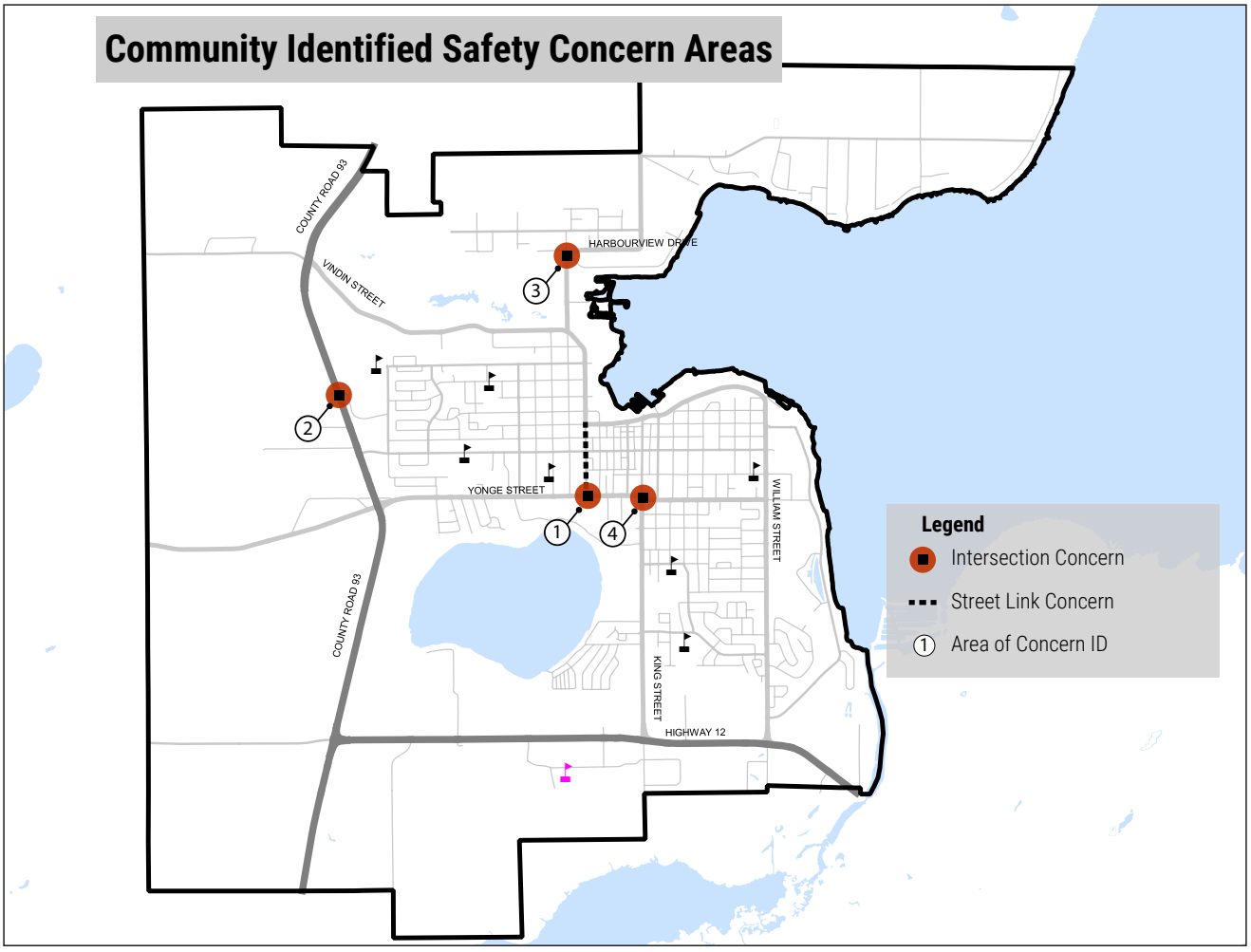


Figure 5.33 Community Identified Areas for further safety evaluation

5.3.2.7 Traffic Calming Recommendations

The advent of future traffic growth on Midland's roadways in conjunction with future active transportation improvements will require the Town to be vigilant in addressing safety concerns in a way that is effective and collaborative with the local community.

The existing and draft traffic calming policies require additional changes so that the policy can be a tool between the town and residents to identify and implement tailor-made safety solutions throughout Midland's transportation network.

As a result, it is recommended that the Town of Midland develop an updated traffic calming policy that integrates the identified additional considerations within this MTMP, as well as addresses the several issues and concerns raised within this section. Additionally, the traffic calming policy should be adjusted to allow town staff to initiate a traffic calming study, rather than requiring a councillor to initiate the process.

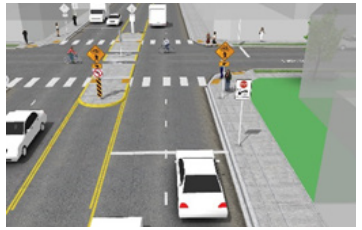
It is further recommended that the Town of Midland develop a traffic calming guide to accompany the traffic calming policy. The intent is so that while the policy can be a legal document, the traffic calming guide can be a more readable and engaging document that is easy to understand by residents. This guide should identify the main framework of the traffic calming policy as well as directly links criteria with recommended physical and non-physical solutions. One size does not fit all when it comes to addressing safety, and there should be flexibility in the guide so that contextually sensitive solutions can be made.

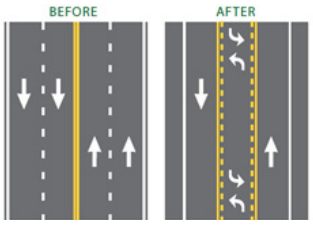
It is also recommended that the applicability of implementing a town-wide speed limit reduction on local streets and the applicability of automated speed enforcement systems in school zones be evaluated further in relation to collision statistics and safety hot spots.

Recommended Policy Documents:

- Update the Town's Traffic Calming Policy;
- Develop a Traffic Calming Guide to accompany the policy;
- Conduct a review of Town-wide collision data and evaluate the suitability of implementing reduced (30 km/h) speed limits on local street and automated speed enforcement systems in school zones; and
- Conduct safety evaluations for the community identified areas using the updated Traffic Calming Policy framework.

