Peterborough County

2022 Transportation Master Plan Update

October 2022

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Land Acknowledgement

We respectfully acknowledge that Peterborough County is located on the Treaty 20 Michi Saagiig territory and in the traditional territory of the Michi Saagiig and Chippewa Nations, collectively known as the Williams Treaties First Nations, which include: Alderville, Beausoleil, Curve Lake, Georgina Island, Hiawatha, Rama, and Scugog Island First Nations. Peterborough County respectfully acknowledges that the Williams Treaties First Nations are the stewards and caretakers of these lands and waters in perpetuity, and that they continue to maintain this responsibility to ensure their health and integrity for generations to come.

Accessibility

Peterborough County is committed to meeting the requirements outlined in the *Accessibility for Ontarians with Disabilities Act, 2005* (AODA). Peterborough County will, upon request, provide or arrange for the provision of accessible formats and communication supports as it relates to information about our goods, services, or facilities.

Project Direction

The **Transportation Master Plan Steering Committee**, comprised of members of County Council, staff from the County's Planning and Public Works Department, and representatives from First Nations and the City of Peterborough, guided the 2022 Transportation Master Plan Update Study. The Steering Committee members included:

County Council Members

Warden J. Murray Jones
Deputy Warden Andy Mitchell
Councillor Scott McFadden
Councillor Jim Martin

First Nations Representatives

Shawn Williams, Capital Director
Clem Carr, Public Works Lead
Ron Howard, Infrastructure Manager
Tom Cowie, Land/Resources Consultation

County Staff

Bryan Weir, Senior Director of Planning and Public Works
Peter Nielsen, Manager, Capital Projects
Doug Saccoccia, Manager, Engineering and Design
Iain Mudd, Manager, Planning

City of Peterborough Representatives

Kemi Akapo, Councillor-at-large, Chair of Transportation
Kevin Jones, Manager of Transportation

The County of Peterborough Council adopted the 2022 Transportation Master Plan Update in principle on October 19, 2022.

Chapter 1 About This Plan

1.1 Study Background and Purpose

The **Peterborough County Transportation Master Plan** (TMP) guides the municipality in planning, developing, and operating its transportation system. Originally adopted in 2004 and last updated in 2014, the plan identifies transportation policies, facilities, and services to meet the needs of residents and businesses, with recommendations for new and improved infrastructure to assist the County with capital planning, prioritization, and preparation for future growth.

With many of the short-term actions from the 2014 plan now implemented, the County initiated this Transportation Master Plan (TMP) Update to review the longer-term recommendations not yet initiated and identify emerging needs and areas for improvement. Like the previous review, the 2022 TMP Update focuses on identifying:

- Short and long-term transportation infrastructure needs;
- Transportation network improvements that best address the needs;
- Enhancements to the policies and standards that guide the planning, development, and operation of the County's transportation system; and
- Costs to implement the plan recommendations and priorities and funding opportunities for the proposed improvements.

This TMP update addresses transportation needs to the year 2051, in alignment with the planning horizon of the new County Official Plan adopted by County Council on June 29, 2022. The update was completed in conjunction with the review of the County's Development Charges Background Study. The roadway expansion projects identified in this plan formed the basis of the growth-related capital program for the Development Charges By-law adopted by County Council on May 4, 2022.

1.2 Municipal Class Environmental Assessment Process

The work undertaken in completing the TMP Update followed the Municipal Class Environmental Assessment (EA) [1], an approved process under the *Environmental Assessment Act* for planning municipal infrastructure projects in Ontario. The study incorporated the key principles of environmental assessment planning, which include:

[1] Municipal Engineers Association. *Municipal Class Environmental Assessment (Class EA).* October 2000, last amended in 2015.

- Consulting with affected parties throughout the study;
- Considering a reasonable range of alternatives;
- Identifying and considering the effects of each alternative on all aspects of the environment;
- Evaluating the alternatives systematically to determine their net environmental effects; and
- Providing clear, complete, and traceable documentation of the planning process.

The Municipal Class EA defines different approaches to conducting master plans. The TMP Update followed **Approach #1**, with preparation of this report at the conclusion of Phases 1 and 2 of the Municipal Class EA Planning and Design Process, which comprise:

- Identifying the problem or opportunity (Phase 1); and
- Identifying alternative solutions to address the problem or opportunity (taking into consideration the existing environment) and establishing the preferred solution (taking into consideration public and review agency input) (Phase 2).

Consistent with this approach, the TMP Update was completed at a broad level of assessment, allowing the plan to serve as the basis for more detailed future investigations required to fulfil the remaining environmental assessment requirements for recommended Schedule B and Schedule C projects. Schedule B projects will still require the filing of a project file, while Schedule C projects will need to fulfill Phases 3 and 4 of the Municipal Class EA process prior to filing an Environmental Study Report (ESR).

The TMP Update also recommends several projects categorized as Schedule A or A+ undertakings, which are considered pre-approved under the Act. Projects of this nature, such as minor intersection improvements, pose limited potential for environmental effects, with routine measures typically utilized to mitigate any effects.

1.3 Public and Stakeholder Engagement

Consultation is a core component of the Municipal Class EA process and a vital element of a master planning study. The **Engagement Program** for the study offered the public, review agencies, other municipalities, and First Nations and Indigenous Peoples a variety of opportunities to learn about the TMP and provide input into the update of the long-range transportation strategy for Peterborough County. Through the study, the County was able to inform and educate interested parties about transportation opportunities and challenges in the Peterborough County area.

The Engagement Program featured a range of consultation, outreach, and communication initiatives to involve a broad spectrum of participants, focused on the following key messages:

- The County is planning for population and employment growth in the coming years;
- The County wants to provide users with a range of safe, efficient, and accessible mobility choices; and
- Involving residents, businesses, agencies, and other stakeholders throughout the study would ensure the updated plan is pragmatic and meets community needs now and into the future.

The County conducted two formal rounds of engagement as part of the TMP Update. Below summarizes the key features and findings of each round. The Technical Compendium (described in **Section 1.4**) contains a detailed synopsis of the program, summarizing the consultation approach, outreach methods, engaged stakeholders, and program milestones for both rounds of engagement, with supporting documentation of the feedback received.

Round #1 (November 26, 2020 to January 4, 2021)

The first round of engagement presented information and invited feedback on the study background and TMP review and update process. The County issued the Notice of Online Public Information Centre (PIC) 1 to the public, agencies, utilities, stakeholders, and Williams Treaties First Nations through local newspaper ads, mailed hardcopies, and emailed electronic copies. Social media notifications were also sent via the County's accounts.

Due to the ongoing COVID-19 pandemic and associated physical distancing requirements, the County hosted PIC 1 virtually on the study website (www.ptbocounty.ca/TMP) from November 26, 2022 to January 4, 2021. The recorded presentation allowed participants the opportunity to read and/or listen to study information, with a comment form available to offer feedback. Study team contact information was also provided on the PIC notice, study website, and presentation for individuals with questions or wishing to offer further input. **Table 1.1** summarizes community participation in the engagement efforts.

Table 1.1: Round #1 Engagement Statistics

Details	Number Reached	Number of Participants
Facebook Engagement	7,013	169
Twitter Engagement	9,034	165
Website Visitors	596	N/A
Total	**16,643**	**334**

The County received 13 comment forms, 1 email, and 1 phone call during Round #1. Key comment themes included:

- Improve road safety by decreasing speed limits, improving street lighting and signage, implementing speed bumps and rumble strips to control speeding, etc.;
- Improve pedestrian safety by providing more sidewalks, increasing the width of sidewalks/multi-use paths, improving pedestrian crossing safety at intersections through increased signage, road markings and lighting, etc.;
- Improve cycling safety by increasing the number of bike lanes, increasing cyclist signage and street lighting, etc.;
- Increase lighting and reflective signage on Highway 7 and 115/35;
- Add turning lanes at intersections to reduce traffic congestion;
- Increase public transit options and frequency of service, such as providing weekly buses from smaller villages to main city centres for shopping;
- Increase frequency of snow removal/salting on public sidewalks, as well as the number of streets that are serviced;
- Provide VIA Rail High Frequency Passenger Train Service; and
- Concern for ORV-use on County roadways (e.g., road safety, user safety for minors, increased dust and noise, damage to roadways/property and air pollution).

Round #2 (July 15, 2022 to September 12, 2022)

The second round of engagement presented information and invited feedback on the alternative solutions assessed and proposed road network plans and transportation policies. Like Round #1, the County issued the Notice of Online PIC 2 to the public, agencies, utilities, stakeholders, and Williams Treaties First Nations through local newspaper ads, mailed hardcopies, and emailed electronic copies. Social media notifications were also sent via the County's accounts.

The County also hosted PIC 2 virtually on the study website (www.ptbocounty.ca/TMP), with the material posted from August 15, 2022 to September 12, 2022. The recorded presentation allowed participants the opportunity to read and/or listen to study information, with a comment form available to offer feedback. Study team contact information was also provided on the PIC notice, study website, and presentation for individuals with questions or wishing to offer further input. **Table 1.2** summarizes public views of the online presentation.

Table 1.2: Round #2 Website Visits (Estimated)

Unique Visitors	Number of Visits
183	284

The County received two comment forms and two letter responses during Round #2. Key comment themes included:

- Provide only three lanes on Ward Street not five;
- Concern about traffic congestion and pedestrian safety on County Road 2 in Keene; and
- Modify the recommended roadway safety and operations policies in consideration of active school travel research.

In addition, the County held virtual meetings with representatives of Curve Lake First Nation (August 15, 2022), the Ministry of Transportation (MTO) (August 17, 2022), and local municipalities (August 18, 2022) to present and gather feedback on the information shared through online PIC 2, including an overview of the study recommendations. The County also invited comment from these parties on the 27 technical memoranda prepared in completing the TMP Update by email on July 15, 2022.

Indigenous Consultation

The County sent the Notice of Study Commencement and Public Comment Invited, Notice of Online PIC 1, and Notice of Online PIC 2 to the following Indigenous communities via mail and email: Alderville First Nation, Beausoleil First Nation, Chippewas of Georgina Island, Chippewas of Rama First Nation, Curve Lake First Nation, Hiawatha First Nation, Mississaugas of Scugog Island First Nation, and the William Treaties First Nations. Responses were received from Alderville First Nation, Hiawatha First Nation, and Curve Lake First Nation, with the latter two indicating they would like to participate in the study. Representatives from both First Nations sat on the Transportation Master Plan Steering Committee, as noted in the Acknowledgements.

The following summarizes the consultation activities with the two First Nations communities over the course of the TMP Update study:

- October 8, 2020 – Virtual meeting with representatives from Curve Lake First Nation to introduce the project.
- February 1, 2021 – Virtual meeting with representatives from Curve Lake First Nation and Hiawatha First Nation to provide information on the geographic area of interest, proposed activity, process overview and background and next steps within the study process. No comments were received at this meeting.
- July 11, 2022 – The County invited Curve Lake First Nation and Hiawatha First Nation to review the 27 technical memorandums summarizing the assessments carried out in completing the TMP Update and attend a meeting to share their feedback on the documents. The First Nations were also informed of PIC 2. Comments were requested by September 12, 2022. No responses were received.

- August 15, 2022 – Virtual meeting with representatives from Curve Lake First Nation to discuss the study findings and recommendations. Hiawatha First Nation did not respond to requests to attend the meeting.

1.4 Report Organization and Content

The remainder of this report is organized into six chapters.

Chapter 2 (Plan Context) explains the County structure, details the guiding policy framework, summarizes the ambitions and achievements of the 2014 TMP Update, and highlights emerging trends and changes since the last update was completed.

Chapter 3 (Existing Conditions) documents the County's transportation networks and travel characteristics at the time of preparing the plan.

Chapter 4 (Future Conditions) summarizes County growth and development projections, forecasts future travel demand on the County road network, identifies anticipated transportation opportunities and challenges, and outlines the two part strategy to meet current and future transportation needs.

Chapter 5 (County Road Network Plan) sets out the roadway network strategy recommended to meet future transportation needs.

Chapter 6 (Transportation Policies) outlines a broad range of policies to guide and support the management and operation of the transportation system.

Chapter 7 (Implementation) explains the process and tools for implementing the TMP recommendations, provides phasing and costing for proposed infrastructure improvements, and outlines monitoring strategies and a process of continual review and updates to the plan.

A **Technical Compendium**, containing the 27 technical memoranda and three background reports prepared in completing the TMP Update, supplements the plan. The compendium documents detail the data collected, research conducted, analysis completed, and conclusions reached in developing the plan recommendations. The Transportation Master Plan Steering Committee vetted each technical memorandum at meetings held over the course of the study, offering feedback on the policy and technical analysis findings that was incorporated into this report.

Chapter 2 Plan Context

2.1 County Structure and Area

Peterborough County is located on the Treaty 20 Michi Saagiig territory and in the traditional territory of the Michi Saagiig and Chippewa Nations, collectively known as the Williams Treaties First Nations, and is home to Curve Lake and Hiawatha First Nations communities. Located northeast of the Greater Toronto Area in central-eastern Ontario, the County is bordered by the City of Kawartha Lakes to the west, Haliburton County to the north, Hastings County to the east, and Northumberland County to the south. The City of Peterborough lies within the County's geographical boundaries but is separated for municipal purposes.

From a land use perspective, the southern half of the County is predominantly agricultural in nature with several small settlement areas, while the northern part comprises a diverse Canadian Shield landscape. Crown lands, active forestry, and aggregate extraction industries are also prevalent in the north. Four municipally serviced settlement areas exist in the southern part of the County: Havelock, Lakefield, Millbrook, and Norwood. These communities serve as the primary focus for new major development.

The County of Peterborough is an upper-tier municipality representing eight local municipalities (Townships of Asphodel-Norwood, North Kawartha, Cavan-Monaghan, Douro-Dummer, Selwyn, Havelock-Belmont-Methuen and Otonabee-South Monaghan, and Municipality of Trent Lakes). According to the 2021 Census of Canada, the County has a population of approximately 64,000 residents distributed over an area of about 4,000 square kilometres, plus a large seasonal residential component.

Table 2.1 summarizes the responsibilities of the County, its local municipalities, and MTO in delivering (surface) transportation services within Peterborough County. The TMP Update focuses primarily on responsibilities under the County's jurisdiction, with actions pertaining to the 690-kilometre County road network being the main emphasis of the plan.

2.2 Policy Context

The TMP Update builds on the land use and transportation planning policy framework established by the Province of Ontario, Peterborough County, and the City of Peterborough, particularly the new County Official Plan adopted by County Council on June 29, 2022. **Figure 2.1** shows the principal municipal and provincial plans and policies that informed the TMP Update. The Technical Compendium contains a more detailed summary of each document and its influence on the plan.

Table 2.1: Transportation Network Responsibilities in Peterborough County

Element	Peterborough County	Local Municipalities	Ministry of Transportation
Provincial Highways			●
County Roads	●		
Local Roads		●	
Pedestrian Network		●	
Cycling Network	●	●	
Multi-Use Trails	●	●	
Transit		●	
Goods Movement	●	●	●
Parking and Curbside Management		●	

Province of Ontario	Peterborough County	City of Peterborough
• Provincial Policy Statement • *Places to Grow Act, 2005* and Growth Plan for the Greater Golden Horseshoe (Growth Plan) • Oak Ridges Moraine Conservation Plan • Greenbelt Plan • *Accessibility for Ontarians with Disabilities Act* • Metrolinx 2041 Regional Transportation Plan • Greater Golden Horseshoe Transportation Plan	• Peterborough County Official Plan • 2019-2022 Peterborough County Strategic and Operational Plan • Peterborough County Development Charges Background Study • Peterborough County Transportation Master Plan Update (2014) • Peterborough County Active Transportation Master Plan	• City of Peterborough Official Plan • City of Peterborough Transportation Master Plan • Eastside Transportation Study • City of Peterborough Transit Review • City of Peterborough Cycling Master Plan

Figure 2.1: Land Use and Transportation Planning Policy Context

2.3 Ambitions and Achievements of 2014 Plan Update

The 2014 TMP Update included a series of recommendations for new/improved infrastructure (e.g., roads, transit, cycling, walking), operational design standards, and transportation policies. The plan organized the recommended actions into four areas:

County Road Network Improvements

The plan recommended a series of short and long-term road improvements to address identified operational and safety concerns and projected capacity needs. **Table 2.2** summarizes the status of the County road network improvement projects presented in the 2014 TMP Update. The County has completed or partially completed most short-term actions on the list.

From this table, **Figure 2.2** shows the recommended road expansion projects. All (except for the County Road 11 realignment between Moncrief Road and Airport Road) still await implementation, with timing anticipated in the medium to long-term given their scale and the lead time needed to bring the projects to completion.

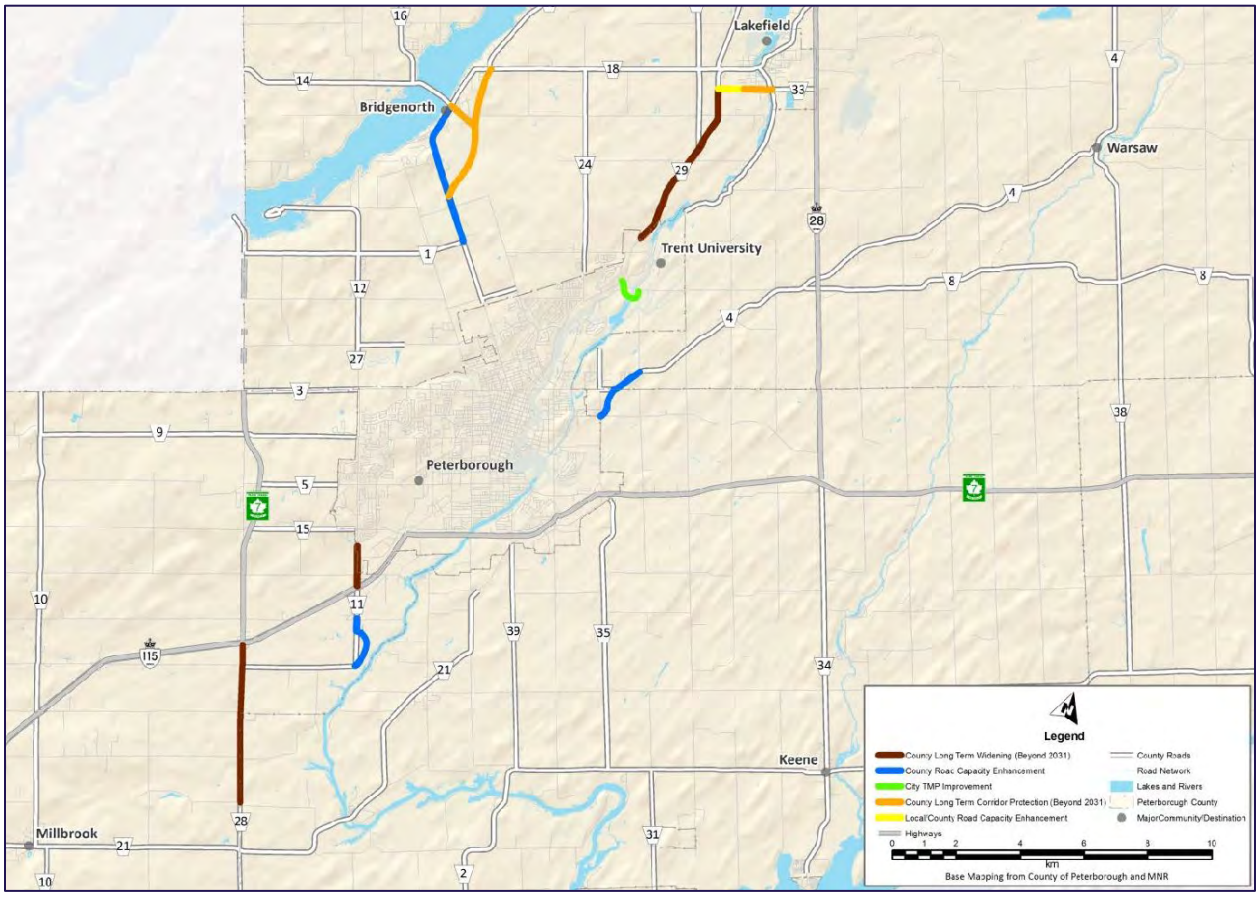

Figure 2.2: Recommended Capacity Improvement Projects in 2014 TMP Update

Table 2.2: Status of County Road Network Improvements Recommended in 2014 TMP Update

Road	Location	Status
Short-Term (0-10 Years)		
County Road 11	Moncrief Road to Airport Road	Complete
County Road 14	James A. Gifford Causeway	Complete
County Road 18	at County Road 29	Complete
County Road 18	Peterborough Limit to County Road 1	Complete
County Road 20	County Road 18 to County Road 23	Complete
County Road 28	at County Road 21	Complete
County Road 29	Concession Street (Lakefield)	Complete
County Road 30	Highway 7 to Old Norwood Road	Complete
County Road 23	at County Road 22	Complete
County Road 6	at County Road 4	Partially Complete
County Road 6	at County Road 40	Partially Complete
County Road 8	at County Road 38	Partially Complete
County Road 16	at County Road 17	Partially Complete
County Road 18	at County Road 24	Partially Complete
County Road 48	at 6th Line	Partially Complete
County Road 18	Gore Street to Champlain Street	Pending Further Study
County Road 14	at County Road 16 (James A. Gifford Causeway)	Outstanding
County Road 18	at County Road 14 (James A. Gifford Causeway)	Outstanding
Medium-Term (10-20 Years)		
County Road 19	County Road 18 to Hilliard Street	Complete
County Road 4	Television Road to University Road (County Road 41)	Outstanding
County Road 6	at County Road 4	Outstanding
County Road 6	at County Road 40	Outstanding
County Road 8	at County Road 38	Outstanding
County Road 18	Peterborough Limit to Wild Water & Wheels	Outstanding
County Road 18	Wild Water & Wheels to County Road 1	Outstanding
County Road 18	County Road 1 to Bridgenorth	Outstanding
County Road 23	at County Road 22	Outstanding
County Road 33	Highway 28 to County Road 32	Outstanding
County Road 33	County Road 29 to Peacock Road	Outstanding
County Road 46	County Road 504 to South of Oak Lake	Outstanding
County Road 56	Highway 28 to County Road 6	Outstanding
Long-Term (20+ Years)		
County Road 18	Bridgenorth By-pass Phase 1 – south of Bridgenorth to County Road 14	Outstanding
County Road 18	Bridgenorth By-pass Phase 2 – County Road 14 to County Road 20	Outstanding
County Road 28	Fraserville to Highway 115	Outstanding
County Road 29	Peterborough Limit to 7th Line	Outstanding
County Road 33	Peacock Road to County Road 32	Outstanding
County Road 33	Highway 28 to County Road 32	Outstanding

Active Transportation

The plan noted the growing prominence of cycling and walking as modes of transportation for both utilitarian and recreational purposes and the County's role in promoting and facilitating their use. To this end, the 2014 TMP Update recommended improved linkages to existing trails and support for development of promotional materials such as trail maps, signage of cycling routes, and provision of bike racks. A conceptual active transportation/cycling network, comprised of both on-road and off-road (trail) active transportation facilities, was also identified. In addition, the plan recommended developing a County-wide Active Transportation Plan and establishing a funding program to support and promote local municipal initiatives.

The County has advanced all initiatives in this category, including the preparation and implementation of its first Active Transportation Master Plan in 2017.

Transit

Acknowledging the challenge of providing cost-effective transit service in rural areas, the plan identified the need for basic public transportation for residents without access to or unable to use a personal automobile, which includes low-income individuals, persons with mobility issues, and the elderly. On this basis, the 2014 TMP Update recommended forming a working group to facilitate more detailed assessment and consideration of transit service delivery options.

The County has made limited progress with this initiative since the 2014 TMP Update. The lessons learned from The Link pilot program will offer further insight into the effectiveness of this form of public transportation in Peterborough County and guide future initiatives (as discussed in **Section 6.5.2**).

Transportation Policies

The plan included recommendations on County policies for roadway design and operational standards in the areas of:

- **Roadway Classification** – Develop a roadway classification system that categorizes roads based on traffic characteristics and their role and function into Class A (Major), Class B (Minor), Class C (Collector), and Special Character County Road designations.
- **Design Standards** – Apply the higher standard "desirable" guidelines of the Transportation Association of Canada's (TAC) *Geometric Design Guide for Canadian Roads* for higher classification roadways and the minimum guidelines for lower classification roadways.
- **Intersection Traffic Control/Safety** – Implement policies to:
    - Require a safety-based network screening in areas with planned capital projects or observed high collision frequencies; and

- Identify and prioritize County road upgrades to improve sight distance on vertical and horizontal curves to at least match the posted speed limit.

- **Traffic Calming/Pedestrian Crossings** – Establish a:
  - Joint County-municipal working group to review traffic calming requests identified at the local municipal or County level;
  - Traffic Safety Working Group of County staff/OPP/Peterborough-Lakefield Police to assess requests and make recommendations to County Council on road safety-related concerns; and
  - Pedestrian crossing warrant policy and procedure based on Ontario Traffic Manual Book 12 requirements.
- **Truck Routes** – Implement a:
  - Permissive truck route policy (using Truck Route signage) to direct heavy vehicles to preferred routes (linked to the County Road Classification System); and
  - Policy to review the benefits-costs of upgrading the pavement on County roads during planned rehabilitation projects to accommodate all-season truck traffic on routes leading to key trucking generators that play a role in supporting the local economy of the County or local municipalities.

The County has initiated most policy recommendations in 2014 TMP Update. Some require more detailed plans, guidelines, or amendments to the County Official Plan to enable full implementation.

Summary

The County has completed about 80% of the short-term road network improvement projects recommended in the 2014 TMP Update. As well, several policies and standards identified in the update have been adopted for use and/or incorporated into the County Official Plan. The remaining road improvements yet to be initiated, as well as the policies not fully in effect, were reviewed as part of this TMP update.

2.4 Recent Trends and Emerging Issues

The TMP Update provides an opportunity to revisit the transportation challenges facing the County considering recent trends and emerging issues. This section examines changes within the County and at a broader level, since adoption of the 2014 plan, that could impact future transportation needs in Peterborough County and their potential implications.

2.4.1 Recent Trends

Broader socio-economic and demographic trends likely to impact future transportation needs, include:

- **Population Growth** – After two decades of modest growth, the County is experiencing higher rates of population and employment growth and, in turn, increased travel demand. **Section 4.1** explores this trend in further detail.
- **Aging Population** – Increases in the adult population aged 65 or more is placing new and growing demands on transportation systems, which will impact the types of transportation modes needed in the future.
- **Communities Designed Around the Automobile** – The automobile is by far the most dominant mode of transportation in rural areas due to trip distance, convenience of travel, and lack of available options. Peterborough County is no exception with longer average trip lengths that decrease the attractiveness of alternatives to the car.
- **Community Health** – There is growing recognition of the health benefits of more active lifestyles and how transportation infrastructure decisions can support healthy communities. However, for most of the population, active modes of transportation (walking and cycling) are only feasible for shorter distance trips.
- **Equity** – Explicitly incorporating equity into transportation planning decisions helps create transport alternatives that serve society fairly and can prioritize the needs of the most disadvantaged community members, many of whom are more likely to rely on travel modes other than the automobile, specifically walking, cycling, and transit.
- **Climate Change and Sustainability** – Motor vehicle travel is a significant contributor to greenhouse gas emissions, a key driver of climate change. Actions to discourage automobile use and promote travel by other, more sustainable modes helps reduce the use of fossil fuels, lower energy consumption, and adapt to the changing climate, consistent with Climate Change Action Plan for the Greater Peterborough Area.
- **Fiscal Constraints** – Municipalities continue to face budget constraints and challenges in keeping pace with growing infrastructure needs. That said, transportation infrastructure condition and travel efficiency influence an area's future economic growth, productivity, and competitiveness.
- **Inflation** – Rising vehicle operating costs due to inflationary pressures could cause people to drive their cars less frequently, carpool more often, reconsider where they live and work, and/or choose other methods of travel, albeit the impact would be less significant in a rural area with limited travel options like Peterborough County. Additionally, inflation tends to increase construction costs leading to postponing, scaling back, or reprioritizing transportation projects.

2.4.2 Emerging Issues

The following changes could influence future transportation needs:

Updated Growth Forecasts

In 2020, the Province amended the Growth Plan to introduce new population and employment forecasts for upper and single-tier municipalities in the Greater Golden Horseshoe. The Growth Plan now forecasts Peterborough County to grow to 82,000 people and 26,000 jobs by the 2051 horizon of the plan, up from about 63,800 people and 16,000 jobs at the time of the last Census in 2021. This represents a population increase of 29% and employment growth of 65%, resulting mostly from in-migration from the Greater Toronto Area.

The updated growth forecasts, now reflected in the new County and City of Peterborough Official Plans, envision the Greater Peterborough Area growing at a faster rate than assumed in the 2014 TMP Update. Refer to **Section 4.1** for a more detailed discussion of the updated growth forecasts used in this study and their implications for the transportation needs assessment.

City of Peterborough Transportation Plans

The City of Peterborough is completing four transportation planning studies with potential impacts for the County.

The City's **Transportation Master Plan** identifies improvements to several roadways that abut or continue as County roads, some of which could influence the need for and timing of future County road works. Specific City improvement projects, as shown on **Figure 2.3**, include:

- Widening (to four lanes) of Television Road and Water Street;
- Reconstruction of Ackison Road, Airport Road, Carnegie Avenue, Cumberland Avenue, Lily Lake Road, Parkhill Road East, and University Road; and
- Protection for future roads between Cumberland Avenue and Hilliard Street, potentially extending from County Road 19 (Line Road 3).

The **Eastside Transportation Study**, completed in conjunction with the City's Transportation Master Plan update, identified the need for improvements to County Road 4 (Parkhill Road/Warsaw Road), subject to further study and coordination with the County. The study also addressed the future of the provincial highway corridor designated on the east side of Peterborough through the Townships of Douro-Dummer, Otonabee-South Monaghan, and Selwyn. Resolving the status of this corridor would offer greater certainty for future transportation and land use planning initiatives in the vicinity of the currently designated corridor.

