

County of Lennox and Addington

Transportation Master Plan Update

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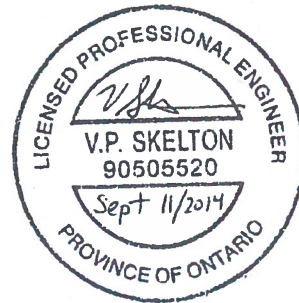
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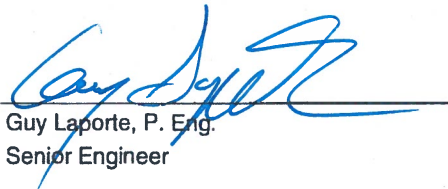
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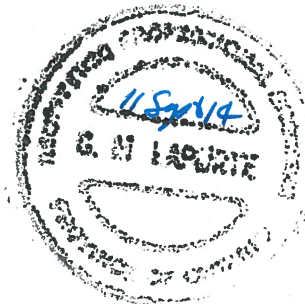
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Senior Engineer



Executive Summary

Introduction

The County of Lennox and Addington is bounded by Lake Ontario to the south, the County of Hastings to the west, the County of Renfrew to the north, and the County of Frontenac to the east. The current population within the County is approximately 42,000 and comprises of those residing in the local municipalities of the Town of Greater Napanee, Loyalist Township and the Townships of Stone Mills and Addington Highlands.

The Master Plan Report (Section 1)

The Transportation Study has been conducted in accordance with the Master Plan process as prescribed in the “Municipal Class Environmental Assessment” (the Class EA) document. The purpose for completing this study as a Master Plan has been to ensure that environmental assessment planning principals and public input are considered in the identification of existing and future transportation infrastructure requirements.

Approval of this document by the County reflects endorsement of the Master Plan and the overall transportation system requirements but does not represent formal approval of any individual element of the transportation system. Although the Master Plan is intended to satisfy Phases 1 and 2 of the Class EA process, formal approvals can only be granted following completion of the appropriate environmental assessments.

Study Objectives (Section 1.4)

The main objective of the Transportation Master Plan is to provide the County of Lennox and Addington clear direction for transportation planning over the next 10-20 years. In 2001, the County completed a Transportation Master Plan (TMP), which identified improvement measures to maximize the use of the existing roadway system and to accommodate future projected travel demands. This project is an update of the 2001 TMP.

Consultation (Section 2)

Throughout the Transportation Study, the public and various interest groups in addition to Provincial Ministries, Municipalities, Agencies and Authorities, have had several opportunities to make comments, identify issues and provide additional information/data relative to the study. A total of four formal contacts with the public were made in conjunction with the preparation of this report.

County Road Jurisdictional Classification (Section 3)

The need for completing the jurisdictional classification review was a result of the County's and the constituent municipalities' desire to address road ownership versus need, usage and function. Specifically, the purpose of this aspect of the study has been to define which roadways should be under the jurisdiction of the County of Lennox and Addington.

Based on the results of the jurisdictional classification review as endorsed by the Steering Committee, Jim Kimmett Boulevard in the Town of Greater Napanee is proposed for transfer to the County. This transfer is dependent on the outcome of the study regarding a new road west of County Road 41. The transfer should be reviewed in the context of the results of the study considering the roads in close proximity to each other that serve a similar direction of traffic flow.

2014-2019

Recommendation: Transfer Jim Kimmett Boulevard to the County depending on the results of the new road EA

Maintenance Agreements (Section 4)

We reviewed the current Level of Service Standards in the Maintenance Agreements between the County and the local municipalities and provided recommendations to be used in the revised Maintenance Agreements.

Recommendations and suggestions that describe the scope and responsibilities of services were provided to the County. The County will develop an adjusted scope of services in consultation with the local municipalities and this will form the basis of the revised Maintenance Agreements. It is recommended that a pay adjustment formula be re-developed based on a detailed analysis of municipal expenditures. Detailed information concerning expenditures is required in order to develop a compensation agreement that is accepted by the County and the local municipalities.

2014-2019

Recommendation: Adopt the Minimum Maintenance Standards (MMS) as produced by the province as part of the Level of Service document for the County. For those items not identified in the MMS, revise Level of Service document. Maintenance agreements between the County and the local municipalities should be revised based on a detailed analysis of municipal expenditures. The scope of services should be revised in the maintenance agreements.

Functional Classification (Section 5.2)

The functional classifications of 'connecting link' and 'urban collector' are similar, making it redundant to use both classifications. Therefore, it is recommended that the following two County Roads change functional classification from 'connecting link' to 'urban collector':

- County Road 2 through the urban area of Greater Napanee (Hessford Street to Bridge Street)
- County Road 41 from Richmond Boulevard/Jim Kimmett Boulevard to County Road 2

There is no impact of this change since the definition of connecting link and urban collector are identical.

Roads classified as 'rural arterial' allow more entrances and access points than those classified as 'major arterial'. In order to support development, it is recommended that the following roads change functional classifications from 'major arterial' to 'rural arterial':

- County Road 4 – south of Highway 401 to Highway 33
- County Road 6 – south of Highway 401 to Shane Street

2014-2019

Recommendation: Change functional classifications.

Funding Programs and Opportunities (Section 12)

Government funding programs from the provincial and federal governments have been available in the past and it is likely they will continue to be available in the future. It is recommended that the County of Lennox and Addington apply for funding from government programs whenever it is applicable.

Development charges are levies imposed by municipalities on developers to pay for growth related infrastructure. In order to implement development charge by-laws, municipalities are required by the Development Charges Act (DCA) 1997 to conduct a detailed development charges background study. This study reviewed the feasibility of implementing development charges and through the analysis it was shown that development charges are a feasible mechanism for funding projects.

Alternative means of financing the County of Lennox and Addington's proposed capital projects includes reserves, grants, property tax, debt or a combination of these.

2014-2019

Recommendation: Undertake a Development Charges By-law Study if Council and staff intend to implement development charges.

Recommendations and Implementation (Section 7 - Section 10)

A review of current and long term travel demands (vehicular and active transportation), policies, collision experience, and infrastructure condition was undertaken to identify problems under the jurisdiction of the County Roads and Bridges Department. A variety of alternative solutions were considered to address the needs that were identified.

Provided in the following table is a summary of the recommendations and corresponding implementation plan resulting from the Transportation Master Plan Study. As major changes to the road system are implemented in the future, the effect on adjacent roads, traffic volumes and the timing/scope of needs should be reassessed and reconfirmed. Depending on the nature of the recommendation, the suggested implementation timing may relate to County administration/staff activities and resources, the availability of financial resources, planning/study requirements, or actual construction.

Summary of Recommendations and Implementation Timing

Costs stated in the table for infrastructure projects include construction costs only and not property acquisition costs, utility relocation costs or design costs.

Timeline	Recommendations	Cost
2014 - 2019	Infrastructure Projects	
	Install roundabout at County Road 23 & County Road 6	\$ 700,000
	Install splitter islands at County Road 1 & County Road 10	\$ 8,000
	Coordination of signals at County Road 41 & County Road 2 with signals at County Road 41 & County Road 1	\$ 5,000
	Install uninterruptible power supplies at traffic signals	\$ 10,000/intersection
	Install folding stop signs along Emergency Detour Route	\$ 5,000
	Review whether accessible pedestrian signals should be included in intersection construction	\$20,000/intersection, Total = \$220,000
	Pedestrian accommodations at County Road 8 and County Road 9	\$ 10,000
	Pedestrian accommodations at County Road 41 and Advance Avenue	\$ 5,500
	Pedestrian accommodations at County Road 2 and County Road 6	\$ 5,000
	Pedestrian accommodations at County Road 41 and Community Road	\$ 2,000
	Analyses and Policies	
	Develop roundabout policy	-
	Implement speed limit policy	-
	Adjust load restricted network	-
	Change functional classification of four County roads	-
	Develop a policy to define a County Road	-
	Review transfer to County jurisdiction of east-west road in Napanee	-
	Review permit fees	-
	Update Scope of Services for Maintenance Agreements	-
	Update Maintenance Standards Document	-
	Studies	
	Revise Maintenance Agreements based on an analysis of municipal expenditures	-
	Support discussions between local municipalities and existing transit organizations	-
	Purchase collision database program to manage collision data	\$5,000 first year \$2,500 subsequent years
	Environmental Assessment for new road west of County Road 41	\$ 350,000
	Consider undertaking Development Charges By-law Study (study cost estimate \$50,000)	-

Timeline	Recommendations	Cost
2019 - 2024	Infrastructure Projects	
	Install roundabout at County Road 23 & County Road 24	\$ 700,000
	Install roundabout at County Road 1 & County Road 10	\$ 1,000,000
	Realign intersection at County Road 1 & County Road 2	\$ 300,000
	Remove southbound right turn lane at County Road 2 & County Road 6	minimal
2024 - 2029	Infrastructure Projects	
	Reconstruct County Road 4	\$ 8,800,000
	Build new road west of County Road 41 (cost excludes property and utilities)	\$ 2,700,000
	Analyses and Policies	
	Review number of lanes on CR 41 between 401 and Goodyear	as part of next TMP update
	Studies	
	Transportation Master Plan Update	\$ 250,000
2029 - 2034	Infrastructure Projects	
	County Road 23 extension	\$ 5,300,000
Ongoing	Infrastructure Projects	
	Maintain current cross-section County Road 5	-
	Install LED traffic signal heads	In capital budget
	Continue paved shoulder trail program	\$ 22,000/km/side
	Analyses and Policies	
	Calculate road length with GIS	-
	Review the addition of accessible pedestrian signals as per the Accessible Pedestrian Signals policy whenever a request is made.	-
	Studies	
	Perform regular network screening of collisions	\$ 5,000/review

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1. Introduction

1.1 Background

The County of Lennox and Addington is bounded by Lake Ontario to the south, the County of Hastings to the west, the County of Renfrew to the north, and the County of Frontenac to the east. A map of the County is shown in **Figure 1-1**. The current population within the County is approximately 42,000 and residents live within one of four local municipalities: Town of Greater Napanee, Loyalist Township, Township of Stone Mills, Township of Addington Highlands. Although the County is primarily rural in nature, urban areas do exist within the Town of Greater Napanee and Loyalist Township south of Highway 401.

1.2 The Master Plan Report

The Transportation Study has been conducted in accordance with the Master Plan process as prescribed in the “*Municipal Class Environmental Assessment as amended in 2011*” (the Class EA) document. In the Master Plan process, environmental assessment planning principals and public input are considered in the identification of existing and future transportation infrastructure requirements. This Master Plan Report documents the proposed recommendations for the County’s transportation system, as well as recommendations regarding policies and further studies.

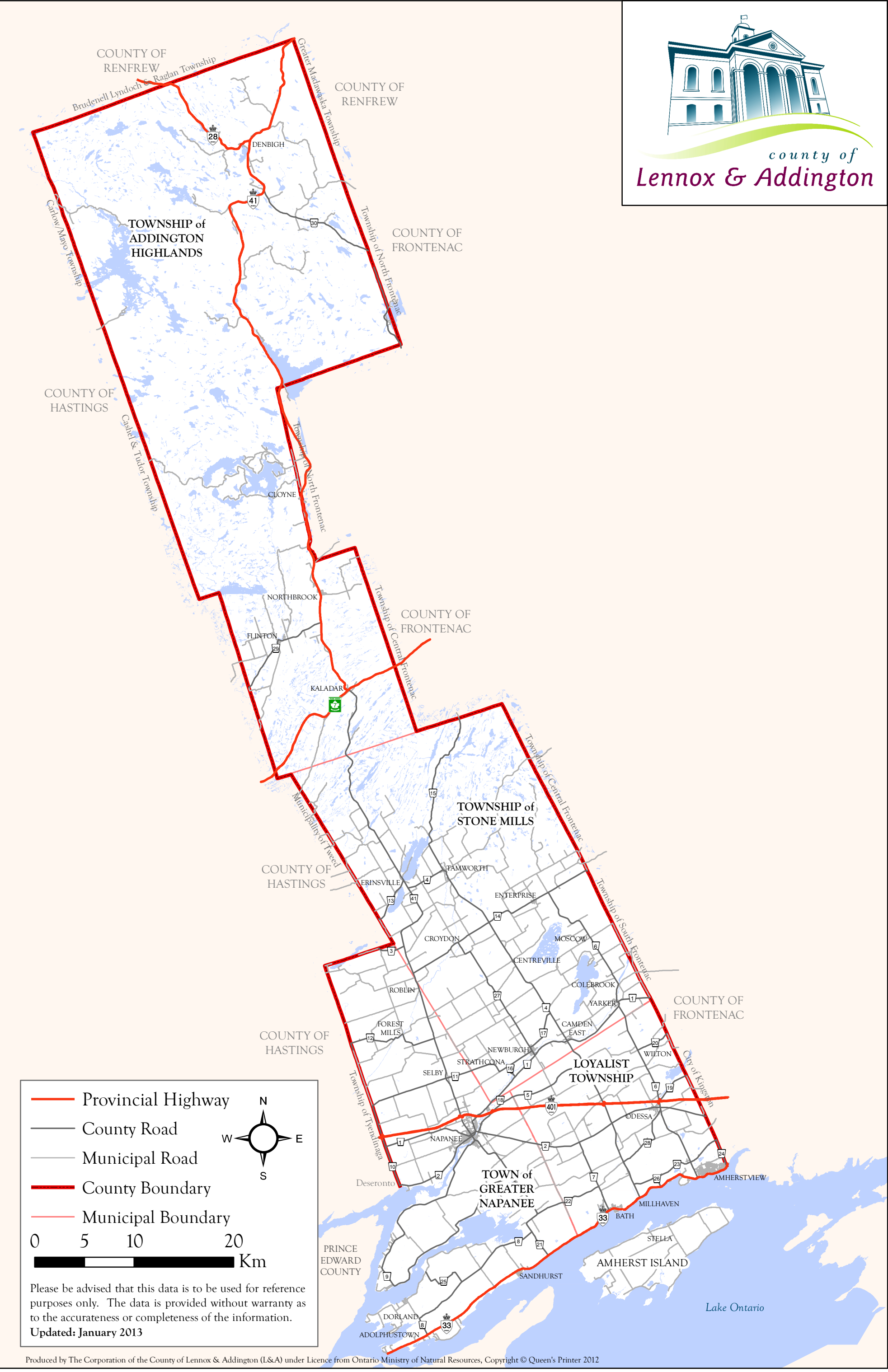
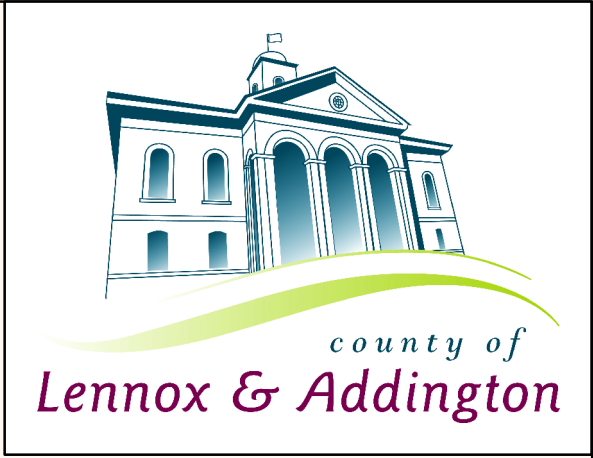
Transportation Master Plans typically differ from project specific studies (or traditional traffic impact studies) in that they are undertaken as strategic plans and recommend a series of transportation works which are distributed throughout a “large” study area and which are to be implemented over a period of time. The scope of these studies usually includes a broader analysis of the transportation system in order to identify a framework for future transportation requirements. While these transportation requirements may be implemented as separate projects as part of a staging or implementation plan, collectively they form part of a larger transportation system management plan.

As each specific road related project is undertaken, more detailed traffic studies will be required to provide specific details regarding operation and physical design requirements.

Approval of this document by the County reflects endorsement of the Master Plan and the overall transportation system requirements but does not represent formal approval of any individual element of the transportation system. Although the Master Plan is intended to satisfy Phases 1 and 2 of the Class EA process, formal approvals can only be granted following completion of the appropriate environmental assessments.

1.3 Study Area

The study area encompasses those areas bounded by the Town of Greater Napanee, Loyalist Township and the Townships of Stone Mills and Addington Highlands. Refer to **Figure 1-1** for the study area. Transportation network plans relative to the County were developed and considered within the study area.



— Provincial Highway
 — County Road
 — Municipal Road
 — County Boundary
 — Municipal Boundary

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 Updated: January 2013

1.4 Study Objectives

At the outset of the study, certain objectives were set such that the conclusions and recommendations resulting from the study would be endorsed by the County of Lennox and Addington with input provided by the local municipalities through the Steering Committee. The following objectives were to be met in order to satisfy the goals of the study:

- Undertake an evaluation of the County and major municipal road systems and identify, if appropriate, recommended jurisdictional transfers;
- Review current funding levels for the maintenance of County roads within each local municipality. Identify the modifications to maintenance expenditures are appropriate;
- Review the County's practices for the establishment of roadway classification and identify, if applicable, any modifications to current procedures and/or roadways which should be reclassified;
- Evaluate the growth potential in the County and resultant impact on long term transportation needs and roadway jurisdictions;
- Review transportation opportunities within the County to provide long term network capacity;
- Review current policies and identify any recommended modifications to current policies;
- Notify and involve any public or interested agencies by methods such as newsletters, transportation surveys and websites to allow them to provide input towards planning, delivery and implementation of future transportation services and needs;
- Identify funding opportunities for roadway projects and examine the feasibility of a County Development Charges project to accommodate growth related improvements; and,
- Establish an implementation strategy for major transportation infrastructure requirements within the County.

2. Project Approach

The purpose of the Transportation Master Plan is to provide the County of Lennox and Addington with a long term strategy for their transportation system. The information in this report is based on the work undertaken as part of the Transportation Study. Provided in this section of the Master Plan is a description of the approach and the internal, agency, stakeholder and public consultation activities that were undertaken during the course of the Transportation Study.

2.1 The Environmental Assessment Process

The County of Lennox and Addington Transportation Study was carried out in accordance with the guidelines articulated for Master Plans in the Ontario Class EA document for Municipal Road Projects.

The Transportation Master Plan addresses Phases 1 and 2 of the Municipal Class EA process and offers a broad level of assessment of transportation in Lennox and Addington. This type of plan offers a framework for the planning of future projects. It can be used to support further work for specific Schedule B and C projects. A more detailed assessment of the natural, social and economic environments will be required for specific Schedule C projects to complete the Municipal Class EA process. The Master Planning process follows the key components of environmental planning in that it involves consultation, considers a range of alternatives, addresses the impacts of the alternatives on all aspects of the environment, evaluates alternatives and provides clear documentation.

As part of the Class EA Master Planning process, public and agency consultation was completed during each phase of the Transportation Study to help the public and agency representatives understand the scope of the study. Opportunities were provided for interested/affected parties to review the study findings and conclusions.

The Master Plan, once adopted by County Council, will represent the first two phases of the Class EA process (refer to **Figure 2-1**).