Table 5.17 Physical Traffic Calming Measures, their applicability, and examples

Measure	Description	Purpose	Applicability	Example
Speed Cushion (Vertical Deflection)	Raised areas placed across a roadway; the raised areas have gaps between them to accommodate emergency vehicles.	Reduces automobile speeds, while accommodating emergency vehicles.	• Residential Land Use • Suburban Context • Urban Context	
On-Street Parking	Restricts the roadway width by allowing automobiles to park along the roadway.	Reduces automobile volume, speed, and cut-through neighborhood traffic.	• Old Residential Land Use • Close to Town Center • Commercial Land Use • Suburban Context • Urban Context	
Raised Median Island	An elevated median installed in the center of a roadway to restrict the width of roadway available. Runs parallel with the direction of traffic.	Reduces automobile speeds, improves pedestrian safety, and allows for in-median landscaping.	• Residential Land Use • Commercial Land Use • Suburban Context • Urban Context	
Raised Median Island Through Intersection	An elevated median installed through an intersection, blocking through traffic and left turning movements in certain directions.	Reduces automobile volume, improves safety, and obstructs short-cutting traffic. Provides refuge and reduces crossing distance for pedestrians.	• Residential Land Use • Commercial Land Use • Suburban Context • Urban Context	
Traffic Circle	An intersection control type; provides a raised island in the center of the intersection which traffic circulates around.	Reduces automobile speed and collision rates. Helps drivers arriving from a wide roadway to adjust to a local small street in a safe and efficient manner.	• Residential Land Use • Suburban Context	

Measure	Description	Purpose	Applicability	Example
Curb Extension	A horizontal extension of a curb into the roadway; also referred to as a bump-out.	Reduces crossing distance for pedestrians. Increases pedestrian safety and visibility.	• Residential Land Use • Commercial Land Use • Suburban Context • Urban Context	
Radar Speed Display Sign	Devices that display the speeds of approaching vehicles, designed to reduce speeds and promote cautious driving.	Reduces automobile speeds and promotes cautious driving. Suitable for high priority areas where young children and older pedestrians are present.	• Residential Land Use • Commercial Land Use • Industrial Land Use • Recreational Land Use • Suburban / Urban Context • Rural Context	
Diagonal Parking	Angled parking spaces designed to change the perception and function of a street. Provides easier maneuvering and more stalls than parallel parking.	Cost-effective strategy which forces drivers to be more aware of nearby vehicles and pedestrians, while also reducing the crossing distance for pedestrians.	• Commercial Land Use • Urban Context	
"Traffic Calmed Neighborhood" Sign	Sign indicating that the driver is entering a traffic calmed neighborhood.	Informs drivers that they are entering a neighborhood that has forms of traffic calming measures in place.	• Residential Land Use • Suburban Context • Urban Context	
Road Diet	A reconfiguration of the roadway; can include narrowing of lane widths or removal of lanes to accommodate bicycle lanes, two-way left turn lanes, and parking.	Reduces automobile speed and can provide opportunity to provide bicycle lanes, two-way left turn lanes, on-street parking, or other streetscape improvements.	• Residential Land Use • Commercial Land Use • Suburban Context • Urban Context	

Measure	Description	Purpose	Applicability	Example
Curb Radius Reduction	A redesign of an intersection corner to allow for a smaller radius. Smaller curb radii result in slower turning speeds and greater pedestrian comfort.	Reduces right turning speeds at intersections and improves pedestrian comfort. Small curb radii also provide pedestrians with larger waiting areas.	• Residential Land Use • Commercial Land Use • Suburban Context • Urban Context	
"Community Safety Zone" Sign	Sign indicating a zone where pedestrian safety is a high priority. Traffic related incidents or violations often result in doubling of fines in these areas.	Encourage safe driving; typically installed near schools, daycare facilities, senior homes, public places, or hospitals.	• Residential Land Use • Commercial Land Use • Suburban Context • Urban Context	
On-Road Messaging (Pavement Markings)	On-road pavement markings which communicate a higher sense of priority to drivers and improve visibility.	Increases the visibility of the message being communicated to drivers (SLOW, School Crossing Ahead, 40 km/h max). Beneficial in high priority areas such as schools.	• Residential Land Use • Commercial Land Use • Urban Context • Rural Context	
Raised Crossings (Vertical Deflection)	Elevated pedestrian crossing, typically implemented mid-block and at intersections, which slows vehicles and increases safety and visibility of pedestrians.	Reduced speed of vehicles approaching the crosswalk. Improves safety and visibility of pedestrians or cyclists utilizing the crosswalk.	• Residential Land Use • Urban Context • Suburban Context	
Raised Intersections – All-Way Stop Control	An intersection that is slightly elevated compared to the intersecting roadways; aims to reduce vehicular speed and improve safety conditions.	Reduced speed of vehicles approaching the intersection. Improves safety and visibility of pedestrians or cyclists crossing the intersection.	• Residential Land Use • Urban Context • Suburban Context	

Measure	Description	Purpose	Applicability	Example
Road Watch Program	A community driven initiative that allows residents and visitors the ability to report dangerous driving to the police.	Encourages safer driving habits by providing residents with the tools to contribute to the enforcement of safe conditions on the roadway.	• Residential Land Use • Commercial Land Use • Industrial Land Use • Urban / Suburban Context • Rural Context	
One Lane Chicane	Two or more curb extensions that are designed to narrow a two-lane roadway to a one-lane roadway for a short distance.	Forces drivers to stop and allow one direction of traffic to pass through the chicane at a time.	• Residential Land Use • Suburban Context • Rural Context	
Textured Crosswalks	A textured or patterned surface placed along a pedestrian crosswalk to increase visibility and safety.	Increases visibility and safety of a pedestrian crosswalk. Can be combined with curb extensions and elevated crosswalks to further enhance pedestrian safety.	• Residential Land Use • Commercial Land Use • Urban Context • Suburban Context	
Right-In/Right-Out Islands	Raised triangular islands in an intersection that prevent vehicles from turning left or driving through an intersection.	Reduces the crossing distance and the number of conflicts at an intersection. May result in increased automobile speeds when drivers are not required to stop.	• Residential Land Use • Urban Context • Suburban Context	
Speed Bumps / Humps	Raised areas along a roadway which can be installed to be temporary or permanent. Inexpensive to design and install.	Reduced automobile speeds and can lead to lower short-cutting traffic volumes.	• Residential Land Use • Local / Collector Streets • Commercial Land Use • Urban Context • Suburban Context	
Speed Tables	Flat-topped speed humps constructed with brick or other materials along the flat portion. Typically, inexpensive to install.	Less effective as reducing automobile speeds compared to speed bumps / humps, however, speed tables do not provide as much discomfort to passengers.	• Residential Land Use • Commercial Land Use • Urban Context • Suburban Context	

Measure	Description	Purpose	Applicability	Example
Full Closure	Installation of a barrier across the entire width of a roadway, preventing drivers from passing through. Built to accommodate emergency vehicles and cyclists.	Prevents through and short-cutting traffic while accommodating emergency vehicles and cyclists.	• Residential Land Use • Commercial Land Use • Urban Context • Suburban Context • Rural Context	
Bicycle Boulevard	Installation of signage and pavement markings indicating that the roadways are shared facilities for bicycles and automobiles.	Promotes active transportation on streets that experience low automobile volumes.	• Residential Land Use • Commercial Land Use • Urban Context • Suburban Context	
Speed Kidney	A vertical traffic calming device that allowing motorists to move through a path instead of over a bump. Consists of a raised and curved area.	Reduces automobile speeds. Acts as a speed bump, while also providing an alternative path to avoid the vertical deflection.	• Residential Land Use • Commercial Land Use • Urban Context • Suburban Context	

5.3.3 Pedestrian Crosswalk Safety

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

During public consultation through this MTMP, as well as through the Official Plan review, several safety-related comments pertaining to pedestrian crosswalks were submitted, particularly with regards to the lack of pedestrian crossings on major arterials.