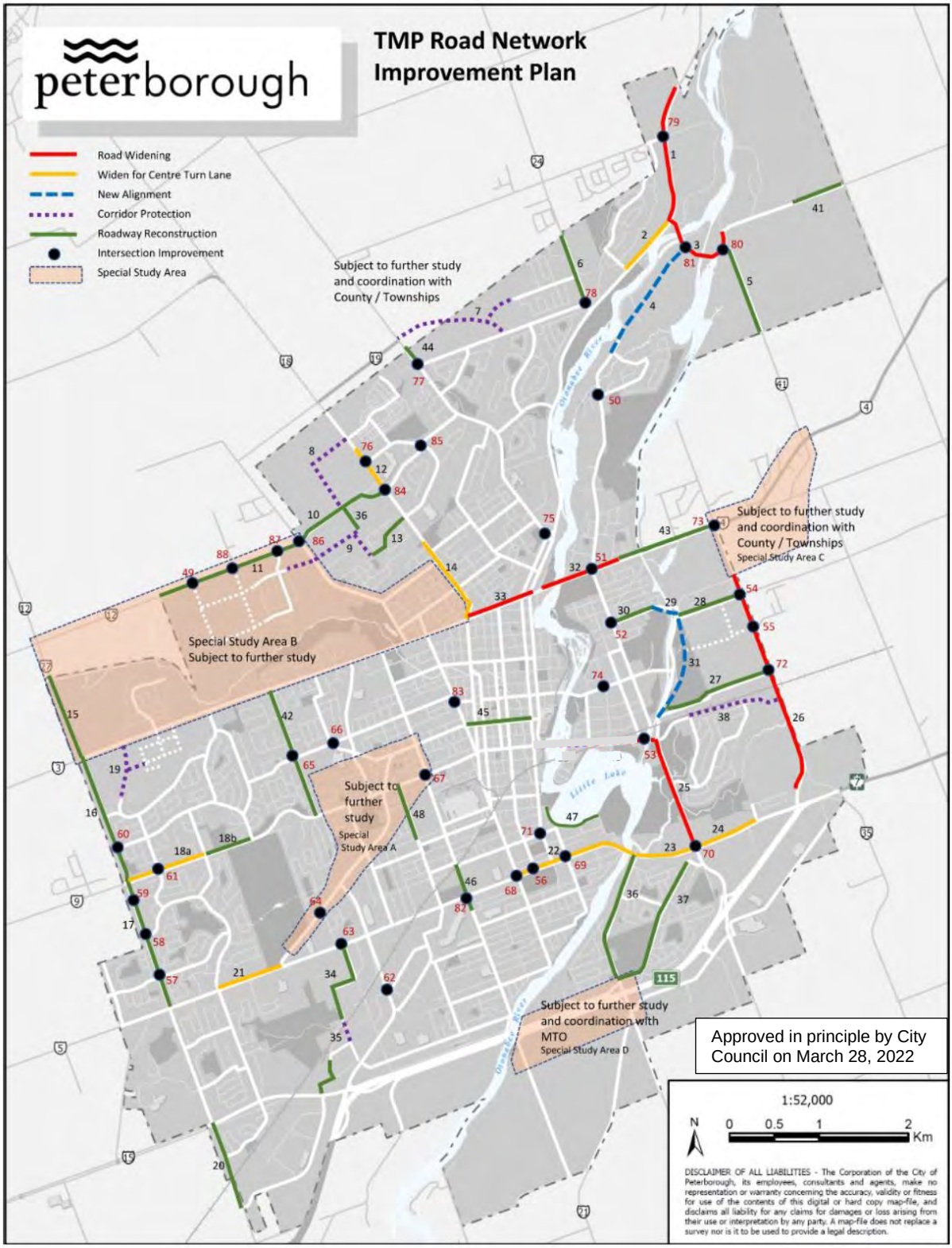

Figure 2.3: 2022 City of Peterborough Transportation Master Plan – Road Network Improvement Plan

The City's **Transit Route Review** notes that expanding transit service to neighbouring communities may not be cost effective in the short-term due to the rural nature of the surrounding area. Even providing service to locations on the periphery of the city poses challenges, with the local municipal and County road networks not always designed to accommodate standard city buses. Alternative service delivery methods, such as Transcab or on-demand service, as well as expansions to the community bus networks, may present service options in new areas.

The Ultimate Cycling Network shown in the City's **Cycling Master Plan** proposes cycling facilities along many City arterial roads that connect to County roads. The plan envisions implementation of most these facilities in the medium (2031-2041) or long (beyond 2041) terms.

Highway 407 East Extension

Phase 2 of the Highway 407 East extension opened in late 2019, connecting Highway 407 from its previous eastern terminus in Oshawa to Highway 35/115 in Clarington, as shown in **Figure 2.4**. Although the highway does not extend directly into Peterborough County, its presence significantly improves connectivity with the Greater Golden Horseshoe, which helps to facilitate growth and development in the County and influence the commuting patterns of County residents.

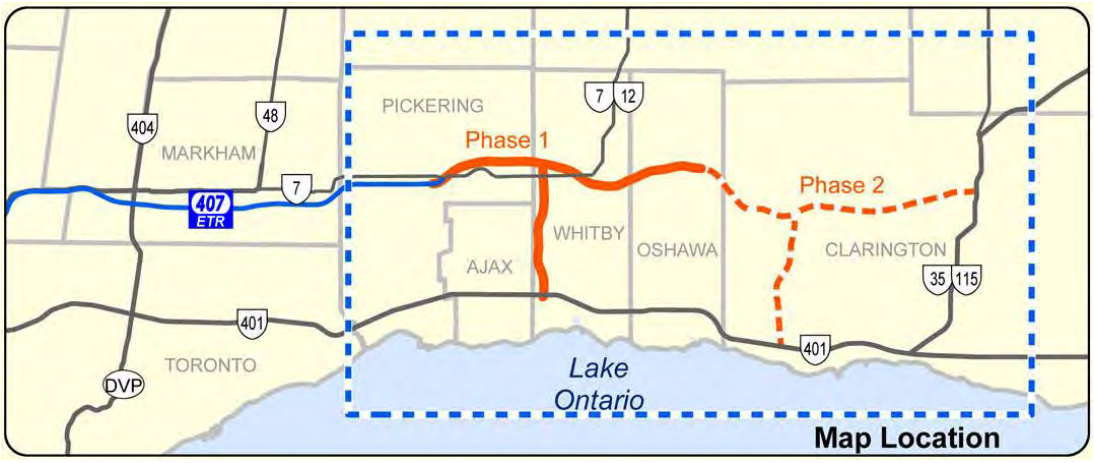

Figure 2.4: Highway 407 East Extension

High Frequency Rail

VIA Rail and the federal government are pursuing a plan to introduce High Frequency Rail (HFR) in the Quebec City-Toronto corridor. The proposal would establish new HFR routes, as shown in **Figure 2.5**, by upgrading discontinued and lower density rail infrastructure, as well as building new tracks in certain locations (potentially within existing rail rights-of-way), including between Toronto-Peterborough-Ottawa. A station in the Peterborough area is contemplated, with the exact location to be confirmed through the planning stage.

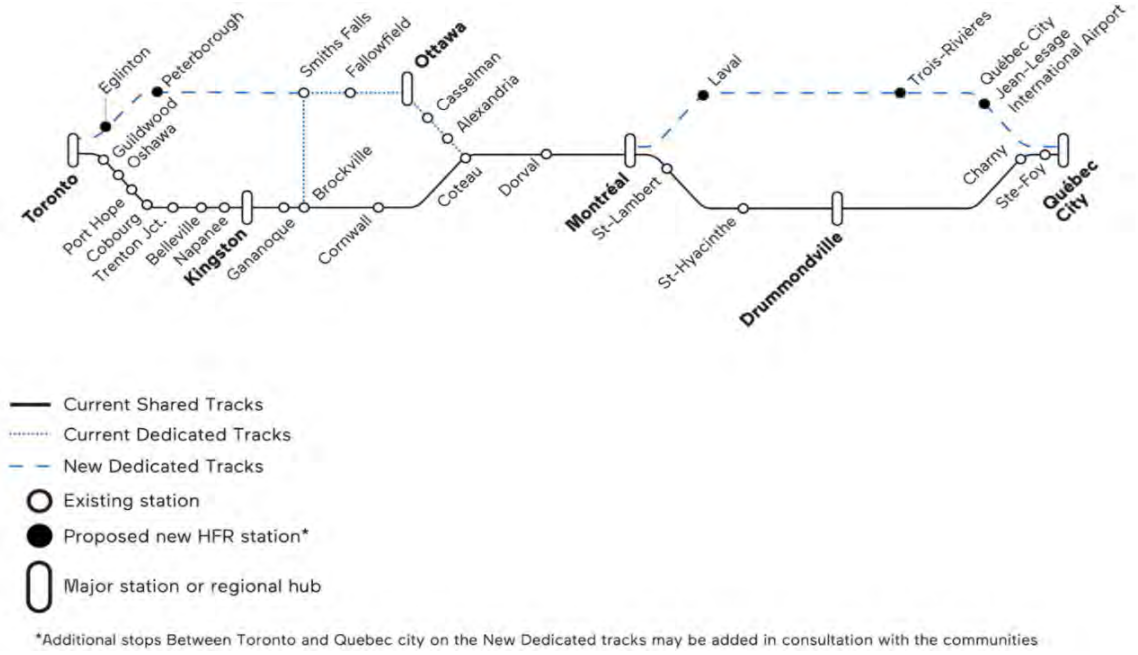

Figure 2.5: Proposed High Frequency Rail Network
(Source: VIA Rail, https://corpo.viarail.ca/en/projects-infrastructure/high-frequency-rail)

Still in development, HFR has the potential to influence transportation needs in the County and may drive the need for increased/enhanced connections to the new rail line.

COVID-19 Pandemic

Transportation was one of the many sectors profoundly impacted by the COVID-19 pandemic. In the early stages of this global health crisis, mandatory stay-at-home orders, closed retail/shops, and general fear of contracting the virus significantly reduced trip making and altered travel behaviour, with people discouraged from moving about. While many previous travel trends have begun to resume as life returns to "normal", the increase in "working from home" and hybrid work arrangements is likely to reduce traditional peak period traffic demands into the future. The emergence of cycling as an alternative for safer mobility and the decline in transit use may also have long-term implications.

Although impossible to predict the full and lasting impact of the pandemic on transportation at this point, some change is inevitable.

Chapter 3 Existing Conditions

3.1 Existing Transportation System

3.1.1 Road Network

As noted in Section 10.2 of the County Official Plan, the road network is designed to facilitate the efficient and safe movement of both people and goods to and from the various land uses within the County and to provide for the movement of through traffic. The network is classified by function to facilitate the planning and implementation of road improvements and maintenance, with public roadways under the jurisdiction of the provincial government (MTO), the County, and the eight local municipalities. An extensive network of private roads also exists.

The County builds, operates, repairs, and maintains a network of 690 kilometres of paved/surface treated roads and 149 bridges and major culverts, which connects to the Provincial and local municipal road networks. Most County roads fall into the category of arterial roadways, although some function more akin to collector or even local facilities in certain locations given adjacent land uses and prevailing design standards.

Three Provincial Highways serve Peterborough County, namely Highways 7, 28, and 115. Several current County Roads (all or portions of County Roads 23, 28, 29, 30, 36, 45, 49, 121, 503, 504, 507, 620 and 620A) are former Provincial Highways after MTO downloaded the facilities to the County in the late 1990's.

Figure 3.1 illustrates the existing road network in Peterborough County.

3.1.2 Public Transit

Peterborough County is not served by regularly scheduled local transit service. Peterborough Transit provides traditional fixed route, Community Bus, Trans-Cab (on-demand), and specialized transit (Accessible Van) services within the City of Peterborough boundaries but does not operate outside the City's boundaries (except for The Link pilot described below).

GO Transit currently operates one commuter transit route in Peterborough County. Route 88 runs between Trent University and the Oshawa GO Station, with stops enroute in the County and Durham Region. The service operates seven days a week, every 1-2 hours on weekdays and every 1-3 hours on weekends. Although direct and with competitive travel times, service is limited to the southwestern part of the County, with stops at:

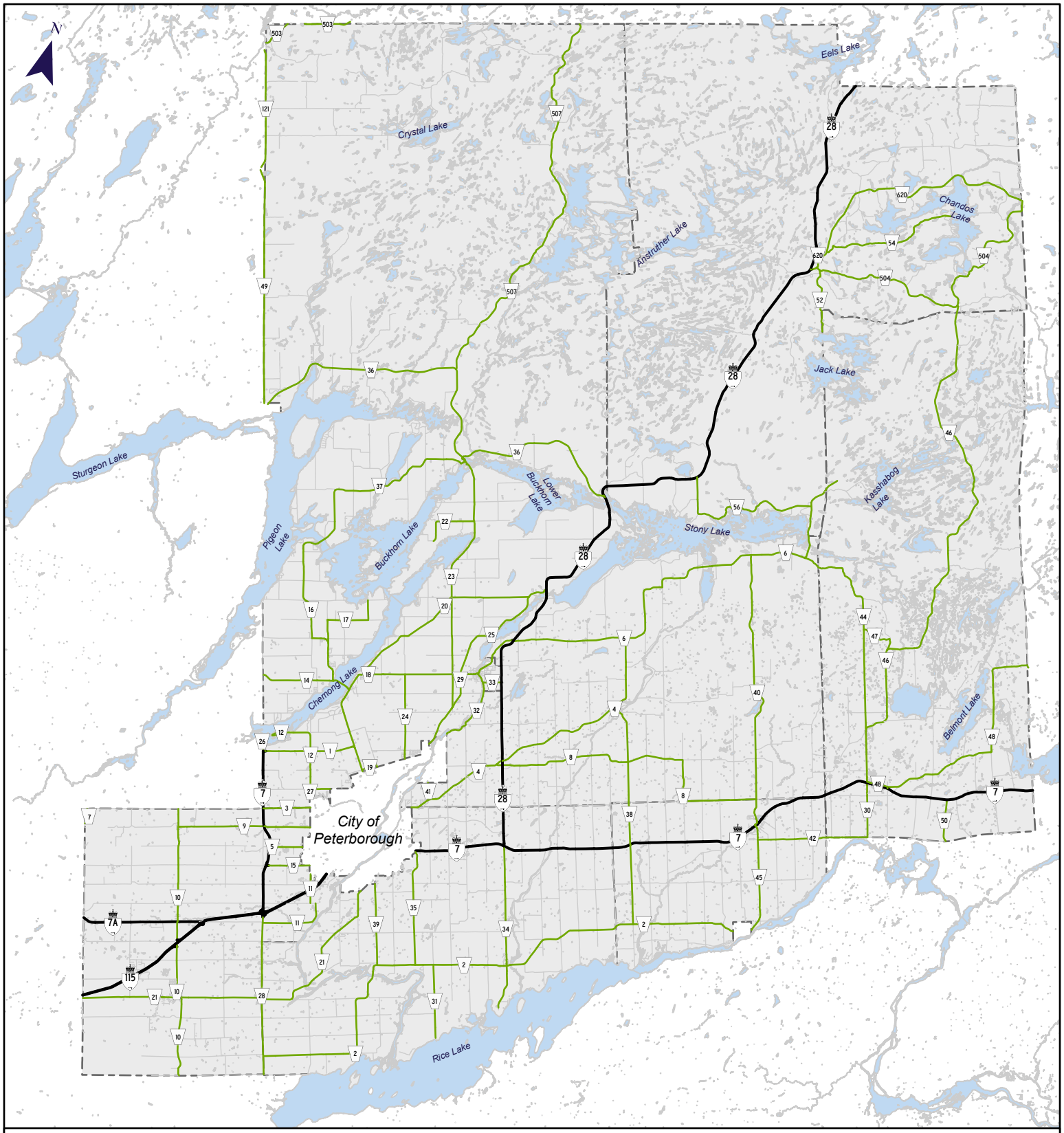

FIGURE 3.1:
EXISTING ROAD NETWORK

LEGEND

- Provincial Highway
- County Road
- Township Road
- Municipal Boundaries

Universal Transverse Mercator Projection Zone 17N

DATA SOURCES:
Peterborough County, Land Information Ontario, ESRI

0 2 4 8 12 16 20
Km

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- Trent University (Peterborough)
- Peterborough Bus Terminal (Peterborough)
- Crawford Drive/Harper Road park-and-ride (Peterborough)
- County Road 10/Highway 115 park-and-ride (Cavan Monaghan)

Users travelling further west can transfer at the Oshawa GO Station to other bus routes or the Lakeshore East commuter rail line towards Union Station in Toronto. Within Peterborough, transfers can be made at any of the three stops in the City of Peterborough onto Peterborough Transit for access to anywhere within the City.

Community Care delivers Peterborough Transit's Accessible Van service and Caremobile, a door-to-door service for Peterborough County residents (outside the City) with disabilities. Caremobile operates Monday to Friday from 8:30am to 4:30pm and services registrants residing in Lakefield, Millbrook, Norwood, Buckhorn, Apsley, and Havelock. Most riders travel to the City of Peterborough, primarily for medical services at sites along Hospital Drive, Charlotte Street, and Lansdowne Street. Other key destinations include grocery stores, banks, and recreational venues.

The Link commenced operation in May 2021 as a three-year pilot funded through the Province of Ontario's Community Transportation Grant Program. The service connects the City of Peterborough and the Township of Selwyn through two bus routes operating between Curve Lake (via Lakefield) (Route 31) and Ennismore (via Bridgenorth) (Route 32) and Trent University five times per weekday in each direction. The fare is $8 for a one-way trip (the service is free-of-charge for the first month). Project partners include Selwyn Township, Curve Lake First Nation, Community Care Peterborough, and the City of Peterborough.

3.1.3 Active Transportation

Peterborough County does not own or manage any dedicated active transportation network infrastructure at present. Cyclists operate within the roadway environment, sharing space with motor vehicles. In 2016, the County initiated a program to widen the pavement structure to 10.0 metres to provide 1.5 metre paved shoulders, where feasible, as part of road rehabilitation and reconstruction projects.

The County, the City of Peterborough, Peterborough and the Kawarthas Tourism, and Shimano Canada partnered to create the area's first official road cycling routes. The Peterborough and Kawartha Classics are a series of three double-loop road cycling routes. Through extensive collaboration with local road cyclists, the Classics identify nearly 300 kilometres of scenic rural roads encompassing the three most dynamic and popular routes around Peterborough County. The routes include approximately 160 wayfinding signs to guide riders and take users "off the beaten path", encouraging visitation to businesses throughout the region.

There are three off-road trails located within the County managed by others:

- **Trans-Canada Trail** – Multi-use off-road trail between Hastings and Peterborough, which continues through Peterborough and west to Omemee generally following the abandoned CN Rail corridor.
- **Rotary Greenway/Lakefield Trail** – A 25-kilometre multi-use urban and rural trail that generally follows the shore of the Otonabee River and connects central Peterborough with Trent University and Lakefield.
- **BEL Rotary/Bridgenorth Trail** – A 2.3-kilometre multi-use off-road trail located on an unopened road allowance established for a potential extension of Hilliard Street, between the 5th Line and Brumwell Street in Bridgenorth. This trail was opened in 2008 as the first step in the development of a trail system that links Bridgenorth to Peterborough, and ultimately connects to Ennismore and Lakefield.

The City of Peterborough has several other walking/bicycle trails and bike lanes located throughout the downtown area with connections to Trent University, the Trans-Canada Trail, and the Rotary/Lakefield Trail. The City plans to expand its cycling network (as noted in **Section 2.4.2**) with these enhancements providing additional opportunities for connections to the active transportation network in the County.

3.2 Travel Trends

Data collected through the 2011 and 2016 Transportation Tomorrow Surveys provided important insights into current travel trends in the County and behavioural changes over time. The Transportation Tomorrow Survey is a comprehensive travel survey conducted in the Greater Golden Horseshoe Area once every five years. Data are categorized into household, person, and trip tables, and geocoded to allow location-specific analyses.

Trip Destination

Residents of Peterborough County travel mostly to points within the County or the City of Peterborough. Durham Region and the City of Kawartha Lakes are the next most common destinations. No significant change in trip destination trends was observed between 2011 and 2016.

Travel Mode

Figure 3.2 illustrates that, in 2016, most trips originating in the County were made by auto, with driver (81%) and passenger (13%) the most common travel modes cited, followed by school bus (4%) and walking (1%). Transit, cycling, motorcycles, and taxis account for the remaining (other) trips (1%).

Table 3.1 summarizes the change in mode share between 2011 and 2016. Of note, the auto passenger and school bus mode shares decreased by 5% and 2%, respectively. This change is attributed to growth in auto drivers, which increased by 7%.

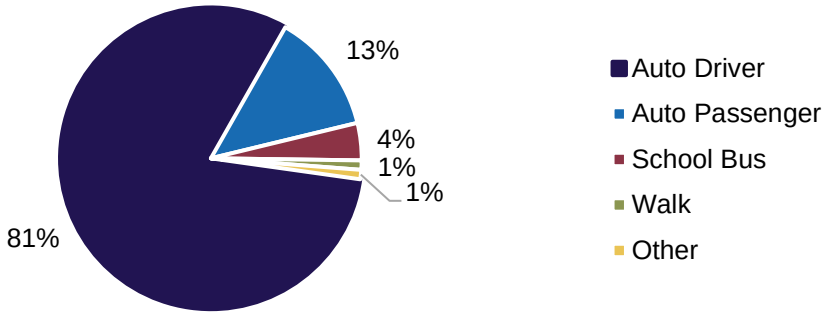

Figure 3.2: Travel Mode Share, 2016

Table 3.1: Change in Mode Share, 2011-2016

Mode	Year		Change
	2011	2016	
Auto Driver	74%	81%	+7%
Auto Passenger	18%	13%	-5%
School Bus	6%	4%	-2%
Walk	1%	1%	-
Other	1%	1%	-

Trip Purpose

Figure 3.3 shows that, in 2016, approximately 44% of daily trips originating in the County were made for discretionary purposes. Home-based work (28%), non home-based (21%), and home-based school (7%) were the next most common trip purposes. Between 2011 and 2016, trip purpose changed slightly, with home-based work and home-based discretionary trips marginally increasing and home-based school and non home-based trips slightly decreasing.

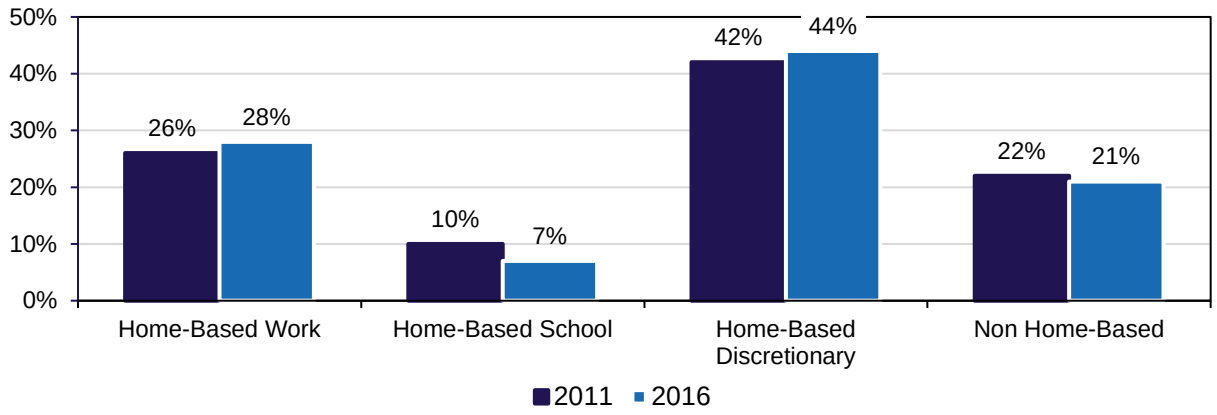

Figure 3.3: Comparison of Trip Purpose, 2011-2016

Trip Length

Figure 3.4 displays the length of trips in the County on a typical weekday in 2011 and 2016. Most trips are under 10 kilometres in length (54% in 2016). Trips between 10 and 25 kilometres are the second most common length of trip. Trips over 25 kilometres account for less than 20% of all trips. The data is relatively consistent between 2011 and 2016, with a slight increase in the share of longer trip lengths.

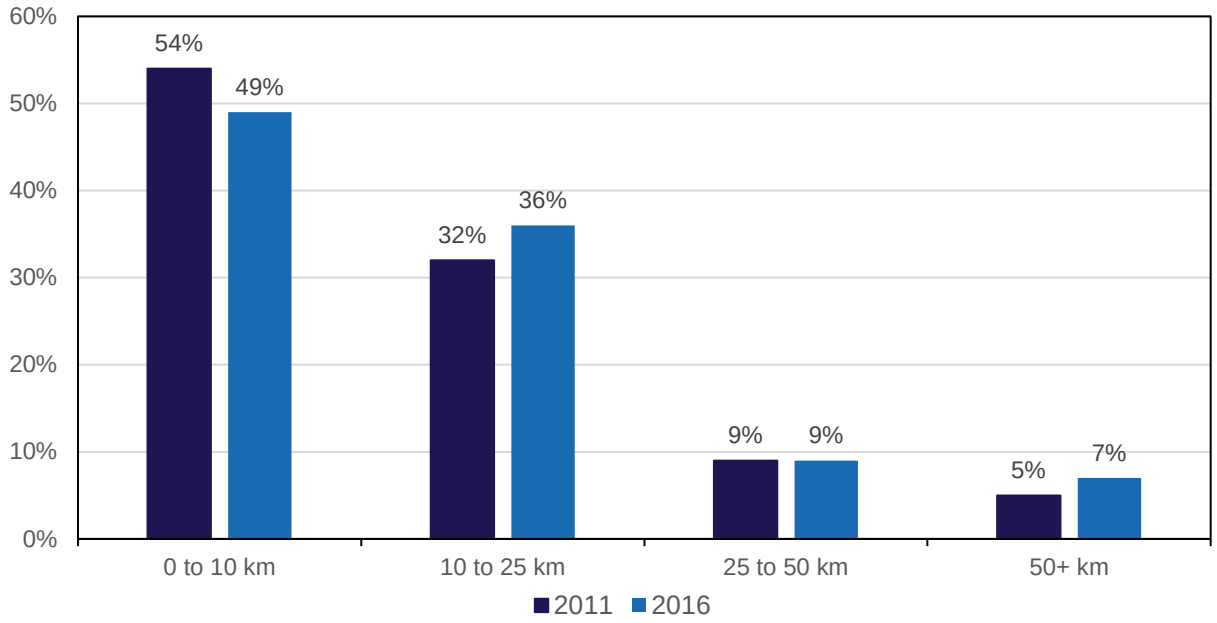

Figure 3.4: Comparison of Trip Length, 2011-2016

3.3 County Road Network

3.3.1 Traffic Volumes and Capacity

Volume to capacity ratio (v/c) is a measure that reflects mobility and quality of travel of a roadway, comparing demand (vehicle volumes) with supply (carrying capacity).

Figure 3.5 illustrates the v/c ratios for the County road network based on estimated year 2021 annual average daily traffic (AADT) volumes. The base year volumes were calculated by applying a compound growth rate of 2% per annum (reflective of historical traffic growth) to the most recent AADT available for the roadway from years prior to 2020. Restrictions on daily activities imposed in response to the COVID-19 global pandemic disrupted traffic volumes and travel patterns to the extent that counts collected in 2020 and 2021 are unlikely to reflect typical conditions (as evidenced by traffic volume decreases in the order of 40% on some County roads).

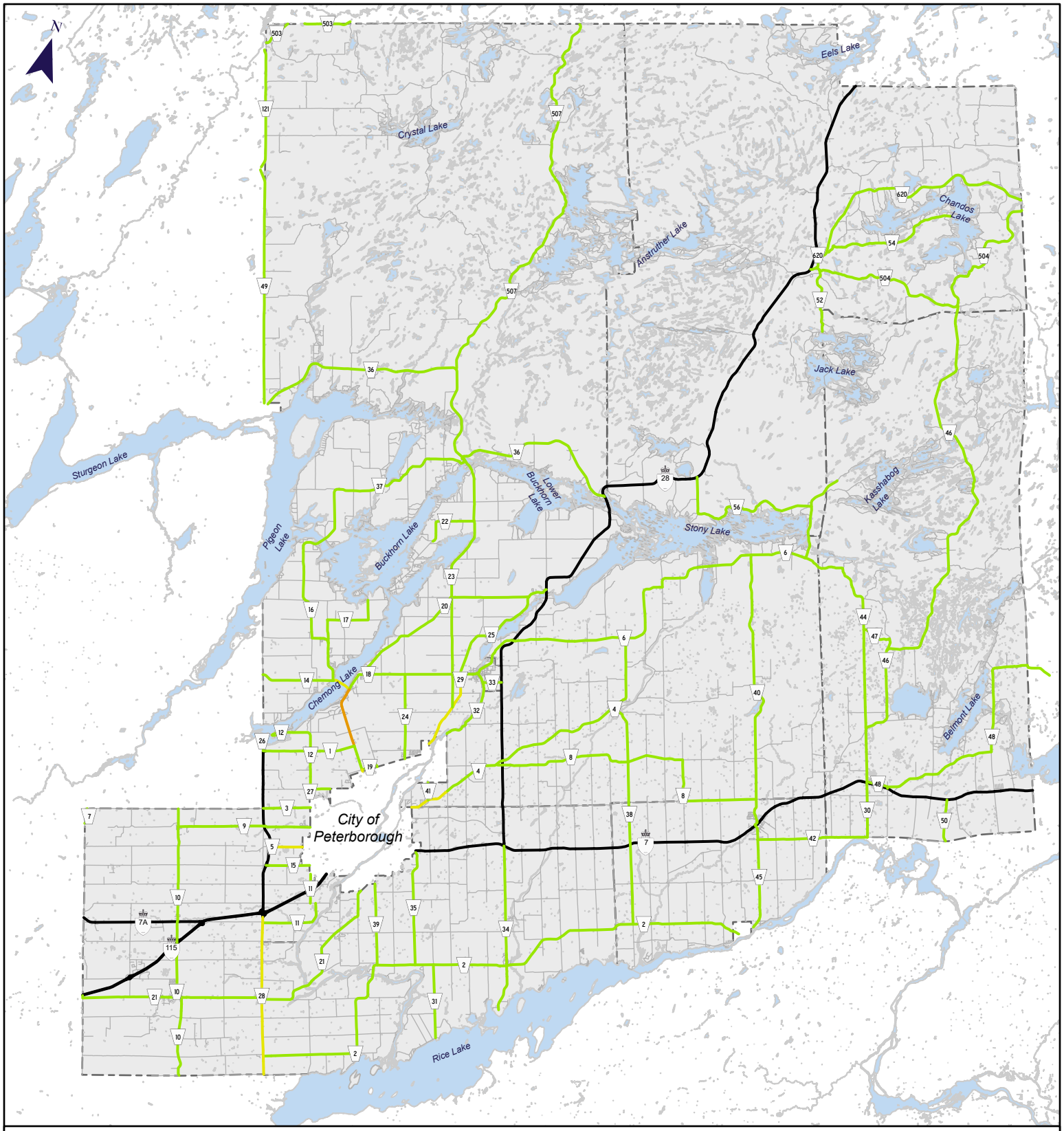

FIGURE 3.5:
2021 VOLUME TO CAPACITY RATIOS FOR COUNTY ROADS

Universal Transverse Mercator Projection Zone 17N

DATA SOURCES:
Peterborough County, Land Information Ontario, ESRI

0 2 4 8 12 16 20
Km

LEGEND

Volume to Capacity (v/c) Ratio

- 0.00 - 0.50
- 0.51 - 0.70
- 0.71 - 0.90
- 0.91 - 1.00

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The v/c calculations assume a two-way roadway capacity of 18,000 vehicles per day (both directions), which is the value historically used by the County for network planning purposes and recommended in this TMP Update (see **Section 6.2.4**). **Table 3.2** summarizes the grouping and colour coding of v/c ratios depicted in the figure (and ones to follow) and provides a qualitative description of traffic flow characteristics typically associated with these conditions.