2.2 Internal Involvement

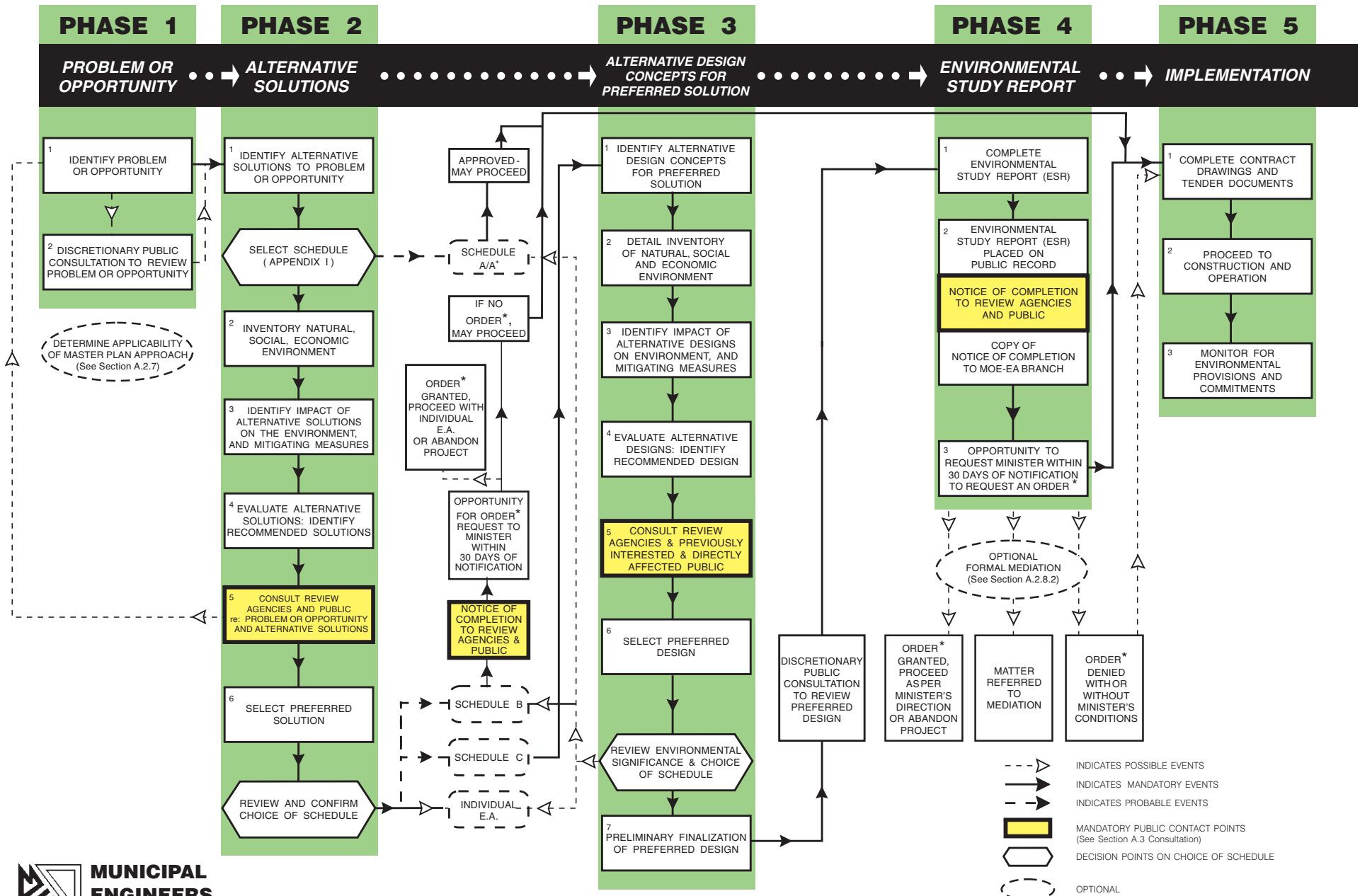
The Project Team was comprised of representatives from the County of Lennox and Addington, Town of Greater Napanee, Loyalist Township and the Townships of Stone Mills and Addington Highlands, and the Consultant (AECOM). General direction of the study was provided by the County with Steering Committee meetings held at “key” points in the process and prior to presenting the study findings to the County Council and members of the public. Those Steering Committee members who provided regular input into the study included:

- Steve Fox, County of Lennox and Addington
- Steve Roberts, County of Lennox and Addington
- Royce Rosenblath, Township of Addington Highlands
- Tanya Rosenblath, Township of Addington Highlands
- David MacPherson, Loyalist Township
- David Thompson, Loyalist Township
- Dave Morgan, Town of Greater Napanee
- Ron Vankoughnet, Town of Greater Napanee
- Mike Garrett, Township of Stone Mills
- Jeff Thompson, Township of Stone Mills
- Vanessa Skelton, AECOM
- Guy Laporte, AECOM

EXHIBIT A.2

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA



2.3 External Involvement

The following external Ministries, Municipalities, Agencies and Authorities, etc. were contacted during the course of the study notifying them of project commencement, information centre dates and requesting their comments. A copy of the relevant project correspondence is included in **Appendix A**.

Federal Departments and Provincial Ministries:

- Fisheries and Oceans Canada;
- Aboriginal Affairs and Northern Development Canada;
- Transport Canada, Ontario Region;
- Correctional Service of Canada, Ontario Regional Headquarters;
- Ministry of Tourism, Culture and Sport;
- Ministry of Natural Resources;
- Ministry of Transportation;
- Ministry of Environment;
- Ministry of Agriculture, Food and Rural Affairs;
- Ministry of Municipal Affairs and Housing; and
- Ministry of Aboriginal Affairs.

Agencies and Authorities:

- Town of Greater Napanee Fire;
- Ontario Provincial Police, Napanee Detachment;
- Kingston, Frontenac Lennox & Addington Public Health;
- City of Kingston;
- The Township of Tyendinaga;
- The Town of Deseronto;
- The Municipality of Tweed;
- The Township of Tudor and Cashel;
- The Township of Carlow/Mayo;
- The Township of Brudenell, Lyndoch, and Raglan;
- The Township of Greater Madawaska;
- The Township of North Frontenac;
- The Township of Central Frontenac;
- The Township of South Frontenac;
- The County of Renfrew;
- The County of Hastings;
- The County of Frontenac;
- Township of Addington Highlands Fire Department;
- Township of Stone Mills, Fire and Emergency Services;
- Loyalist Township Emergency Services;
- Lennox and Addington General Hospital;
- Deseronto Fire Department;
- Lennox and Addington Ambulance Service;
- Kingston Central Ambulance Conservation Authority;
- Limestone District School Board; and
- Algonquin and Lakeshore Catholic District School Board

Utilities:

- Hydro One;
- Lennox Generation Station;
- CN Railway Properties;
- Utilities Kingston;
- Canadian Pacific Railway;
- TransCanada Pipelines Limited;
- Bell; and,
- Union Gas.

2.4 Public Involvement

Throughout the Transportation Study, the public and various interest groups in addition to Provincial Ministries, Municipalities, Agencies and Authorities, have had several opportunities to make comments, identify issues and provide additional information/data relative to the study. A total of four formal contacts with the public were made in conjunction with the preparation of this report. The public correspondence received during the course of the Transportation Study is included in **Appendix A**.

2.4.1 Notice of Study Commencement

The notice of commencement for the Transportation Master Plan project was first issued in June 2013 across a variety of platforms to encourage community engagement:

- | | |
|-----------------------------|----------------------------------|
| • County Website | • Napanee Beaver |
| • Kingston This Week | • EMC- Northeast Edition |
| • Twitter | • Project mailing list |
| • Aboriginal Agencies email | • Aboriginal notification letter |

There were seven written comments received during the time period following the publication of the Notice of Study Commencement.

2.4.2 Public Information Centre No.1

One of the key objectives of the environmental planning process is to provide the public, interested parties and affected agencies with opportunities for meaningful input. In order to achieve this objective, comprehensive public and agency notification of the Public Information Centre (PIC) was undertaken. The notice for the Public Information Centre was issued in September 2013 and was published in the Napanee Beaver, Kingston This Week, Frontenac News, and EMC and posted on the County Website, Facebook and Twitter pages and was sent to the project mailing list and Aboriginal groups.

To accommodate the size of the County of Lennox and Addington, the first Public Information Centre was held in two locations in September 2013. The two meetings were held:

Monday, September 23, 2013
 5:00 PM to 7:00 PM
 Northbrook Lion's Hall
 12328 Highway 41
 Northbrook, ON

Thursday, September 26, 2013
 5:00 PM to 7:00 PM
 Strathcona Paper Centre
 16 McPherson Drive
 Napanee, ON

At the Public Information Centre there was an opportunity to:

- Learn about the study scope and the need for an updated Transportation Master Plan
- Review existing conditions
- Review and comment on proposed alternative solutions
- Ask questions and discuss the project with members of the study team.

Display panels were prepared to aid the explanation of project progress and key issues. The panels included a map of the project area, visuals including graphs and charts to identify County growth projections and transportation study components. The Public Information Centre provided an opportunity for members of the public to view the display material and to discuss the project with County of Lennox and Addington staff and consultant representatives. Sign-in sheets and comment forms were available at the information centre. Attendees were encouraged to provide written comments.

A total of eight people attended first round of consultation, of which four people attended the September 23, 2013 session and four people attended the September 26, 2013 session of Public Information Centre #1. A presentation was given during the Public Information Centre in Napanee which followed the format of the display material. The presentation was not given at the Public Information Centre in Northbrook because the attendees indicated a preference to review the material on the display boards rather than to listen to a presentation.

There were six written comments received during the time period prior to and following the first Public Information Centre.

2.4.3 Public Information Centre No.2

The notice for the Public Information Centre No. 2 was issued in May 2014 and was published in the Napanee Beaver, Kingston This Week, Frontenac News, and EMC and posted on the County Website, Facebook and Twitter pages and was sent to the project mailing list and Aboriginal groups.

To accommodate the size of the County of Lennox and Addington, the second Public Information Centre was held in two locations in June 2014:

Monday, June 16, 2014

5:00 PM to 7:00 PM

Loyalist Township Municipal Office

263 Main Street

Odessa, ON

Wednesday, June 18, 2014

5:00 PM to 7:00 PM

Township of Stone Mills Municipal Office

4504 County Road 4

Centreville, ON

At the Public Information Centre there was an opportunity to review and obtain public input on:

- The Master Plan and consultation process;
- Infrastructure project recommendations;
- Recommended studies;
- Development Charges feasibility; and
- Next steps in the study.

Display panels were prepared to aid the explanation of project progress and key issues. The panels included a map of the project area, visuals including graphs and charts to identify County growth projections and transportation study components.

The Public Information Centre provided an opportunity for members of the public to view the display material and to discuss the project with County of Lennox and Addington staff and consultant representatives. Sign-in sheets and comment forms were available at the information centre. Attendees were encouraged to provide written comments.

A total of eight people attended the second round of consultation, held over two nights in Odessa and Centreville. Comment sheets were made available to participants, and individuals were encouraged to discuss the project with the project team to learn more about the Transportation Master Plan Update, as well as to leave any written comments for the project team to consider. Topics of discussion related to benefits of roundabouts, safety issues at the County Road 10/County Road 1 intersection, and snow removal.

There were seven written comments received during the time period prior to and following the second Public Information Centre.

2.4.4 Notice of Study Completion

Upon County Council approval and report finalization, this document will be made available for public viewing. Notification of the dates and locations where the report will be displayed for public viewing will be by means of newspaper advertisements and mailings to government agencies and interested individuals.

3. County Road Jurisdictional Classification

The evaluation of the jurisdictional classification was undertaken in a number of stages during the course of the study, the details of which were provided to the County and Steering Committee members as separate documents (**Appendix B**). Presented in this section is an overview of the jurisdictional classification review and the proposed County Road system.

3.1 Overview

The need for completing the jurisdictional review was a result of the County and its constituent municipalities desire to address road ownership versus need, usage and function. Specifically, the purpose of this aspect of the study has been to define which roadways should be under the jurisdiction of the County of Lennox and Addington.

The process employed in the jurisdictional review was based on a quantitative analytical approach which allowed for sensitivity testing, consideration of stakeholder opinions and traceability of results. The criteria considered in the evaluation were based on those from the Ontario Good Roads Association (OGRA) Roads Rationalization document. These criteria included the following:

- Connectivity to urban areas;
- Connection to provincial highways or Highway 401;
- Accommodation of commercial vehicles;
- Access across physical barriers;
- Access to public recreation areas;
- Access to adjacent urban centres;
- Posted speed;
- Average annual daily traffic;
- Right-of-way width;
- Existing and future operations;
- Existing road deficiencies;
- Existing and future access requirements;
- Existing and future type of vehicle trips;
- Potential for future growth;
- Connectivity of the road through the County; and
- Importance of the roadway to provide essential transportation service to the community.

3.2 Proposed Changes to Existing County Road System

The following local roads were selected for evaluation:

- Jim Kimmett Blvd: County Rd. 41 - County Rd. 1
- Amherst Dr: County Rd. 6 - County Rd. 24
- Little Creek Rd: County Rd. 2 - County Rd. 9
- South Shore Rd: County Rd. 8 - County Rd. 25
- Richmond Blvd: County Rd. 41 - Camden Rd.
- Camden Rd: Richmond Blvd. - County Rd. 1
- Matawatchan Rd: Buckshot Lake Rd. – County boundary
- Industrial Blvd: County Rd. 41 – County Rd. 1
- Lake Rd: County Rd. 14 – County Rd. 4
- Centreville Rd: County Rd. 41 – County Rd. 4

- Goodyear Rd: County Rd. 41 – County Rd. 11
- Mountain Rd: County Rd. 15 – County boundary
- Deseronto Rd: County Rd. 11 – County Rd. 12

Although Richmond Rd, Industrial Blvd and Jim Kimmett Blvd all met the criteria in the second stage of evaluation, they serve similar needs and functions as current county roads. It is proposed that Jim Kimmett Blvd be changed to County jurisdiction. If this is to occur then consideration should be given to transferring County Road 1 between Jim Kimmett Boulevard and County Rd 41 to the local municipality since both roads serve a similar direction of traffic flow and are in close proximity. The change in road jurisdiction for both Jim Kimmett Boulevard and a section of County Road 1 is dependent on the results of the study for a new road west of County Road 41. The transfers should be reviewed in the context of the results of the study that will decide on a location and design for a new arterial road.

3.3 Monitoring

In theory, all existing County Roads should meet the criteria listed in the Stage 1 and Stage 2 evaluation, otherwise they could be considered for transfer to municipal jurisdiction. The following County Roads have been identified as potential future transfers to the local municipality:

- County Rd. 26 (Jim Snow Dr.): County Rd. 23 – Highway 33
- County Rd. 25: County Rd. 8 – South Shore Rd.
- County Rd. 12: Deseronto Rd. – County Rd. 41
- County Rd. 27: County Rd. 14 – County Rd. 17
- County Rd. 3: County Rd. 41 – Cold Water Rd.
- County Rd. 13: County Rd. 41 – Youngs Rd.

County Roads 12, 25, 26 and 27 were evaluated in 2001 and it was recommended that they be removed from the County Road system. All four roads again did not meet the requirements of the first set of evaluation criteria; therefore they were not evaluated using the second set of criteria. County Roads 3 and 13 were mentioned for evaluation as well. Both roads did not meet the requirements of the first set of evaluation criteria.

Following the review it was deemed unnecessary to change the jurisdiction of the current County Roads. Although the minimum requirements were not met based on the evaluation criteria it was noted that the county road system has evolved based on the needs of Lennox & Addington. The downloading of County roads to local jurisdiction would have significant impact on local budgets.

It is suggested that the County road system be revisited on a five year basis, as major new infrastructure/development occurs within the County, or if significant funding/budgetary elements for the County and its municipalities change. It is also recommended that the County have a policy to define a County Road, which also should include a statement that any additions to the County Road system should meet OGRA criteria. The OGRA criteria would apply to new roads as well as roads affected by developmental growth.

3.4 Conclusion

It is proposed that Jim Kimmett Blvd be changed to County jurisdiction. If this is to occur then consideration should be given to transferring County Road 1 between Jim Kimmett and County Rd 41 to the local municipality since both roads serve a similar direction of traffic flow and are in close proximity. The change in road jurisdiction for both Jim Kimmett Boulevard and a section of County Road 1 is dependent on the results of the study for a new road west of

County Road 41 and the transfers should be reviewed in the context of the results of the study. It was deemed unnecessary to change the jurisdiction of the current County Roads.

It is suggested that the County road system be revisited on a five year basis, as major new infrastructure/development occurs within the County, or if significant funding/budgetary elements for the County and its municipalities change. It is also recommended that the County have a policy to define a County Road, which also should include a statement that any additions to the County Road system should meet OGRA criteria. The OGRA criteria would apply to new roads as well as roads affected by developmental growth.

4. Asset Management

4.1 Road Maintenance and Capital Construction Program

The County undertakes a Roads Needs Study and Bridge Needs Study every two years. These studies identify the current condition of the infrastructure and makes recommendations regarding maintenance and reconstruction. It is recommended to continue updating the Roads Needs Study and the Bridge Needs Study on a regular basis.

4.2 County Road Maintenance

4.2.1 County Road 4

County Road 4 is a concrete road that was constructed in the late 1960's. This road would have been designed for a maximum service life of 50 years. County Road 4 has served for the past 45 years and has reached the end of its useful life. In 2012, AECOM recommended milling the concrete to a depth of 25mm and completing some full depth repairs, grinding, and or padding prior to the placement of 25mm of HL-3 with a PGAC Grade of 64-28 as the preferred cost effective rehabilitation strategy to extend the lifespan of County Road 4. A partial reconstruction with milling of the concrete and an asphalt overlay of the road was begun in 2012 and will continue each year until 2016.

The purpose of the asphalt overlay is to provide a water proof barrier thus slowing down the deterioration of the concrete and improve ridability. The County should be planning for a full reconstruction of County Road 4 in the future after the first application of asphalt overlay has been completed in 2016. **Table 4-1** below provides an evaluation of the alternatives for County Road 4.

Table 4-1. Evaluation of County Road 4 Alternatives

	Alternatives		
	Ongoing Maintenance	Reconstruct the Road	Partial Reconstruction of the Road
Description of Alternatives	Continue program of joint repairs on a section by section basis. This program would be preceded by a crack sealing program and a program of repairing severely deteriorated joints.	Full depth reconstruction, including rubblization of concrete, placement of additional granular material and placement of hot mix asphalt.	Undertake another partial reconstruction in 6 years. A second application may be possible however a geotechnical investigation on the strength of the concrete would have to be performed prior to a recommendation. Remove all loose concrete at joints or pot holes to sound concrete and patch with a medium duty binder asphaltic concrete. Apply an asphalt tack coat and asphalt overlay.
Time until reconstruction	-	10 years	15 years
Cost (2014-2027)	\$ 1,600,0000	\$ 8,800,000	\$ 8,900,000
Recommendation	The recommendation is for a full reconstruction of County Road 4 in 10 years. The current program to mill the concrete and place an asphalt overlay will be monitored for long-term effectiveness after the application. Reconstruction may be deferred or moved forward in the timeline, depending on the effectiveness of the current rehabilitation program.		