Midland has jurisdiction over most roads within the Town's boundaries. While pedestrian facilities, including crosswalks, are under the jurisdiction of the Town of Midland 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.
- **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 bandaid 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 T**able 5.18** on the following page, that were developed based on public consultation and anlysis throughout this MTMP study. The scoring system was developed based on best practices in various 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 Midland 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 5.19** 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.

Table 5.18 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
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

5.3.3.4 Pedestrian safety Recommendations

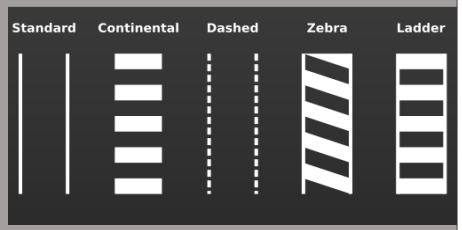
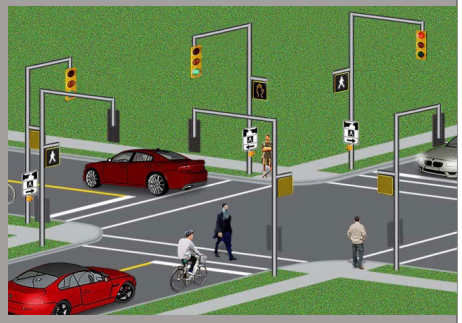
Pedestrian crosswalks and Traffic control devices play a vital role in pedestrian safety and must be implemented to ensure that the most troublesome locations receive attention commensurate with the problem. It is essential that Pedestrian traffic control issues be continually monitored to ensure that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

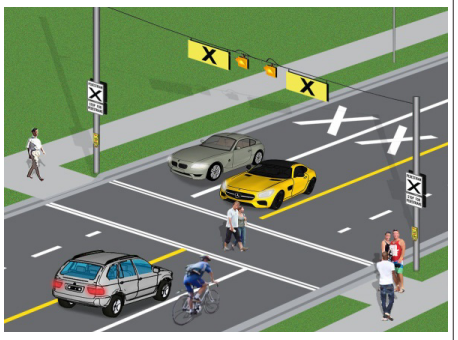
The Town of Midland should develop a pedestrian safety program to systematically and proactively address pedestrian safety issues. This is an important undertaking, especially given the population growth projected for the town and the town's focus on promoting active transportation as an encouraged mode 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 pedestrian safety plan that encompasses an evaluation scoring system for pedestrian crossings.

Table 5.19 Typical Pedestrian Crossing Measures, their applicability, and examples

Pedestrian Crossing Facility	Description	Purpose	Applicability				Example
			Mid-block	Inter-section	Round-about	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	Round-about	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	Singe Builds awareness among road users and students. They help improve pedestrian safety and reduce traffic congestion around school zones	✓	✓			

Figure 5.34
Sketch of an urban complete street

5.3.4 Complete Streets & Road Classification

5.3.4.1 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 Town can present significant safety barriers for residents on foot or on bike, and in Midland'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, Midland is empowered to coordinate with outside agencies on new project designs to ensure that it will serve residents as well as visitors.

5.3.4.2 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.

5.3.4.3 Recommended Road Classification

The Town of Midland 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 Downtown 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 Town. The framework defines the future function of the street network on the basis of overall land use and transport objectives.

The roads within Midland 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 5.35** and changes are summarised in **Table 5.20**. With a comparison of current and recommended design standard complete streets cross-sections on the following pages.

Figure 5.35 Recommended Road Classification

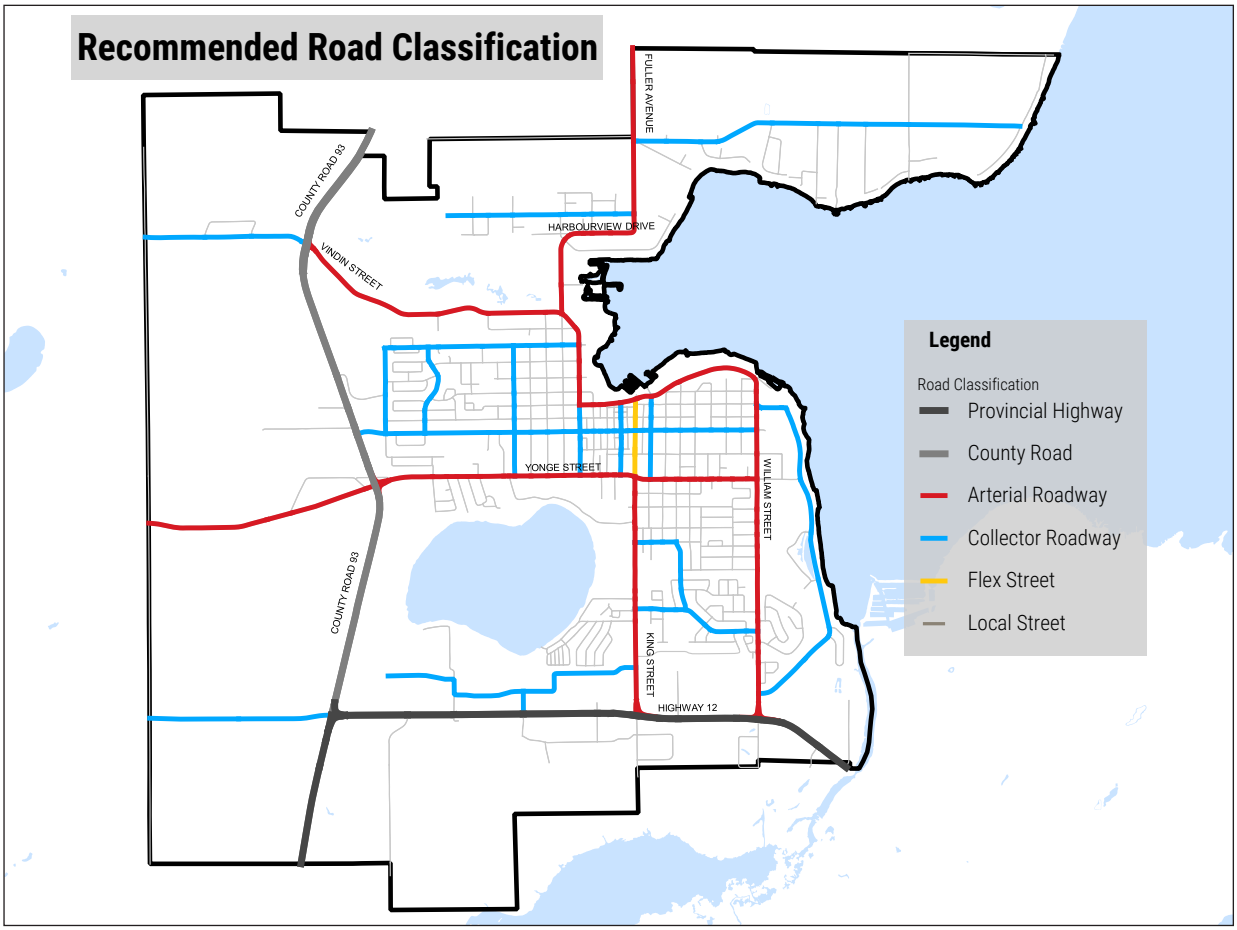


Table 5.20 Recommended Changes to Road Classification and their Implications

Roadway	Description	Recommended Classification	Implications
King Street	Between Yonge Street and Bayshore Drive	Flex Street	• Shared space, traffic calming, discourages through traffic.
New Road 1	New east-west collector road between King Street in the east and Sumac Lane in the west.	Collector Roadway	• New roadway that needs to meet Collector Road maintenance standards.