Table 3.2: v/c Ratio Ranges and Descriptions

v/c Ratio Range	Colour	Description
0.00 to 0.50	Green	Free Flow Conditions
0.50 to 0.70	Yellow	Stable Flow, No Congestion
0.70 to 0.90	Orange	Approaching Capacity, Limited Passing Opportunity
0.90 to 1.20	Red	At Capacity, Unstable Flow, Congestion Potential
Over 1.20	Purple	Over Capacity, Congestion at intersections

Most County roads operate well within capacity. Only one segment (County Road 18 between County Road 1 and County Road 14) exhibits a v/c ratio approaching capacity.

3.3.2 Collision History

Figure 3.6 summarizes the collision history for the County road network, depicting the number of collisions by initial impact type for crashes reported between June 1, 2015, and June 30, 2020.

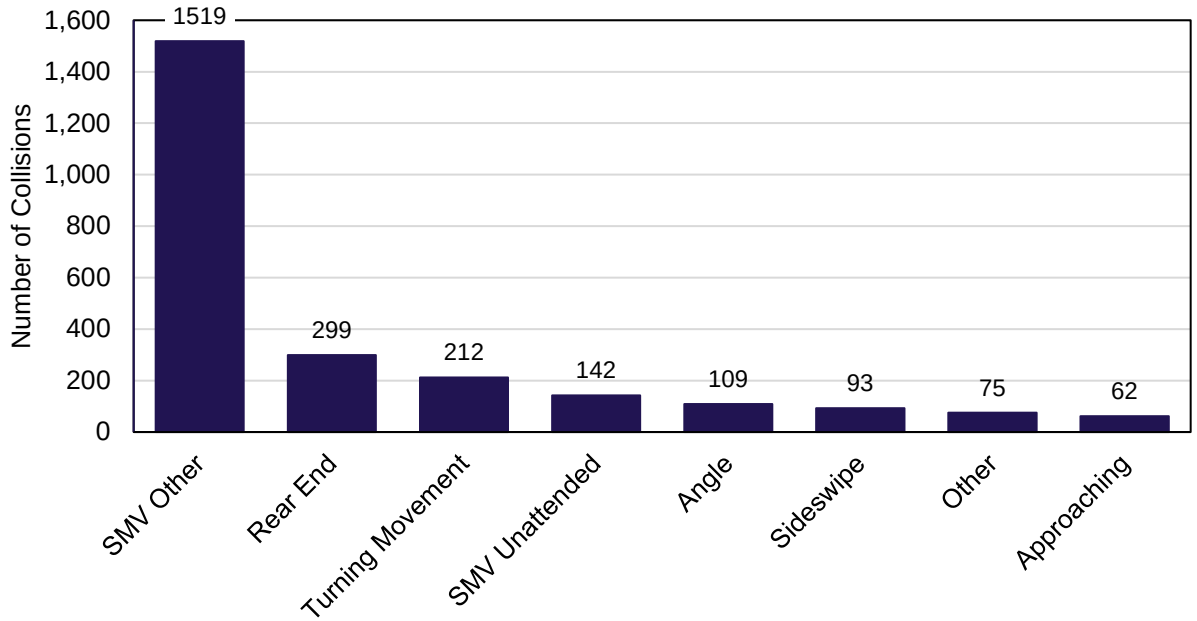

Figure 3.6: Initial Collision Impact Type

Of the 2,578 collisions reported over this five-year period:

- Single motor vehicle collisions were the most frequently occurring collision impact type, accounting for 59% (1,527) of all reported crashes;
- Rear end collisions comprised 13% (326) of the total;
- Turning movement collisions accounted for 9% (234) of the total; and
- Other collision types each comprised less than 5% (between 62 and 143) of all crashes and accounted for 19% (491) of the total combined.

Figure 3.7 shows the percentage of collisions by injury classification. Over this six-year period:

- Property damage only collisions accounted for 78% (2,022) of all crashes;
- Non-fatal collisions accounted for 18% (453) of the total;
- Non-reportable collisions accounted for 3% (82) of the total; and
- Fatal collisions comprised about 1% (21) of the total.

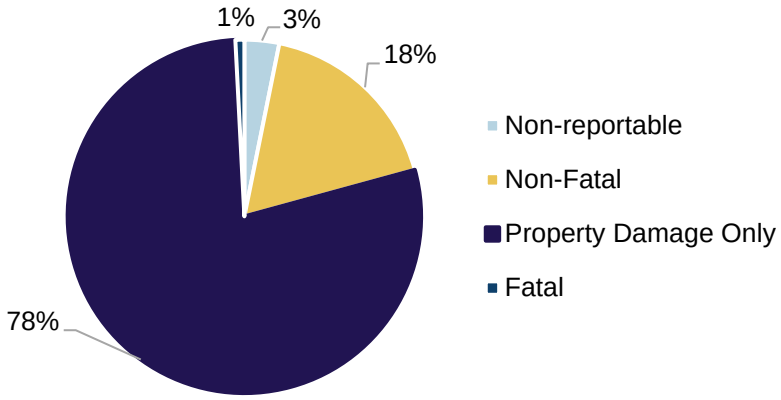

Figure 3.7: Injury Classification

Chapter 4 Future Conditions

4.1 Growth and Development

The County undertook a comprehensive growth analysis [2] in developing its new Official Plan to forecast the change in population and employment in accordance with Provincial legislation. A complementary land needs assessment determined the quantity of land required to accommodate this forecast growth to the 2051 planning horizon.

The new Official Plan reflects the demographic forecasts contained in Schedule 3 of the Growth Plan, which projects Peterborough County growing to a population of 82,000 people (from 63,800) and employment of 26,000 jobs (from 16,000) by 2051. Total population and employment are forecast to increase by about 29% and 65%, respectively, with the overall rate of anticipated growth faster over the next 30 years than it was during the last 30 years.

Table 4.1 summarizes the population and employment forecasts for the County and its local municipalities between 2021 and 2051. About 76% of all population growth and 67% of all employment growth is forecast to occur in the Townships of Cavan Monaghan (40% and 40%), Selwyn (19% and 11%), and Asphodel-Norwood (17% and 16%). The remaining growth is forecast to be distributed relatively evenly across the other five local municipalities in the County, with the Townships of Otonabee-South Monaghan (9% and 10%) and Havelock-Belmont-Methuen (5% and 9%) accommodating most of this remaining growth. All areas of the County are anticipated to grow at faster than historical rates.

Note that other factors beyond local population and employment growth will influence future traffic volumes using the County road network. Growth in communities adjacent to the County also contributes to more vehicles using County roads. For example, the City of Kawartha Lakes is forecast to grow to 117,000 people and 39,000 jobs by 2051 per the Growth Plan. The influence of this growth can be observed in traffic volume increases on County Road 14 (Yankee Line), which provides an alternate route to Highway 7 for traffic travelling to/from Kawartha Lakes. Greater use of County roads by seasonal and recreational travellers also adds to traffic volumes.

[2] Hemson Consulting. *County of Peterborough Growth Analysis Report*. March 28, 2022.

Table 4.1: Forecast Population and Employment Growth

Municipality	Population				Employment			
	2021	2051	Growth	Share	2021	2051	Growth	Share
Asphodel-Norwood	4,760	8,140	3,380	18.6%	1,100	2,290	1,190	11.4%
Cavan Monaghan	10,230	17,540	7,310	40.2%	3,040	7,210	4,170	40.0%
Douro-Dummer	7,800	8,410	610	3.4%	1,450	2,140	690	6.6%
Havelock-Belmont-Methuen	5,190	6,050	860	4.7%	1,720	2,660	940	9.0%
North Kawartha	2,940	3,630	690	3.8%	720	820	100	1.0%
Otonabee-South Monaghan	7,240	8,870	1,630	9.0%	1,950	3,010	1,060	10.2%
Selwyn	19,060	22,110	3,050	16.8%	4,970	6,620	1,650	15.8%
Trent Lakes	6,580	7,250	670	3.7%	1,030	1,660	630	6.0%
Peterborough County	**63,800**	**82,000**	**18,200**		**15,980**	**26,410***	**10,430**	

4.2 Forecasting Future Needs

The TMP Update relied on three methods to forecast future (2051) traffic volumes and road network capacity deficiencies on County roads.

For roads in the **rural areas** of the County, 2051 daily traffic volumes were forecast by applying a uniform growth factor of 1.0% per annum (compounded) (herein referred to as the Growth Factor method), calculated from the population and employment forecasts shown in **Table 4.1**, to existing (2021) AADT volumes. The intersection assessments described **Section 5.3** used the same compound growth rate.

On roads in the **areas surrounding the City of Peterborough**, namely the Townships of Asphodel-Norwood, Cavan Monaghan, Douro-Dummer, Otonabee-South Monaghan, Selwyn, and the westerly portions of Havelock-Belmont-Methuen, 2051 afternoon peak hour traffic volumes were forecast using the City of Peterborough Travel Forecasting Model (herein referred to as the Model or Model method). The Model captures the influence of services and employment opportunities in the Peterborough urban area on travel demands in the County (particularly on roads leading into the city) and location of planned growth (which tends to be on lands proximate to the boundary) better than the uniform growth factor method.

For the **settlement areas** of Bridgenorth, Ennismore, Lakefield, Millbrook, and Norwood, 2051 morning and afternoon peak hour traffic volumes were forecast at the intersection level using more detailed subarea models developed specifically for each community as part of this study.

Overall, the 2014 TMP Update used a similar approach for forecasting traffic in the rural areas and the areas surrounding the City of Peterborough, but the settlement area analysis is new for this TMP Update.

Figure 4.1 illustrates the 2051 v/c ratios and road network deficiencies forecast for the County road network based on Growth Factor method, assuming a two-way roadway capacity of 18,000 vehicles per day (both directions), consistent with the existing condition assessment in **Figure 3.5**. Most County roads are forecast to operate within capacity up to 2051 with v/c ratios below the 0.9 threshold. Some roads near the City of Peterborough are expected to experience congestion.

Figure 4.2 shows the v/c ratios and road network deficiencies forecast for the County road network based on 2051 PM peak hour volumes generated by the Model. The analysis focused on the PM peak period as this represents the most commonly occurring worst-case conditions for travel demands in and around the County and City. The v/c calculations used the roadway capacities specified in the Model for each road section.

The Model network includes all recommended improvements from the City's Transportation Master Plan (see **Figure 2.3**) and uses the updated growth forecasts for the County and City based on the Growth Plan. The City's mode share targets from the Transportation Master Plan were also adopted (no changes in County area mode shares were assumed).

Consistent with the results for the Growth Factor method, most County roads are expected to operate within capacity up to 2051 with v/c ratios below the 0.9 threshold based on forecast volumes from the Model. Again, select roads near the City of Peterborough are expected to experience congestion, in locations consistent with traffic forecasting completed for previous versions of the TMP. Specific "hot spot" locations include:

- County Road 4 in the Donwood area
- County Road 10 in the Millbrook area
- County Roads 18 and 14 in the Bridgenorth area
- County Road 28 in the Fraserville area near Kawartha Downs, and
- County Road 29 in the Lakefield area

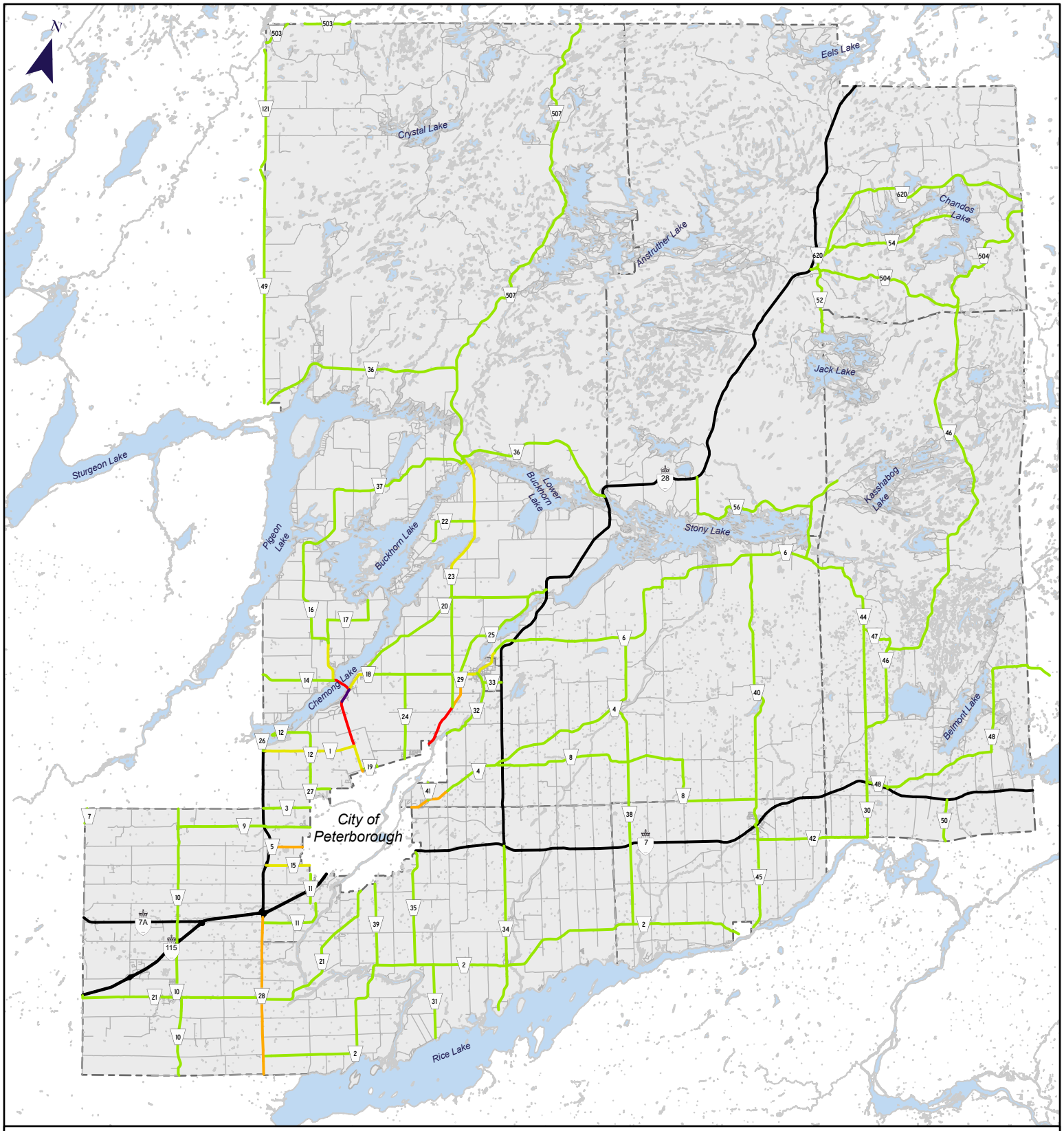

FIGURE 4.1:
ESTIMATED 2051 VOLUME TO CAPACITY RATIOS AND NETWORK DEFICIENCIES - GROWTH FACTOR METHOD (DAILY VOLUMES)

Universal Transverse Mercator Projection Zone 17N

DATA SOURCES:
Peterborough County, Land Information Ontario, ESRI

0 2 4 8 12 16 20 Km

LEGEND

Volume to Capacity (v/c) Ratio

- 0.00 - 0.50
- 0.51 - 0.70
- 0.71 - 0.90
- 0.91 - 1.20
- 1.21 or greater

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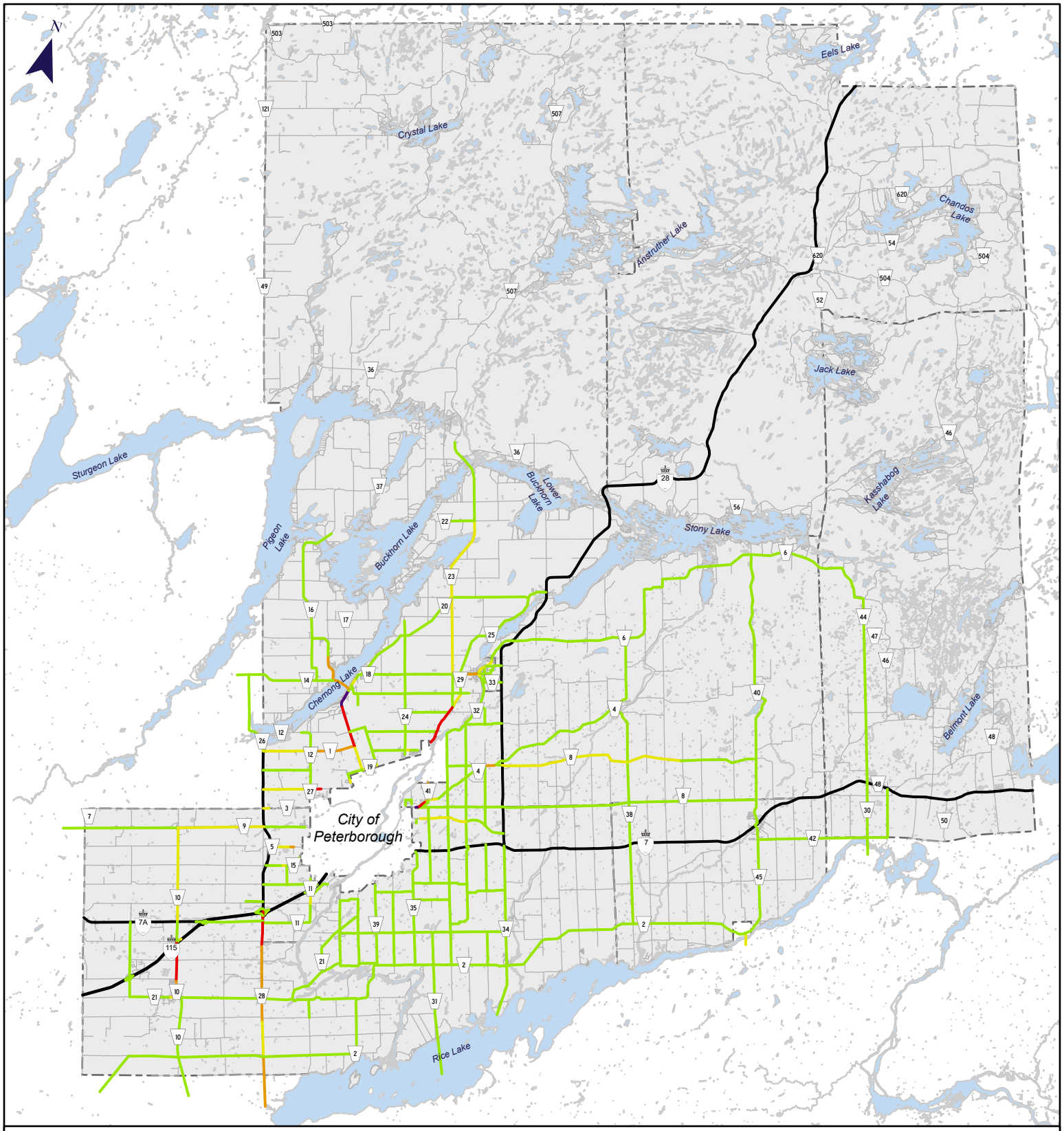

FIGURE 4.2:

ESTIMATED 2051 VOLUME TO CAPACITY RATIOS AND NETWORK DEFICIENCIES - MODEL METHOD (PM PEAK HOUR VOLUMES)

Universal Transverse Mercator Projection Zone 17N

DATA SOURCES:
Peterborough County, Land Information Ontario, ESRI

0 2 4 8 12 16 20 Km

LEGEND

Volume to Capacity (v/c) Ratio

- 0.00 - 0.50
- 0.51 - 0.70
- 0.71 - 0.90
- 0.91 - 1.20
- 1.21 or greater

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4.3 Problems and Opportunities Statement

The assessment summarized in the preceding sections highlights existing conditions and prevailing trends that will shape and influence the County's transportation system in the coming years. It is important to recognize and plan for these opportunities and challenges to develop a transportation network that serves all users. The following summarizes the key transportation opportunities and challenges facing the County:

- **Continued growth could impact how people move around the County.** The County aims to serve forecast growth in a safe, sustainable, and cost-effective manner that facilitates travel by different modes and limits congestion. However, traffic volumes on certain County roads are expected to exceed available capacity with forecast population and employment growth, leading to undesirable operating conditions in these locations, which are mostly within or near designated settlement areas.
- **Continued reliance on the automobile for virtually all trip making could have environmental, economic, societal, and health consequences.** Reducing dependence on motorized vehicles can help mitigate roadway congestion (in locations forecast to experience high volumes), combat climate change, improve public health and user safety, and make the transportation system more equitable to all users. However, expanding the range of mobility options in rural environments can prove challenging given the longer trip lengths, lower population densities, and fiscal constraints.
- **Improvements to road safety could save lives and reduce injuries caused by motor vehicle collisions.** Strategic investments in road safety initiatives, including public education, technologies, infrastructure improvements, and law enforcement, can help make streets safer for all people, particularly vulnerable road users like pedestrians and cyclists.
- **Fiscal constraints make meeting mounting needs and competing priorities difficult.** Finding an optimal balance between expenditures on transportation infrastructure maintenance, rehabilitation, and expansion presents challenges, especially with limited resources. The desire to invest in active transportation facilities and other emerging priorities further complicates this challenge.
- **New technologies and changing public attitudes could help expand the range of options to move people and goods.** The County will need to adapt its transportation and land use planning policies and practices to benefit from these emerging mobility choices.

4.4 Transportation Master Plan Strategy

The recommended strategy to address the Problem and Opportunity Statement comprises two parts.

The **County Road Network Plan** in **Chapter 5** identifies the roadway expansion, corridor improvement, and intersection improvement projects proposed to meet future transportation needs.

The **Transportation Policies** in **Chapter 6** comprise a range of directives intended to guide and support the management and operation of the transportation system. Policies pertaining to road network planning, roadway design, roadway safety and operations, non-auto modes, and emerging technologies.

Chapter 5 County Road Network Plan

5.1 Network Plan Overview

This chapter describes the recommended County Road Network Plan. The strategy details the proposed County road infrastructure investments to address current and future needs. The network plan complements and should be read in conjunction with the transportation policies presented in **Chapter 6**.

The County Road Network Plan comprises three parts being:

- **Roadway Expansions** – Any project that involves adding vehicle travel lanes, including road widenings and new corridors;
- **Corridor Improvements** – Any project that modifies an existing roadway corridor to improve operational and/or safety performance, including two-way left-turn lanes and centre median islands; and
- **Intersection Improvements** – Any project that modifies an existing roadway intersection to improve operational and/or safety performance, including turn lanes and signalization.

Chapter 7 details the implementation provisions for the County Road Network Plan, with **Section 7.2** summarizing the priorities and costing for the identified projects. Refer to the Technical Compendium for additional information.

5.2 Roadway Expansions and Corridor Improvements

5.2.1 Forecast Network Deficiencies

Development of the County Road Network Plan began with forecasting future network capacity deficiencies to identify growth-related road improvement needs.

Table 5.1 lists the road sections in the rural areas of the County and the areas surrounding the City of Peterborough with forecast v/c ratios greater than 0.9 in 2051, per **Figure 4.1** and **Figure 4.2** (see **Section 4.2**). These roads were considered deficient from a capacity perspective and candidates for roadway expansion and/or corridor improvements. The table denotes the forecasting basis for the identified capacity deficiency (i.e., Growth Factor or Model).

Table 5.1: Forecast County Road Network Deficiencies (Road Sections with v/c Ratios Over 0.90)

Road	Limits	Forecasting Method		Comment
		Growth Factor	Model	
County Road 4 (Warsaw Road)	Television Road to County Road 41 (University Road)		●	City's Transportation Master Plan includes continuation of expansion project in City.
County Road 10	Fallis Line to Highway 115		●	Also supported by the subarea model analysis (see **Section 5.2.2**).
County Road 12 (Lily Lake Road)	County Road 27 (Ackison Road) to City of Peterborough Limit		●	City's Transportation Master Plan includes continuation of expansion project in City.
County Road 14 (Bridge Road) (James A. Gifford Causeway)	County Road 16 (Robinson Road) to County Road 18 (Ward Street)	●		Not included in growth-related capital program based on County Council Resolution No. 81-2022 (March 3, 2022).
County Road 18 (Chemong Road)	County Road 1 (Lindsay Road) to South Limit of Bridgenorth	●	●	
County Road 18 (Ward Street)	South Limit of Bridgenorth to County Road 14 (Bridge Road)	●	●	Proposed road improvement must not be Bridgenorth Bypass per County Council Resolution No. 81-2022 (March 2, 2022).
County Road 28	Fraserville to Highway 7/115		●	Further supported due to recently enacted Minister's Zoning Order (MZO), which permits redevelopment of the Kawartha Downs lands including a residential subdivision.
County Road 29 (Lakefield Road)	City of Peterborough Limit to County Road 23 (Buckhorn Road)	●	●	

Table 5.1: Forecast County Road Network Deficiencies (Road Sections with v/c Ratios Over 0.90)

Road	Limits	Forecasting Method		Comment
		Growth Factor	Model	
County Road 29 (Bridge Street/ Queen Street)	West Limit of Lakefield to North Limit of Lakefield			Although not justified based on Model or Growth Factor forecasts, the subarea model analysis (see **Section 5.2.2**) identified a future capacity deficiency, consistent with the findings of the 2014 TMP Update.

5.2.2 Detailed Settlement Area Assessments

Detailed assessments were carried out for the settlement areas of Bridgenorth, Donwood, Ennismore, Lakefield, Millbrook, and Norwood to identify future County road capacity deficiencies and needed improvements. Subarea models were developed for each community (except Donwood [3]) to assess the effects of future development traffic on the network at a finer (intersection) level of detail. The analyses did not examine impacts on Provincial highways or local municipal roads, as improvements to those facilities fall outside the County's jurisdiction and responsibility.

The detailed assessments for Ennismore and Norwood did not identify any further County road improvement needs, with the operational analyses indicating area intersections are forecast to operate with acceptable levels of service in 2051. In Norwood, planned development will increase traffic volumes but not beyond thresholds, so no additional *County road* improvements are required. Operational concerns are likely to occur on Highway 7, which could necessitate action by MTO.

The subsections below present the assessment findings for the Bridgenorth, Donwood, Lakefield, and Millbrook settlement areas. For each area, potential road network alternatives were assessed against a series of evaluation criteria to compare their respective advantages and disadvantages using both quantitative and qualitative measures. **Table 5.2** summarizes the criteria used in the assessment. The criteria capture technical, social/cultural environment, natural environment, and economic impacts and considerations. Each alternative was evaluated on a scale of "Least Preferred" to "Moderately Preferred" to "Most Preferred" for each evaluation criteria.

[3] A subarea model was not developed for Donwood due to its proximity to the City of Peterborough and inclusion in the City's Travel Forecasting Model.

Table 5.2: Evaluation Criteria

Evaluation Criteria	Indicators
Technical	Network performance
	Potential to improve safety
	Reduction in travel delay
Social/Cultural Environment	Potential impacts/benefits to neighbourhoods
	Potential impacts to heritage areas
	Potential impacts to agricultural areas
	Potential impact/benefit to downtown areas
Natural Environment	Potential effects on environmentally sensitive areas
	Potential impacts to watercourses
	Potential impacts to habitat areas
	Potential impacts on air quality
Economic	Cost
	Community accessibility
	Support future growth areas and facilitate related investment
	Support goods movement
	Potential impacts/benefits or deterrents to businesses

Bridgenorth Settlement Area

Problem and Opportunity Statement

The traffic forecasting identified a road network capacity deficiency for County Road 18 through Bridgenorth in 2051. The Ward Street section, particularly, is anticipated to greatly exceed capacity, with the highest forecast v/c ratio of any County road at 1.29.

Alternatives Assessment

The 2014 TMP Update included a comprehensive assessment of the alternatives to address identified capacity deficiencies for County Road 18 (Ward Street) through Bridgenorth. The four network alternatives proposed to address the long-term needs in the previous study comprised:

1. Widening of Ward Street to three lanes
2. Widening of Ward Street to four lanes
3. Construction of the Bridgenorth By-pass

4. Hilliard Street Extension (which would alleviate the need to widen County Road 18 from County Road 1 (Lindsay Road) to the south limit Bridgenorth)

Through the evaluation analysis, the Bridgenorth By-pass and the three-lane widening of Ward Street emerged as the preferred alternatives. On this basis, the plan recommended that the County proceed with the three-lane widening and operational improvements in the short-term and continue to protect for the by-pass corridor within the County's Official Plan, with implementation timing depending on the pace of traffic growth into the future.

As noted in **Section 1.1**, the County updated its Development Charges Background Study concurrent with this TMP Update. The proposed roads capital program contained in the draft Background Study included the Bridgenorth By-pass and Ward Street corridor improvements, as well as the James A. Gifford Causeway (Bridge Road/Yankee Line, County Road 14) widening, to address projected 2051 network capacity deficiencies. The 2014 TMP Update and 2017 Development Charges Background Study recommendations, along with prior Municipal Class EA study findings and County Council's decisions, factored into the rationale to carry these projects forward.

An addendum for the Bridgenorth Causeway Link (Bridgenorth By-pass) Class EA was endorsed by County Council (Resolution No. 36-2018) and filed with the Ministry of Environment and Climate Change on February 19, 2018. The 30-day review period was cleared on March 21, 2018. With the completion of this addendum the project continues to have clearance to proceed for a further ten years.

In considering the draft 2022 Development Charges Background Study at its March 2, 2022 meeting, County Council resolved to remove the Bridgenorth By-pass and Causeway widening from the roads capital program. The County Council resolution effectively precludes further consideration of the Bridgenorth By-pass as a potential solution to projected traffic congestion on Ward Street. Unless future traffic patterns change, widening Ward Street to four lanes is likely the only conceivable option remaining based on the assessment completed for the 2014 TMP Update.

In 2017, the County initiated a Municipal Class EA to investigate the potential widening of Ward Street and develop a comprehensive improvement plan for the overall roadway corridor between Bridge Road and Champlain Road in collaboration with the Township of Selwyn. The project team presented the study findings and recommended plan to Township and County Councils in January and February 2019, respectively. County Council received the Ward Street Widening Class EA presentation and referred the matter to this TMP Update for resolution.

Evaluation Summary

With the Ward Street Widening Class EA already in progress, the County should resume the study but revisit the problem and opportunity statement. The County Council

resolution materially changes a fundamental assumption of the Class EA that the by-pass would eventually exist.

The Ward Street Widening Class EA study should also consider the implications of not implementing the proposed four-lane widening of the James A. Gifford Causeway and roundabout at the Ward Street and Bridge Road intersection, which County Council also removed from the list of potential expansion projects through Resolution No. 81-2022, on traffic conditions in Bridgenorth. The Class EA study has assumed these future improvements would be in place based on the recommendations of the Class EA completed for the causeway in 2013 [4], which were endorsed by County Council (Resolution No. 6-2013).