4.2.2 County Road 5

The section of County Road 5 between Highway 401 and County Road 2 has both a rural cross-section and a cross-section with a mountable curb. The modification of the existing roadway cross-segment from a rural cross-section to a cross-section with a mountable curb will not have an effect on road capacity or operations.

There is currently a paved shoulder in the rural section of the road and the addition of a mountable curb will allow an asphalt path to be constructed for pedestrians. There is no appreciable difference for pedestrians between an asphalt path and an asphalt shoulder.

In terms of safety, there is no definitive increase or decrease in safety with regard to the addition of a curb on an arterial road. The decision whether to add curbs to the roadway should be based on drainage requirements as there is no compelling reason from a transportation perspective to include curbs on County Road 5.

4.3 Level of Service Guidelines

The recommendations related to the Level of Service (LOS) Standards will be used in the revised Maintenance Agreements between the County and the local municipalities.

4.3.1 Background

The Ontario Municipal Act, 2001, identifies a municipality's obligation to maintain roads in a reasonable state of repair. In November 2002, *Regulation 239/02, Minimum Maintenance Standards for Municipal Highways (MMS)* came into effect. An amendment, Regulation 47/13 came into effect on January 25, 2013, amending all previous regulations.

The Minimum Maintenance Standards do not have to be adopted by a municipal council per se. The regulation is provincial, applies to all municipalities, and is available for municipalities to use as a defense if they have met the standard, and documented it.

The more important issue would be to ensure that a municipality has the appropriate Standard Operating Procedures (SOP's) in place, and that they are followed and documented, rather than trying to reword or parallel the language of the regulation into a document that is municipality-specific.

4.3.2 Analysis and Discussion

The County's Maintenance Agreements were structured to include four schedules appended to the agreement:

- Schedule A identifies the County road system by Road Number, description, and MMS Class,
- Schedule B describes the maintenance standards that the County requires.
- Schedule C are definitions related to Schedule B
- Schedule D is a repetition of Regulation 239/02 Minimum Maintenance Standards for Municipal Highways.

Given the number of changes that have occurred in the MMS over the past years, it is recommended that the MMS in their current form as produced by the province be adopted for those LOS that are included in the MMS. The LOS would be tied directly to the Regulation and change as the Regulation changes.

The LOS document for the County should include only those maintenance standards that are not identified in the MMS.

With respect to the maintenance standards not identified in the MMS, the following should be noted:

Dust: The dust specification references roads under construction as the entire County system is hard top. Since the lower tiers may have to perform this service on an exceptional basis rather than an ongoing service, there should be some consideration to make this a contractor responsibility for a specific construction project or a local municipal responsibility for a temporary condition.

Surface Type: This standard states that if a road is gravel surface over the winter it has to be hardtop by the following July. This could be a contract management issue rather than a service level to be provided by the local municipalities.

Clearances: A number of the clearance items currently identified in the LOS standards will be dealt with in other documents and regulations, particularly for structures and roadside safety. The height of grass in the intersection sight triangle is a maintenance issue which may be covered off in the grass mowing section. Having a table in the LOS document related to clearances creates a risk that inadvertently, the County may create a standard that is lesser than required by other standards or regulations, without sufficient support engineering evaluation to make it defensible. The clearances specifications should be reviewed in conjunction with applicable regulations and potentially be given consideration for removal from the LOS document. There is a potential for conflict and risk exposure with this standard and the LOS for shoulder width.

Roadside Debris: Roadside debris is a valid maintenance service standard. However, the frequency and amounts are difficult to estimate and may vary significantly from year to year or between municipalities.

Shoulder Width: The minimum tolerable standard in the inventory manual is 0.5m. It may be prudent to maintain that level as the LOS standard as it may pose less potential for risk exposure if there is an area that does not meet the standard. There is a potential for conflict and risk exposure with this standard and the LOS for clearances.

Trees: The policy provides for a response time but does not provide for an inspection interval. There should be consideration for an inspection interval.

Lane Width: The definition of lane width for gravel surface roads in the first paragraph is not consistent with the definition of lane width in the Ministry of Transportation of Ontario (MTO) "Inventory Manual for Municipal Roads" (Inventory Manual). This could be a problem if the local municipalities decided to follow this lead. In the Inventory Manual there are two factors that come into play in defining the surface width, and indirectly the lane width, on a gravel surface road; minimum tolerable standard for shoulders and the maximum surface width for a class of road. For the County, this is a moot point as the roads will only have a gravel surface during construction.

The lane widths shown appear to conform to the Ontario Geometric Design Standards.

This item is more of a design standard that would be reviewed at the time of reconstruction or major rehabilitation rather than a maintenance standard to which the local municipalities would have to conform. It should be removed from the agreement.

Gradient: The standards noted appear to conform to those noted in the Inventory Manual and the Ontario Geometric Design standards. This item is more of a design standard that would be reviewed at the time of reconstruction or major rehabilitation rather than a maintenance standard to which the local municipalities would have to conform. It should be removed from the agreement.

Illumination: This LOS appears to be a mix of standard and policy. From the content it appears that the installation of illumination would be the County's decision and perhaps not really a maintenance LOS. For that reason the County should continue with the item as a separate policy and should only be included in the maintenance agreement as per the MMS.

4.3.3 Conclusion

It is recommended that the following points be considered for inclusion in revisions to the Schedules of the Maintenance Agreements:

- The Asset ID data field should be added to the table in Schedule A and the limit descriptions should be directly extracted from the roads database.
- The MMS in their current form, as produced by the province, should be adopted for those LOS that are included in the MMS. The regulation should be inserted in the format obtained directly from the province and not re-written.
- The height of grass in the intersection sight triangle is a maintenance issue which may be covered off in the grass mowing section.
- The clearances specifications should be reviewed in conjunction with applicable regulations and potentially be given consideration for removal from the LOS document.
- Consideration should be given to making the minimum shoulder width a standard 0.5m.
- There should be consideration for an inspection interval for the trees policy.
- The County should consider continuing the LOS for Illumination as a policy but it should not be included in the maintenance agreement.
- The lane width standard is not a maintenance standard and should be removed from the agreement.
- The gradient standard is not a maintenance standard and should be removed from the agreement.

4.4 Maintenance Agreements

4.4.1 Compensation Adjustments

Background

The County manages the delivery of maintenance and operational services and coordinates the requisite documentation required by Regulation 239/02, as amended, through a contractual arrangement with the each of the lower tier municipalities. This service delivery arrangement was originally developed in the late 1990's at the time when the County was being restructured. At that time and until the early 2000's the formulae that the Ministry of Transportation had once used to develop a compensation rate for services were used by the County to develop the cost allocations between the County and the local municipalities.

In subsequent years, the annual increases were determined by the CPI index. More recently, the rates have been adjusted annually by factors that include salaries, diesel fuel costs, salt and other program costs. The municipalities are compensated on a monthly basis, based on the municipality and the number of centreline kilometres of County road within the municipality.

Analysis and Discussion

The local municipalities believed that the compensation that they had been receiving has not been adequate for the services delivered. This argument was supported by documentation subsequently provided by the County that indicated both the compensation and reported expenses. The reported expenses were \$214,321 above the compensation. The most current reporting was for 2012. **Table 4-2** identifies the compensation versus the reported costs to deliver the services.

Table 4-2. 2012 Maintenance Allocation and Shortfall by Municipality

SERVICE AREA	Addington Highlands	Greater Napanee	Loyalist	Stone Mills	Total
Winter control	148,422	648,690	258,764	542,104	1,597,980
Bridges & culverts maintenance	851	27,907	24,519	11,455	64,732
Hardtop maintenance	3,739	139,855	49,376	139,990	332,960
Roadside maintenance and traffic control	39,238	136,371	179,054	153,878	508,541
Total Reported Costs	192,250	952,823	511,713	847,427	2,504,213
2012 compensation	181,366	789,416	509,174	809,936	2,289,892
Reported Shortfall	10,884	163,407	2,539	37,491	214,321

There was limited detailed information available from the County other than a high level summary in the four main maintenance areas: Winter Control, Bridges and Culverts, Hardtop Maintenance and Roadside Maintenance and Traffic Control. The summary information provided high level cost breakdowns in the four service delivery areas. The apportionment of the services provided is shown in **Table 4-3**.

Table 4-3. Service Area Cost Apportionment

Cost Apportionment Factors (Average)	
Winter Control	67%
Bridges & Culverts Maintenance	2%
Hardtop Maintenance	12%
Roadside Maintenance and Traffic control	19%
Total Factors	100%

In a general discussion with the Steering Committee, it was determined that the municipal equipment rates used in the calculation of the maintenance allocations may be lower than the rate which represents the full capital depreciation, maintenance and fuel costs.

The municipal equipment rates were reviewed with respect to the Ministry of Transportation 127 rates. The analysis of that difference was then used to develop a methodology for adjusting the compensation rates to the municipalities. It was assumed that 50% of the costs in each service area were for equipment.

The adjusted compensation rates were calculated and applied to the 2012 compensation amounts. The revised compensation amounts calculated using the adjusted rates provided an increase of \$306,846, which is a surplus to the municipalities of \$92,525 when compared to the reported cost amount. The results of this exercise indicate that the rate adjustment requires further detailed information in order to more accurately represent actual costs.

Recommendations

The following options were considered with respect to payment adjustment revisions to the Maintenance Agreements:

- Do Nothing. This option would not be satisfactory to the local municipalities.
- The annual amounts could be adjusted by the average over-expenditure based on information from the last reported year. This is not a defensible approach and would only satisfy a very immediate need. In the longer term the same issues would develop.
- A pay adjustment formula could be re-developed based on a detailed analysis of municipal expenditures. This offers the most defensible basis to move forward on a continuing basis.

The third option requires more detailed information and hence more effort to update the agreements to a level of detail matching expectations of the County and the municipalities. This is the recommended option.

4.4.2 Maintenance Scope

Table 4-4 provides recommendations and suggestions that describe the scope and responsibilities of services that are to be provided. Regulation 239/02, as amended, provides the guidance for the layout of the table. The items listed under MMS requirements are as per the regulation and have the same definition as the regulation.

Table 4-4. Maintenance Scope of Responsibilities

Service	Responsibilities, Requirements and Suggested Scope Limitations
MMS Requirements	
Traffic Counting	County Responsibility
MMS Class Determination	County Responsibility
Patrolling/ weather monitoring	Local Municipality responsibility Frequency per the MMS Documentation required to support
Snow Accumulation	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support
Ice Formation	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support
Potholes on Paved Surface of Road	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support See Hardtop Maintenance Section for limitations within base allocation
Potholes on a Non Paved Surface of Roadway	Non paved surfaces will typically be roads under construction and a contractor responsibility or a local municipal responsibility on a temporary basis
Potholes on a Paved or Non-Paved Surface of a Shoulder	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support See Hardtop Maintenance Section for limitations within base allocation
Shoulder Drop-offs	Local Municipality responsibility

Service	Responsibilities, Requirements and Suggested Scope Limitations
	Frequency/Response Time per MMS Documentation required to support See Hardtop Maintenance Section for limitations within base allocation
Cracks >= 5 cm wide x 5 cm deep	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support See Hardtop Maintenance Section for limitations within base allocation
Debris (on the road)	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support
Luminaires	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support See Illumination Maintenance Section for limitations within base allocation
Signs	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support See Safety Devices Maintenance Section for limitations within base allocation
Regulatory or Warning Signs	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support See Safety Devices Maintenance Section for limitations within base allocation
Traffic Control Signal Systems	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support See Safety Devices Maintenance Section for limitations within base allocation
Bridge Deck Spalls	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support See Bridges and Culverts Maintenance Section for limitations within base allocation
Road Surface Discontinuities	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support See Hardtop Maintenance Section for limitations within base allocation
Bridge Deck Discontinuity	Local Municipality responsibility Frequency/Response Time per MMS Documentation required to support See Bridges and Culverts Maintenance Section for limitations

Service	Responsibilities, Requirements and Suggested Scope Limitations
	within base allocation
Sidewalk Discontinuity	Not included in agreement. Sidewalks are owned by the lower tier and are a lower tier responsibility.
Agreement Requirements and Limitations	
Bridges and Culverts	
Obstruction removals	As required
Deck Cleaning including Drains	Once per year
Minor Concrete Patching	Local Municipality responsibility To include up to 3 m ² per structure per year Repair to be appropriate concrete materials, not cold patch
Hand and Guide Rail Upkeep and Repair	See section on safety devices
Erosion Control	As required. Up to 10t of aggregate meeting OPSS 1004 requirements per structure
Drainage Works including Ditches, Storm Sewers, Catchbasins and Manholes	
Catch Basin Cleaning	Once every 2 years
Sewer Flushing and Video Inspection	Once every 10 years
Ditch Vegetation Control (brushing)	Once every 5 years
Obstruction removals	As required
Local ditch regrading and reshaping	As required to provide positive flow to an outlet. Limited to 50m at any single location. Additional length at additional cost
Catch Basin and Manhole re-bricking	As required Limited to 10 unit per year Additional units at additional cost
Roadside	
Grass mowing	In urban areas, only those boulevard areas that are adjacent to properties that do front onto the County road In rural areas grass shall be mowed twice per year; spring and fall First pass 4m wide, second pass 2m wide
Weed control	Herbicide use and unwanted vegetation control to conform to provincial requirements for pesticide use
Brushing and Vegetation Control	Brush obscuring signs shall be removed as required Brush around structures and guide rail shall be removed as required
Debris on the shoulder	Shoulder not required by MMS – service standard same as roads
Debris and litter pickup-Roadside	Local municipality responsibility To include larger objects that are visible from a vehicle
Stability and erosion control and repair	Repair at additional cost Normal/typical erosion is included in shoulder maintenance Intended to cover erosion from extreme weather events
Hardtop Maintenance	
Patch and Joint repairs - Concrete	Repairs limited to 3 joints per km
Patch Repairs – Hot Mix or Surface Treatment	Repairs limited to 350 m ² /km Spot gravel additions limited to 20m sections-2 per km

Service	Responsibilities, Requirements and Suggested Scope Limitations
Curb and Gutter repair	Repairs limited to 10 sections per km, 1m or less in length
Surface Sweeping	Once per year on rural roads Twice per year on urban roads
Shoulder Regrading	Minimum 2 times/year
Pavement Markings	Once per year to OTM Book 11 standards Additional painting at additional cost
Debris on Road	Per MMS As required
Surface Treatment	Not included in maintenance agreements
Crack Sealing	Cracks that meet or exceed trigger in MMS are a local municipality responsibility Normal Maintenance Crack Sealing is not Included in maintenance agreements
Road Surface Discontinuity- Concrete	Repairs limited to 3 instances per km Not additional to concrete joint repairs To be reported to the County
Road Surface Discontinuity- Flexible	Repairs limited to 3 instances per km To be reported to the County
Winter Control	
Plowing, Sanding, Salting	Per MMS. If annual effort varies by +/- 5% then payment provided or reduction given
Culvert Thawing and Clearing	As required
Safety Devices	
Traffic Signals	Per MMS for inspections and testing. Bulb replacement included in maintenance fee. Other deficiencies at additional cost
Beacons	Per MMS for inspections. Bulb replacement included in maintenance fee. Other deficiencies at additional cost
Signs (Regulatory, Advisory, Direction, Information)	Per MMS for inspections and testing (retro-reflectivity) Replacement included in maintenance costs
Traffic Control Devices	Per MMS
Guiderails	Limited to first \$10,000 per year including guiderail and structures Not to include damage caused by municipal equipment
Street Light Illumination	Local municipality responsible for work that may be required per MMS i.e. bulb replacements etc. County responsible for policy administration for additional pole installation or general illumination requirements
Additional Service Areas	
Dust Control	Contractor responsibility on construction projects or local municipal responsibility on a temporary basis
Surface Type	County Responsibility
Clearances	County Responsibility to correct Local Municipality responsibility to notify County of any potential non-compliance issues
Roadside Debris	See Debris and Litter pick-up - Roadside
Shoulder width	County Responsibility

Service	Responsibilities, Requirements and Suggested Scope Limitations
Trees	Dead trees shall be removed within one year Broken limbs with a potential to fall on the road or cause property damage shall be removed asap
Lane Width	County Responsibility
Road Gradient	County Responsibility

5. Existing Transportation Network

The existing transportation network through the County of Lennox and Addington was reviewed over the course of this study. A description of the existing transportation conditions in the County of Lennox and Addington is provided in this section. The evaluation of needs and the recommendations are discussed in subsequent sections. (Section 6 - Section 10)

5.1 Data Collection

The County of Lennox and Addington provided background information for this study, including traffic volume and collision data, County policies, traffic impact studies for new developments, road studies and County maps.

The County collects traffic data at 158 locations along their road network, and calculates the annual average daily traffic (AADT) with this data. A map of all the counting stations is provided in **Figure 5-1**.



▲ AADT Count Stations (2012) - - - - - Township_Boundary
— Roads

FIGURE 5-1
County of Lennox and Addington
Count Stations



5.2 Road Network

5.2.1 Functional Classification

Roads under the jurisdiction of the County of Lennox and Addington have been classified into the following categories according to their predominant functions.

Major Arterial Roads

Major arterial roads are roads of two or more traffic lanes. Major arterial roads are designed to collect and carry large volumes of traffic at relatively high operating speeds to and from major traffic generating sectors. To facilitate this function, direct access to abutting properties will generally be prohibited.

Rural Arterial Roads

Rural arterial roads are roads of two or more traffic lanes. Rural arterial roads are designed to collect and carry high volumes of traffic, at relatively high operating speeds to Provincial Highways and major arterial roads and/or to distribute traffic to collector and local roads. New direct entrances to rural arterial roads will generally be discouraged; however, limited access to abutting properties may be permitted if the spacing criteria set out in this policy can be met under certain circumstances.

Rural Collector Roads

Rural collector roads are roads of two or more traffic lanes. Rural collector roads are designed to collect and distribute traffic at moderate to relatively high operating speeds to and from local roads and arterial roads. Rural collector roads can tolerate limited direct access to adjacent properties.

Urban Arterial Roads

Urban arterial roads are roads of two or more traffic lanes. Such roads are designed to carry relatively high volumes and provide for movement between principal traffic generators and the interconnection of Provincial Highways, major and rural arterial roads. New direct entrances onto an urban arterial road should generally be discouraged and only permitted where no alternative means of access is available or where the entrance would provide for the infilling of development.

Connecting Link

Roads classified as 'connecting link' shall conform to the specifications set out for urban arterial roads.

Urban Collector Roads

Urban collector roads are existing roads of two or more traffic lanes. Urban collector roads are designed to collect and distribute traffic at speeds of 50 to 60 km/h to and from local roads and arterial roads and further provide for the interconnection of rural, arterial and collector roads. Direct access to abutting properties is generally permitted.

5.2.2 Recommendations

Based on the review, the majority of classifications identified in the County Road System Classification (see **Appendix C**) are appropriate. The following changes to the functional classification are suggested.