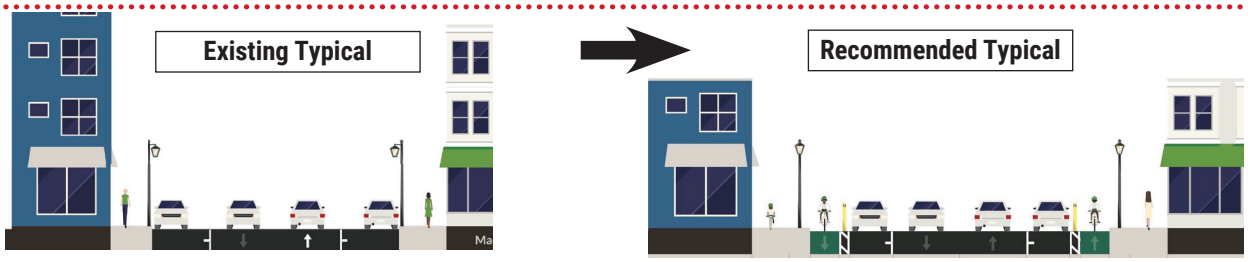
5.3.4.4 Complete Streets Recommendations

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:

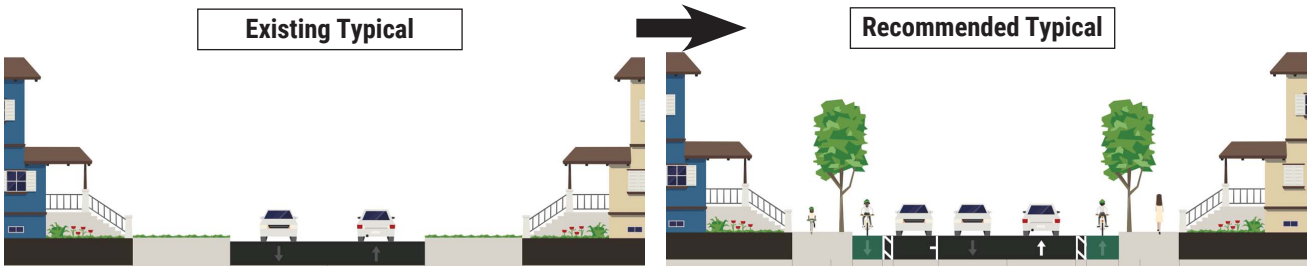
- Official Plan Amendments to account for the updated road classifications and changes;
- Updated Municipal Design Standards for the Road Classification categories to include Transit, Active Transportation, and road safety parameters conducive of Complete Streets.

Arterial



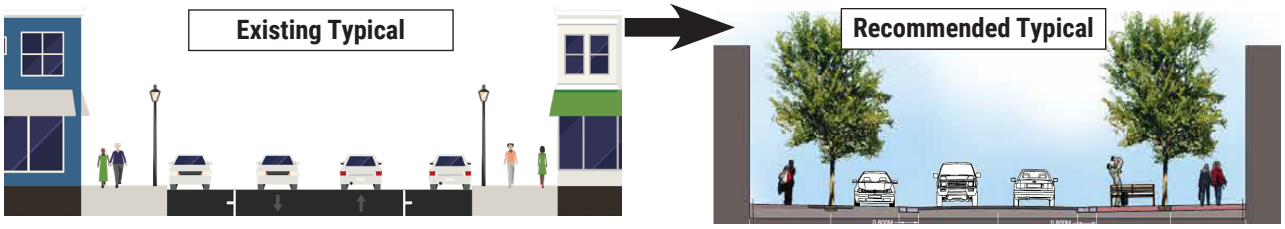
Arterial roadways should connect to the provincial and county road network as well as service major commercial or employment areas in Midland. They should accommodate designated pedestrian and cycling facilities, along with transit priority measures where applicable. The type of pedestrian or cycling 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.

Collector



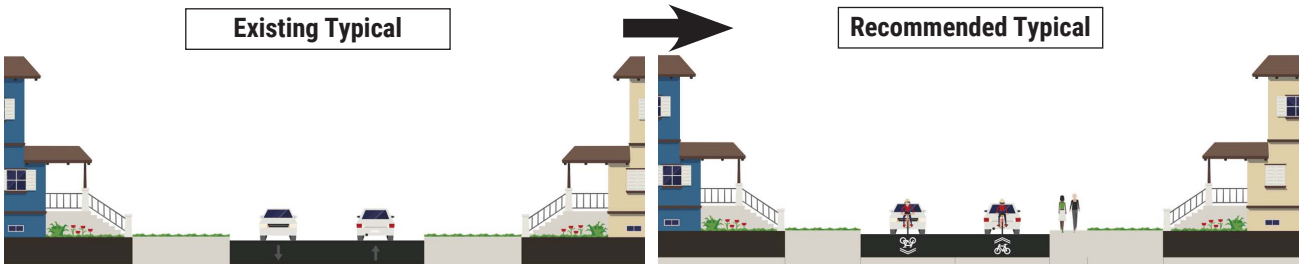
Collector roadways should service major neighbourhood nodes such as schools and community centres as well as provide a link to the broader Major collector roadway system. They should accommodate pedestrian sidewalks on at least one side of the roadway as well as allow for bicycle infrastructure such 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.

Flex Street



The Midland Downtown Master Plan identified King Street to be reconstructed as a Flex Street 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.

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.

5.3.5 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.

Figure 5.36 Example of the impact that winter sand has on bike lane markings on Yonge Street

Currently, the Town of Midland maintains pedestrian sidewalks, but does not have an explicit standard for multi-use paths or bike lanes. The snow maintenance in Midland utilizes sand on roadways in the winter which significantly impacts road markings as shown in **Figure 5.36**.

Public engagement identified reliability as being one of the top three factors influencing mode choice in Midland. Walking and Cycling are mode choices that can be a year-round option for getting around Midland, 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.

5.3.5.1 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 impedance.

Key considerations for winter maintenance and operations include:

- Coordination of street/sidewalk/trails/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 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 5.37**.

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.

5.3.5.2 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.

"Snow removal and winter city planning in terms of transportation. Policy review/refresh/update of our winter removal schedules and techniques to ensure that we're prioritizing sustainable transportation. Ensuring sidewalk network is plowed near schools in the morning, bike lanes are cleared to the late fall/early spring, etc."