The County should protect for the future construction of additional lanes in this section of Ward Street through the proposed Transportation Corridor Protection Plan (see **Section 6.2.3**). The current right-of-way of 18.2 m to 20.09 m, at its narrowest points, would need to be expanded to accommodate a wider roadway.

Recommendations:

1. Resume the Ward Street Widening Class EA and revisit the problem and opportunity statement considering Council Resolution No. 81-2022.
2. Protect sufficient right-of-way on County Road 18 (Ward Street) between Champlain Road and Bridge Road based on the findings of the Class EA study.

Donwood Settlement Area

Problem and Opportunity Statement

The traffic forecasting identified a road network capacity deficiency for County Road 4 (Warsaw Road) through Donwood, between Television Road and County Road 41 (University Road) in 2051.

Alternatives Assessment

The 2014 TMP Update included a comprehensive assessment of the alternatives to address identified capacity deficiencies for County Road 4. **Figure 5.1** shows the alignments of the three network alternatives proposed to address long-term needs in the previous study, which comprised:

[4] Bytown Engineering. “James A. Gifford Causeway Schedule ‘C’ Municipal Class Environmental Assessment, Environmental Study Report”. July 2013.

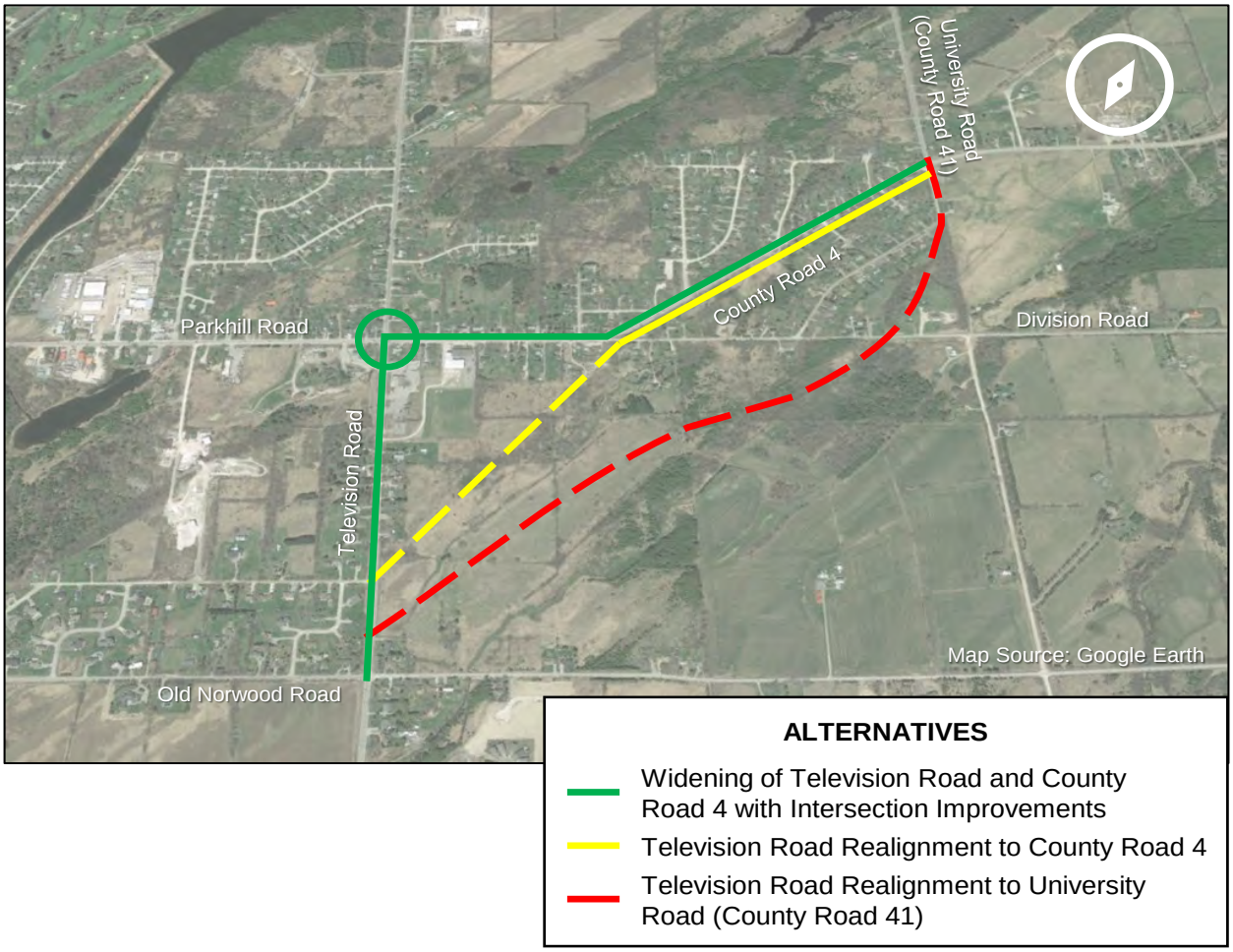

Figure 5.1: Donwood (County Road 4) Network Alternatives

1. Widening of Television Road and County Road 4, with improvements to the Parkhill Road and Television Road intersection (coloured in green)
2. Television Road realignment to County Road 4 at around Division Road and widening County Road 4 to the east (coloured in yellow)
3. Television Road realignment to connect to County Road 41 (coloured in red)

Evaluation Summary

Table 5.3 summarizes the evaluation results for the Donwood area road network alternatives. As with the 2014 TMP Update, the assessment identified Alternative 2 (Television Road Realignment to County Road 4) as the recommended solution for Donwood. This alternative:

Table 5.3: Donwood (County Road 4) Network Alternatives Evaluation Summary

Evaluation Criteria	Alternative Solutions			
	Do Nothing	**Alternative 1 – Widening of Television Road and County Road 4 with Parkhill Road/Television Road Intersection Improvements (green)**	**Alternative 2 – Television Road Realignment to County Road 4 (yellow)**	**Alternative 3 – Television Road Realignment Directly to University Road (red)**
Technical	**Least Preferred** because: • Does not accommodate existing and future travel demands • Does not provide alternative route to community in case of closures • Increases collision risk for turning traffic, pedestrians and/or cyclists • Has highest travel time increase for local and/ or long-distance travel	**Least/Moderately Preferred** because: • Impacts traffic operations during construction • Does not provide alternative route to community in case of closures • May encroach onto significant hydro substation	**Moderately Preferred** because: • Impacts traffic operations along County Road 4 during construction • Increases crossing distances for pedestrians in some areas due to wider pavement (from road expansion) • Crosses hydro transmission lines	**Most Preferred** because: • Can accommodate higher travel demands • Has lowest potential to impact existing roadways during construction activities • Significantly reduces traffic volumes, reducing collision risks • Provides alternate route in case of road closures

Table 5.3: Donwood (County Road 4) Network Alternatives Evaluation Summary

Evaluation Criteria	Alternative Solutions			
	Do Nothing	**Alternative 1 – Widening of Television Road and County Road 4 with Parkhill Road/Television Road Intersection Improvements (green)**	**Alternative 2 – Television Road Realignment to County Road 4 (yellow)**	**Alternative 3 – Television Road Realignment Directly to University Road (red)**
Social/ Cultural Environment	**Most Preferred** because does not affect: • Residential properties • Major community facilities and/or institutions • Recreational areas • Residences and/or commercial operations during construction activities • Archaeological resources	**Least Preferred** because has potential to: • Displace 12 residential buildings • Impact up to 60 residential properties through grading activities • Encroach onto Institutional property • Affect access to several properties during construction to the greatest extent	**Moderately Preferred** because has potential to: • Displace 9 residential buildings • Affect 25 residential properties through grading activities • Impact residences during construction activities	**Least/Moderately Preferred** because has potential to: • Displace 3 residential buildings • Affect 16 residential properties through grading activities • Impact archaeological resources to the greatest extent
Natural Environment	**Most Preferred** because does not affect: • Stormwater quality/ quantity and/or groundwater resources • Designated vegetation community • Species at Risk (SAR) • Fish habitat and/or migration activities	**Least Preferred** because: • Highest potential to directly impact private groundwater supply wells • Presents limited opportunities to introduce stormwater management facilities	**Least/Moderately Preferred because:** • May impact private groundwater wells • Creates barrier to wildlife movement/ migration	**Moderately Preferred because:** • Creates longest barrier to wildlife movement/ migration • Has highest potential to impact fish habitat and/or migration activities

Table 5.3: Donwood (County Road 4) Network Alternatives Evaluation Summary

Evaluation Criteria	Alternative Solutions			
	Do Nothing	**Alternative 1 – Widening of Television Road and County Road 4 with Parkhill Road/Television Road Intersection Improvements (green)**	**Alternative 2 – Television Road Realignment to County Road 4 (yellow)**	**Alternative 3 – Television Road Realignment Directly to University Road (red)**
Economic	**Least Preferred** because: • Reduces accessibility to adjacent land uses • Does not support future growth in community • Impacts movement of commercial vehicles and local/long distance travel	**Moderately Preferred** because: • May impact viability of 4 businesses • May encroach onto a farming operation	**Most Preferred** because: • Has greatest reduction in delays • Does not impact businesses	**Moderately Preferred** because: • Has highest capital cost • May cross 1 active farm operation • May displace 3 commercial operations
Overall	**Not Preferred**	**Not Preferred**	**Preferred**	**Not Preferred**

- Accommodates existing and future demands;
- Poses modest impacts to residential properties;
- Offers low potential for impacts to community facilities/heritage resources; and
- Minimizes impacts to businesses while providing effective delay reduction.

Lakefield Settlement Area

Problem and Opportunity Statement

The traffic forecasting identified a road network capacity deficiency for County Road 29 (Bridge Street) through Lakefield, between County Road 18 (8th Line Smith) and the Otonabee River in 2051.

The subarea model analyses identified several intersections forecast to operate with poor levels of service in 2051. This finding is attributable to both the growth planned in Lakefield and future background traffic growth. While operational changes could potentially address some deficiencies, limited roadway upgrade/capacity expansion options exist within the built-up area, causing the need for a second Otonabee River crossing.

Alternatives Assessment

The 2014 TMP Update included a comprehensive assessment of the alternatives to address identified capacity deficiencies for County Road 29. **Figure 5.2** shows the alignments of the two network alternatives proposed to address long-term needs in the previous study, which comprised:

1. Widening of Bridge Street and the existing Otonabee River bridge crossing to five lanes (coloured in blue)

2. Construction of a new two-lane arterial road and bridge crossing of the Otonabee River (coloured in orange)

Evaluation Summary

Table 5.4 summarizes the evaluation results for the Lakefield area road network alternatives. The assessment identified the Alternative 2 (Construction of New Two-Lane Arterial Road and Bridge Crossing of Otonabee River) as the recommended solution for Lakefield. This alternative:

- Accommodates existing and future demands;
- Reduces traffic on Bridge Street/Queen Street, thereby improving safety for pedestrians and cyclists;
- Reduces collision risk at intersections and entrances;

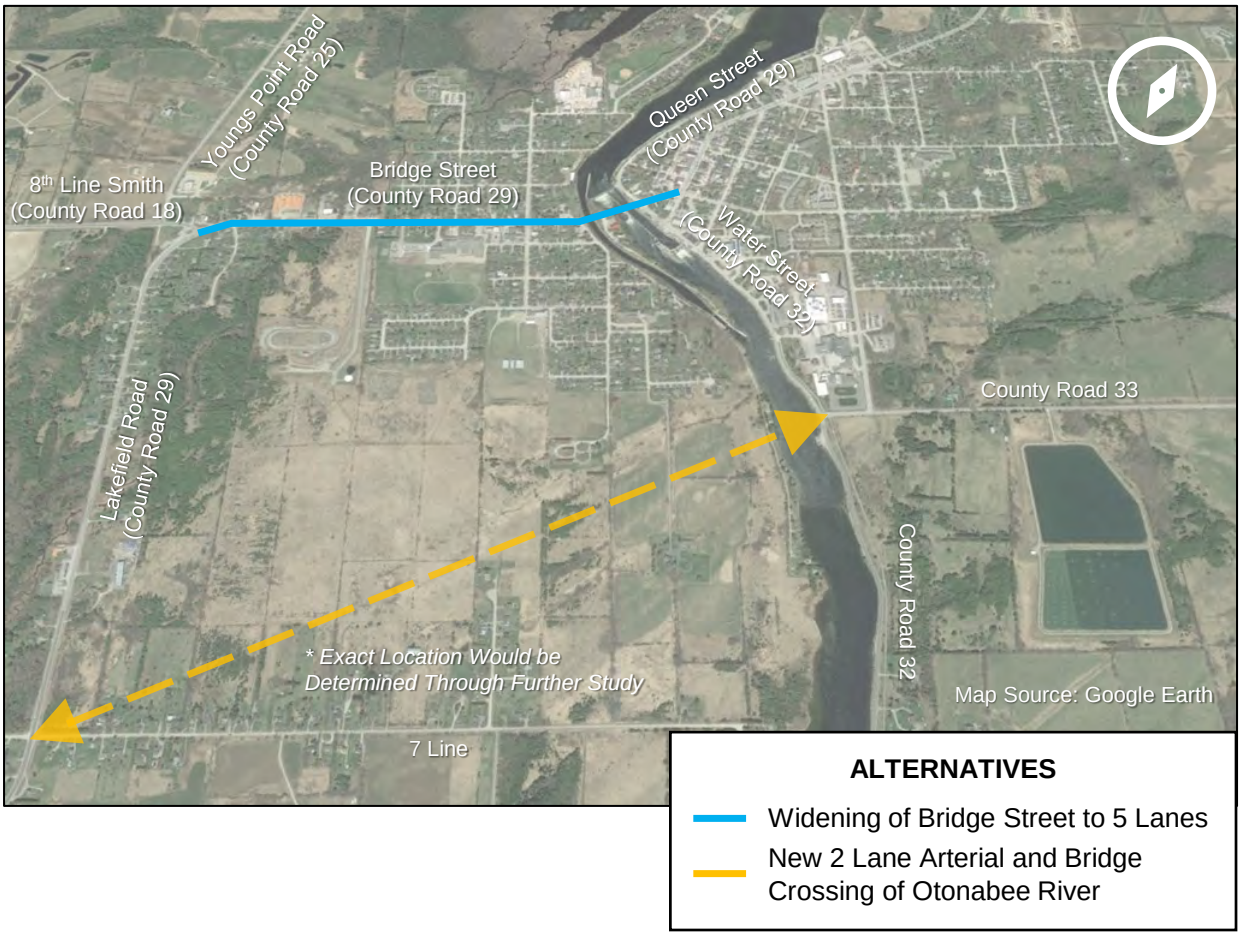

Figure 5.2: Lakefield (County Road 29) Network Alternatives

- Provides an alternate route around Lakefield, and
- Improves access to the Lakefield South Planning Area.

The County should undertake a more detailed investigation to determine the preferred location for this new facility and the overall arterial road network serving Lakefield.

Recommendation:

3. Undertake a Lakefield Network Study to identify the preferred location of the recommended new two-lane arterial road and bridge crossing of the Otonabee River.

Table 5.4: Lakefield (County Road 29) Network Alternatives Evaluation Summary

Evaluation Criteria	Alternative Solutions		
	Do Nothing	**Alternative 1 – Widening of Bridge Street and the Otonabee River Bridge Crossing to Five Lanes (blue)**	**Alternative 2 – Construction of New Two-Lane Arterial Road and Bridge Crossing of the Otonabee River (orange)**
Technical	**Least Preferred** because: • Does not accommodate higher travel demands • Does not provide alternate route • Increases collision risk for pedestrians, cyclists and turning traffic • Increases travel time for local and/or long-distance travel	**Moderately Preferred** because: • Significant impacts to traffic along Bridge Street during construction • Increases crossing distances for pedestrians in some areas due to wider pavement (from road expansion) • Does not provide alternate route • Would require relocation of utilities	**Most Preferred** because: • Accommodates existing and future demands • Provides alternative route to community • Reduces traffic on Bridge Street/ Queen Street, improving safety for pedestrians and cyclists • Reduces collision risk at intersections and entrances along existing roads • Provides greatest reduction in travel time
Social/ Cultural Environment	**Least Preferred** because: • Provides limited opportunities to implement CIP initiatives • Has highest potential to impact noise sensitive areas	**Moderately Preferred** because: • Has potential to displace the highest number of residences • Affects access to several properties/operations during construction	**Most Preferred** because: • Provides greatest opportunity to implement CIP initiatives through reduced traffic on Bridge Street/ Queen Street • Does not impact community facilities and/or institutions • Improves accessibility of Lakefield South Planning Area • But could impact residents/ property owners if new route incorporates any existing roads

Table 5.4: Lakefield (County Road 29) Network Alternatives Evaluation Summary

Evaluation Criteria	Alternative Solutions		
	Do Nothing	**Alternative 1 – Widening of Bridge Street and the Otonabee River Bridge Crossing to Five Lanes (blue)**	**Alternative 2 – Construction of New Two-Lane Arterial Road and Bridge Crossing of the Otonabee River (orange)**
Natural Environment	**Most Preferred** because has least potential to affect: • Designated natural areas • Stormwater and/or groundwater quality • Forest and/or vegetation communities • Fish habitat and/or migration activities	**Moderately Preferred** because: • Encroaches onto ORCA designated Environmental Constraint area and flood plain • Has highest potential to affect fish habitat and/or migration activities • Poses limited potential to introduce water management facilities • May require intrusion into the river to widen bridges	**Least Preferred** because: • Requires intrusion into the river to construct bridge • Introduces new barrier to wildlife movement/migration • May encroach onto ORCA designated Environmental Constraint area • May affect fish habitat *Note – Affects incurred as part of planned development and can be mitigated as part of planning/design
Economic	**Moderately Preferred** because does not support: • Goods movement • Movement between communities • Future growth	**Least Preferred** because: • Has potential to impact operation/viability of 8 businesses • Has potential to displace 1 business • Requires widening of 2 bridges	**Most Preferred** because: • Has highest potential to improve accessibility to/from Lakefield South Planning Area, Queen Street/village area and entrances along Bridge Street • Supports future growth planning
Overall	**Not Preferred**	**Not Preferred**	**Preferred**

Millbrook Settlement Area

Problem and Opportunity Statement

The traffic forecasting identified a road network capacity deficiency for County Road 10 between Fallis Line and Highway 115 in 2051 but not through Millbrook.

The subarea model analyses identified several intersections on County Road 10 (Tupper Street) within Millbrook forecast to operate with poor levels of service in 2051, especially in the PM peak hour. While operational changes could potentially address some deficiencies, more significant intersection/corridor improvements will be required to resolve identified deficiencies.

Alternatives Assessed

The 2014 TMP Update included a comprehensive assessment of the alternatives to address identified capacity deficiencies for County Road 10. **Figure 5.3** shows the alignments of the two network alternatives proposed to address long-term needs in the previous study, which comprised:

1. Implementation of corridor/intersection improvements on County Road 10 between Fallis Line and County Road 21 (King Street) (coloured in brown)
2. Construction of a new two-lane arterial road (coloured in purple)

County Road 28 was not considered to be a reasonable option as it is too far removed from Millbrook and does not serve the adjacent development in the settlement area.

Evaluation Summary

Table 5.5 summarizes the evaluation results for the Millbrook area road network alternatives. The assessment identified Alternative 1 (Implementation of corridor/ intersection improvements on County Road 10 between Fallis Line and County Road 21 (King Street)) as the recommended solution for Millbrook. This alternative:

- Accommodates existing and future demands;
- Offers low potential for impacts to residential properties/institutions; and
- Improves access to Millbrook.

The County should confirm the extent and configuration of the proposed road expansion works through a corridor study following the Municipal Class EA process.

Recommendation:

4. Undertake a corridor study following the Municipal Class Environmental Assessment to confirm the extent and configuration of the proposed road works for County Road 10.

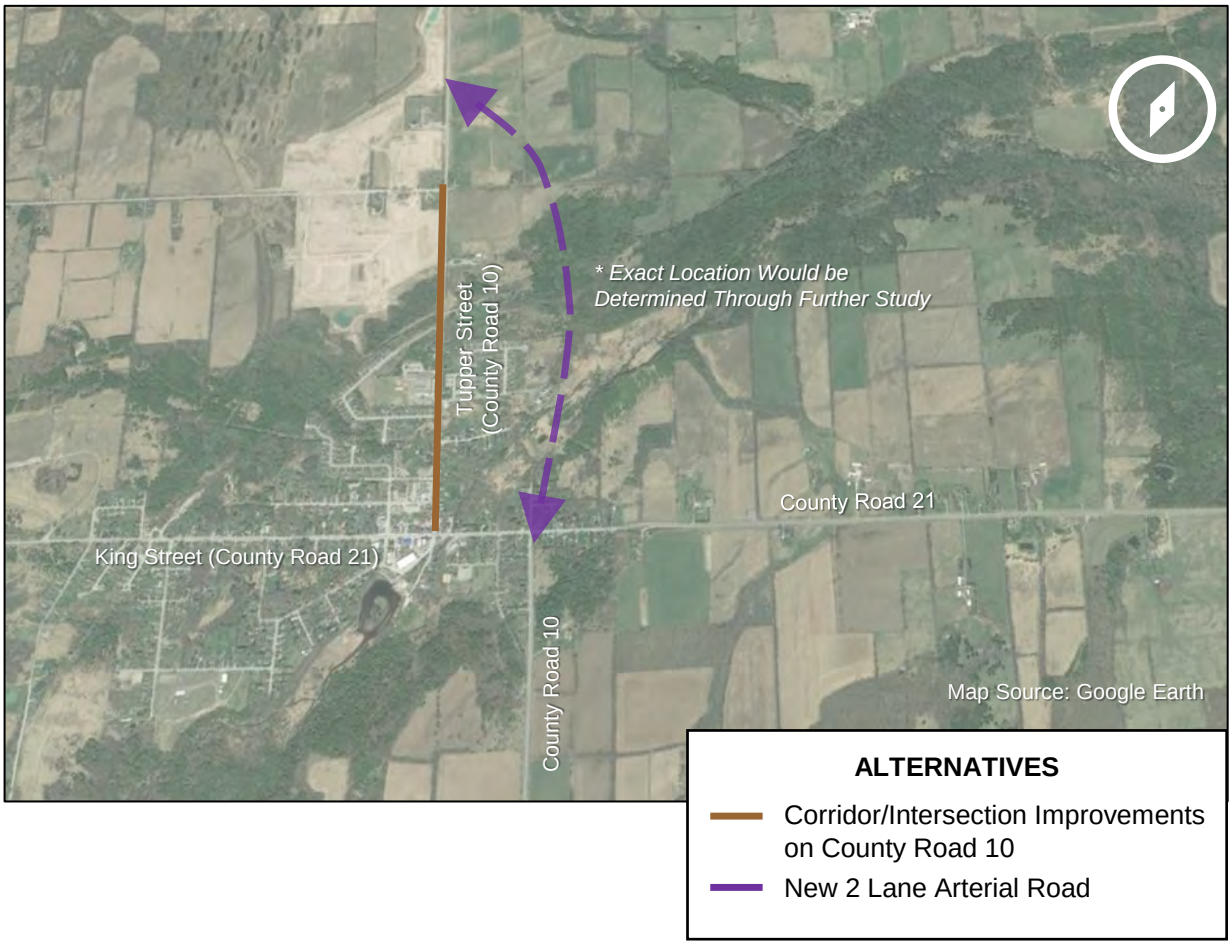

Figure 5.3: Millbrook (County Road 10) Network Alternatives

5.2.3 Recommended Improvements

Table 5.6 summarizes the recommended road expansion and corridor improvement projects to address the anticipated capacity deficiencies attributed to growth to 2051 in the County.

Table 5.5: Millbrook (County Road 10) Network Alternatives Evaluation Summary

Evaluation Criteria	Alternative Solutions		
	Do Nothing	**Alternative 1 – Implementation of Corridor/Intersection Improvements on County Road 10 between Fallis Line and County Road 21 (King Street) (brown)**	**Alternative 2 – Construction of New Two-Lane Arterial Road (purple)**
Technical	**Least Preferred** because: • Does not accommodate higher travel demands • Increased collision risk for pedestrians, cyclists and turning traffic • Increases travel time for local and/or long-distance travel	**Moderately Preferred** because: • Accommodates existing and future demands • Serves/improves access to development lands • Increases crossing distances for pedestrians in some areas due to wider pavement (from road expansion) • Impacts traffic operations during construction • Provides reduction in travel time • Does not provide alternative route • Would likely require relocation of utilities	**Most Preferred** because: • Accommodates existing and future demands • Does not serve/improve access to development lands • Provides alternative route to community • Reduces traffic on Tupper Street, improving safety for pedestrians and cyclists • Reduces collision risk at intersections and entrances along existing roads • Provides reduction in travel time
Social/ Cultural Environment	**Most Preferred** because does not affect: • Residential properties • Community facilities and/or institutions • Residences and/or commercial operations during construction	**Moderately Preferred** because: • May impact residential properties • May impact institutional property • Has highest potential to affect access to properties during construction	**Least Preferred** because: • May impact most residential properties • May impact institutional property • Has potential to affect access to properties during construction

Table 5.5: Millbrook (County Road 10) Network Alternatives Evaluation Summary

Evaluation Criteria	Alternative Solutions		
	Do Nothing	**Alternative 1 – Implementation of Corridor/Intersection Improvements on County Road 10 between Fallis Line and County Road 21 (King Street) (brown)**	**Alternative 2 – Construction of New Two-Lane Arterial Road (purple)**
Natural Environment	**Most Preferred** because: • Least potential to affect stormwater and/or groundwater quality	**Moderately Preferred** because: • May impact stormwater quality • Creates larger barrier to wildlife movement/ migration	**Least Preferred** because: • May require construction of new water crossing • Introduces new barrier to wildlife movement/migration • May impact natural heritage features including wooded areas • May affect fish habitat
Economic	**Least Preferred** because: • Does not support future growth	**Most Preferred** because: • Supports future growth • Maintains traffic through Millbrook and past local businesses • May impact adjacent properties (residential and non-residential) during construction	**Moderately Preferred** because**:** • Supports future growth • May impact local businesses by diverting traffic around Millbrook • May impact adjacent properties (residential and non-residential) during construction • Likely most expensive option
Overall	**Not Preferred**	**Preferred**	**Not Preferred**

Table 5.6: Proposed County Road Expansion and Corridor Improvement Projects

	Road and Limits	Proposed Improvement
1	County Road 4 (Warsaw Road) Television Road to County Road 41 (University Road)	New alignment and widening to 4 lanes
2	County Road 10 County Road 21 (King Street) to Fallis Line	Corridor/intersection improvements (turn lanes, utility relocation, property, traffic control signals). Also corridor study.
3	County Road 10 Fallis Line to Highway 115	Widening to 4 lanes
4	County Road 12 (Lily Lake Road) County Road 27 (Ackison Road) to City of Peterborough limit	Reconstruction and widening to 4/5 lanes
5	County Road 18 (Chemong Road) City of Peterborough limit to 0.6 km N. of County Road 19 (Line Road 3)	Widening to 5 lanes (centre turn lane)
6	County Road 18 (Chemong Road) 1 km N. of County Road 19 (Line Road 3) to County Road 1 (Lindsay Road)	Widening to 5 lanes (centre turn lane)
7	County Road 18 (Chemong Road) County Road 1 (Lindsay Road) to Bridgenorth	Widening to 4/5 lanes (including signals at Fifth Line)
8	County Road 18 (Ward Street) South limit of Bridgenorth to County Road 14 (Bridge Road)	Corridor/intersection improvements
9	County Road 28 Fraserville to Highway 7/115	Widening to 4/5 lanes
10	County Road 29 (Lakefield Road) City of Peterborough limit to 7th Line	Widening to 4/5 lanes
11	County Road 29 (Lakefield Road/Water Street) Crossing of Otonabee River	New 2 lane arterial and bridge crossing of Otonabee River

5.3 Intersection Improvements

5.3.1 Approach and Study Intersections

As part of the TMP Update, the study team reviewed the operational and safety performance of 24 intersections on the County road network. The intersections selected for detailed assessment were identified through the traffic forecasting, collision data analysis (see **Section 3.3.2**), and County and Township staff. **Figure 5.4** shows the study intersection locations.

Potential operational improvements considered at each intersection included:

- **Traffic Control Signals** – Signal warrant analyses were completed for each unsignalized study intersection based on 2021 and 2051 traffic volume estimates. The assessment followed the methodology specified in Justification 7 (Projected Volumes) of *Ontario Traffic Manual Book 12 – Traffic Signals.* [5] The guidebook recommends raising the threshold volumes for meeting the warrant to consider traffic control signals by 20% when using peak hour projections in the calculation. For this reason, warrants were calculated based on meeting justifications to both 100% and 120%.
- **Roundabout** – A high-level screening was completed to assess the merit of converting the study intersection to a modern roundabout, primarily in lieu of traffic control signals. The screening considered safety concerns, atypical geometry, unbalanced turning volumes, and property availability.
- **Auxiliary Turn Lanes** – The need for auxiliary turn lanes was assessed for each study intersection based on 2021 and 2051 traffic volumes as follows:
  - ***Left-Turn Lanes*** – The assessment for unsignalized intersections followed the methodology set out in the MTO *Design Supplement for the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads* [6]. This methodology does not specify a minimum left-turn volume threshold for justifying an auxiliary lane. For this reason, intersections with low left-turn volumes may warrant a lane by virtue of the combination of opposing and advancing traffic volumes. For intersections operating under all-way stop control or traffic control signals, the need for left-turn lanes was assessed based on the operational analysis.
  - ***Right-Turn Lanes*** – The assessment followed guidelines developed by the Virginia Department of Transportation (VDOT), which County staff reference for investigations of this nature.

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5 Ministry of Transportation, Ontario. *Ontario Traffic Manual Book 12: Traffic Signals.* Queen's Printer of Ontario. 2012.

6 Ministry of Transportation, Ontario. *Design Supplement for the TAC Geometric Design Guide for Canadian Roads: Appendix 9A for Section 9.17 (Left-Turn Lanes).* June 2017.