The functional classifications of 'connecting link' and 'urban collector' are similar, making it redundant to use both classifications. Therefore, it is recommended that the following two County Roads change functional classification from 'connecting link' to 'urban collector':

- County Road 2 through the urban area of Greater Napanee (Hessford Street to Bridge Street)
- County Road 41 from Richmond Boulevard to County Road 2

Roads classified as 'rural arterial' allow more entrances and access points than those classified as 'major arterial'. In order to support development, it is recommended that the following roads change functional classification from 'major arterial' to 'rural arterial':

- County Road 4 – south of Highway 401 to Highway 33
- County Road 6 – south of Highway 401 to Shane Street

The County Road System Classification should be revised to include the above changes.

5.3 Existing Roadway Operations

The current roadway operations were assessed using a volume to capacity (v/c) ratio calculation. As the v/c ratio approaches 1.00 there is an increased probability of delays and queuing. Once the v/c ratio exceeds 1.00, excessive delays and queues are expected. A road with a v/c ratio less than 0.50 experiences free flowing traffic conditions.

We identified all counting stations which had at least one report of the Annual Average Daily Traffic (AADT) between 2005 and 2012 of greater than 4000. A volume of 4000 vehicles per day was used as the traffic volume threshold because roads with less than this volume will have a v/c ratio of less than 0.5 and will not exhibit capacity problems. Thirty-two counting stations with an AADT greater than 4000 were carried forward in our analysis. Additionally, we carried forward the counting stations 96 and 97 near the County Road 23 and County Road 24 intersection. We included these locations because of known residential and commercial development to the southwest of the intersection. We also created two new counting stations on Highway 33 to the east and west of County Road 6 to determine the impacts of the new developments in Amherstview on the commuter corridor.

The majority of County roadways under existing conditions are operating with a v/c ratio less than 0.50 during the peak hour. The two roadways which are operating with a v/c ratio greater than or equal to 0.50 during the peak hour are:

- County Road 41 (Centre Street) in Greater Napanee between Advance Avenue and County Road 2 (Dundas Street) with a v/c ratio of 0.72
- County Road 41 (Centre Street northbound only) in Greater Napanee between Industrial Boulevard and Advance Avenue with a v/c ratio of 0.50

These sections of roadway are both part of the commuter route between the Town of Greater Napanee and Highway 401. The section of County Road 41 between Advance Avenue and County Road 2 is within the urban area of Greater Napanee and a v/c ratio greater than 0.7 during the peak hour is not unusual for urban areas. An assessment of need and the related recommendations are provided in Section 6 – Section 10.

5.4 Components of the Active Transportation System

This section describes the existing active transportation infrastructure. Assessment of need and recommendations can be found in Section 6 – Section 10 of this report.

5.4.1 Paved Shoulder Trail Program

The County Paved Shoulder Trails program will be entering its eighth year of operation in 2014. Resulting from recommendations in the County's 2001 Transportation Master Plan, the Program was established in 2006 to develop a system of connecting trails using paved shoulders. The concept of paved shoulders was suggested to:

- provide better accommodation for pedestrians, cyclists, joggers
- provide a wider paved surface to better accommodate wide agricultural equipment and a recovery area for errant vehicles to regain control
- reduce vehicle emissions and energy consumption
- enhance tourism/recreation opportunities and encourage economic growth
- preserve pavement edge and reduce shoulder maintenance

The network of paved shoulders is intended to provide a stable and safe roadside for pedestrians, joggers, cyclists, and other non-motorized means of active transportation. The network has not been promoted specifically for cycling. The network was also developed as an initiative to promote tourism, economic development, recreation and healthy lifestyle activities. There are twelve distinct routes with a total length of 576 km. Approximately forty percent of the County roads now have paved shoulders. Each route includes attractions and points of interest or unique geography and connections to regional trails such as the Trans Canada Trail, Waterfront Trail and Cataraqui Trail. There is a trailhead map for each route and users are guided by route signs along the way.

5.4.2 Sidewalks and other Pedestrian Infrastructure

Although sidewalks are the responsibility of the local municipality, some of the related infrastructure is under the jurisdiction of the County. The County has responsibility for the items listed below and a description of the typical criteria for installation is provided. The following infrastructure is present at intersections within the County.

Pedestrian Signal Heads

Pedestrian signal heads provide a safe crossing facility for pedestrians at signalised intersections. The *Ontario Traffic Manual - Book 12* has a list of conditions under which pedestrian signal heads should be installed in conjunction with vehicular traffic control signals. These conditions include:

- When a traffic signal is installed under the pedestrian justification;
- When pedestrians and vehicles are moving during the same phase and pedestrian clearance intervals are needed to minimize vehicle-pedestrian conflicts;
- When an exclusive phase is provided or made available for pedestrian movement in one or more directions with all vehicles being stopped;
- When heavy vehicular turning movements require a separate pedestrian phase for the protection and convenience of a pedestrian;
- When pedestrian movement on one side of an intersection is permitted while traffic from only one approach is moving;
- When an intersection is so large and complicated or a road so wide that vehicular signals would not adequately serve pedestrians;

- When the minimum green intervals for vehicles at intersections with traffic-actuated controls are less than the minimum crossing time for pedestrians and pedestrian actuation is necessary (normally by pushbutton);
- When complex phasing operation would tend to confuse pedestrians guided only by traffic signal indications;
- When traffic signal heads using arrows are used;
- When pedestrians cross only part of the road, to or from an island, during a particular phase; and
- When the traffic signal heads fall outside of the normal vision of pedestrians, for example, at “T” intersections, on one-way streets, or at large intersections.

For more information regarding the installation of pedestrian signal heads refer to *Ontario Traffic Manual – Book 12, Section 5.7*.

Curb Ramps

Curb ramps improve accessibility for crossing activity for all pedestrians. They are typically provided in urban areas where pedestrian activity exists. Curb ramps are not intended to imply right-of-way, but rather improve accessibility and safety where pedestrian activity has been demonstrated, or is anticipated”.

In addition, curb ramps provide access for people on wheelchairs or scooters at crossings where there is an elevation change between the sidewalk and the street level crossing.

Accessible Pedestrian Signals

According to Ontario Regulation 413/12, Section 80.28 (1) of the Accessibility for Ontarians with Disabilities Act (AODA), “Where new pedestrian signals are being installed or existing pedestrian signals are being replaced at a pedestrian crossover, they must be accessible pedestrian signals”.

The accessible pedestrian signals must include such items as distinct locator tones and walk indicator tones, tactile arrows that align with the direction of crossing, manual and automatic activation features, and both audible and vibro-tactile walk indicators.

6. Needs Assessment

The context for the transportation master plan is defined by the population projections for the horizon years in 2024 and 2034. Travel demand projections are based on existing travel patterns and their relationship to current and future population levels. This section describes the rationale for managing vehicular travel demand and outlines the capacity needs assessment corresponding to the planning horizons. The recommendations for addressing the identified needs are provided in subsequent sections.

6.1 Population Growth

Population growth in the County will result in increases in traffic. **Table 6-1** and **Table 6-2** display the population growth in Lennox and Addington from 1996 to 2011. Population statistics are taken from the Statistics Canada Census data.

Table 6-1: Population Statistics in Lennox and Addington (1996 - 2011)

	Township of Addington Highlands	Town of Greater Napanee	Loyalist Township	Township of Stone Mills	County of Lennox & Addington
Population in 2011	2,532	15,511	16,221	7,560	41,824
Population in 2006	2,512	15,400	15,062	7,568	40,542
Population in 2001	2,402	15,132	14,590	7,337	39,461
Population in 1996	2,429	14,994	14,551	7,229	39,203
'06 to '11 pop change	0.8%	0.7%	7.7%	-0.1%	3.2%
'01 to '06 pop change	4.6%	1.8%	3.2%	3.1%	2.7%
'96 to '01 pop change	-1.1%	0.9%	0.3%	1.4%	0.6%
Total private dwellings (2011)	2,067	6,885	6,174	3,169	18,295
Population density per sq. km	1.9	33.6	47.6	10.7	14.7
Land area (sq. km)	1,330	461	341	709	2,841

Table 6-2. Population Growth in Lennox and Addington (1996 – 2011)

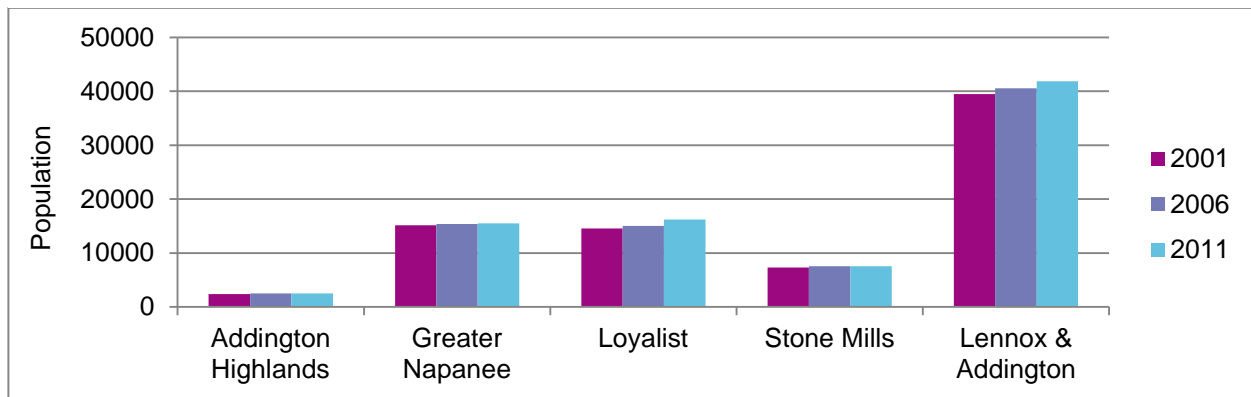
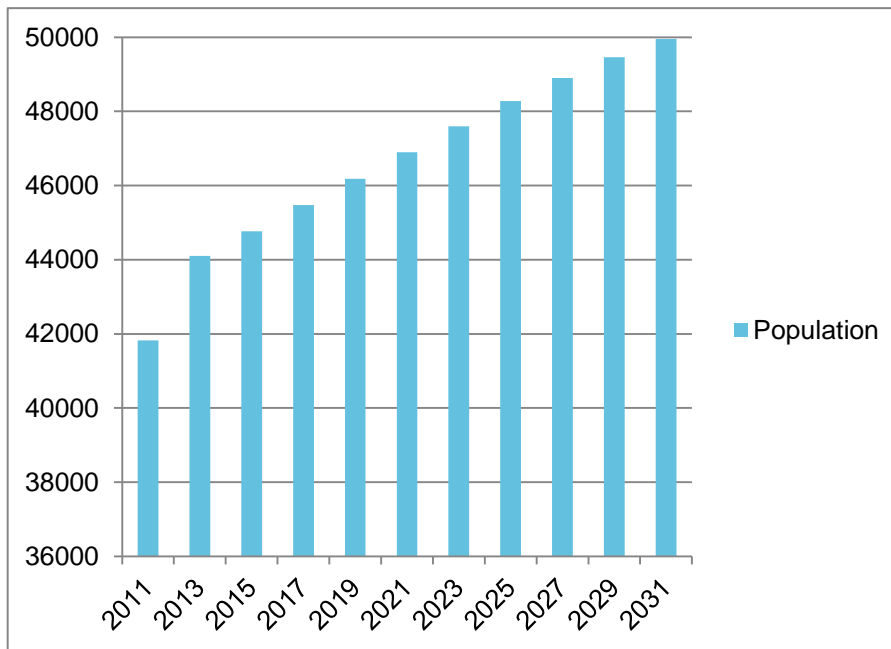


Table 6-3 displays the population projections for the County of Lennox and Addington to 2031. Population statistics are from Statistics Canada estimates (2007) and from the Ontario Ministry of Finance.

Table 6-3. Lennox and Addington Population Projections



6.2 Traffic Growth

The annual traffic growth rates were calculated at all counting stations on County Roads with at least one observed AADT greater than 4,000 in the past eight years of available data (2005 through 2012). The base growth rate was calculated by applying a linear trendline derived from all eight years of available AADT.

To account for future travel demands generated by known residential development, the annual growth rates were adjusted based on the estimated number of trips generated by the developments. Known developments included in the adjusted growth rates were:

- Centre Street Development, Town of Greater Napanee
- Lakeview Ponds Subdivision, Loyalist Township
- Henderson Quarry Site Development, Loyalist Township
- Bridge Street Subdivision, Town of Greater Napanee
- Odessa West Subdivision, Loyalist Township
- Loyalist East Business Park, Loyalist Township

A comprehensive listing of the growth rates applied to the 2024 and 2034 planning horizons is provided in **Appendix D**.

It is recommended that the growth rates be recalculated and revised every 10 years as part of the Transportation Plan update.

6.3 Roadway Operations

In order to determine the road network needs, a review of current and long term travel demands on the County road system was undertaken. An analysis of the existing and future operating characteristics helped determine the locations where measures were required to address deficiencies. Recommendations are provided in subsequent sections of the report.

6.3.1 Current Conditions

The majority of County roadways under existing conditions are operating with a v/c ratio less than 0.50 during the peak hour of traffic flow. The two roadways which are operating with a v/c ratio greater than or equal to 0.50 are:

- County Road 41 (Centre Street) in Greater Napanee between Advance Avenue and County Road 2 (Dundas Street) with a v/c ratio of 0.72
- County Road 41 (Centre Street northbound only) in Greater Napanee between Industrial Boulevard and Advance Avenue with a v/c ratio of 0.50

These sections of roadway are both part of the commuter route between the Town of Greater Napanee and Highway 401. The section of County Road 41 between Advance Avenue and County Road 2 is within the urban area of Greater Napanee and a v/c ratio greater than 0.7 is not unusual for urban areas during the peak hour of traffic flow.

6.3.2 2024 Planning Horizons

There are eleven roadways operating in the 2024 planning horizon with a v/c ratio greater than 0.50 during the peak hour of traffic flow. However, the majority of County roadways are operating with a v/c ratio less than 0.60. The two roadways which will be operating with a v/c ratio greater than or equal to 0.60 are:

- Counting Station 132: County Road 41 (Centre Street North) in Greater Napanee between Advance Avenue and Dundas Street with a v/c ratio of 0.90
- Counting Station 18: County Road 6 in Loyalist Township between Taylor Kidd Boulevard and Amherst Drive with a v/c ratio of 0.60

Volumes at counting station 18 are expected to increase due to the Lakeview Pond development in Amherstview but the roadway is expected to continue to operate well below capacity.

A review of the existing and projected travel demands along County Road 41 (Centre St) indicate that that the existing County and local municipal road system will not be able to accommodate long term travel demands associated with future growth in the western parts of Greater Napanee. County Road 41 at the location of counting station 132 is expected to be approaching capacity at the 2024 planning horizon. The typical functional capacity of a roadway is in the range of 80% of the total capacity. County Road 41 is expected to reach 90% of its total capacity by 2024 indicating that there is a need for additional road capacity. The alternative solutions for addressing this need are discussed in section 7.

6.3.3 2034 Planning Horizons

The same eleven roadways as in the 2024 planning horizon are operating with a v/c ratio greater than 0.50 in the 2034 planning horizon. Seven of these eleven roadways are operating with a v/c ratio greater than 0.60. However, only two roadways will be operating with a v/c ratio greater than 0.70, they are:

- Counting Station 132: County Road 41(Centre Street North) in Greater Napanee between Advance Avenue and Dundas Street with a v/c ratio of 1.00
- Counting Station 18: County Road 6 in Loyalist Township between Taylor Kidd Boulevard and Amherst Drive with a v/c ratio of 0.76

Although County Road 6 will have a v/c ratio approaching the functional capacity limit, there is still expected to be reserve capacity sufficient to handle the traffic demands.

The capacity issue along County Road 41 that was identified at the 2024 time horizon will become worse as traffic increases between 2024 and 2034. With a v/c ratio of 1.00, the roadway is virtually at capacity in the peak hour of traffic demand. Additional roadway capacity to address this need is required. The alternative solutions for addressing this need are discussed in section 7.

6.3.4 Conclusion

The majority of County road network has reserve capacity at all counting station locations. If the traffic growth rate continues to be stable, the road network will continue to operate with reserve capacity in the 10-year and 20-year planning horizons. The known residential and commercial developments will increase traffic volumes and are expected to cause a capacity deficiency along County Road 41 in Greater Napanee. Additional roadway capacity will be required to alleviate the expected congestion along County Road 41. The alternative solutions for addressing this need are discussed in section 7.

6.4 Intersection Operations

An analysis of traffic operations at key County intersections was completed using the Synchro 8 traffic software. A safety review was completed separately from the operational analysis. The intersections reviewed in the operational analysis were selected considering existing vehicle volumes, areas where significant growth in traffic demand is anticipated and past collision experience. Existing traffic operations for 2014 were reviewed, as were future traffic operations in horizon years. The intersections reviewed were:

Town of Greater Napanee

County Road 1 (Bridge Street/Camden Road) at County Road 2 (Dundas Street)
 County Road 1 (Belleville Road) at County Road 10 (Deseronto Road) - unsignalised
 County Road 41 (Centre Street) at County Road 1 (Bridge Street) - signalised
 County Road 41 (Centre Street) at County Road 2 (Dundas Street) - signalised
 County Road 41 (Centre Street) at Jim Kimmett Boulevard/Richmond Boulevard – signalised
 County Road 8 at County Road 9 (River Road) - signalised

Loyalist Township

County Road 2 (Main Street) at County Road 6 (Wilton Road) – signalised
 County Road 2 at Potter Drive - unsignalised
 County Road 6 at County Road 23 (Taylor-Kidd Boulevard) - unsignalised
 County Road 23 (Taylor-Kidd Boulevard) at County Road 24 (Coronation Boulevard) - unsignalised

The assessment of the intersection operations was based on the most recent peak hour volumes obtained from the County as well as expected volumes in future years.

The level of service (LOS) criteria noted in **Table 6-4** was used to assess the intersection operations. A volume to capacity ratio of 0.9, which corresponds to a Level of Service 'E', was considered critical and a location where mitigation is required.

Table 6-4. Level of Service Criteria

Level of Service	Volume to Capacity Ratio (v/c)	Description
LOS A	0.0 - 0.59	At this level of service, vehicles rarely wait longer than one red indication to clear the intersection, turning movements are made easily, and the drivers are not obstructed by other vehicles.
LOS B	0.6 - 0.69	At this level of service, drivers will often have to yield to opposing traffic before making turns, and will begin to feel somewhat restricted within groups of vehicles approaching an intersection.
LOS C	0.7 to 0.79	At this level of service, the flow of traffic is stable. Drivers will have to yield to opposing traffic before making left turns, and may occasionally have to wait longer than one traffic signal cycle to clear the intersection. Short queues may develop for a few cycles.
LOS D	0.8 to 0.89	At this level of service, the motorist experiences increasing restriction and instability of traffic flow. There are substantial delays to approaching vehicles during short peaks within the peak period, and it becomes difficult to find gaps in traffic to complete left turns.
LOS E	0.9 to 0.99	At this level of service, capacity is reached and the flow of traffic is not stable. There are frequent queues of vehicles approaching intersections and delays to vehicles may extend to several signal cycles.
LOS F	Greater than 1.0	At this level, capacity is exceeded. There are persistent long queues of vehicles waiting on all approaches to the intersection and vehicles will often have to wait numerous signal cycles to clear the intersection.