- Anonymous comment from the Official Plan Review

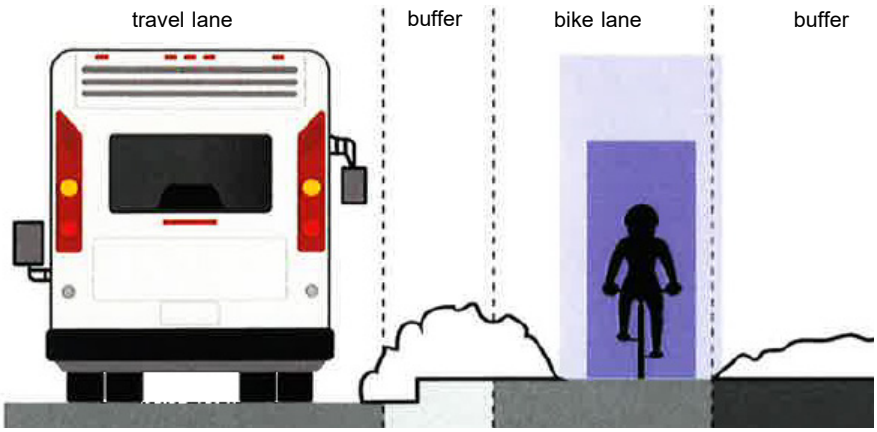


Figure 5.37 Example of buffer areas between active transportation and roadway facilities being used for snow

The MMS now include specific sections outlining winter maintenance standards for snow accumulation in bicycle lanes. **Table 5.21** compares the new snow accumulation depth standards for bicycle lanes as compared to the existing standards for roadways.

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 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.

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.

Table 5.21 Provincial minimum maintenance standards for bicycle lanes and roadways

Class of Highway or Adjacent Highway	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 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 Midland where a significant portion of cycling infrastructure is provided as a multi-use trail.

5.3.5.3 Midland's Current Winter Maintenance Standards

Midland's Maintenance Policy states that sidewalks will be cleared as soon as practicable after a snowfall. 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:

- Access to schools;
- Major thoroughfares; and
- Access to the Downtown.

Sanding will be carried out as required, primarily only where there is heavy pedestrian traffic, or where the surface is icy or has a gradient. Where no sanding is carried out, a layer of packed snow will remain on the sidewalk surface after plowing.

Along King Street in Downtown the by-law allows occupants and owners to deposit snow and ice removed from Town-owned property in the gutter for removal by the Town's forces. This practice is unique to Midland and is called "Percy's Peaks", named after Town Engineer, Percy Ehler, who came up with the idea to push all the snow in the Downtown toward the centre of the street and then hauled away by municipal vehicles as shown in **Figure 5.38**.

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

Table 5.22 Best Practices for Active Transportation Snow Clearing in Canada and Abroad

Municipality	Standards
Ottawa, ON	• Plowing: started after 2.5 to 5.0 cm of snow accumulation; • Snow Removal: 50% widrow encroachment into cycling facility.
Montreal, QC	• Sweeping: 3.0 to 5.0 cm of snow accumulation; • Plowing: more than 5.0 cm of snow accumulation.
Calgary, AB	• 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	• 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 5.38 Example of "Percy's Peaks" along King Street.

5.3.5.4 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 5.22** 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 Midland for roadways and sidewalks).

5.3.5.5 Fleet Considerations

The addition of over 77 km of cycling infrastructure (including multi-use paths), as well as 23 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 Town's current winter maintenance standards.

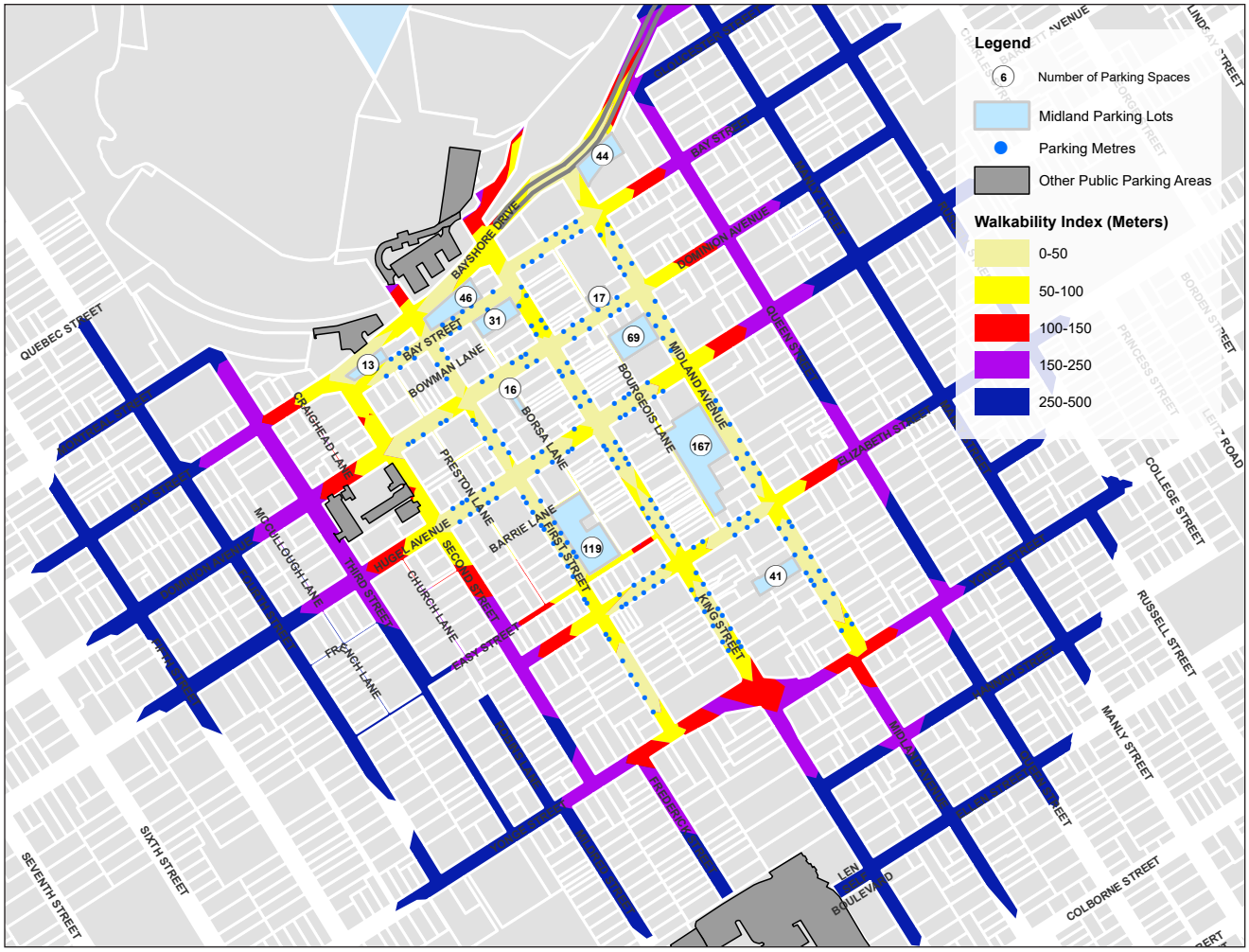


Figure 5.39 Downtown Parking Accessibility

5.3.5.6 Active Transportation Winter Maintenance Recommendations

Winter is an inevitable part of yearly life in Midland. 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 Town. 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 Town safely.

The Town of Midland 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.