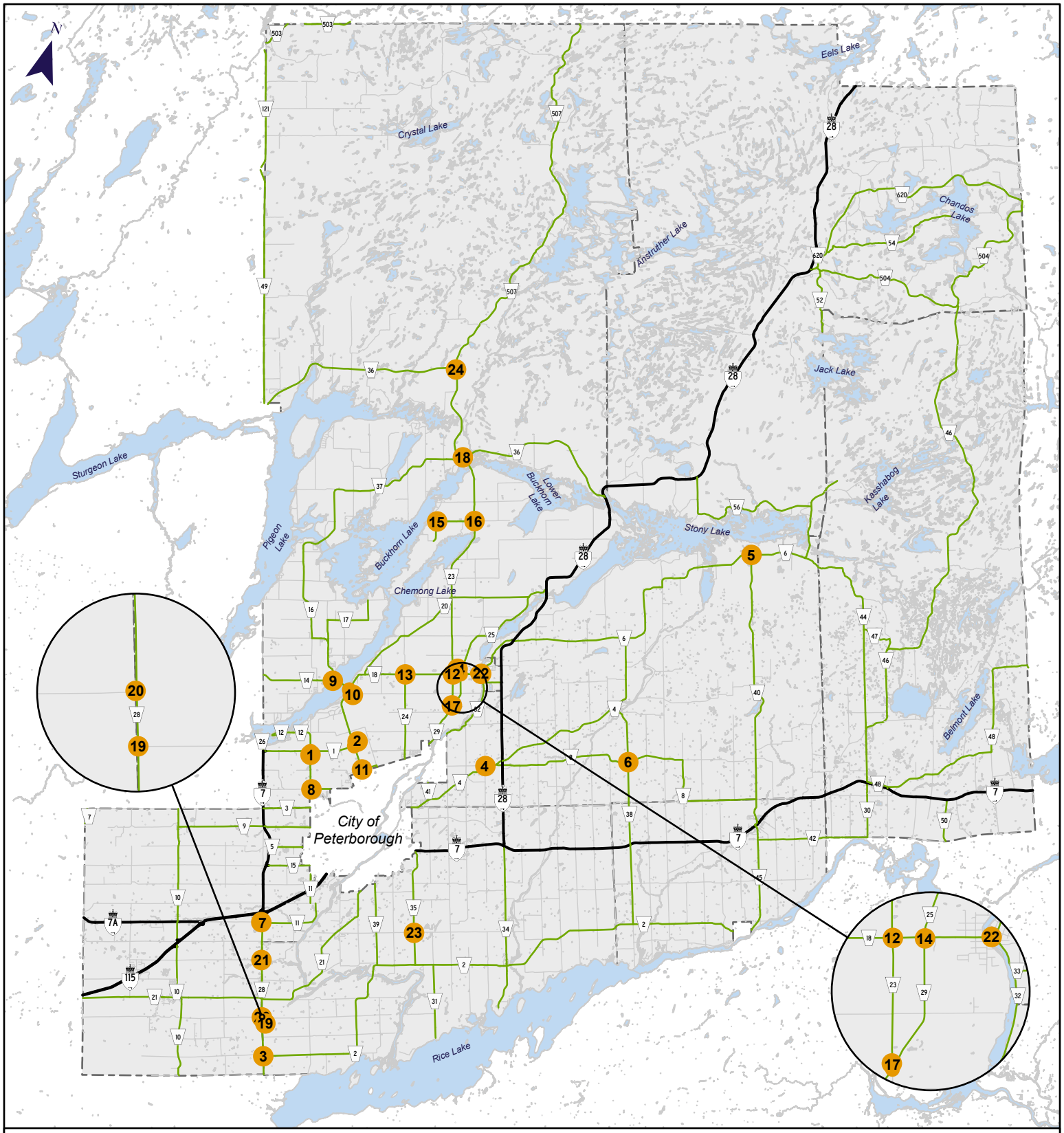

FIGURE 5.4:
STUDY INTERSECTIONS

Universal Transverse Mercator Projection Zone 17N

DATA SOURCES:
Peterborough County, Land Information Ontario, ESRI

0 2 4 8 12 16 20
Km

LEGEND

- Study Intersection
- Provincial Highway
- County Road
- Township Road
- Municipal Boundaries

Peterborough County
Our History - Your Future

2022 TRANSPORTATION MASTER PLAN UPDATE

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Table 5.7 and **Table 5.8** summarize the measures of effectiveness criteria applied in assessing traffic operations for signalized and unsignalized County road intersections, respectively, based on the County of Peterborough *Traffic Impact Study Guidelines*[7], with the modifications recommended in this TMP Update (see **Section 6.2.4**).

Table 5.7: Criteria for Signalized Intersections on County Roads

Condition	Level of Service (LOS)	Average Delay	Volume to Capacity (v/c) Ratio	Queue Storage
Intersection and Critical Movements	E	≤ 80 s	≤ 0.85 ≤ 0.95 for left turns[1]	95th percentile queue length accommodated within turn lane

Note: 1. Revised per recommendations in **Section 6.2.4**.

Table 5.8: Criteria for Unsignalized Intersections on County Roads

Roadside Environment	Speed	Level of Service (LOS)	Volume to Capacity (v/c) Ratio
Urban/Rural	> 60 km/h	D	≤ 0.85
Urban/Suburban	≤ 60 km/h	E	≤ 0.85

Traffic operations exceeding the thresholds listed above would typically be characterized as “unacceptable” or critical conditions, triggering the need to consider mitigation measures to address identified concerns.

Additionally, detailed analyses of the collision patterns at each study intersection were undertaken to identify items requiring attention and potential measures to mitigate safety concerns. The analysis is based on the same collision data for the five-year period of June 2015 to June 2020 reported in **Section 3.3.2**.

5.3.2 Operational Analysis

Existing (2021) Traffic Volumes

Table 5.9 summarizes the level of service for each study intersection by approach and overall (where appropriate) under 2021 traffic volumes. Traffic counts collected prior to 2021 were factored to the common base year using a compound growth rate of 2% per annum. Critical conditions (i.e., operation at LOS E or LOS F) are identified in red text.

[7] County of Peterborough. *Traffic Impact Study Guidelines*. n.d.

All study intersections operate with acceptable levels of service and within capacity under existing traffic volumes except for County Road 14 (Yankee Line) and County Road 16 (Robinson Road). Critical conditions were noted for the southbound approach in the AM peak hour and westbound approach in the PM peak hour at this intersection.

Future (2051) Traffic Volumes

Year 2051 traffic volumes were estimated for the study intersections assuming a 1% compound annual traffic growth factor applied over 30 years, as noted in **Section 4.2**. This factor does not explicitly account for localized traffic growth caused by specific development plans. As such, future traffic volumes may be underestimated for intersections situated in higher growth areas.

Table 5.10 summarizes the level of service for each intersection by approach and overall (where appropriate) based on 2051 traffic volumes. Critical conditions (e.g., operation at LOS E or LOS F) are identified in red text.

The study intersections are largely expected to operate at acceptable levels of service and within capacity under 2051 traffic volumes. Critical conditions were noted for:

- Southbound approach on County Road 18 (Chemong Road) at County Road 1 (Lindsay Road) in the AM peak hour;
- Eastbound and southbound approaches in the AM peak hour and westbound approach in the PM peak hour at County Road 14 (Yankee Line) and County Road 16 (Robinson Road);
- Overall intersection at County Road 14 (Bridge Street) and County Road 18 (Ward Street) in the PM peak hour, as well as southbound approach in both peak hours and northbound approach in the PM peak hour;
- Southbound approach on County Road 18 (Chemong Road) at County Road 19/3rd Line Smith in the PM peak hour;
- Westbound approach on County Road 18 (8th Line Smith) at County Road 23 (Buckhorn Road) in the PM peak hour;
- Northbound and southbound approaches at County Road 22 (Curve Lake Road)/16th Line Smith and County Road 23 (Buckhorn Road) in the PM peak hour;
- Northbound approach at County Road 23 (Buckhorn Road) and County Road 29 (Lakefield Road) in the PM peak hour; and
- Eastbound approach on Larmer Line at County Road 28 in the PM peak hour.

Table 5.9: 2021 Weekday AM and PM Peak Hour Level of Service Summary for Study Intersections

#	Intersection	Control[1]	AM Peak Hour					PM Peak Hour				
			EB	WB	NB	SB	INT	EB	WB	NB	SB	INT
1	County Road 1 (Lindsay Road) and County Road 12 (Fifes Bay Road)	AWSC	-	-	-	-	-	-	-	-	-	-
2	County Road 1 (Lindsay Road) and County Road 18 (Chemong Road)	TCS	C	-	A	B	B	C	-	A	B	B
3	County Road 2 and County Road 28	TWSC	-	B	A	A	-	-	C	A	A	-
4	County Road 4 (Warsaw Road) and Nassau Road/Douro Seventh Line	TWSC	A	A	B	B	-	A	A	B	B	-
5	County Road 6 and County Road 40/Crowe's Landing Road	TWSC	A	A	A	A	-	A	A	A	A	-
6	County Road 8 (Webster Road) and County Road 38 (South Street)	AWSC	A	A	A	A	-	A	A	A	A	-
7	County Road 11 (Moncrief Line) and County Road 28	TWSC	-	B	A	A	-	-	C	A	A	-
8	County Road 12 (Fifes Bay Road)/ County Road 27 (Ackison Road) and County Road 12 (Lily Lake Road)/ 2nd Line Smith	AWSC	A	B	A	A	-	A	B	B	A	-
9	County Road 14 (Yankee Line) and County Road 16 (Robinson Road)	TWSC	C	C	-	F	-	B	F	-	C	-
10	County Road 14 (Bridge Road) and County Road 18 (Ward Street)	TCS	C	B	A	D	C	C	C	C	D	C
11	County Road 18 (Chemong Road) and County Road 19/3rd Line Smith	TCS	B	B	B	C	B	B	B	C	D	C
12	County Road 18 (8th Line Smith) and County Road 23 (Buckhorn Road)	AWSC	B	B	A	B	-	B	B	B	B	-
13	County Road 18 (8th Line Smith) and County Road 24 (Centre Line Smith)	TWSC	A	A	B	B	-	A	A	B	B	-
14	County Road 18 (8th Line Smith) and County Road 25 (Youngs Point Road)	TWSC	A	A	-	B	-	A	A	-	B	-
15	County Road 22 (Curve Lake Road) and Gazelle Trail	TWSC	B	-	A	A	-	B	-	A	A	-
16	County Road 22 (Curve Lake Road)/16th Line Smith and County Road 23 (Buckhorn Road)	AWSC	B	A	B	B	-	B	B	C	C	-

Table 5.9: 2021 Weekday AM and PM Peak Hour Level of Service Summary for Study Intersections

#	Intersection	Control[1]	AM Peak Hour					PM Peak Hour				
			EB	WB	NB	SB	INT	EB	WB	NB	SB	INT
17	County Road 23 (Buckhorn Road) and County Road 29 (Lakefield Road)	TWSC	A	A	A	B	-	A	A	D	B	-
18	County Road 23 (Buckhorn Road)/County Road 36 and County Road 36/County Road 37 (Lakehurst Road)	TCS	A	A	C	C	B	A	A	C	B	B
19	County Road 28 and Third Line	TWSC	-	B	A	A	-	-	B	A	A	-
20	County Road 28 and Zion Line	TWSC	C	-	A	A	-	C	-	A	A	-
21	County Road 28 and Larmer Line	TWSC	C	-	A	A	-	C	-	A	A	-
22	County Road 29 (Bridge Street) and County Road 32 (Water Street)	TWSC	A	A	B	B	-	A	A	B	B	-
23	County Road 35 (Keene Road) and Base Line	TWSC	A	A	A	A	-	A	A	A	A	-
24	County Road 36 and County Road 507	TWSC	-	A	A	A	-	-	B	A	A	-

Note: 1. Control Type: TWSC – Two-way Stop Control, AWSC – All-way Stop Control, TCS – Traffic Control Signals

Table 5.10: 2051 Weekday AM and PM Peak Hour Level of Service Summary for Study Intersections

#	Intersection	Control[1]	AM Peak Hour					PM Peak Hour				
			EB	WB	NB	SB	INT	EB	WB	NB	SB	INT
1	County Road 1 (Lindsay Road) and County Road 12 (Fifes Bay Road)	AWSC	-	-	-	-	-	-	-	-	-	-
2	County Road 1 (Lindsay Road) and County Road 18 (Chemong Road)	TCS	C	-	B	E	D	C	-	A	B	B
3	County Road 2 and County Road 28	TWSC	-	C	A	A	-	-	D	A	A	-
4	County Road 4 (Warsaw Road) and Nassau Road/Douro Seventh Line	TWSC	A	A	B	B	-	A	A	B	B	-
5	County Road 6 and County Road 40/Crowe's Landing Road	TWSC	A	A	A	A	-	A	A	A	A	-
6	County Road 8 (Webster Road) and County Road 38 (South Street)	AWSC	A	A	A	B	-	A	A	B	B	-
7	County Road 11 (Moncrief Line) and County Road 28	TWSC	-	C	A	A	-	-	D	A	A	-
8	County Road 12 (Fifes Bay Road)/ County Road 27 (Ackison Road) and County Road 12 (Lily Lake Road)/ 2nd Line Smith	AWSC	A	B	B	B	-	B	C	C	B	-
9	County Road 14 (Yankee Line) and County Road 16 (Robinson Road)	TWSC	E	D	-	F	-	C	F	-	C	-
10	County Road 14 (Bridge Road) and County Road 18 (Ward Street)	TCS	C	C	B	E	C	C	C	F	F	F
11	County Road 18 (Chemong Road) and County Road 19/3rd Line Smith	TCS	B	B	C	C	C	B	B	D	F	E
12	County Road 18 (8th Line Smith) and County Road 23 (Buckhorn Road)	AWSC	B	C	B	B	-	C	E	C	C	-
13	County Road 18 (8th Line Smith) and County Road 24 (Centre Line Smith)	TWSC	A	A	B	B	-	A	A	C	B	-
14	County Road 18 (8th Line Smith) and County Road 25 (Youngs Point Road)	TWSC	A	A	-	C	-	A	A	-	C	-
15	County Road 22 (Curve Lake Road) and Gazelle Trail	TWSC	B	-	A	A	-	B	-	A	A	-
16	County Road 22 (Curve Lake Road)/16th Line Smith and County Road 23 (Buckhorn Road)	AWSC	B	B	C	C	-	D	B	F	E	-

Table 5.10: 2051 Weekday AM and PM Peak Hour Level of Service Summary for Study Intersections

#	Intersection	Control[1]	AM Peak Hour					PM Peak Hour				
			EB	WB	NB	SB	INT	EB	WB	NB	SB	INT
17	County Road 23 (Buckhorn Road) and County Road 29 (Lakefield Road)	TWSC	A	A	B	C	-	A	A	F	C	-
18	County Road 23 (Buckhorn Road)/County Road 36 and County Road 36/County Road 37 (Lakehurst Road)	TCS	A	A	C	B	B	B	B	D	B	C
19	County Road 28 and Third Line	TWSC	-	C	A	A	-	-	C	A	A	-
20	County Road 28 and Zion Line	TWSC	C	-	A	A	-	C	-	A	A	-
21	County Road 28 and Larmer Line	TWSC	D	-	A	A	-	E	-	A	A	-
22	County Road 29 (Bridge Street) and County Road 32 (Water Street)	TWSC	A	A	B	B	-	A	A	B	C	-
23	County Road 35 (Keene Road) and Base Line	TWSC	A	A	A	A	-	B	B	A	A	-
24	County Road 36 and County Road 507	TWSC	-	B	A	A	-	-	B	A	A	-

Note: 1. Control Type: TWSC – Two-way Stop Control, AWSC – All-way Stop Control, TCS – Traffic Control Signals

5.3.3 Safety Analysis

Reported collisions were reviewed to identify trends and potential safety concerns at the 24 study intersections. **Table 5.11** summarizes the number of collisions reported over the five-year period at each location. The intersections experiencing the most collisions over this period were (in order):

- County Road 1 (Lindsay Road) and County Road 18 (Chemong Road) (31 collisions)
- County Road 14 (Bridge Road) and County Road 18 (Ward Street) (21 collisions)
- County Road 18 (Chemong Road) and County Road 19/3rd Line Smith (18 collisions)

The intersections with the fewest reported collisions were (in order):

- County Road 6 and County Road 40/Crowe's Landing Road (no collisions)
- County Road 23 (Buckhorn Road)/County Road 36 and County Road 36/County Road 37 (Lakehurst Road) (2 collisions)

Collision rates varied between 0.00 collisions per million entering vehicles (County Road 6 and County Road 40/Crowe's Landing Road) and 1.09 collisions per million entering vehicles (County Road 35 (Keene Road) and Base Line). Caution should be exercised in interpreting the rates due to data limitations (e.g., underreporting, data entry errors) and the influence of traffic volume on collision exposure, especially for rural road intersections experiencing relatively few crashes.

5.3.4 Recommended Improvements

Table 5.12 summarizes the key operational and safety improvement recommendations resulting from the individual assessments of the study intersections. No improvements were identified for Intersection #5 – County Road 6 and County Road 40/Crowe's Landing Road.

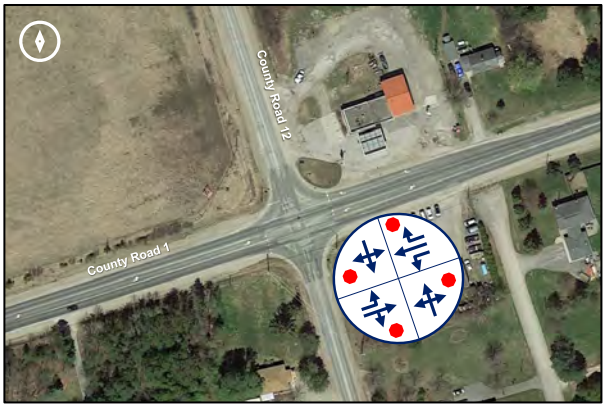
Table 5.11: 2015-2020 Collision Summary for Study Intersections

#	Intersection	Total Collisions 2015-2020	Intersection Collision Rate[1]
1	County Road 1 (Lindsay Road) and County Road 12 (Fifes Bay Road)	15	0.79
2	County Road 1 (Lindsay Road) and County Road 18 (Chemong Road)	31	0.93
3	County Road 2 and County Road 28	17	1.05
4	County Road 4 (Warsaw Road) and Nassau Road/Douro Seventh Line	3	0.41
5	County Road 6 and County Road 40/Crowe's Landing Road	0	0.00
6	County Road 8 (Webster Road) and County Road 38 (South Street)	3	0.94
7	County Road 11 (Moncrief Line) and County Road 28	4	0.20
8	County Road 12 (Fifes Bay Road)/County Road 27 (Ackison Road) and County Road 12 (Lily Lake Road)/2nd Line Smith	6	0.45
9	County Road 14 (Yankee Line) and County Road 16 (Robinson Road)	7	0.31
10	County Road 14 (Bridge Road) and County Road 18 (Ward Street)	21	0.68
11	County Road 18 (Chemong Road) and County Road 19/3rd Line Smith	18	0.45
12	County Road 18 (8th Line Smith) and County Road 23 (Buckhorn Road)	16	0.92
13	County Road 18 (8th Line Smith) and County Road 24 (Centre Line Smith)	5	0.59
14	County Road 18 (8th Line Smith) and County Road 25 (Youngs Point Road)	3	0.25
15	County Road 22 (Curve Lake Road) and Gazelle Trail	7	0.89
16	County Road 22 (Curve Lake Road)/16th Line Smith and County Road 23 (Buckhorn Road)	11	0.59
17	County Road 23 (Buckhorn Road) and County Road 29 (Lakefield Road)	8	0.39
18	County Road 23 (Buckhorn Road)/County Road 36 and County Road 36/County Road 37 (Lakehurst Road)	2	0.15
19/20	County Road 28 and Third Line/Zion Line	10	0.62
21	County Road 28 and Larmer Line	4	0.20
22	County Road 29 (Bridge Street) and County Road 32 (Water Street)	4	0.20
23	County Road 35 (Keene Road) and Base Line	4	1.09
24	County Road 36 and County Road 507	5	0.67

Note: 1. Intersection collision rates expressed in collisions per million entering vehicles

Table 5.12: Recommended Operational and Safety Improvements for Study Intersections

1. County Road 1 (Lindsay Road) and County Road 12 (Fifes Bay Road)

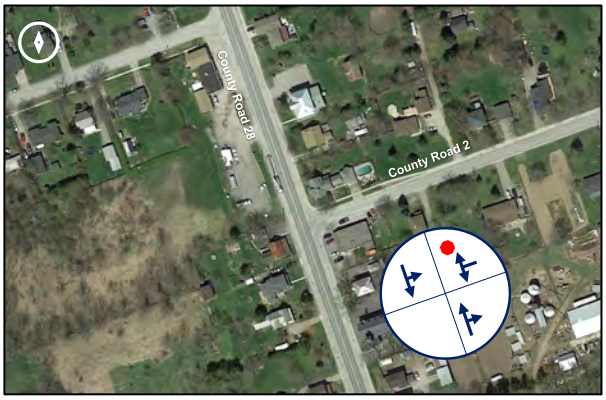


- Provide advanced warning signage for stop control
- Install eastbound right-turn taper
- Install northbound right-turn taper
- Install traffic control signals (or roundabout)

2. County Road 1 (Lindsay Road) and County Road 18 (Chemong Road)

- Provide advanced warning signage for channelized right turn lane
- Realign channelized eastbound right-turn lane
- Remove channelized eastbound right-turn lane

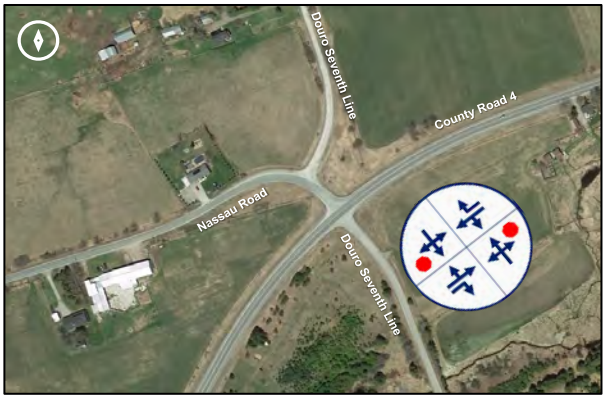
3. County Road 2 and County Road 28



- Update on-road parking regulations
- Add raised curb or pavement markings for driveways on east side
- Trim trees to address northeast corner sight obstruction
- Install southbound left-turn lane
- Install northbound right-turn lane
- Remove tree obstructing northeast corner sightline

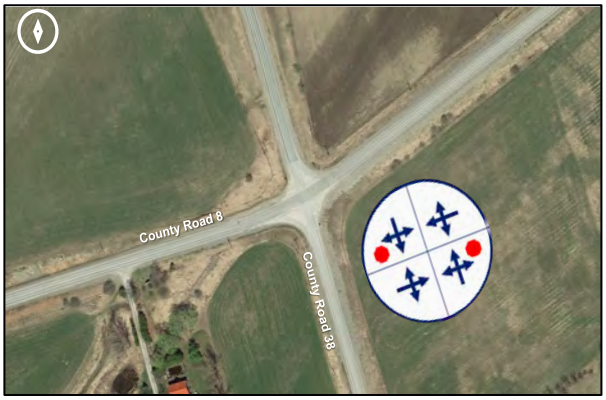
Table 5.12: Recommended Operational and Safety Improvements for Study Intersections

4. County Road 4 (Warsaw Road) and Nassau Road/Douro Seventh Line



- Add side road stop bar and turn lane pavement markings
- Trim trees to address southwest corner sight obstruction
- Extend westbound right-turn lane
- Realign intersection outside horizontal curve
- Consider installing roundabout (subject to further review)

6. County Road 8 (Webster Road) and County Road 38 (South Street)



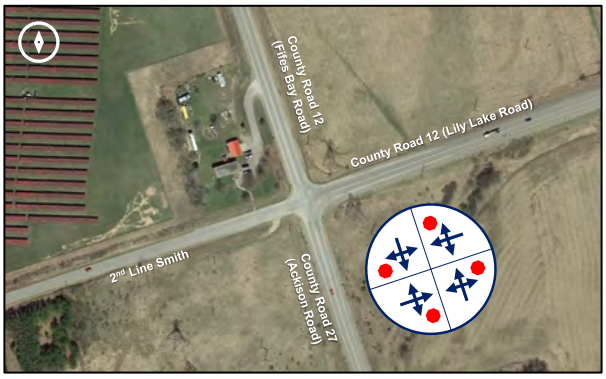
- Install advanced warning signage for intersection
- Trim trees to address southeast corner sight obstruction
- Realign east approach
- Consider installing roundabout (subject to further review)

7. County Road 11 (Moncrief Line) and County Road 28

- Complete an illumination assessment

Table 5.12: Recommended Operational and Safety Improvements for Study Intersections

8. County Road 12 (Fifes Bay Road)/ County Road 27 (Ackison Road) and County Road 12 (Lily Lake Road)/2nd Line Smith



- Install flashing beacon
- Install northbound right-turn lane
- Install traffic control signals (with development)
- Install left-turn lanes (with development)
- Install westbound right-turn taper
- Enhanced pavement for north approach
- Change grade for north approach
- Grade hill to address northwest corner sight obstruction

9. County Road 14 (Yankee Line) and County Road 16 (Robinson Road)

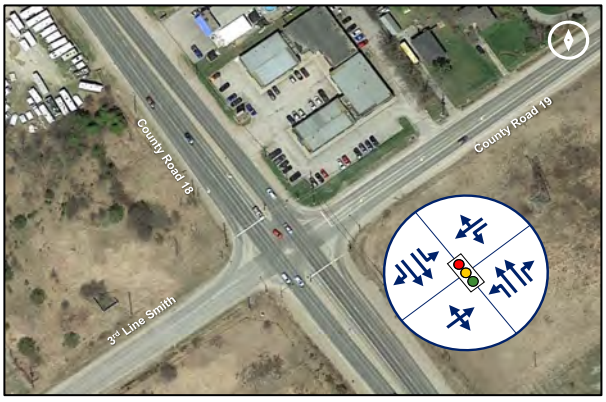
- Add raised curb or pavement markings on south side for access management
- Install traffic control signals (or roundabout)
- Install roadside protection on south side
- Extend northbound merge lane

Table 5.12: Recommended Operational and Safety Improvements for Study Intersections

10. County Road 14 (Bridge Road) and County Road 18 (Ward Street)

- Install advanced warning signage for channelized right-turn lanes
- Add eastbound right-turn lane arrow
- Reroute driveway connection on east side
- Realign channelized right-turn lanes
- Remove channelized right-turn lanes
- Consider installing roundabout (subject to further review)

11. County Road 18 (Chemong Road) and County Road 19/3rd Line Smith



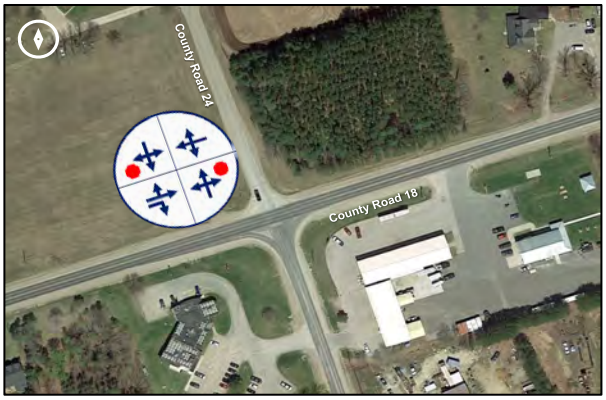
- Install westbound right-turn lane

12. County Road 18 (8th Line Smith) and County Road 23 (Buckhorn Road)

- Install westbound right-turn lane
- Install southbound right-turn taper
- Install traffic control signals

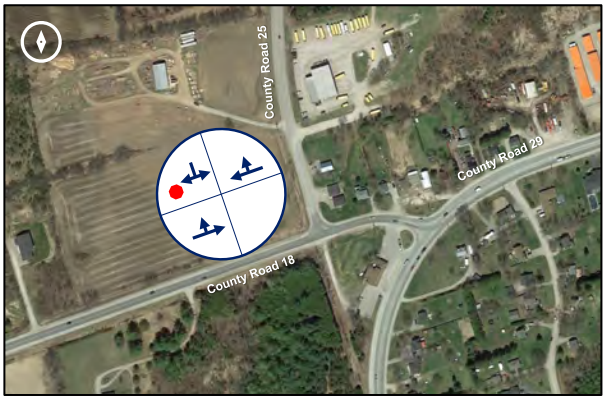
Table 5.12: Recommended Operational and Safety Improvements for Study Intersections

13. County Road 18 (8th Line Smith) and County Road 24 (Centre Line Smith)



- Add eastbound right-turn arrow
- Trim trees to address northeast corner sight obstruction
- Install eastbound left-turn lane
- Install westbound left-turn lane

14. County Road 18 (8th Line Smith) and County Road 25 (Youngs Point Road)



- Install westbound right-turn taper
- Install eastbound left-turn lane
- Restrict cut-through traffic at west side private property
- Consider installing roundabout (subject to further review)

15. County Road 22 (Curve Lake Road) and Gazelle Trail

- Complete an illumination assessment
- Trim trees to address sight obstructions on all corners

Table 5.12: Recommended Operational and Safety Improvements for Study Intersections

16. County Road 22 (Curve Lake Road)/16th Line Smith and County Road 23 (Buckhorn Road)

- Add raised curb or pavement markings for church driveway
- Install eastbound right-turn lane
- Install southbound right-turn lane
- Install traffic control signals (or roundabout)
- Complete an illumination assessment
- Convert northbound lanes to left and thru-right lane
- Install northbound left-turn lane

17. County Road 23 (Buckhorn Road) and County Road 29 (Lakefield Road)

- Add southbound right-turn pavement markings and/or signage and extend acceleration lane
- Remove 60 km/h warning sign
- Add edge line east side of Lakefield Road
- Install raised centre median islands
- Consolidate private accesses
- Realign roads to intersect perpendicularly
- Install traffic control signals (or roundabout)

Table 5.12: Recommended Operational and Safety Improvements for Study Intersections

18. County Road 23 (Buckhorn Road)/ County Road 36 and County Road 36/ County Road 37 (Lakehurst Road)

- Install advanced warning signage for intersection
- Install roadside protection on east and west sides
- Add pavement widening on northeast and southwest corners to support dedicated northbound and southbound left-turn lanes. Remove or replace overhead lane designation signs
- Realign roads to intersect perpendicularly

19. County Road 28 and Third Line
20. County Road 28 and Zion Line

- Install checkerboard signs opposite T-intersections
- Install southbound left-turn lane
- Complete an illumination assessment
- Reduce curb radius on southeast corner

Table 5.12: Recommended Operational and Safety Improvements for Study Intersections

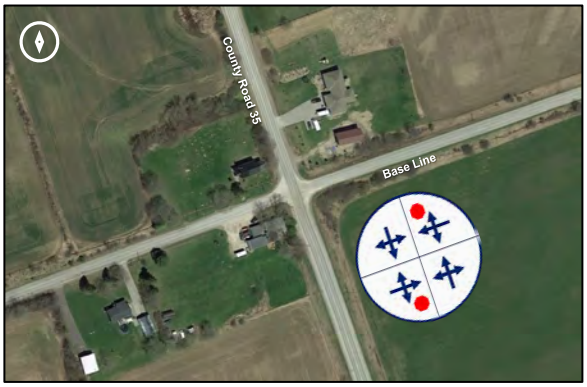
21. County Road 28 and Larmer Line

- Install southbound right-turn taper
- Complete an illumination assessment

22. County Road 29 (Bridge Street) and County Road 32 (Water Street)

- Add north and south right-turn lane pavement markings and/or signage
- Install raised centre median island

23. County Road 35 (Keene Road) and Base Line



- Install (un)paved shoulders
- Install hazard markings on hydro poles within the clearance zone
- Trim trees to address obstructions within sight triangles

Table 5.12: Recommended Operational and Safety Improvements for Study Intersections

24. County Road 36 and County Road 507

- Install advanced warning and chevron signage for intersection
- Complete an illumination assessment
- Realign intersection outside horizontal curve

Chapter 6 Transportation Policies

6.1 Policies Overview

A range of County policies guide and support the management and operation of the transportation system, particularly the County road network. The TMP Update included a review of existing guidance and emerging issues to ensure the transportation policy framework reflects industry best practice and remains relevant for objective decision-making now and into the future. The policy review examined, by category:

Road Network Planning	Establishes the policy framework for planning the road network, encompassing road classification, Special Character roads, corridor protection, level of service and road transfer rationalization.
Roadway Design	Describes the roadway design requirements for County roads including clear zones, building/structure setbacks, traffic noise, and Equivalent Single Axle Loads in pavement design.
Roadway Safety and Operations	Summarizes the safety and operational considerations for County roads.
Non-Auto Modes	Details the active transportation, rural transit, and rail opportunities in the County.
Emerging Technologies	Outlines new and developing transportation considerations including emerging mobility options, mobility as a service and connected and autonomous vehicles.