Source: Transportation Research Board, *Highway Capacity Manual, Special Report 209* (Washington, D.C., 1994).

6.4.1 County Road 1 (Belleville Road) at County Road 10 (Deseronto Road)

The intersection of County Road 10 and County Road 1 is currently two-way stop controlled on the north and south approaches of County Road 10, while on County Road 1 there is no traffic control for the east-west direction.

The County provided traffic volume data at the intersection in the format of turning movement counts for July 25, 2013 between 15:30 and 17:30.

An annual growth rate of 2.07% was applied to the existing traffic volumes to estimate the PM peak hour traffic volumes for 2024 and 2034. The traffic operational analysis results indicate that there are currently no operational issues at the intersection of County Road 1 / County Road 10 and there is not expected to be operational issues in 2024 or 2034. A safety review at this intersection was also undertaken and the results are discussed in section 6.5.

Table 6-5. Existing and Future Traffic Operations - County Road 1 and County Road 10

Intersection	Peak Hour	2013			2024			2034		
		v/c ratio	Delay (s)	Critical Movement	v/c ratio	Delay (s)	Critical Movement	v/c ratio	Delay (s)	Critical Movement
CR1 / CR10	PM	0.16	13.1	-	0.23	15.2	-	0.34	19.3	-

Critical movements are turning movements with a v/c ratio greater than 0.90.

6.4.2 County Road 41 (Centre Street) at County Road 2 (Dundas Street)

The traffic signal at the intersection of County Road 41 and County Road 2 does not have coordinated traffic signal timing with the traffic signal at the adjacent intersection of County Road 41 and County Road 1. Coordinated traffic signals could improve the delays for the southbound movements. Traffic growth from the Napanee School TIS and the Bridge Street Subdivision was applied to the traffic volumes for the AM and PM peak hours at the 2024 and 2034 horizon years.

Table 6-6. Existing and Future Traffic Operations - County Road 41 and County Road 2

Intersection	Peak Hour	2013			2024			2034		
		v/c ratio	Delay (s)	Critical Movement	v/c ratio	Delay (s)	Critical Movement	v/c ratio	Delay (s)	Critical Movement
CR41 / CR2	AM	0.37	15.8	-	0.57	23.9	-	0.60	24.3	-
	PM	0.54	18.9	-	0.79	24.7	-	0.83	26.2	-

Critical movements are turning movements with a v/c ratio greater than 0.90.

6.4.3 County Road 41 at Jim Kimmett Boulevard / Richmond Boulevard

The intersection of County Road 41 and Jim Kimmett Boulevard was analyzed using Synchro version 8, with the HCM2000 methodology. The analysis assumed the existing signal timing and lane configurations for the existing conditions and future horizons. The v/c ratio and delay results of the analysis are summarized in the **Table 6-7**.

Table 6-7. Existing and Future Traffic Operations - County Road 41 and Jim Kimmett Boulevard

Intersection	Peak Hour	2013			2024			2034		
		v/c ratio	Delay (s)	Critical Movement	v/c ratio	Delay (s)	Critical Movement	v/c ratio	Delay (s)	Critical Movement
CR41 / Jim Kimmett	AM	0.33	13.0	-	0.39	14.4	-	0.39	14.4	-
	PM	0.54	19.8	-	0.59	22.1	-	0.59	23.0	-

Critical movements are turning movements with a v/c ratio greater than 0.90.

Currently, this intersection is operating with reserve capacity since the intersection v/c ratio is not approaching 0.90. The average vehicle delay at this intersection is less than 25s and there are no critical turning movements. The background growth for this intersection is 0%. Therefore, the only growth projected in the 10-year and 20-year planning horizons is from new development. This intersection is expected to continue operating with reserve capacity in both the AM and PM peak hours in the 10-year and 20-year planning horizons.

6.4.4 County Road 1 (Bridge Street/Camden Road) at County Road 2 (Dundas Street)

The current intersection at County Road 1 and Alma Street features two offset T-intersections. The eastbound and westbound approaches on County Road 1 have STOP signs as does Alma Street while the northbound approach is uncontrolled. The existing layout of these intersections is shown in **Figure 6-1**.



Figure 6-1. County Road 1, County Road 2, Alma Street Layout

There is a 30 metre section of roadway connecting County Road 1 and County Road 2. The intersection of this road and County Road 2 is controlled by traffic signals. The east approach features a shared through/right turn lane, the west approach has one through lane and one left turn lane, and the north approach has one shared right turn/left turn lane.

There are no capacity or delay problems at the signalised intersection, however the unconventional layout of the two stop controlled intersections may create confusion regarding right-of-way. The alternative solutions for addressing this need are discussed in section 8. The analysis results for the signalised intersection are provided in **Table 6-8**.

Table 6-8. Existing Traffic Operations - County Road 1 and County Road 2

Intersection	Peak Hour	2013		
		v/c ratio	Delay (s)	Critical Movement
CR1 / CR2	PM	0.46	7.0	-

6.4.5 County Road 2 at County Road 6

The intersection of County Road 6 (Wilton Road) and County Road 2 (Main Street) was analyzed using Synchro version 8, with the HCM2000 methodology. The analysis assumed the existing signal timing and lane configurations for the existing conditions and future horizons. The v/c ratio and delay results of the analysis are summarized in the **Table 6-9**.

Table 6-9. Existing and Future Traffic Operations - County Road 2 and County Road 6

Intersection	Peak Hour	2013			2024			2034		
		v/c ratio	Delay (s)	Critical Movement	v/c ratio	Delay (s)	Critical Movement	v/c ratio	Delay (s)	Critical Movement
CR2 / CR6	AM	0.44	7.4	-	0.82	19.3	-	0.82	19.3	-
	PM	0.51	8.2	-	0.86	22.0	WBT=0.95	0.86	22.0	WBT=0.95

Critical movement are turning movements with a v/c ratio greater than 0.90.

Currently, this intersection is operating with reserve capacity (the intersection v/c ratio is not approaching 0.90). The average vehicle delay at this intersection is less than 25s and there are no critical turning movements.

The background growth for this intersection is 0%. Therefore, the only growth projected in the 10-year and 20-year planning horizons is from new development.

In the 10-year and 20-year planning horizons (2024 and 2034), this intersection begins to experience queuing and delays. The v/c ratio in both peak hours is approaching 0.90 and the westbound through movement is critical with a v/c ratio of 0.95. There is an expected increase in traffic at this intersection due to the proposed residential development on County Road 2 west of the intersection. Additionally, some traffic from the Lakeview Ponds residential development in Amherstview is expected to travel north along County Road 6 and impact the operations at the intersection of County Road 2 and County Road 6. The increased traffic causes the delays at the intersection. The alternative solutions for addressing this need are discussed in section 8.

6.4.6 County Road 2 at Potter Drive

The current intersection at County Road 2 and Potter Dr. in Odessa features two offset T-intersections. The northbound (Potter Dr.) and southbound (Ernestown Secondary School entrance) approaches are stop-controlled. The development of a subdivision to the south of Potter Dr. will increase traffic at the intersection, potentially causing delays at the two intersections.

The intersection is under evaluation by the developers and a plan for intersection design and control will be part of the site development. The County will be a participant in the site plan approval process and will be able to comment on the plans through those means.

6.4.7 County Road 6 at County Road 23

This stop controlled intersection operates with reserve capacity in existing conditions. However in future horizons with the expected development from Lakeview Ponds there are increased delays, as well as critical movements on three of the four approaches. The overall v/c ratio for an intersection with four-way stop control cannot be calculated. The alternative solutions for addressing this need are discussed in section 8.

Table 6-10. Existing and Future Traffic Operations - County Road 6 and County Road 23

Intersection	Peak Hour	2014		2027	
		Delay (s)	Critical Movement	Delay (s)	Critical Movement
C6 / CR23	AM	15.4	-	59.5	NBT=1.25, WBT=0.99, SBT=1.02
	PM	14.0	-	57.8	NBT=0.92, EBT=1.07, SBT=1.22

6.4.8 County Road 23 at County Road 24

This intersection has stop control on the County Road 24 approaches in the north-south direction and no traffic control for the east-west direction along County Road 23. The intersection operates with reserve capacity in existing conditions. However in future horizons with expected development from the Lakeview Ponds development and from the Henderson Quarry Site there are increased delays, as well as critical movements in the northbound and southbound directions. The alternative solutions for addressing this need are discussed in section 8.

Table 6-11. Existing and Future Traffic Operations - County Road 23 and County Road 24

Intersection	Peak Hour	2013			2024		
		v/c ratio	Delay (s)	Critical Movement	v/c ratio	Delay (s)	Critical Movement
CR23 / CR24	AM	0.33	4.3	-	2.82	322	SB, NB
	PM	0.16	3.6	-	3.71	81.2	SB, NB

Critical movement are turning movements with a v/c ratio greater than 0.90.

6.5 Safety Assessment

The County of Lennox and Addington provided the consultant team with ten years of collision records for the period of January 1, 2001 to December 31, 2010. In total, 2322 collisions (excluding collisions with animals) were reported on County roads during this time period.

Collision statistics at sixteen intersections throughout the County were reviewed. The sixteen intersections were:

- County Rd. 1 at County Rd. 10
- County Rd. 1 at Jim Kimmett Blvd.
- County Rd. 1 at John St.
- County Rd. 1 at Robert St.
- County Rd. 2 at County Rd. 6
- County Rd. 2 at Factory St.
- County Rd. 2 at John St.
- County Rd. 8 at Mill St.
- County Rd. 41 at Advance Ave.
- County Rd. 41 at County Rd. 1
- County Rd. 41 at County Rd. 2
- County Rd. 41 at Graham St.
- County Rd. 41 at Industrial Ave.
- County Rd. 41 at Isabella St.
- County Rd. 41 at Jim Kimmett Blvd.
- County Rd. 41 at Thomas St.

The total number of observed collisions at each intersection over the past ten years was recorded. Using methods described in the Highway Safety Manual 2010, the expected number of collisions per year for each intersection was

determined. This value was compared to the observed collision frequency. If an intersection recorded a higher observed value than an expected value, then it was flagged for further investigation. County Rd. 1 at County Rd. 10 was the only intersection that was identified with a safety issue.

6.5.1 County Road 1 (Belleville Road) at County Road 10 (Deseronto Road)

The intersection of County Road 10 and County Road 1 is currently two-way stop controlled on the north and south approaches of County Road 10, while on County Road 1 there is no traffic control for the east-west direction.

According to collision information for this intersection, twenty collisions occurred between 2000 and 2010. Specific information concerning the collisions is shown below:

- 13 injury-related collisions – 65%
- 6 property damage only collisions – 30%
- 1 fatal collision – 5%
- 78% of collisions occurred during the day, 18% at dusk, 4% after dark
- 81% of collisions occurred with clear weather and 19% of collisions when it was raining
- 89% were angle collisions involving northbound traffic, 7% were angle collisions involving southbound traffic and 4% of collisions were single motor vehicle collisions

The angle collisions are of two types:

- a failure to stop at the STOP signs on the minor approach (32%) or
- the driver on the minor approach stopped and then pulled out into the intersection (60%)
- other types of collisions (8%).

The majority of the angle collisions (88%) involve northbound vehicles. The collision pattern indicates a problem with drivers that stop at the STOP sign but then pull into the intersection despite oncoming traffic from the east or west. This may be due to a difficulty in judging an appropriate gap or may be due to the expectation of a 4-way stop-controlled intersection.

To evaluate the need for mitigation measures at this intersection, the existing collision data was compared to the calculated expected collisions using the method outlined in the *Highway Safety Manual 2010*.

There was an average of 2.07 observed collisions per year at this intersection. The expected number of collisions was determined to be 1.89 per year. Since the observed collisions exceed the expected collisions at County Road 1 and County Road 10, the need for mitigation measures was confirmed. The alternative solutions for addressing the need are discussed in section 8. Several countermeasures are already in place to improve safety at this intersection. During the course of this study supplementary stop signs and supplementary pavement markings were also installed as additional safety measures.

6.5.2 Segment Collision Report

A crash assessment of all roads in the County of Lennox and Addington was performed using data provided by the County. The total number of observed crashes per segment of roadway over the past ten years was recorded. This data did not include collisions with animals or collisions at intersections. Using methods described in the Highway Safety Manual 2010, the expected number of collisions per year for each segment was determined. This value was compared to the observed collision frequency. If a road segment recorded a higher observed value than an expected value, then it was flagged. These segments were then ranked with the top twenty segments listed below by municipality. Each list includes the name of the road and the approximate location along each roadway.

Table 6-12. County Road Segments in Addington Highlands

Road Name	Location
County Rd. 29	County Rd. 41 – 0.2km west of 5th Concession Road South
County Rd. 29	Upper Flinton Rd. – 0.25 km west of Upper Flinton Rd.

Table 6-13. County Road Segments in Loyalist Township

Road Name	Location
County Rd. 22	County Rd. 7 – County boundary
County Rd. 23	County Rd. 6 – 1.1 km west of County Rd. 6

Table 6-14. County Road Segments in Greater Napanee

Road Name	Location
County Rd. 9 (River Road)	1.1 km west of Southcrest Drive - 4.0 km west of Southcrest Drive
County Rd. 2	County Rd. 41 – Adelphi St.
County Rd. 1	Wiggins Bridge – Enviro Park Ln.
County Rd. 2	Old Hamburg Rd. – Townline Rd.
County Rd. 41	0.1 km north of Dairy Ave. – 97 m north of Richmond Blvd.
County Rd. 18	County Rd. 5 – County boundary
County Rd. 41	Isabella Ave. – 0.1 km north of Advance Ave.
County Rd. 9 (North Shore Road)	Fitchett Rd. – 0.9 km east of Fitchett Rd.
County Rd. 1	West St. - County Rd. 41
County Rd. 1	Marilyn Ave. – Thomas St.
County Rd. 2	County Rd. 10 – Oliver Side Rd.
County Rd. 9 (North Shore Road)	4.0 km west of Southcrest Dr. – Fitchett Rd.

Table 6-15. County Road Segments in Stone Mills

Road Name	Location
County Rd. 4	North limit of Camden East – Bethel Rd.
County Rd. 6	Wilson Rd. - County Rd. 1
County Rd. 6	North intersection with County Rd. 1 in Yarker – North limit of Yarker
County Rd. 1	1.3 km east of Earl St. – 2.8 km east of Earl St.

The sites listed above with the largest difference between observed collisions and expected collisions do not necessarily have a collision problem. The methodology that was used to prepare the list is a tool to identify sites for

further analysis. To determine if certain segments pose a problem it is recommended that a more in depth study take place, including on-site visits to determine site-specific factors that may contribute to collisions. Potential countermeasures to aid in the reduction of collision frequencies are listed in **Table 6-16**.

Table 6-16. Road Segment Countermeasures

Countermeasures
Review sight distance requirements
Reapply centre lines and edge lines on a regular basis
Review shoulder conditions annually
Compile an inventory of roadside hazards
Review all horizontal curves
Conduct a conformance review of all warning signs
Review the use of edge lines and centre lines

6.6 Active Transportation

6.6.1 Pedestrian infrastructure

A number of locations along County roads were identified where additional pedestrian infrastructure could be provided. Local municipalities are responsible for sidewalk construction and maintenance but projects related to sidewalks could be coordinated with County road infrastructure projects under the capital projects budget with local municipalities contributing to the cost. Locations where pedestrian signal heads, curb ramps, sidewalks or corner pedestrian refuge areas are required are listed below:

- County Road 8, Palace Road to Original Road
- County Road 41, Advance Avenue to Richmond Boulevard
- County Road 41 and Community Road intersection
- County Road 2, County Road 5 to skateboard park
- County Road 6 and County Road 2 intersection

The alternative solutions for addressing the need are discussed in section 8.

6.6.2 Paved Shoulder Trail Network

The paved shoulder system has provided benefits to the County of Lennox and Addington in the form of improved safety, reduced maintenance costs and increased tourism. The Highway Safety Manual indicates a measurable improvement in safety when a two-lane rural road has paved shoulders instead of gravel shoulders. There is an expected 1% reduction in collisions when paved shoulders are compared to gravel shoulders.

The County has seen benefits in reduced maintenance requirements. Roads in the County had problems with the creation of berms along the edge of the roadway as gravel was pushed into mounds on the side of the roads. These berms led to water build-up which was an issue for water pooling at the road edge and on the road which resulted in edge of pavement deterioration and in asphalt cracks due to the freeze-thaw cycle. The water was also a safety hazard because hydroplaning was possible.

Paved shoulders have reduced the need for maintenance grading and the periodic addition of gravel to the shoulders. Because the traffic, and in particular trucks, is further from the edge of the pavement, there is a reduced

likelihood of gravel spreading onto the driveable portion of the roadway. Less maintenance is required to brush the roads to remove the grit and gravel that can be tracked onto the travelled roadway. There is also a reduction in 'edge drop-off'. The additional hard surface width provides a roadside recovery area that can assist in the reduction of 'run off the road' collisions.

Pavement life may also be extended when a paved shoulder is present as there is a reduced tendency for edge cracking. These types of cracks are difficult to maintain as cracks within 300mm of the edge should not be routed and sealed. Since there is a reduced likelihood of cracking, the length of time between routine road repairs can be extended.

The adoption of the paved shoulder initiative has resulted in increased tourism spending in Lennox & Addington. Starting in 2007, the County Trails Road Cycling Network has promoted 12 cycling routes that highlight the paved shoulders available in the county. Increased cycling tourists have resulted in economic spinoffs to county restaurants, shops, and overnight accommodation providers.

The paved shoulder program has been very successful in the County of Lennox and Addington both financially for the roads departments and for the community services and economic development departments. The County should continue to move forward with including paved shoulders on all road reconstruction projects where feasible.

7. Future System Requirements

7.1 New Route West of County Road 41

The 2001 TMP included a concept for a new north-south arterial and associated connecting collector roads for the Town of Greater Napanee to support long term travel demands through the downtown and additional capacity to/from Highway 401 and across the Napanee River. The 2001 concept included three new arterial roads:

- Extension of Richmond Boulevard westerly
- Extension of Industrial Boulevard westerly
- New north-south arterial (Highway 401 to CR8, crossing the railway and the Napanee River)

Since 2001, Richmond Boulevard has been extended westerly to County Road 1 and named Jim Kimmett Boulevard.

Future development in west Greater Napanee is expected to cause County Road 41 between County Road 2 (Dundas Street) and Highway 401 to exceed its functional capacity by 2024. Widening County Road 41 would be very disruptive to residential properties. Therefore, there is a need for an alternate route to serve west Greater Napanee and provide a connection between Highway 401 and County Road 2 (Dundas Street).

The plan from the 2001 TMP included a new crossing of the Napanee River. This plan was reviewed as part of the current TMP update and based on the analysis of the projected 10-year and 20-year traffic volumes, there is not a need for additional capacity across the Napanee River in the time horizon of this TMP.