Recommended Policy Documents:

- Develop snow maintenance standards for the cycling, pedestrian, and multi-use trails network and amend the changes to the existing Winter Control Policy;
- Re-evaluate the fleet requirements for maintaining additional active transportation infrastructure.

5.3.6 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.

5.3.6.1 Context

The Town of Midland has an extensive parking program, with over 600 parking spaces located in the downtown core as Municipal off street and on street parking most of which is within a 150m walk of commercial businesses and properties as visualized in **Figure 5.39**.

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 138 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 2012 Parking Analysis of Downtown Midland revealed the average parking utilization in the downtown core to be between 40-70% depending on the parking lot

(with Lot 2 being the most utilized). The surplus parking in the commercial core if managed properly, could effectively serve the increased future typical demand caused by traffic growth and any new developments without the need for expanding the existing parking infrastructure. However, special events such as the Butter Tart Festival would need further consideration for additional temporary solutions given the growth that the event has experienced over the past few years.

5.3.6.2 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 Town of Midland can support the downtown revitalization while balancing land use objectives. These measures include:

Demand Priced Parking

A system could be developed whereby the town 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.

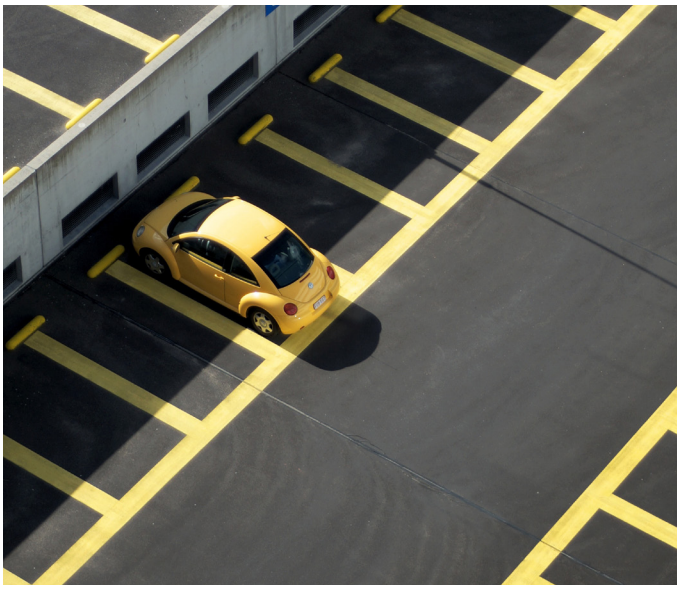
They are a flexible way to address growing demand for parking spaces at relatively low construction cost and no additional land requirements.

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 tenets 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.



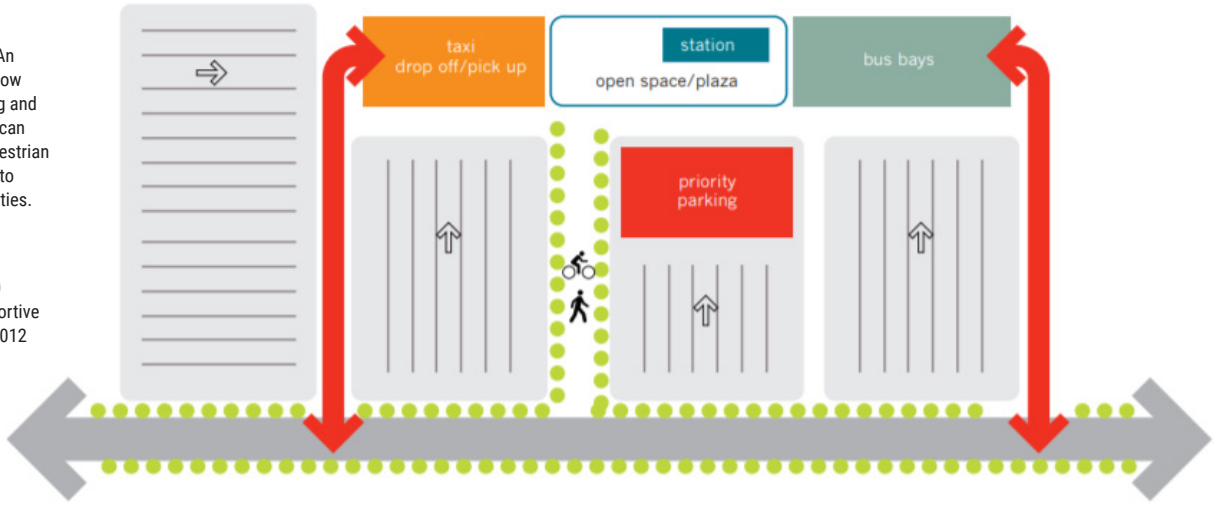


Figure 5.40 An example of how streetscaping and landscaping can enhance pedestrian connections to parking facilities.

Source: MTO Transit-Supportive Guidelines, 2012

Wayfinding and Signage

A comprehensive and uniform wayfinding and signage program for theTown'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 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 5.40**.

5.3.6.3 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 5.41** shows an example of what a manage curbside looks like.

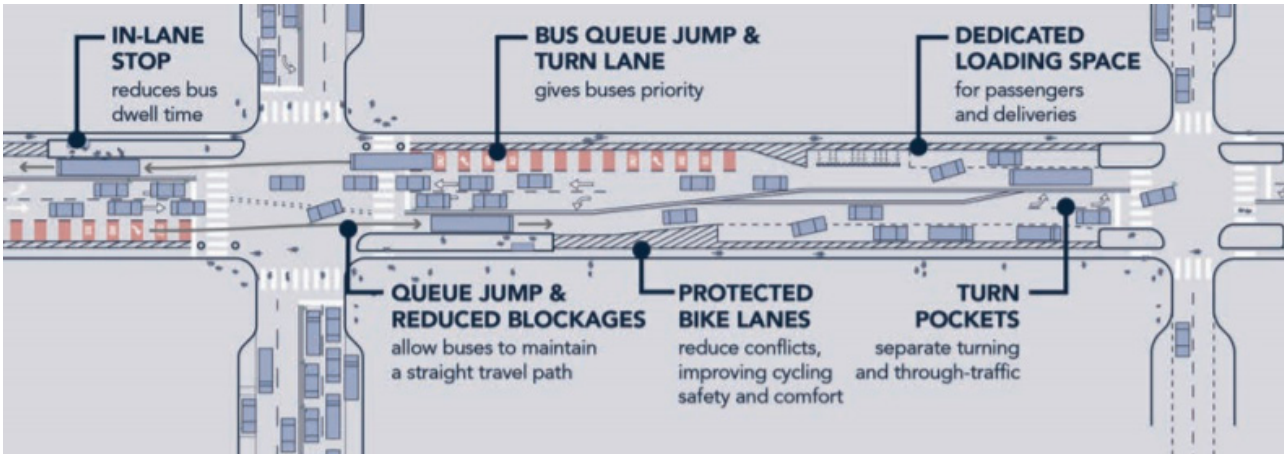


Figure 5.41 An example of what a managed curbside looks like.

Source: NACTO Curb Appeal, 2017

5.3.6.4 Downtown Parking Management Recommendations

It is recommended that the Town of Midland 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 special events, future parking and curbside demand needs.