The following sections summarize the policy review and provide recommendations to guide the County transportation system. Refer to the Technical Compendium for additional information.

6.2 Road Network Planning

6.2.1 Road Classification System

A functional roadway classification system establishes a “hierarchy” of roads that provides for a gradation in service from access to movement. The concept is based on the principle that roads do not operate independently but are part of an interconnected system, with each facility type performing a specific function in the network.

Prescribing a road network hierarchy helps to minimize potential conflicts by differentiating roads based on their intended role and function. The road system operates most efficiently and safely when each type of facility is designed and managed to serve a designated trip stage consistent with its role in the hierarchy. Attempting to prioritize both movement and access results in neither function being well served. This "mixing" of functions typically results in higher collision rates, greater traffic congestion, excessive vehicle emissions, and more fuel consumption.

Factors influencing roadway classification include the density of access, service function, traffic volume, flow characteristics, and design speed. The number of access points and their spacing is a major influence on the running speed and flow characteristics of a roadway.

The 2014 TMP Update recommended a four-category County road classification system comprising Class A, Class B, Class C, and Special Character Roadways. County staff has since incorporated this system into its administration of the County road network in decision-making on roadway design and asset management. Appendix B of the new County Official Plan contains recommended design standards based on this hierarchy. However, this classification system has yet to be formally integrated into the transportation network policies set out in Section 10.2 of the new plan. Further, the new plan does not include a composite schedule of the County road network, relying on the combined land use, environmental, and transportation schedules by local municipality to designate the County roads.

Table 6.1 provides the proposed County Road Classification System. The three categories proposed in the 2014 TMP Update remain recommended, although application of the traffic volume criterion resulted in few County roads being classified as Class C facilities based on 2051 traffic forecasts (see **Section 4.2**). However, retaining the classification provides flexibility should future roadway characteristics warrant its use. The table should be supplemented with right-of-way, entrance spacing, and select geometric design criteria for each class, with corresponding policies pertaining to their application, when incorporating the provisions into the new County Official Plan.

Figure 6.1 shows the proposed County Road Network schedule for the new Official Plan based on a two-category classification system – Class A and Class B. The few roads categorized as Class C facilities were designated as Class B. The schedule also depicts Special Character Roads, which are proposed to form an overlay designation instead of a separate category (per **Section 6.2.2**), and the transportation corridor protection plan (per **Section 6.2.3**).

Table 6.1: Proposed County Road Classification System

Characteristic		Class A	Class B	Class C
TAC Guide Classification		Arterial	Collector	Local
Service Function		Traffic movement primary	Traffic movement and land access equally important	Land access primary
Flow Characteristics		Uninterrupted except at traffic control signals or stop signs	Interrupted	Interrupted
Typical Daily Traffic Volumes (veh/day)		≥ 5,000 AADT	< 5,000 AADT	< 1,000 AADT
Posted Speed[2]	**Rural**	80 km/h	60 to 80 km/h	50 to 80 km/h
	Urban	50 to 80 km/h	40 to 60 km/h	40 to 50 km/h
Design Speed[2]		20 km/h over posted speed	10 km/h over posted speed	Posted speed
Vehicle Types		All, up to 20% trucks	All	Mostly passenger vehicles, light to medium trucks, and occasional heavy trucks

Notes:

1. Characteristics for Special Character Roads may vary from typical criteria.
2. Typical for free-flowing areas. Lower design speeds, curve radii, and posted speed limits may be used within built-up areas. Lower posted speed limits may be used within transition areas to built-up areas or where the roadway geometry suggests that lower speeds are required.

Recommendations:

5. Introduce a formal County Road Classification System (Class A, Class B, and Class C) (per **Table 6.1**) and County Road Network schedule (per **Figure 6.1**) into the new County Official Plan.

6. Specify right-of-way, entrance spacing, and select geometric design criteria for each class, with corresponding policies pertaining to their application, when incorporating the provisions into the new County Official Plan.

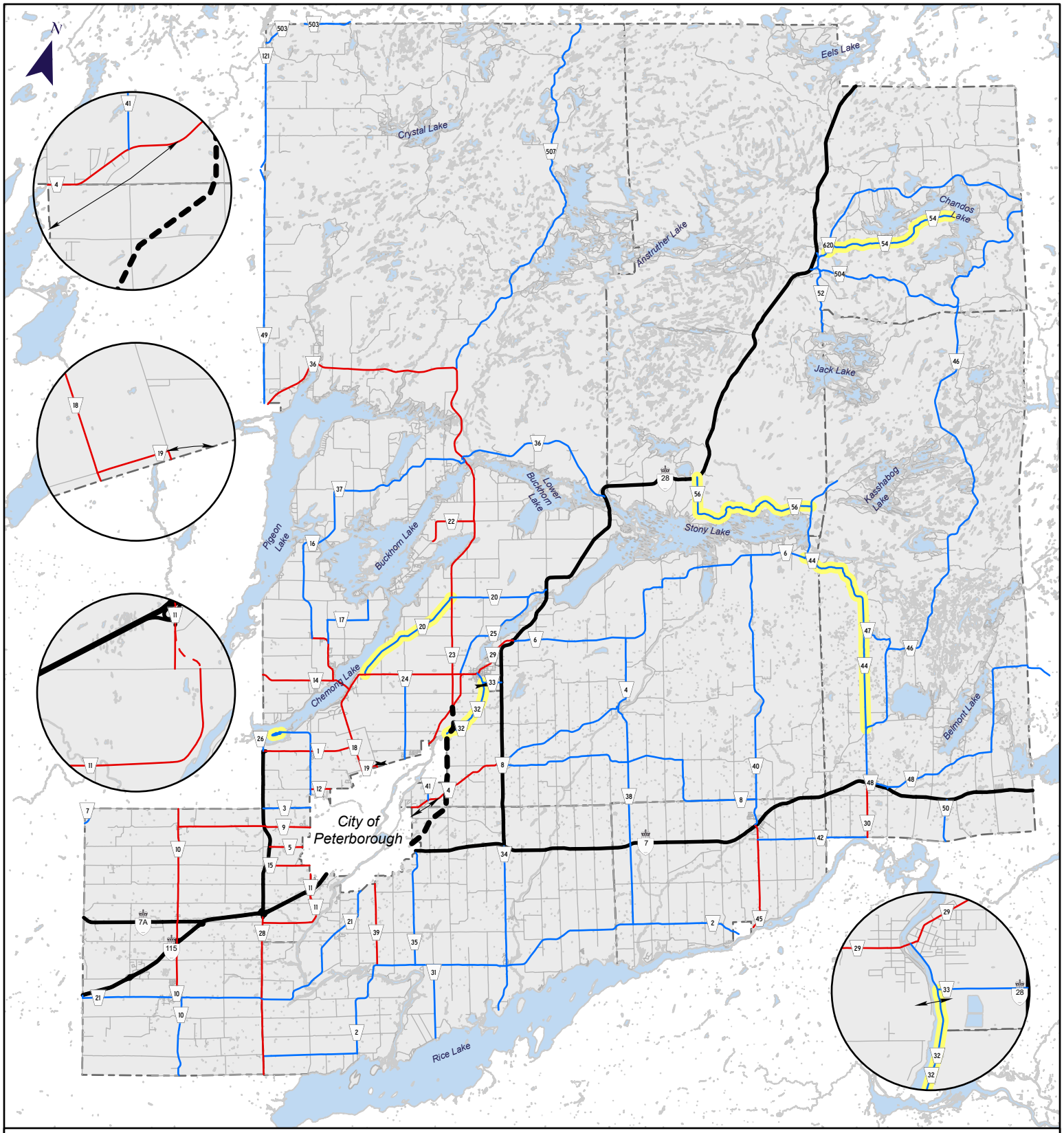


FIGURE 6.1:
PROPOSED COUNTY ROAD NETWORK SCHEDULE

Universal Transverse Mercator Projection Zone 17N

DATA SOURCES:
Peterborough County, Land Information Ontario, ESRI

0 2 4 8 12 16 20 Km

LEGEND

- Special Character Road
- Proposed Future Connection (subject to further study to determine location)

EXISTING	PROPOSED
Class A	Class A
Class B	Class B
Provincial Highway	Provincial Highway

Peterborough County
Our History - Your Future

2022 TRANSPORTATION MASTER PLAN UPDATE

October 2022

6.2.2 Special Character Roads

The term “Special Character Road” is used to describe a road corridor with unique natural, cultural, historical, and/or recreational attributes or qualities that differentiates the facility from others in the network. These roads are identified by their distinctive structural, topographic, and visual characteristics, as well as abutting vegetation, built environment and cultural landscape, and/or historical significance. In many instances, the roads feature atypical geometric design and/or operating characteristics owing to their unusual setting or context.

The County does not currently have a formal classification system for roads under its jurisdiction in the County Official Plan, including Special Character Roads. All County roads are treated similarly from a policy perspective, although it is acknowledged that certain criteria (such as entrances, design standards, intersection controls, etc.) are applied more stringently on higher volume, less constrained facilities.

Certain County roads possess unique attributes or qualities that differentiate the facility from others. These roads warrant special treatment because of their distinctive characteristics. By classifying a road as special character, lower posted speed limits and different design specifications can be used to convey the significance and value of the facility. While some may contend that “reducing the design standard” compromises safety for the sake of economy, this is not necessarily the case due to reduced exposure to collision risk (because traffic volumes are usually lower) and heightened driver awareness of unique conditions (aided with careful selection of design elements).

The proposed County Road Network schedule in **Figure 6.1** shows the Special Character Roads recommended for designation. Criteria specific to the County would aid in evaluating roads that may be proposed in the future for designation. Guidelines outlining the parameters and guidance for designing Special Character Roads would also be beneficial.

Recommendations:

7. Introduce a Special Character Road designation in the new County Official Plan that allows exemptions to geometric design and/or maintenance standards if upgrading the facility to meet prevailing criteria would significantly (and detrimentally) alter its scenic and/or historic character.

8. Designate the road segments shown on **Figure 6.1** as Special Character Roads in the new County Official Plan.

9. Develop evaluation criteria and design guidelines specific to the County for Special Character Roads.

6.2.3 Corridor Protection

The corridor protection process encompasses measures intended to:

- Prevent or minimize development within the proposed right-of-way of a planned transportation facility or improvement;
- Acquire right-of-way in advance of construction need; and
- Preserve the safety and efficiency of the future facility or improvement through access management.

Corridor protection provides greater clarity of public intentions regarding the location and timing of future roadway improvements and promotes orderly development of the transportation network to serve planned growth. Coordinating transportation corridor planning with land use planning within and adjacent to proposed facilities also helps to avoid land development within future rights-of-ways, which, if happens, could require the County to:

- Identify an alternative location for the facility, which could place the corridor in a less desirable and/or more environmentally impactful area;
- Revise plans and postpone project delivery, thereby delaying and/or increasing the cost of implementation; and/or
- Pay higher costs to acquire property if the corridor is not relocated.

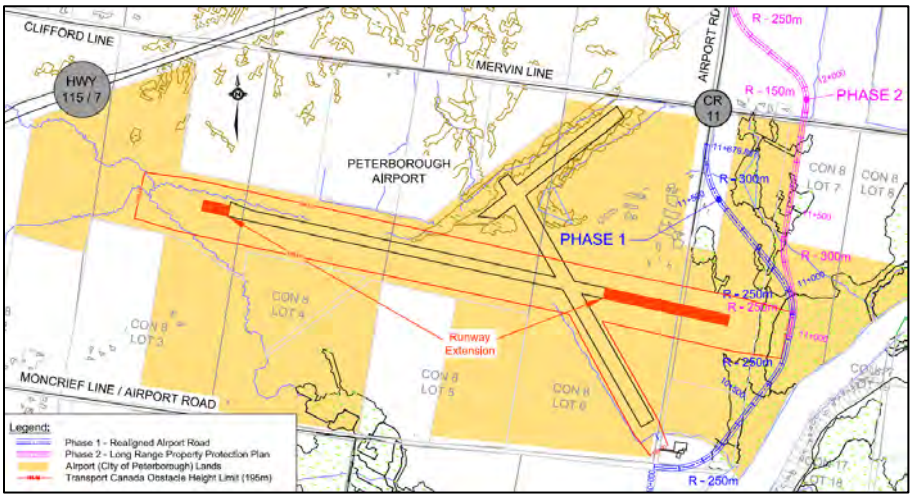
While the new County Official Plan includes general policy direction regarding the protection of transportation corridors, the document does not fully articulate the methods and guidance for protecting and/or acquiring rights-of-way. The plan would also benefit from a table or map specifying required road allowance (right-of-way) widths and/or a generic policy indicating typical widths by roadway category (e.g., 36 m for Class A County roads).

Specific County Road Corridors for Protection

Table 6.2 lists future County roads proposed for corridor protection, with the rationale provided. The list of roads, also shown on **Figure 6.1**, was developed through the needs assessment (see **Section 5.2**) and from previously completed Municipal Class EA studies and TMP updates.

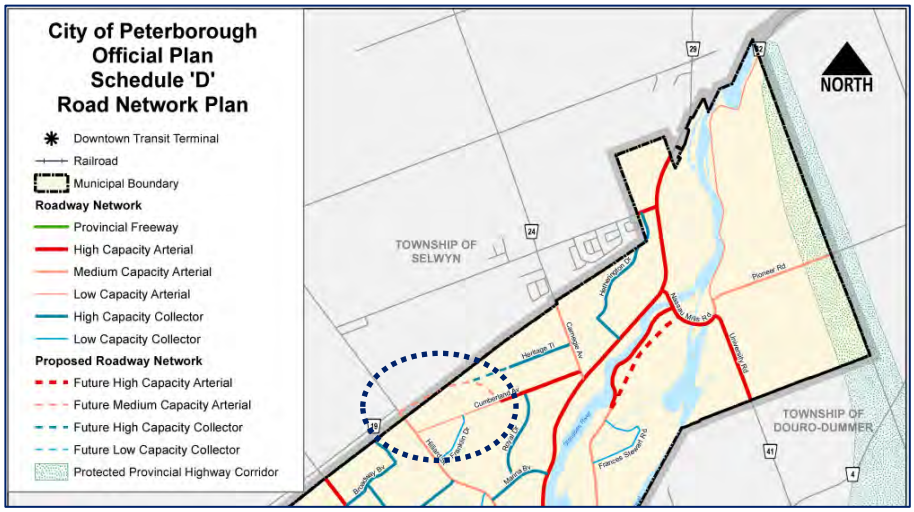
The alignments of the corridors shown, except for County Road 11 (Airport Road), are approximate and subject to more detailed planning and engineering studies to determine their location. These studies will identify community and environmental impacts and measures to mitigate any such concerns.

Table 6.2: Future County Roads Proposed for Corridor Protection

Description	Rationale
County Road 4 (Warsaw Road) Donwood New road connection east of Television Road	The traffic forecasting projects a future capacity deficiency on County Road 4 immediately east of Television Road, attributed, in part, to the intersection configuration and roadway alignment. To address this concern, the proposed road expansion program summarized in **Table 5.6** includes a new, four-lane road connection (Item 1), as recommended in the 2014 TMP Update. The recently approved City of Peterborough Transportation Master Plan and Eastside Transportation Study also recommended realignment and widening of County Road 4 in this location.
County Road 11 (Airport Road) Cavan Monaghan New road connection north of Mervin Line to eliminate jog	The 2011 *Class Environmental Assessment and Transportation Study for the County Transportation Network in the General Area of the Peterborough Airport*[8] proposed a two-phased approach to implementing the recommended road improvements shown in the figure below. The County still needs to complete the remainder of Phase 2, comprising the realignment of Airport Road north of the Mervin Line to eliminate the jog.  (Source: Figure 1-3, "Class Environmental Assessment and Transportation Study for the County Transportation Network in the General Area of the Peterborough Airport")

[8] Genivar. "Class Environmental Assessment and Transportation Study for the County Transportation Network in the General Area of the Peterborough Airport." October 2011.

Table 6.2: Future County Roads Proposed for Corridor Protection

Description	Rationale
County Road 19 (Line Road 3) Selwyn New road connection to Cumberland Avenue in Peterborough	The recently approved City of Peterborough Transportation Master Plan, as well as the City's Official Plan, identify a potential extension to Cumberland Avenue to serve planned growth. Further work is required to identify the preferred location for the road connection and confirm the road will link to County Road 19.  (Source: Schedule 'D', City of Peterborough Official Plan, adopted by City Council on November 29, 2021)
County Road 29 (Lakefield Road/ Water Street) Lakefield New Otonabee River Crossing and Road Connections	The traffic forecasting projects a future capacity deficiency on County Road 29 crossing the Otonabee River. The subarea model analysis confirmed the need. To address this concern, the proposed road expansion program summarized in **Table 5.6** includes a new, two-lane river crossing and road connection (Item 11), as recommended in the 2014 TMP Update. The recently approved 2022 Development Charges Background Study [9] identifies a network planning study for Lakefield to help establish the preferred location for the bridge and approach roads.

[9] Hemson Consulting. *County of Peterborough Consolidated Development Charges Background Study.* June 28, 2022.

Provincial Highway Corridor (Peterborough East By-pass)

In the mid 1970's, the Ministry of Transportation (MTO) designated a new provincial highway corridor on the east side of Peterborough through the Townships of Douro-Dummer, Otonabee-South Monaghan, and Selwyn. The route runs in a north-east direction from the current Highway 7/115 intersection with Television Road and Lansdowne Street, following Douro-Dummer 9th Line, and crossing the Otonabee River to connect with former Highway 28/Highway 507, now known as County Road 29 (Lakefield Road) and County Road 23 (Buckhorn Road), just south of Lakefield. **Figure 6.1** shows the designated corridor, which is also depicted on the land use and transportation schedules for the three Townships in the new County Official Plan. **Figure 6.2**provides an excerpt from the Douro-Dummer transportation schedule.

Despite considerable changes in the area planning context and road network, MTO continues to actively protect the Peterborough East By-pass corridor to ensure local land use decisions do not impact its ability to implement a new Provincial highway at some point, even though the Ministry has no plan to proceed with construction in the foreseeable future. This action causes uncertainty and impedes property owners from undertaking any meaningful changes to or, in some cases, selling their land. It has also impacted plans by Trent University and the City of Peterborough to develop a Trent Research and Innovation Park (now known as Cleantech Commons) on the East Bank lands of the university campus.

Given the historical road network improvement plans for this area, the City's recently completed Eastside Transportation Study included a sensitivity analysis to assess the impact of the MTO corridor on traffic patterns and infrastructure needs in the County and City. The assessment found that in the absence of improvements by MTO, portions of the Provincial highway network east of Peterborough can be expected to experience capacity deficiencies during typical weekday peak periods. Orienting the corridor to connect to Highway 28 would appear to serve longer distance travel demands better, and may be more aligned with MTO interests, than the corridor currently designated but does not eliminate the need for County/City road improvements.

Resolution of these matters relies on MTO undertaking further review to determine Provincial interest in continuing to protect for a future Peterborough East By-pass, and if so, the most appropriate location for the corridor. The County and City require this information in the near term to establish/confirm future road network needs in this area and local funding priorities. Resolving the corridor status would also offer greater certainty for land use planning applications in the vicinity of the currently designated corridor.

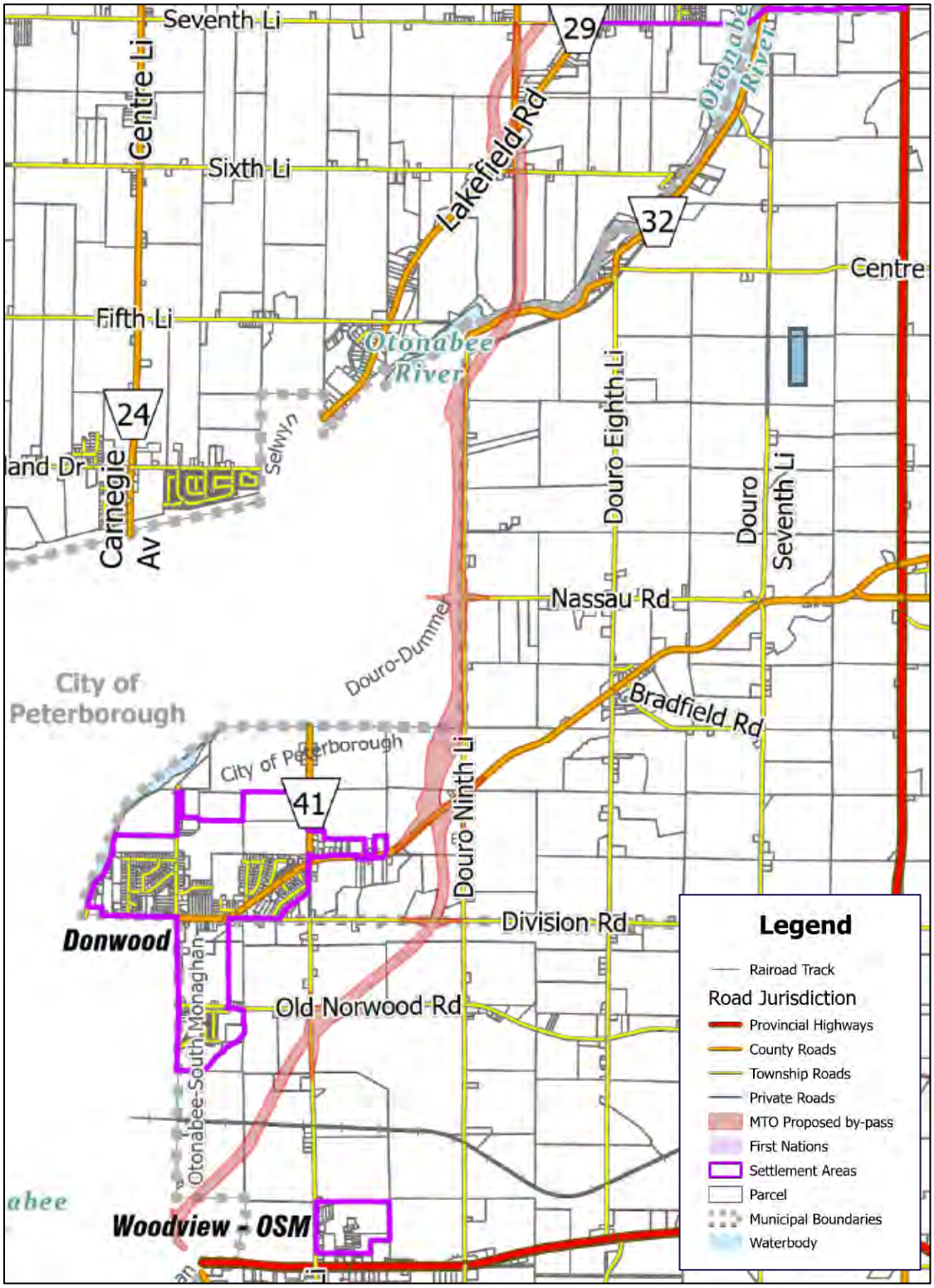


Figure 6.2: Corridor for Proposed Peterborough East By-Pass
(Source: New Peterborough County Official Plan (Adopted by Council on June 29, 2022))

Recommendations:

10. Designate the road corridors shown on **Figure 6.1** for corridor protection in the new County Official Plan.

11. Add a table or map schedule specifying required road allowance (right-of-way) widths by County road and/or a generic policy indicating typical widths by roadway category (e.g., 36 metres for Class A County roads, 30 metres for Class B County roads)

12. Include a policy in the new County Official Plan defining the mechanisms to acquire and protect designated corridors.

13. Request the Ministry of Transportation to undertake the necessary analysis to determine the need to continue to protect for the east side by-pass of the City of Peterborough and, if the need is confirmed, review the designated route and update the route planning study as appropriate.

6.2.4 Level of Service

Traffic Operations Conditions

Level of service metrics provide a useful framework for understanding the operation and condition of the County road network and its impacts on users. Jurisdictions like Peterborough County typically rely on these criteria in their transportation decision-making at the planning, design, operations, and maintenance phases to assess performance and support investments.

In long-range roadway planning, level of service is typically assessed based on the v/c ratio for roads crossing specified screenlines and for significant corridors. A roadway corridor or screenline with a v/c ratio of 1.0 is considered saturated and cannot theoretically accommodate more vehicles.

Many municipalities use a v/c ratio target of 0.9 for planning level analyses. Traffic flow on facilities exceeding this value tends to be unstable, with periods of congestion that cause decreases in speed and related capacity. For this reason, a v/c ratio of 0.9 can be assumed to represent the practical capacity of a road for planning purposes and thus considered to be an appropriate level of service objective.

Table 6.3 shows typical capacity ranges, measured in number of vehicles per hour per lane, based on roadway classification. The table differentiates between urban and rural areas given the different operating characteristics of roads within these environments. If calculating a v/c ratio based on AADT volumes, a two-way roadway capacity of 18,000 vehicles per day (both directions) should be assumed.

Table 6.3: Typical Roadway Planning Capacities

Road Classification	Road Capacity (vehicles per hour per lane)	
	Urban	Rural
Arterial (County Class A)	800 – 900	900 – 1,200
Collector (County Class B)	750 – 950	400 – 750
Local (County Class C)	400 – 500	500 – 700

For operational reviews, the County of Peterborough Traffic Impact Study Guidelines [10] provides level of service criteria for intersections on County roads. The approach (based on HCM methods) and most values appear consistent with the practices of other upper-tier municipalities in Ontario, except for the critical v/c ratio for left-turn movements at signalized intersections. Increasing the value from 0.85 to 0.95 would provide a more practical threshold for warranting improvements. Drivers tend to accept longer delays when making left turns than other manoeuvres at intersections.

Pavement Surface Condition

The County does not currently have a policy pertaining to pavement surface condition level of service, commonly referred to as Pavement Condition Index (PCI). In practice, County staff applies a pavement surface condition rating scheme and process developed by the Ontario Good Roads Association (OGRA), supplemented with information from the MTO *Manual for Condition Rating of Flexible Pavements* [11]. Staff rely on the PCI values generated by the methodology in identifying and prioritizing rehabilitation treatments on the County road network. Ratings have been updated on an on-going basis for about the last 10 years.

[10] *Traffic Impact Study Guidelines*, County of Peterborough

[11] Ministry of Transportation. *Manual for Condition Rating of Flexible Pavements (SP-024)*. August 1989.

Recommendations:

14. Modify the level of service criteria set out in the County of Peterborough Traffic Impact Study Guidelines by increasing the critical v/c ratio for left turn movements at signalized intersections from 0.85 to 0.95.

15. Adopt the following transportation analysis performance measures and criteria:

    a) Network Planning – Threshold v/c ratio of 0.9 for screenline and corridor level analyses and road link capacities set out in **Table 6.3**.

    b) Operational Reviews – Criteria set out in the County's Traffic Impact Assessment Guidelines with the change for left-turn movements.

16. Adopt the MTO method for measuring pavement surface condition.

6.2.5 Road Transfer Rationalization

Road rationalization is a process intended to assign ownership and responsibility for certain roads to the most appropriate municipal authority (assuming the Provincial highway network remains unchanged and the responsibility of MTO). Rationalization aims to create a municipal road system whereby local municipalities have responsibility for roads primarily providing local service and upper-tier municipalities have jurisdiction over roads principally serving through traffic. Assigning jurisdiction based on intended function helps promote efficient and effective delivery of road services and the application of consistent design, operations, and maintenance standards and practices on roads with similar roles.

The County does not currently have a policy pertaining to road rationalization other than a general statement in the County Official Plan about the road network comprising local municipal roads, County roads, and Provincial highways.

The technical memorandum on road rationalization in the Technical Compendium sets out a recommended policy for assessing potential road transfers. The policy describes:

- The principles intended to define the objectives of the County road network and differentiate a County road from a local municipal road;
- A series of 10 criteria and weightings to be applied in confirming the role and function of existing County roadways and assessing local municipal roads;
- Unique circumstances that may warrant consideration of additional factors beyond the assessment criteria noted; and
- A seven-step methodology to complete a road rationalization review, based on a process recommended by OGRA. Engaging with the affected local municipalities throughout the rationalization process is a critical feature of the methodology.

Jurisdiction reviews should focus on specific road sections or subareas. A system-wide review is not recommended as the jurisdiction for most roads in the current municipal road network serving Peterborough County appears consistent with their intended role and function.

Potential Rationalization of Identified Road Sections

The TMP Update included a review of the road sections listed in **Table 6.4** for potential transfer based on the proposed policy and criteria.

Table 6.4: Roads Reviewed for Potential Transfer

Road Section	Current Jurisdiction	Municipality
County Road 21 (King Street)	County	Cavan Monaghan
Tapley Quarter Line	Township	Cavan Monaghan
County Road 48 (Ontario Street, George Street, Mary Street)	County/Township	Havelock-Belmont-Methuen
Belmont 2nd Line and 6th Line	Township	Havelock-Belmont-Methuen
County Road 12 (Maryland Drive)	County	Selwyn
County Road 19/Line Road 3, Fairbairn Street	County/Township	Selwyn

Based on the preliminary assessment of the select County road sections, potential candidates for transfer to the local municipalities include:

- County Road 48 (Ontario Street/Quebec Street/George Street/Mary Street)
- County Road 12 (Maryland Drive)

The assessment also identified the following roads as candidates for potential local municipal transfers to the County:

- Tapley Quarter Line from County Road 21 to Highway 7A. The road connects to a Highway 115 interchange, but traffic volume data was not available to confirm merit for transfer.
- Line Road 3 from Fairbairn Street to County Road 18 (Chemong Road) and Fairbairn Street from the City of Peterborough Boundary to Line Road 3. Traffic volumes warrant consideration for transfer. The roads also connect to other County roads.