There is an existing Canadian National Rail (CNR) rail line running east-west through the County south of Highway 401. Any alternate route to County Road 41 for residents of west Greater Napanee will require use of a new or existing rail crossing. Constructing a new at-grade rail crossing would increase the conflict potential between trains and vehicles. A new grade separated rail crossing would reduce the conflict, but would be costly. There is residual capacity available at the existing grade separated crossing on County Road 1 (Belleville Road) which could therefore accommodate traffic diverted from County Road 41 between west Greater Napanee and the Highway 401 / County Road 41 commercial area.

7.1.1 Network Options

There are four network options to alleviate congestion on County Road 41 caused by the future development in west Greater Napanee:

- Do Nothing
- Improve Existing Roads
- Extend Jim Kimmett Boulevard and connect to County Road 2
- Extend Alkenbrack Street and connect to County Road 2



Figure 7-1. Do Nothing – County Road 41

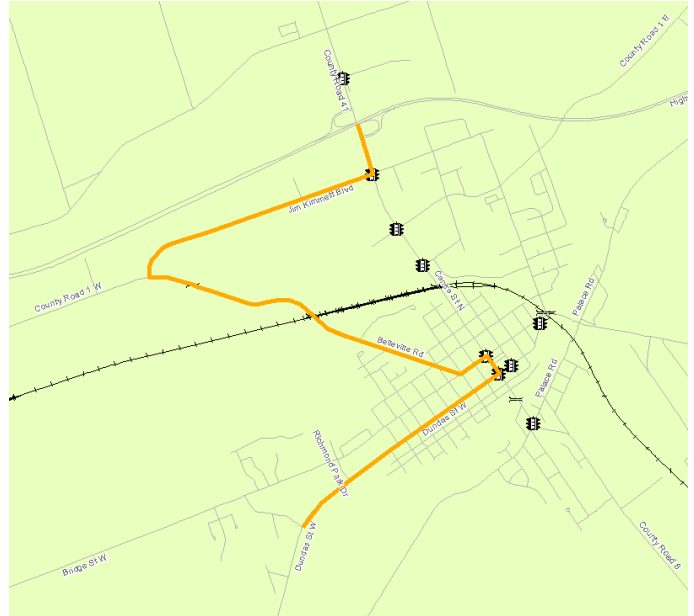


Figure 7-2. Improve Existing Roads – Alternate Route

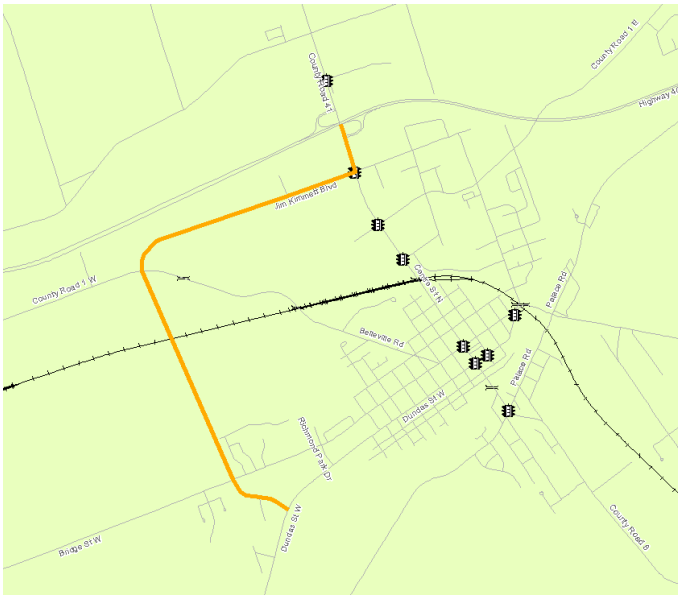


Figure 7-3. Jim Kimmatt Boulevard Extension

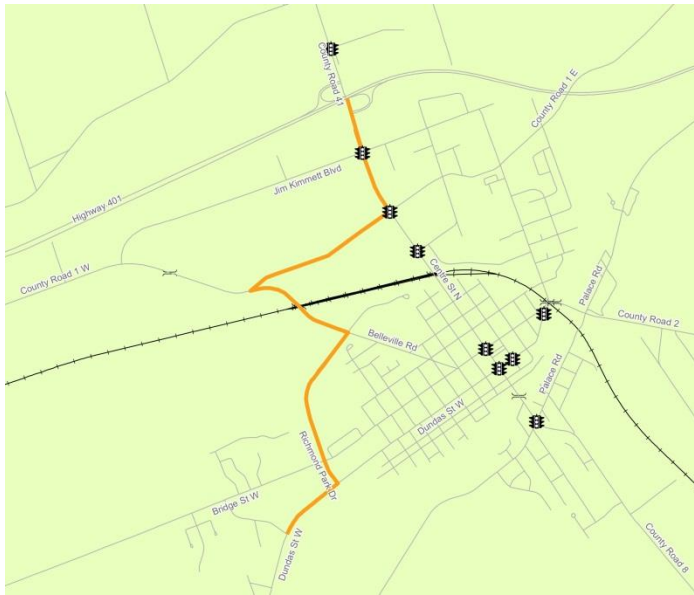


Figure 7-4. Alkenbrack Street Extension

A comparison of the alternatives considered the approximate distance travelled, a travel time estimate, the peak hour vehicle demand, and percent share (volume) of north-south traffic. **Figure 7-1** evaluates the different alternative solutions.

Table 7-1. Evaluation of Alternatives for New Road West of County Road 41

Alternatives					
	Do Nothing	Improve Existing Roads		Jim Kimmett Boulevard Extension	Alkenbrack Street Extension
Description of Problem	<p>A review of the existing and projected travel demands along County Road 2 (Dundas St) and County Road 41 (Centre St) indicate that the existing County and local municipal road system will not be able to accommodate long term travel demands associated with future growth in the western parts of Greater Napanee.</p> <p>Based on visual observations and review of current travel demands, the existing County Road 41 (Centre St) is “busy” but not yet at capacity. Even though the current road system is functioning reasonably, this is not anticipated to last indefinitely.</p>				
Description of Alternatives	Keep the existing configuration and traffic control.	Encourage drivers to use existing road network more effectively.	Widen County Road 41 between County Road 2 and the railway underpass.	Extend Jim Kimmett Blvd. from County Road 1 to County Road 2.	Extend Alkenbrack Street to connect with County Road 1. Connect County Road 1 and County Road 2 at Enviro Park Lane and Richmond Park Drive, respectively.
Utilities	No impacts	No impacts	Multiple Ontario Hydro poles will require relocation due to their proximity to County Road 41.	No impacts	No impacts
Property	No impacts	No impacts	Impacts to existing residential properties along County Road 41.	Impact to agricultural properties.	Impact to agricultural properties.
Structures	No new crossings required.	No new crossings required.	No new crossings required.	One railroad crossing and one water crossing required.	No water crossings required.
Operational Factors	<p>Distance travelled: Distance travelled between County Road 41 at Highway 401 and County Road 2 at Slash Road.</p> <p>Travel time: Includes estimated travel time at posted speed limit and delay at signalised intersections. Travel delay based on link congestion was not included due to the variability of data available.</p>				
Operations	Distance travelled: 4200m Travel time: 7m 10s	Distance travelled: 7400m Travel time: 8m 50s	Distance travelled: 4200m Travel time: 5m 10s	Distance travelled: 4285m Travel time: 5m 25s	Distance travelled: 4525m Travel time: 5m 30s

	2024 Pk Hr Demand: 1290 2024 Pk Hr Share: 100%	2024 Pk Hr Demand: 13 2024 Pk Hr Share: 1%	2024 Pk Hr Demand: 1290 2024 Pk Hr Share: 100%	2024 Pk Hr Demand: 587 2024 Pk Hr Share: 46%	2024 Pk Hr Demand: 629 2024 Pk Hr Share: 49%
Cost	\$ 0	Minimal cost	\$3,500,000*	\$ 6,500,000*	\$2,700,000*
	* These costs do not include the cost to acquire property or to move utilities, both of which have not been determined. The Jim Kimmett Extension cost does not include the \$5,000,000 to \$7,000,000 required to build a new overpass				
Recommendation	The recommended alternative is to extend Alkenbrack Street from its current location to County Road 1 (Belleville Rd). Another road will connect County Road 1 at Enviro Park Lane with County Road 2 (Dundas St) at Richmond Park Drive. This road will be effective in reducing travel demands on County Road 41, will have less impact than improving existing roads and will provide a shorter connection between County Road 41 and County Road 2 than the Jim Kimmett Extension. Also, the construction cost estimate is less expensive than the Jim Kimmett Extension or the road widening options.				

7.1.2 Conclusion

Given the conceptual nature of the new road system identified, it is recommended that more definitive identification of the potential road needs and timing be established. To achieve this, it is recommended that a Municipal Class Environmental Assessment study be undertaken to thoroughly investigate the alternative methods of meeting the capacity needs and to assess the impacts of the alternatives.

Given the limited ability to increase capacity on County Road 41 (Centre Street), County Road 1 (Bridge Street), and County Road 2 (Dundas Street), it will be important that a new west Greater Napanee connection be provided to relieve traffic congestion through downtown Greater Napanee prior to the completion of the west Greater Napanee residential developments. The new road will reduce congestion on the existing roads and provide another option for north-south travel. The additional connection in the road network will allow for more efficient travel and will provide another route for emergency services. There will also be an increased potential for new development in the area of the new road.

7.2 County Road 23 Westerly Extension

7.2.1 Background

County Road 23 extends from County Road 4 to County Road 24 in Loyalist Township. Since the mid 1970’s there have been plans by the County of Lennox and Addington to extend County Road 23 westerly to County Road 7 and ultimately to County Road 21. Since this time, a number of studies have been completed confirming the need for the extension and identifying preliminary alignments.

For this component of the Transportation Study, the scope of work has been to reconfirm the need for the extension. Also, this study was expected to reconfirm the selection of the extension as the preferred planning alternative to accommodate future east-west travel demands through the subject corridor in Loyalist Township.

7.2.2 Needs Assessment

The need for the extension will be driven by future development to the west of Amerhestview and in the Village of Bath. We undertook a capacity evaluation assuming a hypothetical future development west of Amherstivew to be

twice the size of the proposed Lakeview Ponds development in the area bounded by CR6, CR23, and Highway 33. We assumed existing traffic patterns when distributing the hypothetical traffic through the County road network. When Highway 33 reaches capacity, it will either be necessary to widen the highway or extend County Road 23. The widening of Highway 33 is not desirable due to the physical impacts on adjacent lands.

Highway 33, west of County Road 6, is currently operating with a v/c ratio of less than 0.40. In 2033, with known developments in Amherstview, Highway 33 west of County Road 6 is expected to operate with a v/c ratio of less than 0.65. Any additional developments to the west of Amherstview or in the Village of Bath will increase the v/c ratio.

7.2.3 Recommendations

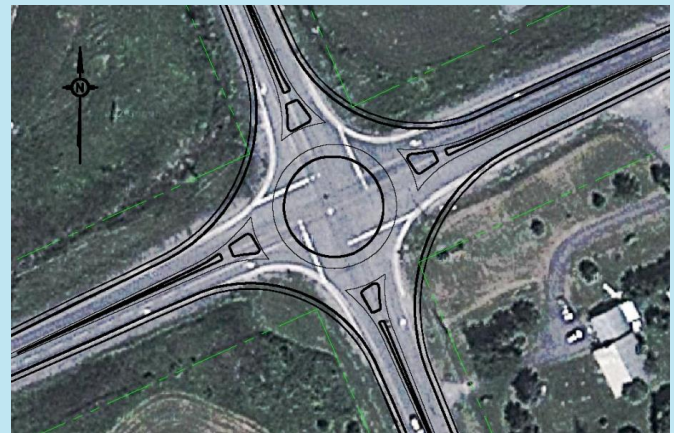
It is recommended that the County continue planning to extend County Road 23. Construction will be expected by the 2029 – 2034 horizon or earlier as dictated by development construction.

8. Infrastructure Project Recommendations

As part of Phase 2 of the Municipal Class EA process, alternative solutions were considered for each of the problems identified in the needs assessment. Various infrastructure projects are recommended to address the operational needs identified through the intersection analysis process.

8.1 County Road 6 and County Road 23

Description of Problem	The current traffic control at the intersection will not function adequately given projected traffic volumes for 2024 and 2034 horizons.
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	Alternatives		
	Do Nothing	Install Traffic Signals	Install Roundabout
Description of Alternatives	Keep the existing all-way stop control.	Replace the existing all-way stop control with traffic signals. Left turn lanes added on all approaches.	Replace the existing all-way stop control with a roundabout.
Utilities	No impacts	There are two street lights located in close proximity to the intersection that may require relocation.	There are two street lights and three hydro poles located in close proximity to the intersection that may require relocation.
Property	No impacts	No impacts	Minor property impacts at intersection corners for daylighting and ditches.
Operations	AM Peak Hour: Overall intersection LOS 'F'.	AM Peak Hour: Overall intersection LOS 'B'.	AM Peak Hour: Overall intersection LOS 'A'.
	PM Peak Hour: Overall intersection LOS 'F'.	PM Peak Hour: Overall intersection LOS 'C'.	PM Peak Hour: Overall intersection LOS 'A'.
Construction Cost	\$ 0	\$ 905,000	\$ 700,000
Recommendation	A roundabout is suggested at this intersection due to the fact that a roundabout is expected to operate below capacity and with minimal delay. Studies indicate that the conversion of an all-way STOP intersection to a roundabout have no definitive impact on collisions. There are no property impacts and cost of the roundabout is expected to be less than a signalled intersection.		

8.2 County Road 23 and County Road 24

Description of Problem	The current traffic control at the intersection will not function adequately given projected traffic volumes for 2024 and 2034 horizons.
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Alternatives

	Do Nothing	Install Traffic Signals	Install Roundabout
Description of Alternatives	Keep the existing all-way stop control.	Replace the existing two-way stop control with traffic signals. Left turn lanes added to east, south and west approaches.	Replace the existing two-way stop control with a roundabout.
Utilities	No impacts	There is one street light and one hydro pole that would require relocation.	There is one street light and two hydro poles that would require relocation
Property	No impacts	No impacts	Minor property impacts at intersection corners for daylighting and ditches.
Operations	AM Peak Hour: Overall intersection LOS 'F'.	AM Peak Hour: Overall intersection LOS 'C', volume to capacity ratio (v/c) for eastbound through lane is 0.9, v/c ratio for northbound through/right turn lane is 0.87.	AM Peak Hour: Overall intersection LOS 'B'.
	PM Peak Hour: Overall intersection LOS 'F'.	PM Peak Hour: Overall intersection LOS 'C', v/c ratio for westbound left turn lane is 0.85.	PM Peak Hour: Overall intersection LOS 'A'.
Construction Cost <small>(cost sharing possible with neighbouring municipality)</small>	\$ 0	\$ 770,000	\$ 700,000
Recommendation	A roundabout is suggested at this intersection. A roundabout is expected to operate below capacity with minimal delay. Several movements are approaching capacity (v/c > 0.90) in the future horizons with a signalised intersection. Installation of a roundabout at an existing two-way STOP controlled intersection is expected to reduce the number of collisions by 71%, as per Highway Safety Manual, 1st Edition, Volume 3.		

8.3 County Road 1 and County Road 2

Traffic operations were reviewed at the intersections of County Road 1 at Alma Street and County Road 2 at Alma Street using turning movement counts from May 2011. For this evaluation a new intersection layout was used that moves the road connecting County Roads 1 and 2 to the east, to align with Alma Street. **Figure 8-1** shows a sample layout of the realignment concept.



Figure 8-1. Realignment concept of County Road 1 and County Road 2

A realigned County Road 1 and Alma Street intersection shifts the roadway that connects County Road 1 and County Road 2 towards the west, aligning it with Alma Street and allowing the installation of an all-way stop-controlled intersection. This change gives drivers on the northbound and southbound approaches improved sight lines.

At the modified intersection, the northbound approach has a dedicated left turn lane and a lane for right turning and through vehicles. A separate left turn lane is suggested due to the number of vehicles turning left during the PM peak hour. The addition of a left turn lane reduces the delays for the northbound approach. The operations at this intersection were evaluated using Synchro 8 and all approaches maintained a level of service (LOS) "A" or "B".

The signalised intersection of County Road 2 and Alma Street extension will be shifted to the west and the intersection will retain the existing traffic control, but the lane configuration will be changed. Vehicles westbound on County Road 2 will have a through lane and a separate right turn lane, while eastbound vehicles will have a through

lane and a separate left turn lane. The street connecting County Road 2 and County Road 1 will have one southbound left turn lane, as well as a short right turn lane. **Table 8-1** evaluates the alternative solutions at this intersection.

Table 8-1. County Road 1 and County Road 2 Alternative Solutions

	Alternatives		
	Do Nothing	Realign Intersection with One Signalised Intersection	Realign Intersection with Two Signalised Intersections
Description of Problem	The current intersection at County Road 1 and Alma Street features two offset T-intersections. The eastbound and westbound approaches on County Road 1 have STOP signs as does Alma Street while the northbound approach is uncontrolled. The existing intersection may create confusion regarding right-of-way due to the unconventional layout and traffic control.		
Description of Alternatives	Keep the existing configuration and traffic control.	Realign the intersections, with traffic signals at County Road 2 and all-way stop control at County Road 1.	Realign the intersections with traffic signals at both County Road 1 and County Road 2.
Utilities	No impacts	Two hydro poles servicing Ontario Hydro would need to be relocated.	
Property	No impacts	Green space on the western side of roadway between County Road 1 and County Road 2 will be eliminated. However, the green space on the eastern side of the new roadway could be expanded. Two residential properties that are situated between County Road 1 and County Road 2 need to be acquired.	
Operations	The existing intersection alignments may create confusion regarding right-of-way for drivers, which affects intersection safety.	CR1 PM Peak Hour (Stop): Overall intersection LOS 'B'.	CR1 PM Peak Hour (Signals): Overall intersection LOS 'A'.
		CR2 PM Peak Hour (Signals): Overall intersection LOS 'B'.	CR2 PM Peak Hour (Signals): Overall intersection LOS 'B'.
		The maximum projected queue length for northbound vehicles at County Road 1 is 10.2 metres. The maximum projected queue length for southbound vehicles at County Road 2 is 17.8 metres. Available space is 30 metres.	The maximum projected queue length for northbound vehicles at County Road 1 is 12.3 metres. The maximum projected queue length for southbound vehicles at County Road 2 is 17.8 metres. Available space is 30 metres.
Construction Cost	\$ 0	\$300,000	\$450,000
Recommendation	The realignment facilitates traffic movement through the intersections and provides a standard intersection layout at County Road 1 and Alma Street. The operational evaluation at both intersections indicated that there was a good level of service in the PM peak hour. It is recommended that the County plan to reconfigure the intersections with one signalised intersection. This alternative provides an acceptable level of service at both intersections, and is the more cost-effective solution.		

8.4 County Road 1 and County Road 10

Between 2000 and 2010 there were 20 collisions at this intersection: 13 injury-related collisions, 6 property damage collision and 1 fatal collision. Many of these collisions were due to drivers failing to stop at the stop signs on the minor approach or drivers stopping and then pulling out into the intersection.