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 the vast majority of the population now owns a smartphone.

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

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 the vast majority of the population now owns a smartphone.

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.

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 private 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 (i.e. a round-trip booking), while some car-sharing models allow

Figure 5.42
An example of autonomous microtransit being used at Califronia's GoMomentum Station.

the user to park at a different location than their origin (i.e. 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. 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 (i.e. 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.

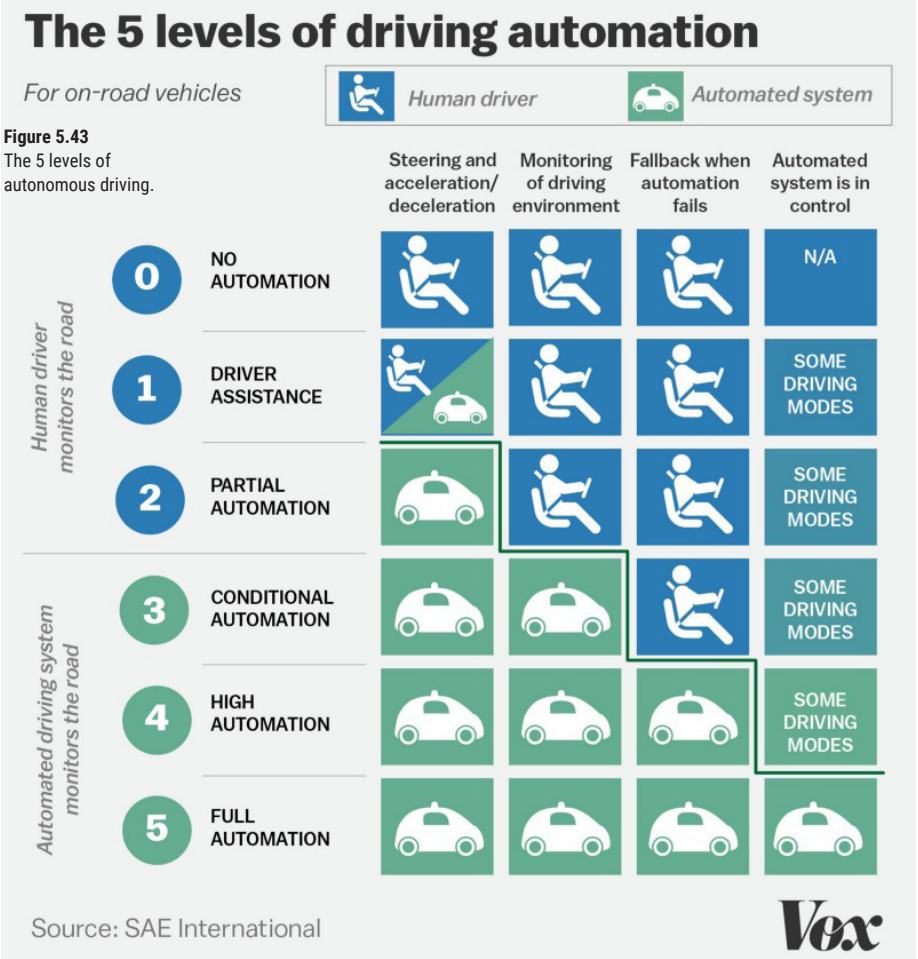


Figure 5.43
The 5 levels of autonomous driving.

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 (Society of Automotive Engineers) International. 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 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 as seniors and people with

Figure 5.44 An example E-scooters operating in Nashville, TN.

"Micro mobility, future flexible road network for new modes of micro transportation - electric scooters, skateboards, ebikes, etc. There's a growing trend of rentable electric scooters in SoCal that we might see expand to Canada. Basically, the miniaturization of electric motors means that we're seeing bikes, skateboards, scooters get super charged, which creates a future challenge for our AT network. We're already seeing conflicts with fast ebikes and walkers on our mutli-use trails."

- Anonymous comment from the Official Plan Review

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 (i.e. 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 are 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 Town of Midland be proactive and prepare for emerging technology to leverage their benefits. Often, this requires a municipality to do some legwork 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 Town of Midland 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:

- Collaborate with neighbouring North Simcoe municipalities to evaluate the feasibility of a Bikeshare/E-scooter system within Midland;
- Develop a comprehensive transportation data monitoring plan including intersection counts, downtown curbside demand usage, parking utilization, and corridor volumes;
- Develop an open data portal and upload/maintain transportation data at regular intervals.

Figure 5.45 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 **$57,894,820** (not including improvements and costs to be incurred by the Province or County).

Of the total capital costs, **$20,118,622** is needed for short-term improvements (<5 years), **$34,265,444** for medium term (5-10 years), and **$3,511,755** for long-term (10-20 years). Approximately **50%** of the costs are associated with sustainable modes of transportation with the remaining **50%** dedicated to roadway improvements. This aligns closely with stakeholder engagement which identified a desire for 60% of this MTMP to be dedicated to sustainable modes of transportation other than automobiles as summarised in **Table 5.24**.

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 medium and long-term improvements will be triggered by development, particularly within North and South Midland. 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 re-alignment of intersections along Harbourview Drive, Vindin Street and Aberdeen Boulevard are required to accommodate the influx of new residents.

Approximately **61%** of the capital improvement costs will be eligible for cost recovery through DC mechanisms. The remaining **39%**, 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 5.23**.

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 5.23 Estimated Capital Programming Costs by Horizon and by Jurisdiction

Phasing	Town of Midland			MTO/County
	Total Cost (DC + Non-DC)	DC	Non-DC	Total Cost
Short-Term (<5 years)	**$20,118,622**	**$6,951,245**	**$13,167,377**	**$2,727,344**
Cycling	$6,245,371	$1,742,277	$4,503,094	$612,444
Pedestrian	$5,249,250	$232,678	$5,016,572	-
Multi-Use	$1,115,696	$496,729	$618,967	$1,539,900
Roadway	$4,255	-	$4,255	-
Intersections	$7,504,049	$4,479,561	$3,024,489	$575,000
Medium-Term (5-10 years)	**$34,264,444**	**$26,017,186**	**$8,247,258**	**$2,697,724**
Cycling	$5,265,479	$4,091,744	$1,173,735	$641,608
Pedestrian	$2,068,853	$344,764	$1,724,089	-
Multi-Use	$1,527,507	$1,145,631	$381,877	$2,056,116
Roadway	$16,232,044	$13,298,377	$2,933,667	-
Intersections	$9,170,560	$7,136,670	$2,033,890	-
Long-Term (10-20 years)	**$3,511,755**	**$2,480,924**	**$1,030,831**	**-**
Cycling	-	-	-	-
Pedestrian	-	-	-	-
Multi-Use	$2,936,755	$2,049,674	$887,081	-
Roadway	-	-	-	-
Intersections	$575,000	$431,250	$143,750	-
Total	**$57,894,820**	**$35,449,355**	**$22,445,466**	**$5,425,068**

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 5.24 Breakdown of municipal costs by mode

Mode	Municipal Cost	% of total	Survey focus %
Cycling	$11,510,850	20%	60%
Pedestrian	$7,318,104	13%	
Multi-Use	$5,579,959	10%	
Intersections - AT Improve	$4,482,275	8%	
Roadway	$16,236,299	28%	40%
Intersections - Veh Improve	$12,767,335	22%	
Total	**$57,894,820**	**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.