Further in-depth analysis is required for the candidate road sections listed above before offering definitive recommendations on proposed road transfers.

Recommendations:

17. Explore opportunities to rationalize the municipal road system serving the County in collaboration with the local municipalities, focusing on specific road sections or subareas.

18. Adopt a road rationalization policy based on the principles, methodology, criteria, and weightings set out in the technical memorandum on road rationalization for assessing candidate County and local municipal roads for transfer.

19. Consider the potential transfer of the following County roads to the local municipalities:

    a) County Road 48 (Ontario Street/Quebec Street/George Street/Mary Street) (Havelock-Belmont-Methuen)
    b) County Road 12 (Maryland Drive) (Selwyn)

20. Consider the potential transfer of the following local municipal roads to the County:

    a) Tapley Quarter Line from County Road 21 to Highway 7A (Cavan Monaghan)
    b) Line Road 3 from Fairbairn Street to County Road 18 (Chemong Road) and Fairbairn Street from the City of Peterborough Boundary to Line Road 3 (Selwyn)

6.3 Roadway Design

6.3.1 Clear Zones

The TAC *Geometric Design Guide for Canadian Roads* defines the clear zone as "the roadside area immediately adjacent to the outer travelled lane, clear of hazards, which may be used safely by errant vehicles." [12] The clear zone includes shoulders, bike lanes, and auxiliary lanes (except those auxiliary lanes that function like through lanes). It also encompasses recoverable slopes and non-recoverable slopes with a clear run-out area.

The clear zone distance for a subject road section is dependent upon traffic volumes, design speed, and roadway geometry and represents the minimum recovery area that should be provided for a given design situation. The wider the clear zone, the lower the frequency and severity of collisions with fixed obstacles. However, there is a point beyond which any further expenditure to move or protect these objects is not warranted because the marginal risk reduction is too small.

[12] Transportation Association of Canada. 2017. *Geometric Design Guide for Canadian Roads*. Ottawa, ON. p. G-2.

It is not always practical to provide the widest clear zone that can be reasonably afforded, after considering physical, environmental, and funding constraints. In such circumstances, roadside mitigation treatments should be assessed to determine the appropriate cost beneficial design alternative treatment to reduce the probability and/or severity of collisions with a roadside obstacle.

On September 18, 2013, County Council approved a policy pertaining to Clear Zones on County Road Allowances (Policy PW-7, now ISD-E&D-03). Achieving the desired clear zone distance can present physical, financial, and other challenges in the County's context. The common occurrence of water bodies, rock/earth embankments, trees, utility poles, historic buildings/structures, and other impediments in the roadside environment complicates provision of full width clear zones on many County roads. Establishing reasonable clear zone requirements thus remains important.

Since Council adopted the Clear Zone Policy in 2013, MTO has revised its design guidance. The new *Roadside Design Manual*[13] carries forward, updates, and expands upon the concepts and topics contained in the superseded 1993 manual. TAC also updated the *Geometric Design Guide for Canadian Roads* in 2017, including revisions to the section on roadside design (Chapter 7).

Moving forward, both documents should be referenced, with the most appropriate guidance applied, subject to specific direction contained in an updated Clear Zone Policy. The MTO *Roadside Design Manual* should typically be referenced for most applications, with the TAC *Geometric Design Guide for Canadian Roads* providing supplemental guidance where the MTO document is silent or not as relevant for the specific situation. The TAC guide should, though, serve as the basis for the updated clear zone distances in the County's policy. The national guidebook provides greater flexibility than the MTO manual, enabling the County to more appropriately respond to the range of road environments and conditions experienced in Peterborough County.

Recommendation:

21. Revise the Clear Zone Policy to reflect industry best practice and current County procedures, specifically:

    a) Replace the Clear Zone Width table with guidance from the updated TAC *Geometric Design Guide for Canadian Roads*
    b) Update the methods of addressing collision hazards
    c) Add commentary and criteria to consider exceptions and exemptions, with guidance specific to settlement areas, low volume roads, and Special Character Roadways

[13] Highway Standards Branch. 2020. *Roadside Design Manual*. Downsview, ON. Ministry of Transportation of Ontario.

6.3.2 Building/Structure Setback

A setback is the minimum distance a building or other structure must be placed or offset from a road, land boundary, river, shoreline, floodplain, woodlot, railway tracks, or any other place or feature deemed to need protection. Setbacks form boundaries by establishing an exact distance from a fixed point, such as a property line or an adjacent structure, within which building is prohibited. Municipalities create setbacks through zoning and other by-laws usually for reasons of public policy such as safety, privacy, uniformity, and environmental protection.

Setbacks are commonly used to control the placement of buildings, structures, fences, and the development of lands adjacent to public roads. This control is intended to reduce the likelihood that future changes in the road right-of-way will necessitate the relocation of abutting buildings and structures. It can also help mitigate the adverse effects of road use, such as noise, light, vibration, and stormwater runoff, by ensuring physical separation of buildings and structures, including features like septic systems, from the roadway.

The County does not have a policy or by-law specific to building/structure setbacks from County roads. In the absence of more formal direction, County staff assess setback provisions on an ad-hoc, site-specific basis and regulate requirements via conditions of approval on development applications. The County Official Plan contains policies pertaining to building/structure setbacks from County roads, which staff rely on as authority to request setback provisions through development applications.

A setback policy would provide guidance, consistency, efficiency, and clarity on how the Country controls the placement of buildings and structures on property abutting County Roads. The policy would be implemented through the review of land development (*Planning Act*), building permit, and related applications.

Recommendation:

22. Implement a Road Setback Policy and By-law pursuant to Section 58 of the *Municipal Act, 2001*, which includes:

    a) Specifications for setback distances and sight triangles
    b) Process for applying for a permit
    c) Strategy for coordination with the local municipalities
    d) Administration and enforcement provisions

6.3.3 Traffic Noise

Road traffic noise (RTN) is defined as the unwanted sound generated by vehicles travelling along a roadway. Sources of RTN considered for this purpose are the combination of sound generated by wheels in contact with a driving surface and typical sound created by a motor while moving. Other short duration or temporary sources of

noises related to vehicle traffic such as downshifting, engine breaking, honking, etc. are not considered as noise contributors.

The County does not have a policy pertaining to RTN. The Ministry of the Environment, Conservation and Parks (MECP) provides guidelines for the proper control of sources of sound emissions to the environment and prevention of potential adverse effects of RTN.

The technical memorandum on RTN in the Technical Compendium sets out a recommended policy for assessing traffic noise. The policy provides:

- Noise control guidelines for land use planning, County road projects, and existing developments impacted by noise from existing County roads;
- Technical requirements for feasibility and detailed development noise studies, including noise control requirements;
- Guidelines for assessing road traffic noise including qualifications of practitioners, noise prediction software and modelling assumptions, and vehicle data; and
- Barrier wall specifications.

Recommendation:

23. Adopt a road traffic noise policy based on the guidelines and requirements set out in the technical memorandum on traffic noise, which requires Noise Impact Studies and mitigation measures, if needed, for:

    a) Development applications for noise sensitive land uses adjacent to County roads and Provincial highways
    b) County road reconstruction and expansion projects
    c) Existing developments impacted by noise from County roads

6.3.4 Equivalent Single Axle Loads in Pavement Design

Equivalent Single Axle Load (ESAL) is a concept developed from data collected at the American Association of State Highway Officials (AASHO later revised to AASHTO) Road Test to establish a relationship for comparing the effects of various axle configurations and loading to the damage incurred by the pavement structure. Each axle configuration and load are unique but can be converted to an ESAL for pavement design using the AASHTO 1993 *Guide for the Design of Pavement Structures*[14] (AASHTO 93). AASHTO 93 pavement design uses the cumulative ESALs over the course of the pavement life to determine the structural requirements for the pavement.

Based on the policy assessment, pavement designs should be completed based on ESALs, and not solely the AADT, to capture the truck traffic needs of the roads. The

[14] AASHTO. (1993). *AASHTO 1993 Guide for the Design of Pavement Structures.*

MTO methodology for determining ESALs based on the AADT, commercial vehicle loading, and roadway cross-section, as defined in Adaptation and Verification of AASHTO Pavement Design Guide for Ontario Conditions (MI-183), should be used.

If truck data is not available, the general estimated AADT can be used for the pavement design. Roads servicing commercial or agricultural areas should be reviewed thoroughly to assess potential land uses on the pavement design.

For rehabilitation projects, the existing structure should be considered when completing a pavement design. The existing materials could be reused as part of the new design, as it is not necessary to remove all existing materials in most cases.

Recommendations:

24. Prepare pavement designs based on Equivalent Single Axle Loads (ESALs) and not solely on the AADT, unless truck data is not available.

25. Use the MTO methodology for determining ESALs based on the AADT, commercial vehicle loading, and roadway cross-section.

6.4 Roadway Safety and Operations

6.4.1 Road Safety

Deaths and injuries resulting from motor vehicle collisions represent a significant public health concern. Each year in Canada, about 2,000 people are killed and 165,000 are injured (10,000 seriously) using the road transportation system, costing society $37 billion (2.2% of Canadian GDP) annually[15], not to mention the enormous toll of emotional, psychological, and physical trauma. While many of these deaths and injuries are sustained by motor vehicle passengers and drivers, they also impact pedestrians, cyclists, and motorcycle riders.

Improving road safety in the County requires a concerted, comprehensive effort, involving stakeholders and decision makers from a variety of perspectives and disciplines. Road safety improvements can also support Council and community aspirations and deliver real benefits in important areas such as quality of life and the environment.

The County does not have a road safety strategy or policy to guide future initiatives. The 2014 TMP Update recommended that the County implement a policy requiring a safety-based network screening in areas where capital projects are being planned or where high collision frequencies have been observed in the past. This approach would use a systematic methodology to review and possibly prioritize the need for upgrades to

[15] Transport Canada, 2015 Draft Report on the Social Costs of Collisions in Canada, 1996-2012.

signage, pavement markings, roadside barrier treatments, and roadway geometry to address observed collision patterns, or upgrade current standards, or address potential safety improvement opportunities.

Recommendation:

26. Develop a County Road Safety Strategy to set out safety goals, objectives, and action plans to guide the County and its road safety partners towards creating safer roads and reducing the number of fatal and injury collisions on roads in Peterborough County.

6.4.2 Global Speed Limit

Speed limits aid motorists in selecting safe operating speeds for the prevailing conditions, which will vary as roadway geometry, traffic demands, and road environment change. The selection of a posted speed limit must take into consideration legislative regulations, public recognition and understanding, ease of implementation, and adherence to recognized engineering standards and practices.

The *Highway Traffic Act* (HTA) establishes the regulatory framework for setting speed limits in Ontario. Subsection 128.(1) of the HTA defines the "default" limits as:

- 50 km/h on roads within a local municipality or a *built-up area*; and
- 80 km/h on roads not within a *built-up area* and within a local municipality that had the status of a township on December 31, 2002. All eight local municipalities in the County fall into this category.

These provisions, commonly known as the urban and rural statutory speed limits, respectively, apply to all roads without Maximum Speed signs posted. Subsection 128.(2) of the HTA permits municipal councils to prescribe rates of speed that differ from these statutory limits on roads under their jurisdiction. The speed limit set must be less than 100 km/h.

The County does not have a global speed limit policy currently. Informally, County staff apply the guidance contained in the TAC *Canadian Guidelines for Establishing Posted Speed Limits*[16] (CGEPSL) in assessing requests for speed limit modifications on County Roads.

[16] Transportation Association of Canada. 2009. *Canadian Guide for Establishing Posted Speed Limits.*

Recommendations:

27. Continue to apply the methodology set out in the TAC *Canadian Guidelines for Establishing Posted Speed Limits* in setting speed limits on County roads

28. Maintain the statutory 50 km/h speed limit on roads within Settlement Areas designated in the new County Official Plan and 80 km/h on roads in the rural area.

29. Conduct regular reviews of posted speed limits.

6.4.3 School Zones and Community Safety Zones

Improving safety on roads adjacent to schools and other community facilities is a key priority for municipalities given the higher volume of pedestrians and cyclists present, particularly children who are more vulnerable due to their lack of experience with traffic. This concern is often heightened in more rural communities like Peterborough County where prevailing operating speeds on these roads – usually the "main street" serving the area – tend to be higher and can vary within the traffic stream. Further compounding the issue for school zones, the area can become hectic (and in some instances overwhelming) around bell times, with busses arriving and leaving, parents dropping off and picking up their children, and students walking, biking, and skateboarding to school.

Under the *Highway Traffic Act* (HTA), the County has the authority to designate (through the installation of regulatory signs) two types of "zones" for heightened safety and enforcement emphasis on roads abutting schools and community facilities:

- **School zones** (SCHOOL ZONE MAXIMUM SPEED signs), which advise motorists to reduce their speeds at certain times because they are entering an area where school children are present and may be crossing the road; and
- **Community Safety Zones**, which inform drivers they are entering an area the community has deemed paramount to the safety of its citizens. These sections of roadway are typically near schools and other pedestrian generating uses (e.g., day care centres, playgrounds, parks, hospitals, senior citizen residences). Traffic related offences committed within Community Safety Zones are subject to increased fines, with many set fines for speeding and traffic signal related offences doubled.

In 2014, County Council endorsed a staff report that established the minimum standards for the design and installation of traffic management devices within school zones along County Roads. The purpose of the staff report was to establish consistency for roadway signage, flashing beacons, and pavement markings as potential "traffic calming measures" for road users travelling within school zones.

In 2006, County Council endorsed a staff report that established the following criteria for the consideration and designation of a Community Safety Zone on a County Road:

- Recommendation made by local Police Service Board;
- Endorsement by local municipal council;
- Commitment from local Police Service Board to fund additional police enforcement in the Community Safety Zones;
- Road sections must have high accident/collision rates and a high number of traffic (moving) violations; and
- The County assume no financial obligation for any costs involved in the preparation and installation of Community Safety Zone signage.

These criteria should be reviewed and updated with input from the local municipalities.

Recommendations:

30. Use the School Zone Input Worksheet detailed in the TAC *School and Playground Areas and Zones: Guidelines for Application and Implementation* in considering new and revising existing school zones on County roads.

31. Set the speed limit no lower than 40 km/h in school zones and denote with SCHOOL ZONE MAXIMUM SPEED WHEN FLASHING signs (Rb-6a), including flashing amber beacons.

32. Update the criteria and process for establishing a Community Safety Zone on a County road, including eliminating the requirement for the local municipality to finance the preparation and installation of Community Safety Zone signage.

6.4.4 Automated Speed Enforcement

In 2017, the provincial government amended the *Highway Traffic Act* (HTA), as part of the *Safer School Zones Act, 2017*, to allow municipalities to use ASE technology to address vehicle speed concerns and collision patterns involving speeding. ASE is an automated system that uses a camera and a speed measurement device to enforce speed limits in identified areas. The strategy is designed to work in tandem with other road safety measures, such as engineering activities, education initiatives, and traditional police enforcement, to help improve safety for people of all ages by:

- Increasing speed compliance;
- Altering driver behaviour; and
- Increasing public awareness about the consequences of inappropriate vehicle operating speeds and the critical need for drivers to slow down.

If a vehicle exceeds the posted speed limit in an ASE area, the system captures an image and records the speed of the vehicle and date and time of the offence. In Ontario, the recorded information is reviewed by an officer appointed pursuant to the *Provincial*

Offences Act (POA). If the vehicle is confirmed speeding, an image of the offence, license plate, and ticket with an associated fine will be mailed to the owner of the vehicle.

Current practice in Ontario limits the deployment of ASE to Community Safety Zones and school zones. Targeting these locations helps better serve the most vulnerable road users within a community.

ASE can be an effective program if implemented correctly at appropriate locations. Early results of modern deployment show positive safety statistics in the form of reduced vehicle operating speeds and collision activity. Site selection has been a key area of consideration for many municipalities, with selection primarily being based on vehicle operating speeds, collision activity, pre-existing Community Safety Zone and school zone presence, and community input. To ensure program effectiveness, there is a need to work with other municipalities and agencies in a coordinated manner. ASE program size needs to match the needs of the municipality, but also reasonably align with realistic constraints, such as potential capital and labour costs.

Recommendations:

33. Assess the merit of implementing Automated Speed Enforcement, including reviews of safety statistics, potential sites, financial implications, and Administrative Monetary Penalty System for adjudicating fines.

34. Liaise with other agencies for opportunities to share resources.

6.4.5 Emergency Detour Routes

MTO designates Emergency Detour Routes (EDRs) for motorists when an emergency closure of a major road or highway occurs. The EDR directs motorists away from the closed highway to a parallel route, and ultimately to a point where the motorist can safely rejoin the facility. Through their design and implementation EDRs minimize the disruption to the local road network and are essential tools for first responders to manage emergency situations. Each EDR is demarcated with a series of signs denoting the highway number and, in some instances, directional arrow(s) to inform motorists where to turn.

Provincial Highways

MTO denotes an EDR network for Highway 115 between The Parkway in the City of Peterborough and Highway 401 in Durham Region. The Ministry does not identify EDRs for other Provincial highways traversing the County.

Beyond Highway 115, Highway 7 is the primary east-west roadway serving the County. The highway carries upwards of 13,300 vehicles per day in some sections, transporting people and goods within and through Peterborough County while functioning as the

main street for the communities of Havelock and Norwood. The corridor also serves as the primary means of access for numerous properties and businesses adjacent to the roadway. Suffice to say, the road plays an important role in the County's transportation network.

Incidents resulting in the closure of Highway 7, particularly those involving the railway crossing in Norwood, can significantly impact motorists (inconvenience), nearby businesses and residents (loss of access and intrusion), and the host municipalities (additional "wear and tear" on County and local municipal roads). With the frequency of such incidents seemingly increasing (or at least becoming more impactful), it would be prudent to consider establishing a series of EDRs to guide drivers detoured from the highway. **Figure 6.3** shows the potential EDRs for Highway 7 within the County.

County Roads

The County does not identify EDRs for any of its roads. In most locations, an EDR would provide limited benefit given relative traffic volumes, frequency of incidents, and impacts of detouring vehicles, especially when compared to Provincial highways. The expanse of the County road network and the multitude of routing options also pose challenges to defining specific EDRs.

Identifying EDRs in select locations of the County road network may benefit where:

- Detour options in the event of a closure are limited or require considerable rerouting;
- A significant number of road users are unfamiliar with the area (e.g., tourist locations);
- Detouring along a specific road section poses traffic safety and/or structural adequacy concerns; and/or
- Traffic volumes are higher.

In most cases, these situations arise on County roads featuring significant water crossings, such as:

- County Road 14 (Bridge Road) at James A. Gifford Causeway
- County Road 21 (Wallace Point Road) at bridge crossing of Otonabee River
- County Road 2 at Bensfort Bridge

Recommendation:

35. Encourage the expansion of the Emergency Detour Route network within the County to include detours for Highway 7 and select County roads.

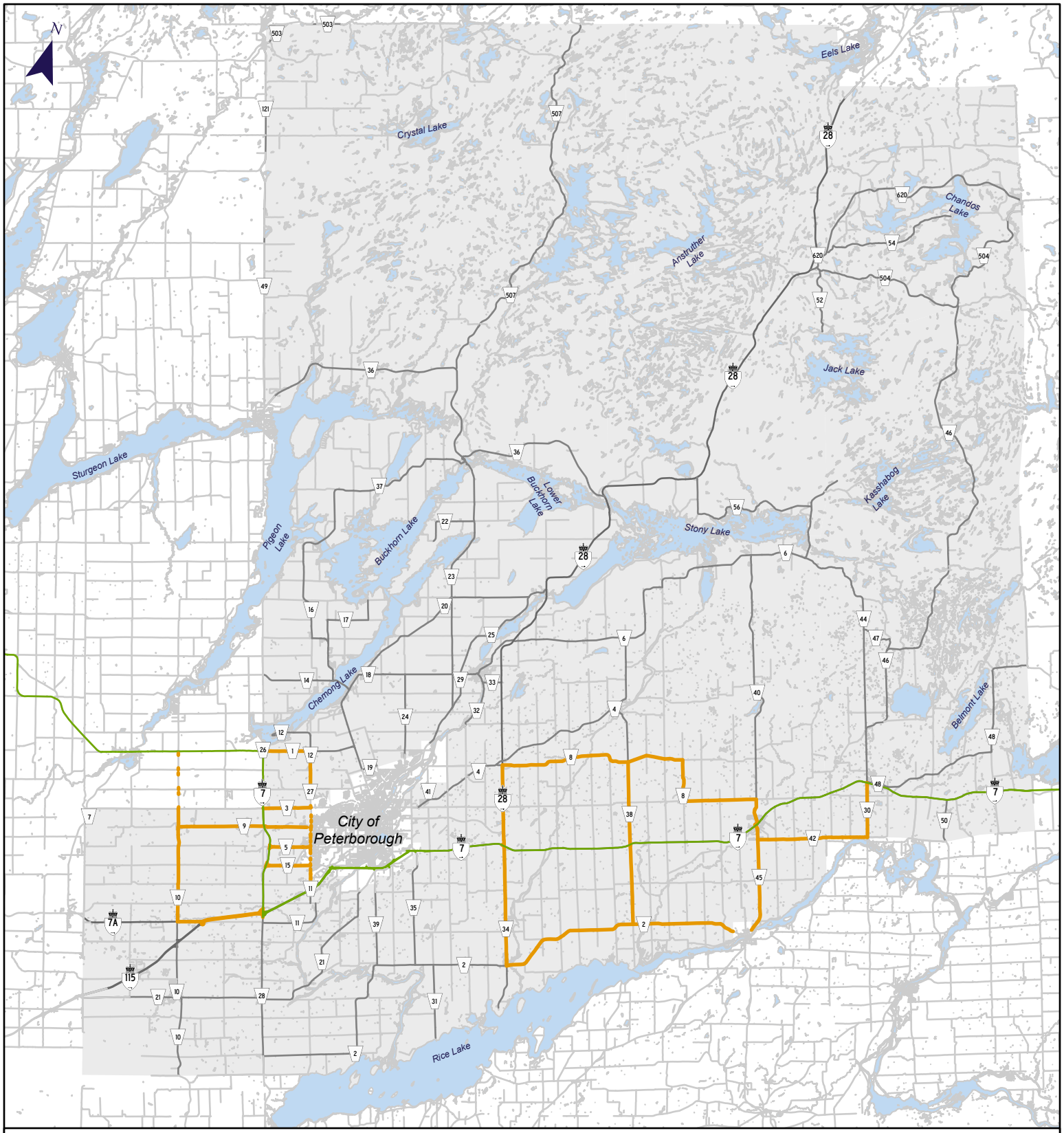


FIGURE 6.3:
POTENTIAL EMERGENCY DETOUR ROUTES FOR HIGHWAY 7

LEGEND

- Highway 7
- Potential EDR (Other Municipalities)
- Potential EDR

Universal Transverse Mercator Projection Zone 17N

DATA SOURCES:
Peterborough County, Land Information Ontario, ESRI

0 2 4 8 12 16 20
Km

Peterborough County
Our History - Your Future

2022 TRANSPORTATION MASTER PLAN UPDATE

October 2022

6.4.6 No-Truck Routes

A “truck route” is defined as a road that a municipality has formally designated for certain trucks to use when traveling through or within that jurisdiction. “The purpose of a truck route network is to provide rules that balance the needs of commerce and the trucking industry with the desire to minimize the impacts of trucks on sensitive land uses.” [17] Typically, the routes use the most suitable roads to the greatest extent possible, while limiting intrusion into sensitive areas to the minimum possible. To focus of truck route planning is to define a network that is:

- Safest for the movement of large vehicles;
- Supports local and regional commerce; and
- Provides enough capacity and adequate design features to accommodate the anticipated volume, size, and weight of vehicles.

The County currently has only one truck restriction in place. Site and/or season specific restrictions are also used to limit loads during the spring and enforce weight restrictions on older structures. But outside these limited locations, the County’s practice has traditionally been to permit truck traffic on all County Roads.

Recommendations:

36. Introduce a Permissive Truck Route policy that directs heavy vehicles to preferred routes with signage.

37. Undertake cost-benefit review to upgrade pavement during rehabilitation projects to accommodate all-season truck traffic on routes leading to key trucking destinations.

38. Analyze existing and future commercial vehicle demand to identify key corridors.

6.4.7 Oversized/Overweight Vehicle Loads

Any combination of vehicle and load that exceeds one or more of the legal maximum dimensions of width, height, and/or length set out in O.Reg. 413/05 (Vehicle Weights and Dimensions – For Safe, Productive and Infrastructure-friendly Vehicles) of the *Highway Traffic Act* (HTA) is, by definition, an oversize load. Like oversize shipments, overweight loads exceed the legal maximum weights defined in the HTA. Oversize and overweight loads both impact the road network, but in different ways.

[17] Ontario Trucking Association. December 2011. *Local Truck Routes: A Guide for Municipal Officials*. p. 6.

Peterborough County requires owners to obtain permits to operate oversize/overweight vehicles on County Roads. The County currently operates a tiered permit system. Permit types depend on the vehicle gross weight, dimensions, and configuration. If the County believes the vehicle could significantly impact any bridges and/or culverts along the route, the applicant may be required to hire a certified engineer to evaluate the adequacy of the structures to accommodate the load. Liability insurance is required in all situations.

An oversize/overweight vehicle and load permit program enables the County to control and monitor use of its road network by large vehicles, helping to manage wear and tear, ensure adequacy and fit for use, and limit adverse community impact. The program should continue but there may be opportunities to refine the policy to improve coordination with other parties involved in the process, particularly MTO, and enhance its effectiveness.

Recommendations:

39. Formalize Oversize/Overweight Vehicles and Loads Policy.

40. Revise the current permit process to:

    a) Request additional information from the application
    b) Align with the No Truck Routes Policy
    c) Provide carriers with additional guidance for truck routing
    d) Allow annual permit holders to operate outside normal periods

6.4.8 Pavement Markings

The County's pavement marking policy should promote uniformity in the design and installation of pavement markings so that road users may recognize and understand them immediately. Pavement markings should be applied with the best interests of the public in mind, which includes the consideration of safety and cost-effectiveness.

The existing policy outlining the pavement marking guidelines is not sufficient in encompassing the standards required for the various road users throughout the County. The standards outlined within the existing policy also require updating, while other standards should be added to provide more detailed and straightforward refences for the County.

Recommendations:

41. Adopt applicable standards outlined by the Province of Ontario and Transportation Association of Canada for the design and installation of traffic management devices on County roads.
42. Apply the standards outlined in Ontario Traffic Manual Book 11 for the application of edge lines on County roads (continuous single solid retroreflective 10 cm wide).

6.5 Non-Auto Modes

6.5.1 Active Transportation

Active transportation is defined by the Public Health Agency of Canada to be: *"any form of human-powered transportation* (such as) *walking. cycling, using a wheelchair, in-line skating or skateboarding."* The need to better accommodate active modes of transportation is increasing within the County of Peterborough and across Canada.

In 2017, the County completed its first Active Transportation Master Plan (ATMP), which provides an outline of a staged plan for programs, policies, and projects to promote active transportation. The vision of the ATMP is "to promote leadership and community partnerships that make the County of Peterborough a healthy, prosperous and sustainable community, with active transportation as a key component of a safe, accessible, integrated transportation system linking where we live, work and play". In partnership with area municipalities and in consultation with area stakeholders, the study developed and reviewed potential programs, policies, and projects to promote active transportation and safety throughout the County.

Implementation of the ATMP is progressing, with several policies and programs, such as the road shoulder paving initiative, now in effect. Opportunities to coordinate and integrate the ATMP recommendations into other County policy documents, including the TMP and the new County Official Plan, should continue to be pursued. Preferably, the next update to the TMP should incorporate active transportation provisions into the plan to provide a more integrated County-wide transportation strategy.

Recommendations:

43. Implement the supporting programs, policies, and infrastructure as identified in the Active Transportation Master Plan.
44. Incorporate an active transportation policy into the new County Official Plan.
45. Consider creating a County Active Transportation schedule in the new County Official Plan.
46. Update and integrate the Active Transportation Master Plan with the next update of the County Transportation Master Plan.

6.5.2 Rural Transit

Two important considerations in evaluating opportunities for public transit are the demand and the need for transit service. In jurisdictions such as Peterborough County that are predominantly rural and have relatively modest population and employment and low population density combined with above-average household incomes and car ownership, the demand for transit is typically low.

Nevertheless, the need for transit is often great, as transit services can significantly impact the lives of those who do not have access to a car, and who may have to travel longer distances to access employment, amenities, and recreation opportunities. Moreover, there is a shifting cultural preference across all age groups – particularly among youth and senior citizens – suggesting an increasing desire for alternative transportation options (in addition to driving). This trend is true not only in big cities, but also in smaller centres and towns, and in suburban and rural areas.

Section 3.1.2 summarizes the existing and planned public transit services currently operating in and around Peterborough County. Options, at present, are somewhat limited.

In recent years, transit operators have been rethinking the approach to transit service delivery, recognizing that transit does not necessarily have to mean a 40-foot bus operating on a fixed route on a fixed schedule. Technology permits more creative solutions to transit service delivery that can satisfy the need while being better tailored to demand. Many of these transit solutions fall under the umbrella of “microtransit”, which generally refers to forms of flexible and demand-responsive transit service.

Recommendations:

47. Confirm *Accessibility for Ontarians with Disabilities Act* (AODA) requirements (to provide complementary specialized transit service where conventional (fixed route) service is delivered) and initiate conversations with Caremobile.

48. Monitor the success of The Link and consider if a closer collaboration with the project partners might be mutually beneficial in the future.

49. Undertake targeted public engagement in select communities to assess transit feasibility in the County (beginning with Cavan Monaghan likely).

50. Evaluate other potential transit opportunities in the County.

6.5.3 Rail

An existing rail line runs east-west through the southern part of the County, passing though the City of Peterborough. On the eastern end of the County, the rail line branches, travelling northerly into the Unimin mining sites and processing centres and

easterly to the Kawartha Ethanol chemical plant. While portions of the original rail line continue to be used for freight uses, there is currently no passenger rail service operating within the County.

In 2010, a proposal for passenger rail service between Peterborough and Toronto, called the Shining Waters Railway, was established. The plan involved upgrading the existing freight corridor for passenger service, with several small sections of new track to allow for connections to Toronto. The plan was refined through the mid-2010s and received backing from several federal and provincial officials. Eventually, the idea of using this corridor was adopted by VIA Rail, which has incorporated the concept into its High-Frequency Rail (HFR) proposal. The VIA HFR plans are still in development and impacts to freight and location of rail stations are not yet known.

Through the preparation of the TMP Update and discussions with the Township of Cavan-Monaghan, the County Road 10 crossing of the CP Railway was identified for further study. The crossing is grade-separated; however, County Road 10 narrows to one lane under the railway bridge. The County has confirmed CP Rail is the senior authority for the railway crossing.

Recommendations:

51. Form a Rail Working Group of County staff and/or Council representatives to facilitate relevant communication on passenger and freight rail service within and through the County.