Figure 8-2. Intersection of County Road 1 and County Road 10 from South

Several countermeasures are already in place to improve safety at this intersection. Regular maintenance of the pavement markings and rumble strips could help to maintain an equal level of safety throughout the year. During the course of this study supplementary stop signs and supplementary pavement markings were installed to attempt to reduce collisions. **Table 8-2** evaluates the alternative solutions discussed at this intersection.

Table 8-2. Evaluation of Alternative Solutions at County Road 1 and County Road 10

	Alternatives		
	Do Nothing	Install Splitter Islands	Install a Roundabout
Description of Alternatives	Keep the existing configuration and traffic control.	Install splitter islands on the minor approaches to emphasize the presence of an intersection.	Replace the existing intersection with a roundabout.
Property	No impacts	No impacts	Additional land may be required on all corners of the intersection.

Effectiveness	A collision modification factor (CMF) indicates whether a countermeasure may be more likely or less likely to change the prevalence of collisions at a particular location. A factor of 1.0 indicates that the countermeasure has no effect on safety; lower CMF's indicate that the countermeasure is more effective at reducing collisions whereas CMF's greater than 1.0 indicate that the situation worsens with the countermeasure in place.		
	CMF: 1	CMF: 0.29	CMF: 0.29
Construction Cost	\$ 0	\$ 8,000	\$700,000
Recommendation	The most effective countermeasures are the installation of a roundabout or the addition of splitter islands. Splitter islands can be installed on the minor approaches to an intersection to emphasize to the drivers the presence of an intersection, the presence of STOP signs and the difference between the minor road and the major road. The addition of splitter islands on the minor approaches to the intersection are a less expensive measure than the roundabout with a similarly effective reduction in collisions. During the course of this study the County has implemented additional stop signs and "STOP AHEAD" markings. It is recommended that splitter islands be installed in the short term and that the effectiveness of this measure in addressing the collision problem be monitored. Should it be required based on the results of the monitoring, it is recommended that a roundabout be installed by 2024 or when financial resources are available.		

8.5 County Road 2 and 6

The intersection of County Road 2 and County Road 6 is constrained by existing land use. The eastbound left turn is a difficult move for oversized vehicles. This problem may be alleviated by moving the stop bar for the southbound traffic further back and eliminating the southbound right turn lane. These changes can be implemented during the annual line painting process.

The capacity issues at this intersection are related to the development projected west of the intersection. The likelihood of the full build-out of the development occurring and the timeline is uncertain. Until more information concerning the development is communicated to the County, no further recommendations are proposed.

8.6 Highway 401 Emergency Detour Route

The Emergency Detour Routes for Highway 401 through Lennox and Addington were reviewed for potential areas of improvement.

The AADT data from 2010 for Highway 401 was compared to the traffic at the count stations along the County roads that are used as Emergency Detour Routes (EDR). On average, Highway 401 has eleven times more daily traffic than the County roads used for Emergency Detour Routing. If these vehicles are re-routed onto roads not built to sustain that volume of traffic, there will be delays and congestion. **Table 8-3** shows a list of potential improvements or upgrades to help traffic flow when an Emergency Detour Route is used:

Table 8-3. Emergency Detour Route Improvements

Detour Segment	Intersection	Current Condition	Improvements
Exit 570 - Exit 579 County Rd. 10 – County Rd. 41	County Rd. 10 (Desoronto Rd.) and County Rd. 1 (Belleville Rd.)	Stop control for northbound & southbound legs	Install roundabout.

Detour Segment	Intersection	Current Condition	Improvements
Exit 579 – Exit 582 County Rd. 41 – County Rd. 5	Industrial Blvd. @ Advance Ave. (under local municipality control)	All-way stop control	Install part-time (folding) stop signs on all legs. During detours, only northbound and southbound have stop control
	County Rd. 1 @ Camden Rd.	All-way stop control	Install part-time (folding) stop signs on all legs. During detours, only northbound and southbound have stop control
Exit 582 – Exit 593 County Rd. 5 – County Rd. 4	County Rd. 5 @ County Rd. 2	Stop control on northbound & southbound. Dedicated westbound right	Install part-time (folding) stop signs on all legs. During detours, only eastbound and westbound have stop control. Review of plan to be provided by OPP.

These recommendations assign the right of way to the flow of traffic that is detouring from Highway 401, with the exception of the intersection of County Road 1/ County Road 10 where a roundabout is suggested. In the case of a roundabout, normal priority rules would apply. A roundabout was installed at County Road 2/County Road 4 which is used as part of the EDR and traffic has been able to flow quite effectively through the intersection when an EDR is in place.

8.7 Traffic Signals

8.7.1 LEDs

Since an LED array provides equal brightness across the entire surface of the signal light, LED signal heads appear brighter than conventional incandescent lamps which tend to be darker on the edges. The increased brightness provides enhanced intersection safety. LED's are significantly cheaper to operate with a typical power consumption that is roughly 20% of conventional signal heads. The lifespan of an LED signal head is also much longer than an incandescent lamp. LED signal heads can last for as long as 5 years while incandescent lamps typically last for 1-3 years, therefore additional savings can be realized from much less frequent requirement for maintenance staff to go on site with a bucket truck to replace traffic signal lamps.

Another benefit of LED is the elimination of catastrophic failures. Unlike an incandescent lamp which has only one filament, an LED signal is made out of a matrix of several dozen LEDs. The signal would continue to function even if several LEDs stopped working. When an incandescent bulb fails, the signal goes dark and requires immediate replacement.

Use of LED signals will also eliminate the phantom effect created for signals on east-west approaches during morning and evening hours. Since incandescent traffic signals use reflectors behind the bulbs all colors seem to light up when the sunrays fall directly on these signals. This problem is eliminated when LED signals are used because there are no reflectors in LED signals. The County should continue the program to replace existing traffic signals with LED bulbs.

8.7.2 Uninterruptible Power Supply

With the reduced load requirements (typically 400 to 600 watts) for traffic signal systems using LED traffic signals it has become feasible to install uninterruptible power supply/battery backup system (UPS system) to provide emergency power when utility supply is unavailable. Intersections utilizing UPS battery backup systems can normally operate for 4 to 6 hours on battery without interruption. It would be recommended to implement installation of UPS

systems first at any intersection locations that experience reoccurring power issues such as frequent power failures (blackouts), voltage sags and surges, brown outs (under voltages) and over voltages, all which can damage traffic signal equipment. Implementation of UPS systems (which can also function as a power conditioner and/or voltage regulation device) can alleviate these concerns. If power issues are not a factor, then installation of UPS at the busiest intersections first would be recommended to minimize traffic tie-ups during any system wide power interruptions.

8.7.3 Intersections of County Road 41 at County Road 1 and at County Road 2

The traffic signal at the intersection of County Road 41 and County Road 2 does not have coordinated traffic signal timing with the traffic signal at the adjacent intersection of County Road 41 and County Road 1. Coordinated traffic signals could improve the delays for the southbound movements at the County Road 1 intersection and northbound movements at the County Road 2 intersection. It is recommended that the traffic signals at County Road 41 and County Road 2 be coordinated with the signals at County Road 41 and County Road 1.

8.7.4 Accessible Pedestrian Signals

According to Ontario Regulation 413/12, Section 80.28 (1) of the Accessibility for Ontarians with Disabilities Act (AODA), "Where new pedestrian signals are being installed or existing pedestrian signals are being replaced at a pedestrian crossover, they must be accessible pedestrian signals".

The accessible pedestrian signals must include such items as distinct locator tones and walk indicator tones, tactile arrows that align with the direction of crossing, manual and automatic activation features, and both audible and vibro-tactile walk indicators.

It is recommended that the County review whether accessible pedestrian signals should be included when construction of a new intersection or the reconstruction of existing intersections is undertaken, as according to the AODA these changes must be in place by January 1, 2025.

8.8 Pedestrian Infrastructure Recommendations

A number of locations along County roads were identified where additional pedestrian infrastructure could be provided. Local municipalities are responsible for sidewalk construction and maintenance but projects related to sidewalks could be coordinated with County road infrastructure projects under the capital projects budget with local municipalities contributing to the cost.

County Road 8

The eastern side of County Road 8 from Palace Road to Original Road was identified as a location for a new sidewalk. The sidewalk, shown in **Figure 8-4**, would be approximately 300 metres in length. If a sidewalk is constructed then curb ramps should be installed at the southeast corner as part of this project.

Currently there are curb ramps on the northeast and northwest corners of the intersection of County Road 8 and County Road 9. Curb ramps are recommended for installation at the southwest corner.

There are no pedestrian signal heads at the existing intersection. It is recommended that pedestrian signal heads be installed at the northeast, northwest and southwest corners to accommodate the two existing crosswalks. If a sidewalk is installed on the eastern side of County Road 8, pedestrian signal heads should be installed at the southeast corner.

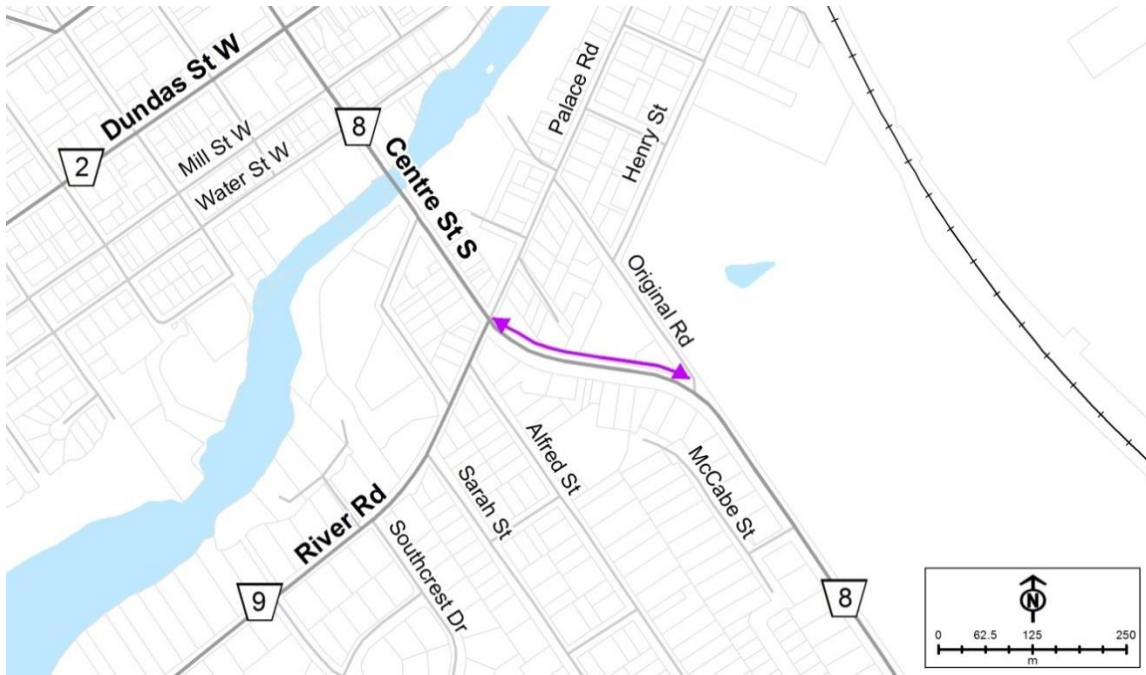


Figure 8-3. Identified Location for Sidewalk Installation along County Road 8

County Road 41

A section along the eastern side of County Road 41, from Advance Avenue to Richmond Boulevard, was identified as a location for a new sidewalk. The length of this sidewalk would be approximately 450 metres, as shown in Figure 8-5.



Figure 8-4. Identified Location for Sidewalk Installation along County Road 41

There are currently six pedestrian signal heads at the intersection of County Road 41 and Advance Avenue for crosswalks on the north side, west side and east side. The west side is a driveway for the hardware store parking lot. Pedestrian signal heads are not needed to cross a driveway, therefore it is recommended that the entrance to the hardware store be reconfigured as a roadway rather than a driveway. In addition, pedestrian signal heads should be installed on the southeast and southwest corners to provide control for a new crosswalk on the south side.

The intersection of County Road 41 and Richmond Boulevard/ Jim Kimmett Boulevard has curb ramps at the northwest and southwest corners. It is recommended that curb ramps be installed on the northeast corner of the intersection. If the sidewalk is installed on the eastern side of County Road 41, curb ramps should also be installed at the southeast corner. If a sidewalk is not built, it is recommended that a corner sidewalk area with curb ramps be installed on the southeast corner.

County Road 41 and Community Road intersection

There are currently pedestrian signal heads with pushbuttons located on the northeast, southeast and southwest corners of this intersection. As there are no sidewalks within the vicinity of the intersection it is recommended that corner sidewalk pedestrian refuge areas be installed at northeast, southeast and southwest corners of the intersection.

County Road 2 and County Road 5

There are currently no sidewalks on the south side of County Road 2 between County Road 5 and the skateboard park. This location, shown in **Figure 8-6**, was identified as a location for a new sidewalk to provide pedestrian access for users of the park. The new sidewalk is the responsibility of the local municipality.



Figure 8-5. Identified Location for Sidewalk Installation along County Road 2

County Road 2 and County Road 6

There are existing pedestrian facilities at the southeast (gravel path) and southwest (sidewalk) corners of the

intersection.

Curb ramps are only available at the southwest corner of this intersection. There are utility poles at the southeast corner, making it difficult to connect to the existing pedestrian facility to the east. Therefore it is recommended that a corner sidewalk area be added at the southeast corner with curb ramps for accessibility.

Depending on future development, a sidewalk should be considered along the eastern side of County Road 6, extending 175 metres north of County Road 2 to the OPP station. If a sidewalk is installed, it is recommended that curb ramps also be included in the design. **Figure 8-7** shows the identified location for potential sidewalk installation.



Figure 8-6. Identified Location for Sidewalk Installation along County Road 6

There are currently no pedestrian signal heads at this intersection. It is recommended that pedestrian signal heads be installed at the southeast and southwest corners to provide signals for the existing crosswalk on the south side of the intersection. If a sidewalk is constructed at the northeast corner, it is recommended that pedestrian signal heads be installed at the northeast and southeast corners to provide signals for that crosswalk.

8.9 Paved Shoulder Trail Network

The paved shoulder system has provided benefits to the County of Lennox and Addington in the form of improved safety, reduced maintenance costs and increased tourism. The paved shoulder program has been very successful in the County of Lennox and Addington both financially for the roads department and for the community services and economic development departments. The County should continue to move forward with including paved shoulders on all road reconstruction projects where feasible.

9. Policy Recommendations

9.1 Speed Limit Policy

The Speed Limit Modification Policy is a resource for the County of Lennox and Addington to address requests for the reduction or increase of speed limits on local roads. This policy will permit equitable treatment of each request from the community and will allow a technical review of each location when a request for a speed limit modification is received.

9.1.1 Background

Providing speed limits that coincide with the expectations of drivers is one way to create a safer road environment. It is important that these speed limits take into account the design and engineering of the roadway segment as well as the surrounding area to ensure it meets all local and provincial standards.

The Transportation Association of Canada released guidelines related to establishing speed limits in December of 2009. According to the Transportation Association of Canada document “Canadian Guidelines for Establishing Posted Speed Limits”, a recommended posted speed limit evaluation methodology should meet the following objectives:

- The posted speed limit is a function of the road classification, function, physical characteristics and engineering factors that influence the level of risk;
- It is applicable to all types of roadway characteristics across Canada;
- It is systematic, consistent and repeatable; and,
- It is simple to use.

It is important that the County of Lennox & Addington have a speed limit policy, so that changes may be made to the existing posted speeds when needed. To determine whether a locale has a legitimate need for change in posted speed limits, a review process should be implemented to evaluate all requests for speed limit changes.

When taking into account requests from the public and County employees, it is important to remember many misconceptions about speed change policies, including:

- Reduced speed limits will slow the speed of traffic;
- Reduced speed limits will decrease the collision rate and increase safety;
- Raising a posted speed limit will cause an increase in the speed of traffic; and,
- Any posted speed limit must be safer than an un-posted speed limit, regardless of the traffic and prevailing roadway conditions.

9.1.2 Initiation

The first step of this process involves identifying speed limit problems or issues within the County. There are three ways that speeding issues could trigger a speed limit policy review.

Resident Request

Speed limit complaints, concerns or informal petitions submitted by residents may or may not explicitly request speed limit changes. They may relate to traffic safety concerns, to issues of traffic volume or to environmental factors such as noise and air pollution on sections of road. While residents may make their concerns known in any

number of different ways, the County should encourage residents to provide their concerns in writing. For each request that is received, the following information should be recorded:

- Resident’s name and home address
- Contact information such as phone number, fax number and email address
- Exact location of the problem (street(s) name, address, intersection etc.)
- Detailed description of the concern
- The time(s) at which this problem typically occurs (morning peak, night time, all day, spring, winter etc.)

Additionally, any related information regarding the conditions or potential solutions may be identified by the individual and should also be formally recorded.

Staff Initiation

This could be triggered by County or municipal staff knowledge and observation, or through an annual review of traffic speed data in the County database.

Council Direction

County Council could direct staff to investigate a specific concern that has been identified.

A preliminary traffic assessment of the subject location(s) will be conducted by staff using available speed data. The preliminary investigation will also include an initial site visit to verify road grade, sightlines, land use, pavement markings and placement of regulatory and warning signs.

Using the information collected, staff will determine if the site conditions merit further investigation. The issue is taken forward to the evaluation stage for further investigation if the average operating speed is at least 10 km/h above the posted speed.

9.1.3 Evaluation

The process diverges at this point depending on whether the issue can be resolved through adjusting the posted traffic speed.

- Issues not related to posted speed limits may be resolved through corrective action to mitigate the traffic problem, such as sign repair or replacement, removal of sightline obstructions or pavement marking improvements.
- In order for the speed limit change to be considered, thresholds for several criteria must be met. These thresholds are shown in **Table 9-1**. If the thresholds are met, then the local municipality will be advised that a review of the speed limit is underway through the County’s Technical Advisory Committee. Additional data collection will be undertaken.

Table 9-1. Threshold Parameters for Implementing Measures

Speed Limit	Speed Threshold
50 – 70 km/h	85 th percentile speed is 15 km/h over speed limit
80 km/h	85 th percentile speed is 20 km/h over speed limit

Updated speed and traffic volumes will be collected for the roadway under examination and the collision reports specific to the location will be requested from the relevant police authority. The police will also be asked if there has been a history of complaints with regard to inappropriate driver behaviour. Traffic volumes will be collected for a 24 hour period and the peak hour volumes will be calculated. Vehicular speed will be measured and the average and 85th percentile speeds will be calculated. The County Technical Advisory Committee will be involved in review process for all County of Lennox and Addington Speed Limit Policy reviews.

The current data will then be compared to the acceptable parameters for the type of roadway. The threshold parameters noted in Table 9-1 were developed based on the review of existing conditions on County roads and the threshold parameters used in the Traffic Calming Policies of other municipalities.

9.1.4 Implementation

If the roadway meets the threshold criteria, a review of the speed limit should be considered. County Council will be informed of the progress of the study and their support will be required to continue with the process. Once a decision has been made to investigate a change in the speed limit, a more detailed review is required.