Beyond these programs there is the federal Public Transit Infrastructure Fund (PTIF) which is primarily meant for transit improvements but can also be used for active transportation improvements that support and connect to transit. There is also the Investing in Canada Infrastructure Program (ICIP) which is a federal program designed to build sustainable resilient communities. There is a Green Infrastructure stream for this funding that can be used to fund projects that will reduce a community's carbon footprint, which cycling and pedestrian infrastructure would be applicable for. Additionally, there is the Ontario Community Infrastructure Fund (OCIF) which provides steady, long-term funding for small, rural and northern communities to develop and renew their infrastructure. Projects eligible for funding include core infrastructure projects (roads, bridges, water and wastewater) that are identified as a priority in the community's asset management plan and that addresses an existing health or safety issue, or renews, rehabilitates or replaces an existing critical piece of infrastructure.

6.0 Bibliography

- City of Barrie. (2018, November 6). Oversize Load Permit. Retrieved from Barrie Municipal Website: https://www.barrie.ca/Doing%20Business/PermitsandLicenses/Pages/Oversize-Load-Permit.aspx
- City of Toronto. (2017). Toronto Complete Streets Guidelines. Toronto: City of Toronto.
- CUTA. (2015). Canadian Transit Fact Book. Toronto.
- Dillon Consulting Ltd. (2018). Transit Operational Review - Draft Report - Phase 2: Proposed Service STrategy. Midland: Town of Midland.
- Hemson Consulting Ltd. (2014). Development Charges Background Study. Midland: Town of Midland.
- Ministry of Municipal Affairs, Ontario. (2017). Growth Plan for the Greater Golden Horseshoe. Toronto: Government of Ontario.
- Parachute Vision Zero Network. (2017). Vision Zero: The Canadian Landscape. Cas Study Series, 1-13.
- Prozzi, J., Murphy, M., Loftus-Otway, L., Banerjee, A., Kim, M., Wu, H., . . . Weissmann, A. (2012). Oversize/Overweight Vehicle Permit Fee Study. Austin: University of Texas.
- Simcoe County. (2018, November 6). Permits and Fees. Retrieved from Simcoe County Municipal Website: https://www.simcoe.ca/TransportationEngineering/Pages/PermitsFees.aspx
- Simcoe Muskoka District Health Unit. (2018, October 31). Senior Population Count. Retrieved from Simcoe Muskoka Health Stats: http://www.simcoemuskokahealthstats.org/topics/population/senior-population
- Smart Growth America. (2018, June 13). Complete Streets Policies Nationwide. Retrieved from Organization Website for Smart Growth America: https://smartgrowthamerica.org/program/national-complete-streets-coalition/policy-development/policy-atlas/
- Statistics Canada. (2017, February 8). Census Profile, 2016 Census. Retrieved from Statistics Canada Census Program: http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E
- Town of Midland. (2012). Transportation Master Plan. Midland: Town of Midland.
- Town of Midland. (2017). Draft Official Plan Review. Midland: Town of Midland.
- Town of Midland. (n.d.). Ridership Stats. Midland: Town of Midland.
- University of Toronto - Data Management Group. (2011). Transportation Tomorrow Survey. Toronto: University of Toronto.
- University of Toronto - Data Management Group. (2016). Transportation Tomorrow Survey 2016. Toronto: University of Toronto.
- City of Toronto. (2017). Toronto Complete Streets Guidelines. Toronto: City of Toronto.
- CUTA. (2015). Canadian Transit Fact Book. Toronto.
- Ministry of Municipal Affairs, Ontario. (2017). Growth Plan for the Greater Golden Horseshoe. Toronto: Government of Ontario.
- Parachute Vision Zero Network. (2017). Vision Zero: The Canadian Landscape. Cas Study Series, 1-13.
- Prozzi, J., Murphy, M., Loftus-Otway, L., Banerjee, A., Kim, M., Wu, H., . . . Weissmann, A. (2012). Oversize/Overweight Vehicle Permit Fee Study. Austin: University of Texas.
- Simcoe County. (2018, November 6). Permits and Fees. Retrieved from Simcoe County Municipal Website: https://www.simcoe.ca/TransportationEngineering/Pages/PermitsFees.aspx
- Simcoe Muskoka District Health Unit. (2018, October 31). Senior Population Count. Retrieved from Simcoe Muskoka Health Stats: http://www.simcoemuskokahealthstats.org/topics/population/senior-population
- Smart Growth America. (2018, June 13). Complete Streets Policies Nationwide. Retrieved from Organization Website for Smart Growth America: https://smartgrowthamerica.org/program/national-complete-streets-coalition/policy-development/policy-atlas/
- Statistics Canada. (2017, February 8). Census Profile, 2016 Census. Retrieved from Statistics Canada Census Program: http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E
- Transit Consulting Network. (2017). Operational Review of Orillia Transit Service. Orillia: City of Orillia.
- University of Toronto - Data Management Group. (2011). Transportation Tomorrow Survey. Toronto: University of Toronto.
- University of Toronto - Data Management Group. (2016). Transportation Tomorrow Survey 2016. Toronto: University of Toronto.
- (n.d.). Retrieved from https://www.google.com/url?sa=i&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwis9eao_PrhAhWWqp4KHZ7WALcQjhx6BAgBEAM&url=https%3A%2F%2Fwww.androidpit.com%2Flime-scooters-pulled-in-switzerland&psig=AOvVaw3iTbVDNfdcpAZqaPj3NMGm&ust=1556822053606473
- Engadget. (n.d.). Retrieved from https://o.aolcdn.com/images/dims?quality=85&image_uri=http%3A%2F%2Fo.aolcdn.com%2Fhss%2Fstorage%2Fmidas%2Fe2af5e3b425bb70fa35f17e8ba8de0d7%2F206516916%2F0710_toyota-.jpg&client=amp-blogside-v2&signature=8a6a4f64a41201a6c14d7b121103ec696bb79e31
- Koka, J. (2018, June 4). Demystifying the future of connected and autonomous vehicles. Retrieved from https://3c1703fe8d.site.internapcdn.net/newman/csz/news/800/2018/demystifying.jpg
- McCarthy Tetrault. (2018, September 25). E-Scooter Mania and the Laws of Canada. (McCarthy Tetrault) Retrieved May 1, 2019, from https://www.mccarthy.ca/en/insights/blogs/mccarthy-tetrault-moves/e-scooter-mania-and-laws-canada
- New Mobility News. (n.d.). Whim app combines all means of transport in Antwerp. Retrieved from https://newmobility.news/wp-content/uploads/2017/05/Schermafbeelding-2017-05-19-om-09.57.41-e1495181025632-960x640.png
- SAE International. (n.d.). Automated Driving. Retrieved May 1, 2019, from https://www.sae.org/misc/pdfs/automated_driving.pdf
- TechCrunch. (n.d.). Retrieved from https://techcrunch.com/wp-content/uploads/2019/04/waymo-app.jpg?w=730&crop=1