52. Communicate with VIA Rail High Frequency Rail (VFR) planning staff to better understand the impacts of the proposal on future passenger rail service in the County, as well as freight service in local communities.

53. Assess the need for further County studies to supplement the work being completed for the VFR project and pursue grant funding if available.

54. Consult businesses currently using the corridor to better understand freight rail needs now and in the future.

55. Complete a railway crossing study to determine the plan for the CP Rail Line crossing of County Road 10.

6.6 Emerging Technologies

6.6.1 Electric Kick Style Scooters

An e-scooter is a power-assisted scooter with a step-through frame where a single rider can stand while driving the vehicle, with no seat. It can be parked in an upright position

with use of a kickstand. E-scooters can vary in design, weight, and speed and comprise a wide variety of configurations.

E-scooters are a form of micro-mobility, an umbrella term for light personal transportation devices that include human and motorized vehicles. Other common micro-mobility vehicles include bicycles and electric assist bikes (e-bikes). Shared systems provide people access to these vehicles through membership, pay-per-use, and/or time-based fares.

The Province introduced a pilot program in 2020 to permit the operation of e-scooters on public roads in Ontario. E-scooter use would only be permitted if the County passes a by-law pursuant to O. Reg. 389/19 under the *Highway Traffic Act*.

E-scooters have the potential to pose safety concerns (especially on higher speed, rural roads) and impacts to other users. Its also unlikely e-scooter use would be considerable (or desirable) on most County Roads given the rural environment. These vehicles tend to be most effective for short distance trips within built-up urban areas. Prohibiting e-scooter use on County Roads would also provide clear direction for enforcement.

Recommendation:

56. Do not introduce a by-law to permit e-scooter use on County roads.

6.6.2 Automated, Connected, and Electric Vehicles

Over the past decade, the automotive industry has experienced considerable change due to innovation and rapidly evolving technology, some of which impacts local governments. Potentially transformative automobile technologies likely to have significant effects on municipal land use and transportation in the coming 10 to 30 years include:

- **Automated Vehicles (AVs)**, which have at least some aspect of a safety-critical control function (e.g., steering, throttle, or braking) occur without direct driver input. There are six levels of vehicle automation, starting from Level 0: No Automation to Level 5: Full Automation (or Autonomous), as defined by the Society of Automated Engineers (SAE) International;
- **Connected Vehicles (CVs)**, which rely on different wireless communication technologies to communicate with the driver, other cars on the road (vehicle-to-vehicle [V2V]), roadway infrastructure (vehicle-to-infrastructure [V2I]), and the “Cloud” [V2C], and
- **Electric Vehicles (EVs)**, which use one or more electric or traction motors for propulsion. An EV may be powered through a collector system by electricity from off-vehicle sources, or may be self-contained with a battery, solar panels, or an electric generator to convert fuel to electricity.

Automated, connected, and electric (ACE) vehicles, offer promise to improve transportation system safety and efficiency in communities. At the same time, if not deployed and managed properly, these technologies could lead to more traffic, inequitable access to mobility, and adverse environmental impacts.

While large scale deployment of ACE vehicles is not immediately imminent, a strategic action plan would outline the tasks required to prepare for their inevitable introduction in the Peterborough County area. The plan, which should be completed in the next 5 to 10 years in collaboration with key stakeholders, should address potential implications, preparations, and public acceptance of ACE vehicles, ensuring the County is well-positioned to both maximize opportunities and mitigate impacts arising from their arrival.

Once the strategic action plan is prepared and approved, the testing and deployment of CAVs on County roads could be permitted. An automated, connected, and electric vehicle public education program should also be developed and introduced.

Recommendations:

57. Develop an Automated, Connected and Electric (ACE) Vehicles strategic action plan outlining the tasks required to prepare for their inevitable deployment in the County.

58. Introduce an ACE vehicle public education program based on the recommendations of the strategic action plan.

59. Permit the testing and deployment of connected and automated vehicles (CAVs) on County roads following approval of the strategic action plan.

6.6.3 Information Technology

Recent technological advancements have opened new opportunities for municipalities to incorporate information technology (IT) solutions into the management of their transportation systems. Intelligent Transportation Systems (ITS) is the broad term used to describe the application of IT in transport. More specifically defined, ITS are the control and information systems that use integrated communications and data processing technologies, such as cameras, Bluetooth detection, and advanced data analytics, for the purposes of:

- Improving the mobility of people and goods;
- Increasing safety, reducing traffic congestion, and managing incidents effectively; and

- Meeting transportation policy goals and objectives, such as demand management or public transportation priority measures. [18]

As new technologies develop, such as automated and connected vehicles, the uses of ITS will grow.

The County does not currently have a policy pertaining to the application of IT solutions for transportation purposes. In September 2021, the County's leadership team approved a project charter for implementing the Municipal511 system. Under one operating license, the County and local municipal road authorities will be able to make use of this online, publicly accessible, map-based road information management for the publication of information regarding road construction and maintenance activities being performed on their roadways that may impact the movement of traffic, goods, and services in this region.

Recommendations:

60. Explore opportunities to expand technology already in use by the County, including Global Positioning Systems, Automatic Vehicle Location Systems, Dynamic Roadway and Speed Warning Systems and Traveller Information Systems (Municipal511).

61. Investigate Dynamic Roadway and Speed Warning Systems focused on mitigating collisions with animals.

62. Develop an Intelligent Transportation Systems strategic action plan outlining the tasks required to better leverage emerging technologies.

[18] PIARC. https://rno-its.piarc.org/en/intelligent-transport-systems/what-its. Accessed October 5, 2021.

Chapter 7 Plan Implementation

7.1 Implementation Tools

7.1.1 Official Plan Amendments

The TMP Update introduces key themes and principles that should be incorporated into the County Official Plan, the municipality's guiding land use and policy document. Below summarizes the proposed policy and schedule changes that will inform the future Official Plan Amendment pursuant to the *Planning Act.*

- Policies:
  - County Road Classification System
  - Road widening, right-of-way, and entrance spacing policies
  - Special Character Roadway designation
  - Mechanisms to acquire and protect designated corridors
  - Active transportation
- Schedules:
  - County Road Network schedule, including designated Special Character Roads and protected corridors
  - Schedule/table setting out right-of-way requirements by County road section
  - County Active Transportation schedule (possibly)

7.1.2 Future Environmental Assessment Requirements

The TMP Update will be relied upon in completing the Municipal Class EA studies for future projects identified herein. In some cases, the plan will satisfy Phases 1 (identify the problem) and 2 (identify alternative solutions to the problem) of the five-phase Municipal Class EA planning and design process. Functional plans will be completed for each project to assess costs and impacts in greater detail. It is assumed that these more detailed studies will not result in a complete rethink of the underlying basis for the project, but rather the implementation and adaptation of the initiative.

It may be desirable to alleviate adverse environmental consequences of a proposed project by relocating the facility, altering the design, or choosing not to proceed with its implementation. However, in many instances the infrastructure already exists or the options for new or improved alignments are limited. In these situations, mitigation measures are needed to minimize the negative impact of the transportation facility or service.

7.1.3 Development Approval Process

The *Planning Act* establishes the framework for land use planning in Ontario, providing the basis for a variety of mechanisms municipalities use to facilitate development in their communities. As part of the approval process, municipalities are responsible for ensuring alignment with Provincial interests and mandates. The most common tools used by the County to guide and control development in Peterborough include Official Plan Amendments, Plans of Subdivision, Plans of Condominium, and severances/consents for lands within Peterborough County. The type of application(s) will depend on the development contemplated and the permission required from the County to enable the plan.

The development approval process can also be used to implement the transportation infrastructure and policies identified in the TMP Update directly related to specific lands. The *Planning Act* authorizes municipalities to impose conditions on development approvals to secure compliance. From a transportation perspective, typical conditions imposed include:

- Dedication of property for abutting road, pathway, and other transportation rights-of-way described in the County Official Plan at no cost to the municipality;
- Design conditions for access to/from the subject development, such as intersection controls, lane arrangements, ramps, curbing, and traffic signs;
- Requirements and design conditions for off-street loading and parking facilities; and
- Design conditions for walkways, walkway ramps, and other means of pedestrian access.

Transportation infrastructure improvements identified in the TMP Update may be implemented through the development approval process if the improvements are directly replated to the subject development.

7.2 Priorities and Costing

7.2.1 Infrastructure Projects

Costs for implementing the road network projects identified in **Chapter 5** were estimated based on cost information obtained from the 2014 TMP Update and more current benchmark cost data provided by the County. Costs from previous years were increased to reflect construction price escalation and inflation. The cost estimates developed for the TMP Update were also incorporated into the County's 2022 Development Charges Background Study for the corresponding projects.

Note that the project identification and costing was carried out at a high-level based on the assumptions stated above. The analysis did not include assessments of project feasibility, constructability, and/or environmental impact, relying on the simplifying

assumption that the potential road widenings could be implemented with typical considerations. Further detailed studies, including Municipal Class EAs, are required prior to considering implementation of the identified projects.

The phasing of the proposed road network projects considers the forecast growth in population and employment within the County and associated travel demand. Relative priority compared to other initiatives and the broader transportation objectives of the County were also considered. Implementation timing and final extent and configuration of the proposed works will be confirmed through future study and capital budgets, prior to construction.

Table 7.1 details the recommended phasing and indicative costs of the road expansion and corridor improvement projects listed in **Table 5.6** with the anticipated Municipal Class EA schedule for the undertaking. The total cost of the recommended road expansion and corridor improvement program is estimated at approximately $113.3 million dollars. Typical, ongoing maintenance and rehabilitation costs are not included in this estimate.

Table 7.2 details the recommended phasing and indicative costs of the intersection improvement projects listed in **Table 5.12**. The total cost of the growth-related intersection improvement program is estimated at approximately $6.0 million dollars. Other projects where indicative costs could be estimated totalled about $580,000. Of the remaining initiatives, it is anticipated that County staff will undertake the 20 with indicative costs denoted as "Internal", depending on available resources. For the final 21 projects, with indicative costs identified as “TBC”, further, more detailed information is required to prepare a representative estimate. All these projects fall in the 10-20 or 20+ year horizons. Typical, ongoing maintenance and rehabilitation costs are also not included in these estimates.

Figure 7.1 illustrates just the recommended growth-related road improvements, comprising both the road expansion and corridor improvement projects listed in **Table 7.1** and the growth-related intersection improvement works denoted with an asterisk (*) in **Table 7.2**. County Council endorsed these projects through its approval, on May 2, 2022, of the development-related capital roads program contained in Appendix C of the County’s 2022 Development Charges Background Study.

Table 7.1: Recommended Phasing and Indicative Costs of Road Expansion/Corridor Improvement Projects

	Road	Proposed Improvement	Municipal Class EA Schedule	Timing (Years)	Indicative Cost
1	County Road 4 (Warsaw Road) – Television Road to County Road 41 (University Road)	New alignment and widening to 4 lanes	C	10-20	$7,680,000
2	County Road 10 – County Road 21 (King Street) to Fallis Line	Corridor improvements (turn lanes, utility relocation, property, traffic control signals). Also corridor study/Municipal Class EA.	C	0-10	$9,800,000
3	County Road 10 – Fallis Line to Highway 115	Widening to 4 lanes	C	10-20	$11,207,000
4	County Road 12 (Lily Lake Road) – County Road 27 (Ackison Road) to City of Peterborough Limit	Reconstruction and widening to 4/5 lanes	C	20+	$6,560,000
5	County Road 18 (Chemong Road) – City of Peterborough Limit to 0.6 km N. of County Road 19 (Line Road 3)	Widening to 5 lanes (centre turn lane)	C	10-20	$2,197,000
6	County Road 18 (Chemong Road) – 1 km N. of County Road 19 (Line Road 3) to County Road 1 (Lindsay Road)	Widening to 5 lanes (centre turn lane)	C	10-20	$1,896,000
7	County Road 18 (Chemong Road) – County Road 1 (Lindsay Road) to Bridgenorth	Widening to 4/5 lanes (including signals at Fifth Line)	C	10-20	$6,600,000
8	County Road 18 (Ward Street) – South Limit of Bridgenorth to County Road 14 (Bridge Road)	Corridor improvements	C	0-10	$17,460,000
9	County Road 28 – Fraserville to Highway 7/115	Widening to 4/5 lanes	C	10-20	$9,300,000
10	County Road 29 (Lakefield Road) – City of Peterborough Limit to 7th Line	Widening to 4/5 lanes	C	20+	$14,760,000
11	County Road 29 (Lakefield Road/Water Street) – Lakefield Improvements	New 2 lane arterial and bridge crossing of Otonabee River	C	20+	$25,800,000
Total					**$113,260,000**

Table 7.2: Recommended Phasing and Indicative Costs of Intersection Improvement Projects

#	Intersection	Recommended Improvement	Rationale		Timing (Years)	Indicative Cost
			Operations	Safety		
1	County Road 1 (Lindsay Road) and County Road 12 (Fifes Bay Road)	Provide advanced warning signage for stop control		●	0-10	Internal
		Install eastbound right-turn taper*	●		0-10	$75,000
		Install northbound right-turn taper*	●		0-10	$75,000
		Install traffic control signals* (or roundabout)	●	●	10-20	$275,000
2	County Road 1 (Lindsay Road) and County Road 18 (Chemong Road)	Provide advanced warning signage for channelized right turn lane		●	0-10	Internal
		Realign channelized eastbound right-turn lane		●	10-20	TBC
		Remove channelized eastbound right-turn lane		●	20+	TBC
3	County Road 2 and County Road 28	Update on-road parking regulations		●	0-10	Internal
		Add raised curb or pavement markings for driveways on the east side		●	0-10	$50,000
		Trim trees to address northeast corner sight obstruction		●	0-10	Internal
		Install southbound left-turn lane*	●		0-10	$175,000
		Install northbound right-turn lane*	●		10-20	$100,000
		Remove tree obstructing northeast corner sightline		●	20+	Internal
4	County Road 4 (Warsaw Road) and Nassau Road/Douro Seventh Line	Add side road stop bar and turn lane pavement markings		●	0-10	Internal
		Trim trees to address southwest corner sight obstruction		●	0-10	Internal
		Extend westbound right-turn lane		●	0-10	$100,000
		Realign intersection outside horizontal curve		●	20+	TBC
		Consider installing roundabout (study)	●	●	20+	$10,000

Table 7.2: Recommended Phasing and Indicative Costs of Intersection Improvement Projects

#	Intersection	Recommended Improvement	Rationale		Timing (Years)	Indicative Cost
			Operations	Safety		
6	County Road 8 (Webster Road) and County Road 38 (South Street)	Install advanced warning signage for intersection		●	0-10	Internal
		Trim trees to address southeast corner sight obstruction		●	0-10	Internal
		Realign east approach		●	20+	TBC
		Consider installing roundabout (study)	●	●	20+	$10,000
7	County Road 11 (Moncrief Line) and County Road 28	Complete illumination assessment		●	10-20	$5,000
8	County Road 12 (Fifes Bay Road)/County Road 27 (Ackison Road) and County Road 12 (Lily Lake Road)/2nd Line Smith	Install flashing beacon		●	0-10	$5,000
		Install northbound right-turn lane*	●		0-10	$100,000
		Install traffic control signals (with development)*	●		10-20	$275,000
		Install left-turn lanes (with development)*	●		10-20	$175,000
		Install westbound right-turn taper*	●		10-20	$75,000
		Enhanced pavement for north approach		●	10-20	TBC
		Change grade for north approach		●	20+	TBC
		Grade hill to address northwest corner sight obstruction		●	20+	TBC
9	County Road 14 (Yankee Line) and County Road 16 (Robinson Road)	Add raised curb or pavement markings on south side for access management		●	0-10	$50,000
		Install traffic control signals* (or roundabout)	●	●	10-20	$275,000
		Install roadside protection on south side		●	10-20	TBC
		Extend northbound merge lane*		●	20+	$75,000

Table 7.2: Recommended Phasing and Indicative Costs of Intersection Improvement Projects

#	Intersection	Recommended Improvement	Rationale		Timing (Years)	Indicative Cost
			Operations	Safety		
10	County Road 14 (Bridge Road) and County Road 18 (Ward Street)	Install advanced warning signage for channelized right-turn lanes		●	0-10	Internal
		Add eastbound right-turn lane arrow		●	0-10	$10,000
		Reroute driveway connection on east side		●	10-20	TBC
		Realign channelized right-turn lanes		●	10-20	TBC
		Remove channelized right-turn lanes		●	20+	TBC
		Consider installing roundabout (study)	●	●	20+	$10,000
11	County Road 18 (Chemong Road) and County Road 19/3rd Line Smith	Install westbound right-turn lane*	●		0-10	$100,000
12	County Road 18 (8th Line Smith) and County Road 23 (Buckhorn Road)	Install westbound right-turn lane*	●		0-10	$100,000
		Install southbound right-turn taper*	●		0-10	$75,000
		Install traffic control signals*	●	●	10-20	$275,000
13	County Road 18 (8th Line Smith) and County Road 24 (Centre Line Smith)	Add eastbound right-turn arrow		●	0-10	$10,000
		Trim trees to address northeast corner sight obstruction		●	0-10	Internal
		Install eastbound left-turn lane*	●		0-10	$175,000
		Install westbound left-turn lane*	●		0-10	$175,000
14	County Road 18 (8th Line Smith) and County Road 25 (Youngs Point Road)	Install westbound right-turn taper*	●		0-10	$75,000
		Install eastbound left-turn lane*	●		10-20	$175,000
		Restrict cut-through traffic at west side private property		●	10-20	TBC
		Consider installing roundabout (study)	●	●	20+	$10,000

Table 7.2: Recommended Phasing and Indicative Costs of Intersection Improvement Projects

#	Intersection	Recommended Improvement	Rationale		Timing (Years)	Indicative Cost
			Operations	Safety		
15	County Road 22 (Curve Lake Road) and Gazelle Trail	Complete illumination assessment		●	0-10	$5,000
		Trim trees to address sight obstructions on all corners		●	0-10	Internal
16	County Road 22 (Curve Lake Road)/16th Line Smith and County Road 23 (Buckhorn Road)	Add raised curb or pavement markings for church driveway		●	0-10	$50,000
		Install eastbound right-turn lane*	●		0-10	$100,000
		Install southbound right-turn lane*	●		0-10	$100,000
		Install traffic control signals (or roundabout)*	●	●	0-10	$2,160,000
		Complete illumination assessment		●	10-20	$5,000
		Convert northbound lanes to left and thru-right lane		●	10-20	TBC
		Install northbound left-turn lane*	●		10-20	$175,000
17	County Road 23 (Buckhorn Road) and County Road 29 (Lakefield Road)	Add southbound right-turn pavement markings and/or signage and extend acceleration lane*		●	0-10	$75,000
		Remove 60 km/h warning sign		●	0-10	Internal
		Add edge line east side of Lakefield Road		●	0-10	Internal
		Install raised centre median islands		●	10-20	TBC
		Consolidate private accesses		●	10-20	TBC
		Realign roads to intersect perpendicularly		●	20+	TBC
		Install traffic control signals* (or roundabout)	●	●	20+	$275,000
18	County Road 23 (Buckhorn Road)/ County Road 36 and County Road 36/ County Road 37 (Lakehurst Road)	Install advanced warning signage for intersection		●	0-10	Internal
		Install roadside protection on east and west sides		●	10-20	TBC
		Widen pavement on northeast and southwest corners to support dedicated northbound and southbound left-turn lanes. Remove or replace overhead lane designation signs.*	●	●	0-10	$180,000

Table 7.2: Recommended Phasing and Indicative Costs of Intersection Improvement Projects

#	Intersection	Recommended Improvement	Rationale		Timing (Years)	Indicative Cost
			Operations	Safety		
		Realign roads to intersect perpendicularly		●	20+	TBC
19 & 20	County Road 28 and Third Line and County Road 28 and Zion Line	Install checkerboard signs opposite T-intersections		●	0-10	Internal
		Install southbound left-turn lane*	●		0-10	$175,000
		Complete illumination assessment		●	10-20	$5,000
		Reduce curb radius on southeast corner		●	10-20	TBC
21	County Road 28 and Larmer Line	Install southbound right-turn taper*	●		0-10	$75,000
		Complete illumination assessment		●	10-20	$5,000
22	County Road 29 (Bridge Street) and County Road 32 (Water Street)	Add north and south right-turn lane pavement markings and/or signage		●	0-10	Internal
		Install raised centre median island		●	10-20	TBC
23	County Road 35 (Keene Road) and Base Line	Install (un)paved shoulders		●	0-10	$100,000
		Install hazard markings on hydro poles within the clearance zone		●	0-10	Internal
		Trim trees to address obstructions within sight triangles		●	0-10	Internal
24	County Road 36 and County Road 507	Install advanced warning and chevron signage for intersection		●	0-10	Internal
		Complete illumination assessment		●	10-20	$5,000
		Realign intersection outside horizontal curve		●	20+	TBC
Subtotal:		**Growth-Related Project Costs**				**$6,005,000**
		Other Projects with Indicative Cost Estimates				**$580,000**
Count:		**Internal Projects**			**20**	
		Cost to be Confirmed Projects (TBC)			**21**	

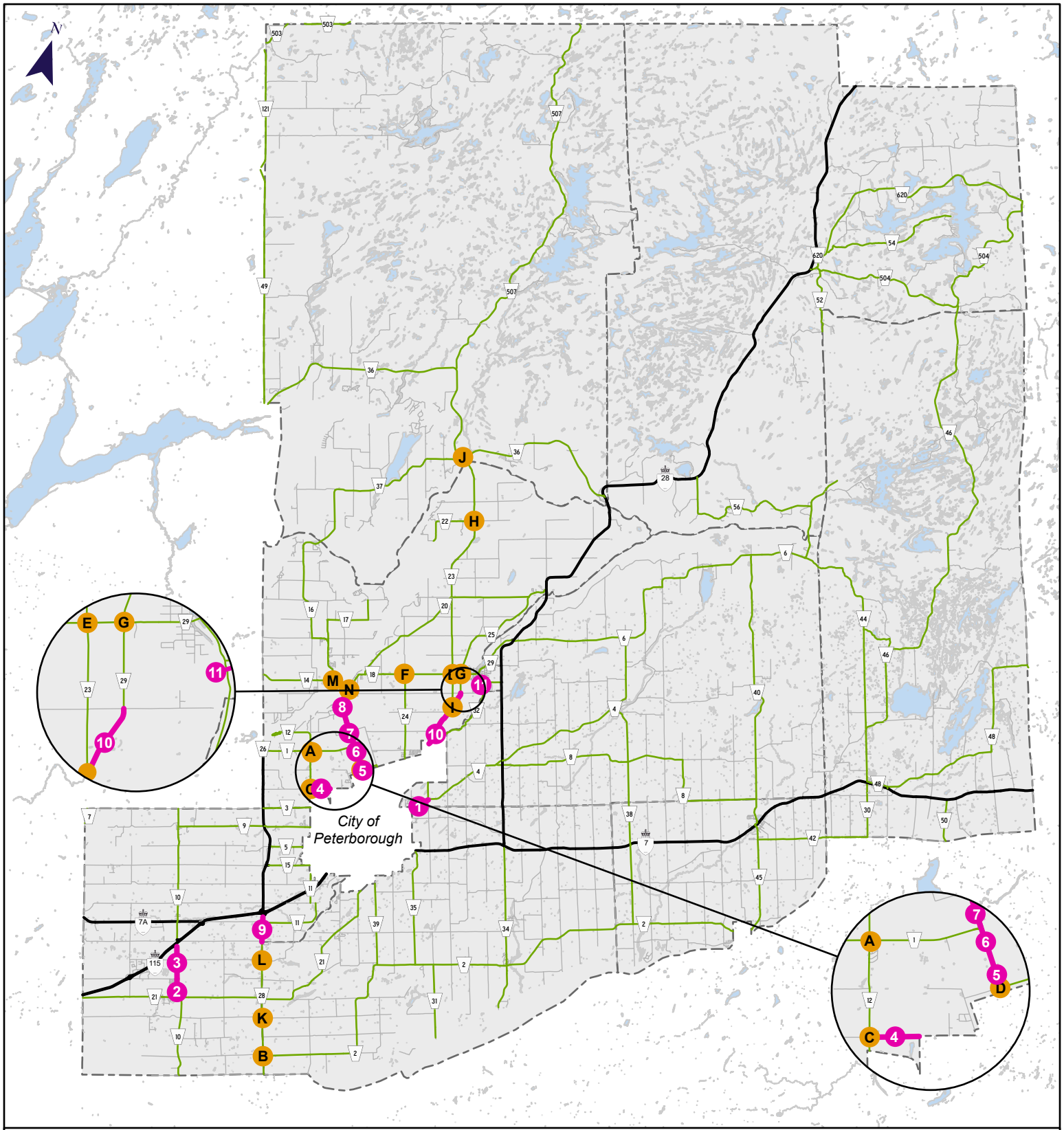


FIGURE 7.1:
PROPOSED GROWTH RELATED ROAD IMPROVEMENTS

LEGEND

- Intersection Improvements
- Road Widening
- New Connection

Universal Transverse Mercator Projection Zone 17N

DATA SOURCES:
Peterborough County, Land Information Ontario, ESRI

0 2 4 8 12 16 20
Km

Peterborough County
Our History - Your Future

2022 TRANSPORTATION MASTER PLAN UPDATE

October 2022

7.2.2 Policies and Studies

Table 7.3 details the recommended phasing and indicative costs of the transportation policies and studies proposed in the TMP Update. The total cost for the 11 initiatives is estimated at approximately $525,000. It is anticipated that County staff will undertake the five initiatives with indicative costs denoted as "Internal", depending on available resources.

Table 7.3: Recommended Phasing and Indicative Costs of Proposed Policies and Studies

Policy		Anticipated Timing	Indicative Cost
1.	Lakefield Network Study	Short-term	$100,000
2.	Special Character Roadway Design Guidelines	Medium-term	$50,000
3.	Clear Zone Policy	Short-term	Internal
4.	Road Setback Policy and By-law	Short-term	Internal
5.	Road Traffic Noise Policy	Short-term	Internal
6.	Road Safety Strategy	Short-term	$150,000
7.	Permissive Truck Route Policy	Short-term	Internal
8.	Oversize/Overweight Vehicles and Loads Policy	Short-term	Internal
9.	County Road 10 Railway Crossing Study	Medium-term	$75,000
10.	Automated, Connected and Electric (ACE) Vehicles Strategic Action Plan	Medium-term	$75,000
11.	Intelligent Transportation Systems Strategic Action Plan	Medium-term	$75,000
TOTAL			**$525,000**

7.3 Monitoring Progress

Ongoing monitoring of the transportation system will enable the County to evaluate the effectiveness and overall contribution of the recommended system changes, expansions, and policies. **Figure 7.2** details the recommended process to monitor the effectiveness of the TMP Update.

Measures, such as intersection v/c ratios and level of service, can be used to monitor the County road network performance, gauging the effectiveness of the policies and recommendations of the TMP Update in achieving the vision and goals of the plan. If performance measures indicate progress in the wrong direction, adjustments, or updates to the TMP can be made.

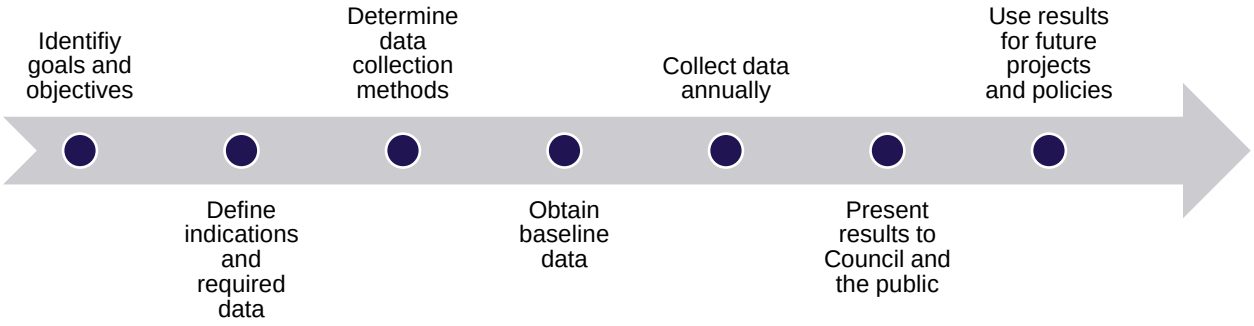


Figure 7.2: Monitoring Process

The following recommendations should be considered in the ongoing monitoring of transportation conditions in the County:

- **Corridor Traffic Count Program (ATR)** – Daily traffic counts collected for the County road network provide the basis for many programs and are used in calculating AADT volumes on each road segment. The program should continue and potentially be extended to develop day of week and seasonal factors to better capture recreational and tourist traffic impacts, which typically occur on weekends and during the summer and contribute to the transportation challenges in the County.
- **Transportation Tomorrow Survey (TTS)** – Continuing to participate in the TTS, undertaken every 5 years, will provide an update of transportation patterns in the County and surrounding area and ensure that up to date information is available to assess changing transportation trends in the community for the next TMP update.
- **City of Peterborough Traffic Model** – TMP updates rely on access to the traffic forecasts produced by the City of Peterborough Travel Forecasting Model. A more formal relationship should be considered with the City to maintain access and facilitate updates to the Model. As part of the agreement, the coverage and capabilities of the Model could be extended Peterborough County.
- **Collision Data** – Maintaining access to collision data for the County road network will enable the County to track trends in road safety and undertake safety-specific investigations. The proposed County Road Safety Strategy should set out how collision data is monitored and used.

The monitoring program should examine user preference for facilities, levels of use and other key factors over an extended timeframe to avoid immediate response bias (which occurs right after a new improvement is implemented). Data should be collected every two to three years (maximum every five years) and at the same time/season.

Results of the monitoring program could be reported to Council and the community through information reports and other publications. The report could highlight progress made in implementing the TMP Update, summarize the performance measures and targets for the previous period, and outline upcoming initiatives.

Recommendations:

63. Implement a regular, ongoing monitoring program and set performance measures and targets to track progress.

64. Prepare a periodic report to County Council on the State of the Transportation System.

7.4 Reviews and Updates of the Plan

Regular reviews and updates of the TMP Update allow for the ongoing assessment of the performance and effectiveness of the plan. Establishing this stable transportation planning cycle ensures the strategies can respond to unforeseen conditions and imprecise assumptions, remain relevant, and fulfil the County's transportation objectives.

Generally, master plans should be reviewed every five years to determine the need for a detailed formal update. The need to renew the TMP should be examined in conjunction with a similar assessment of the County Official Plan and Development Charges Background Study, which are also required every five years per the *Planning Act* and *Development Charges Act*, respectively. The monitoring program will also provide an indication of the necessity for an update. In the intervening period, individuals seeking a current statement of County transportation policies must consult the record of Council decisions in addition to the plan.

Recommendation:

65. Review the Transportation Master Plan every five years, ideally in conjunction with updates to the County of Peterborough Official Plan and Development Charges Background Study.