The ideal speed is determined based on the typical functions of arterial, collector and local roads; in addition, the public's expectations are taken into consideration. A systematic evaluation of risks should be performed pertaining to the geometry and traffic criteria of the roadway, which will allow for the determination of a recommended posted speed. The geometric and traffic related criteria include:

- Land use
- Median separation
- Road hierarchy
- Number of through lanes
- Length of corridor
- Design speed
- Horizontal & vertical geometry
- Lane width
- Roadside hazards
- Pedestrian & cyclist exposure
- Pavement surface
- Intersection & interchange density
- Access (driveway) density
- On-street parking

A description of the process is outlined in Section 6.0 of the Transportation Association of Canada Canadian Guidelines for Establishing Posted Speed Limits. The County should follow this established process to set the posted speed limits.

9.2 County Road Reduced Loads Schedule

The County's existing reduced load schedule indicates the roads that have seasonal weight restrictions. The County could consider removing some roads from the reduced load road network. The heavy loaded trucks would be spread across numerous roads if there were additional roads without weight restrictions. Increasing the number of roads without weight restrictions, would allow for more efficient haulage routes which could be both an economic benefit

and an environmental benefit since shorter travel routes will use less fuel. Note that it is recommended that a geotechnical investigation be undertaken before a road is removed from the load restricted network.

County Road 8 and County Road 21

Removing load restrictions on these two roads between County Road 2 and Highway 33 would allow heavy traffic travelling along Highway 33 to have a more direct route into Greater Napanee. This would serve as an alternative to using County Road 4 and County Road 2 to enter the urban area of Greater Napanee.

County Roads bordering the County of Frontenac

There are multiple County roads with seasonal restrictions that continue into the County of Frontenac; these roads include County Road 1, County Road 14, County Road 19 and County Road 20. In the County of Frontenac these roads have no restrictions. This situation could be problematic for drivers who cross into the County Lennox and Addington from the County of Frontenac. While in the County of Frontenac, these roads have no restrictions but upon crossing the border with the County of Lennox and Addington the same road now has a load restriction. It is recommended that County Road 1, County Road 19 and County Road 20 be changed to have no restrictions between the County boundary and County Road 6, and that County Road 14 be changed to have no restrictions between the County Boundary and County Road 41.

County Road 6

In conjunction with the previous recommendation, County Road 6 should also be changed to remove the load restrictions. Currently the segment from Highway 33 to Chipmunk Ridge Road has no restrictions but, north of Chipmunk Ridge Road, County Road 6 has load restrictions. It is recommended that County Road 6 have no load restrictions between Chipmunk Ridge Road and County Road 1.

County Road 5

To facilitate truck traffic from Highway 401 to Strathcona, the following segments of road have no restrictions on them: County Road 5 (from Highway 401 – County Road 18), County Road 18, County Road 1 (from County Road 18 – County Road 16), and County Road 11 (from County Road 16 – Strathcona). Since a portion of County Road 5 already has no restrictions on it, it is recommended that the load restrictions be removed on County Road 5 until its intersection with County Road 2. This would allow for truck traffic travelling on Highway 401 and into the urban area of Greater Napanee to have an alternative route to use, as currently the only option is County Road 41.

9.3 Right-of-Way Permits

The County issues permits for construction work and other activities that occur within the right-of-way of a County road. There are fees associated with the issuance of the permits and a review of the fees was completed.

The permit fees for Lennox and Addington were compared to the fees from other Counties. Data regarding right-of-way permit fees was collected from the County of Lanark, the County of Renfrew, United Counties of Stormont, Dundas and Glengarry, and the County of Leeds and Grenville. Information was also collected from the County regarding the number of hours required to prepare the permit and conduct field work associated with the issuance of the permit. Recommendations for permits fees were developed taking into account the fees in other jurisdictions and the time required for the preparation of the permit. The recommendations are shown in **Table 9-2**.

Table 9-2. Recommended Permit Fees

Permit	Current Fee	Recommended Fee
Entrance Permit	\$50	\$ 150
Excavation (cut) Permit	\$0	\$ 150
Encroachment Permit	\$0	\$ 100
Excess Load Permit (Single Trip)	\$50	\$ 50
Excess Load Permit (Annual Permit)	\$50	\$ 100
Municipal Consent	No fee	No fee

9.4 Roundabout Policy

Roundabouts are becoming more common in Ontario with many municipalities and the MTO installing roundabouts at intersections. There are specific situations where roundabouts are most effective for intersection control or for safety needs. It is recommended that the County develop a policy regarding the installation of new roundabouts. A policy could be developed for the County that indicates under what type of circumstances roundabouts should be considered as intersection control. As development occurs, a policy that states that a roundabout and new traffic signals will both be considered if an intersection meets the warrants for signalisation would be beneficial for the development approval process. Specific information about typical design features that are appropriate for the County could also be included in a policy.

10. Recommendations for Further Investigation

10.1 Investigate Transit

Deseronto Transit currently provides service from Greater Napanee to Belleville with a stop in Deseronto. With the proposed Trans-Canada plant construction expected to be ready for commercial operation in 2017, a large number of construction workers will need access to the site. In order to alleviate traffic congestion issues, the expansion of the transit service may be considered as a temporary measure. It is recommended that, as deemed necessary, the local municipality engage in discussions with Deseronto Transit and Kingston Transit about temporarily increasing the transit in the County.

Transit is provided in Loyalist Township in Amherstview through an agreement with Kingston Transit. An expansion of transit in Loyalist Township is the responsibility of the local municipality and could be considered if it is found to be feasible.

10.2 Annual Network Screening of Collisions

It is recommended that the County perform an annual network screening of collisions. This process would review all collisions in the County in the previous year, and rank intersections or road segments according to their observed collisions versus expected collisions, as per the *Highway Safety Manual, 2010*. This would determine problem areas and allow the County to prioritize these locations for adjustments in order to improve safety.

11. Study Maintenance/System Monitoring

The success of long-range plans depends on the ongoing monitoring of relevant conditions, actions and impacts.

The TMP must respond to changes in Lennox and Addington with the passage of time. Community values and priorities may shift. Ongoing monitoring would also be necessary in determining the effectiveness of the initiatives identified in the plan. The Transportation Master Plan should be monitored on an annual basis, taking into consideration the following:

- New trends and technologies in traffic operations that may be applicable to the County
- The status of transportation related provincial initiatives, policies and funding programs
- Population growth and land use changes within the community
- The need to re-assess, amend or update components of the Transportation Master Plan

A Transportation Update should be provided to Council every 10 years, to advise council on recent trends with respect to transportation patterns within the County, and the need to update the Transportation Master Plan. For example, development is anticipated north of Highway 401 in the area near Goodyear Road. This could have an impact on County Road 41. It is in the County's five year plan that improvements will be made to the intersection of County Road 41 and Goodyear Road. Development pressures could necessitate additional lanes on County Road 41. It is recommended that this review take place in conjunction with the next TMP update.

11.1 Collision Database Software

A system for inputting and managing collision data is important for analysis of safety on the County's roads. A database system capable of easily storing and sorting the relevant collision information will help the County to determine the locations where in depth safety analysis should occur. Three collision database software packages were reviewed and compared in order to select the most appropriate package for the County.

11.1.1 Traffic Engineering Software

Traffic Engineering Software (TES) is a software program developed and maintained by *TES Information Technology Ltd*, an Ontario company located in Kitchener. TES is currently being used across Ontario by more than 20 transportation agencies, including: the Ministry of Transportation of Ontario, Region of York, County of Simcoe, City of Ottawa, and Town of Caledon.

TES comes with ready-to-use forms, reports, and diagrams which are associated with the six modules. The modules can work as a stand-alone system or together as an integrated system depending on the needs of the transportation agency. The available TES modules include:

- Infrastructure (this is the base module)
- Collisions
- Traffic Studies
- Safety
- Sign Inventory
- GIS

For the purpose of this summary, we are providing information on the collision module only. The collision module allows for easy input, review, and modification of collision data. According to TES, MTO will require all collision

reporting to be completed with a new electronic e-collision system in June 2014. Data from the new system will be easily importable into the TES software, meaning less manual data input.

Relevant functionality of the collision module includes:

- automatic generation of collision diagrams
- calculation of collision rates
- creation of template or custom reports
- graphical representation of annual statistics

The upfront cost to purchase the infrastructure and collision modules is between \$4,000 and \$5,000. The upfront cost to purchase each additional module is between \$3,000 and \$4,000. The upfront cost includes a single user license and one year of support and upgrades. Annual support includes:

- creation of report templates
- customization of report templates
- sharing of customized reports amongst all paying support users

Following the first year, the annual license/support cost is roughly 50% of the total upfront cost. Furthermore, for a fee, TES can convert historical collision data to a format usable by the TES software. Also for a fee, the infrastructure layers (taken from ESRI ArcGIS) can be installed by TES. The infrastructure layers can also be installed by the client.

11.1.2 OnTRAC

OnTRAC is a web-based collision data management tool created by *TRIMAP Communications Inc*, an Ontario company located in Toronto. OnTRAC can collect, manage, and analyze police-reported collision and traffic volume data. Collisions are mapped to a specific intersection or road segment.

Recently, a number of transportation agencies in Ontario have moved away from the OnTRAC system. Cost data was not readily available.

11.1.3 Crash Magic

Crash Magic was created by *Pd' Programming Inc.*, an American company located in Lafayette, CO. Crash Magic has two versions of their software, an on-line version entitled Crash Magic online and a desktop version entitled Intersection Magic. Both versions can perform the following activities:

- generate collision diagrams
- create frequency diagrams
- prepare graphical representation of annual statistics
- map collision data in GIS

Intersection Magic has an annual cost of \$2,500. The Map Magic Module is an additional \$1,000. Pd' Programming strongly recommends that they assist with the initial Intersection Magic configuration; this is a one-time fee of \$1,000.

11.1.4 Recommendation

It is recommended that TES be investigated for use as a collision database. It has a higher cost but it is becoming commonly used in Ontario. It is more likely that data will be more able to be easily shared between jurisdictions and the OPP may have familiarity with the software.

11.2 County Road Network Length

11.2.1 Summary of Previous Methodology

The road section lengths included in the County's WorkTech asset database (formerly SAMS) have been established through an evolving process. In this regard, the SAMS database initially included lengths for each section measured by odometer and recorded to the nearest tenth of a kilometre (100m), for example 0.4km.

Since migrating data to WorkTech, incremental modifications have been made to the lengths of specific road sections when sections have undergone changes to their limits. Changes to section limits arise when sections are split and/or combined to reflect the physical changes that result from construction and rehabilitation activities that do not always coincide perfectly with existing section limits. The rationale for making section changes of this nature is to organise the database in a way that accurately reflects conditions found in the field. If this is not done, road section characteristics such as width, number of lanes, pavement condition and recommended needs cannot be accurately captured and summarized.

As road sections are changed, the lengths of the new sections have been established using GIS-based measurements of the two-dimensional length of the new road section line segments. The lengths are then recorded in the database to precision of the nearest hundredth of a kilometre (10m), for example 0.42km.

The result of this is a gradual shift towards using two dimensional GIS-based values to represent road section lengths.

11.2.2 Methodology Comparison

The table below summarizes the total system length based on the two methods. Overtime the current practice of refining sections to reflect two-dimensional GIS-based lengths will gradually cause the total system length to trend towards 476.95 km.

Table 11-1. Comparison of Total System Length

Information Source	Total Centre Line Length (km)
Two-Dimensional GIS Line Length	476.95
Values Currently Recorded in WorkTech (mixed)	477.84

Note: These lengths are not adjusted for boundary road sharing with respect to capital and maintenance road responsibilities.

The difference in the two total lengths can be attributed to rounding of older values to the nearest 100m. **Table 11-1** confirms that using the GIS method to determine the road length will not significantly alter the reporting of the total system length. However, changes on individual sections may be more significant as specific rounding "errors" are gradually removed.

11.2.3 Road Section Numbering Considerations

Road section numbers are established using a combination of the County road number and a three digit linear reference representing the distance from the beginning of the section in question as illustrated below.

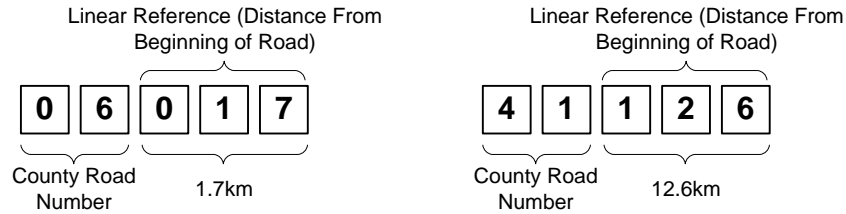


Figure 11-1. County Road Numbering System

The three digit value does not allow section numbers to be completely aligned with cumulative distances/lengths in all cases as certain section lengths are measured in increments of less than 100m.

11.2.4 Recommendations

It is recommended that the County continue to revise road section lengths in the WorkTech Asset Manager database to reflect two-dimensional GIS lengths on an incremental basis.

In addition, a fourth digit should be added to the linear reference portion of the road section number to allow for a more precise alignment of values. A fifth digit could also be added if a desire exists to align lengths and linear reference IDs to the nearest metre.

12. Funding Programs and Opportunities

The County of Lennox and Addington covers a large geographic area (2,841 square kilometres according to Census Canada) and correspondingly has an extensive road network. The capital cost involved in the maintenance of this network is a significant burden on the County's population. In the past, the County's population could adequately maintain its extensive road network with financial assistance from the Province of Ontario. In the absence of provincial subsidies, the County of Lennox and Addington may find it difficult, particularly in the 10 to 20 year time from, to raise sufficient tax revenues to upgrade their road network and implement infrastructure improvements that will be necessary to accommodate long term growth.

In consideration of this, a component of the study has been undertaken to investigate opportunities for the County to fund upgrades to their transportation system. Provided in this section of the report is a discussion of various funding strategies that the County should consider

12.1 Potential Government Funding Sources

12.1.1 Federal Government

One source of potential government funding is through federal government programs. Programs through the federal government have been available in the past, examples include:

- **Building Canada Fund-Communities Component (2008):** Delivered jointly with the Government of Ontario to provide long-term, stable and predictable funding to help meet infrastructure needs across Ontario in communities with populations of less than 100,000.
- **Canada-Ontario Municipal Rural Infrastructure Fund (2005 – 2007):** Delivered by the governments of Canada and Ontario, the Association of Municipalities of Ontario, and Ontario municipalities to improve and renew small urban and rural public infrastructure across the province.

One example of a program currently in place is the **New Building Canada Fund: Provincial-Territorial Infrastructure Component, Small Communities Fund (2014)**. This \$10-billion Provincial-Territorial Infrastructure Component (PTIC) provides support for projects of national, local or regional significance. This includes the Small Communities Fund (PTIC-SCF) that will provide \$1 billion for projects in municipalities with fewer than 100,000 residents. Unlike Building Canada Fund 2007, it will not require framework agreements with provinces and territories, which should avoid lengthy negotiations and delays in the implementation of the New Building Canada Fund.

12.1.2 Provincial Government

Another source of funding is through provincial government programs. Two past examples of provincial government funding programs are:

- **Municipal Infrastructure Investment Initiative (MIII) – Asset Management (August 16, 2012 to October 22, 2012):** Through the MIII Asset Management Program, the Province made \$8.25 million available to small and rural communities to assist them in preparing detailed asset management plans.
- **Infrastructure stimulus funding (2008):** The Government of Ontario made a number of investments in infrastructure as a way to stimulate Ontario's economy in the wake of the global recession that began in 2008. The government did so in partnership with the federal and municipal governments. These efforts made it possible to renew, rebuild and in some cases replace aging infrastructure.

A current fund available is the **Small Rural & Northern Municipal Infrastructure Fund**. The government has allocated \$71 million through the Capital Program to support municipal roads, bridges, water and wastewater infrastructure. Projects are to be identified as priorities in municipal asset management plans. The program has a two-stage selection process. The first stage of the application process closed on November 1, 2013.

A recently announced program is the Ontario Community Infrastructure Fund, where \$100 million will be available annually to small, rural and northern communities. A sum of \$50 million is allocated based on an application from the communities and the remaining \$50 million is allocated based on a funding formula that takes into account various factors about each municipality. This funding is to support municipal infrastructure projects including roads and bridges.

12.1.3 Conclusion

Government funding programs have been available in the past and it is likely they will continue to be available in the future. It is recommended that the County of Lennox and Addington apply for funding from government programs whenever it is applicable.

12.2 Alternative Financing Strategies

Alternative means of financing the County of Lennox and Addington's proposed capital projects includes reserves, grants, property tax, debt or a combination of these.

Capital Reserves are a type of account on a municipality's balance sheet that is reserved for long-term capital investment projects. By setting aside funds, future capital projects may be partially or fully financed depending on the term and amount of reserve savings. Committing funds to capital reserves enables municipalities to reduce or eliminate the need for excessive tax hikes or debt financing of capital projects. Capital reserve accounts will accrue any interest earned in the account. Lennox and Addington could establish a capital reserve for proposed roads and related services projects. The reserve could be funded from annual operating funds transferred to the reserve.

Another means by which Lennox and Addington could potentially fund capital projects is through grants. Local roads and highway projects are eligible for grants under the federal Gas Tax Fund (GTF). The GTF provides funding for Canadian municipalities to assist them to build and revitalize their local public infrastructure. Since 2005 the GTF has provided \$13 billion to assist municipalities with their infrastructure projects and will provide another \$21.8 billion over the next ten years. By the end of 2011, 28% of grants to municipalities received from the GTF were spent on local roads and bridges.

12.3 Development Charges Program

12.3.1 Introduction

Development charges are levies imposed by municipalities on developers to pay for growth related infrastructure. These levies assist with financing growth-related capital costs of providing services such as roads, water and wastewater services, police, fire and transit. In order to implement development charge by-laws, municipalities are required by the Development Charges Act (DCA) 1997 to conduct a detailed development charges background study.

The background study determines the maximum development charge that a municipality is able to levy with reference to:

- average capital service levels over the ten-year period preceding preparation of the background study;

- estimates of projected residential, commercial and industrial development;
- estimates of new services required to support projected development;
- and estimates of costs of development-related capital projects to support the increased need for services (DCA, 1997).

Although this report addresses some of the issues in assessing the feasibility of a development charge, it is not intended to take the place of a full background study.

12.3.2 Eligibility of Projects to be Included in a Development Charge

For capital projects to be eligible for financing through a development charge, certain criteria under the DCA need to be met. Specifically, projects need to demonstrate that they are to service future growth and not to:

- increase the level of service (LOS) in excess of the historic ten-year average;
- provide benefit to existing development; or
- provide excess capacity.

Projects oftentimes fail to satisfy each of the above criteria. For projects that do not fully meet these criteria, the amount eligible for financing is subject to a deduction. Furthermore, development-related capital projects not pertaining to water supply services, waste water services, storm water and drainage control, police and fire protection and highways are subject to a 10% statutory deduction.

The main criteria influencing the eligibility of Lennox and Addington's growth related capital projects for development charge financing are historic ten-year average LOS and benefits conferred by new capital projects to existing development. With regards to the former, if the LOS delivered by a new capital project is greater than the historic ten-year average LOS the cost of the project eligible for development charge financing is reduced. By delivering LOS in excess of the historic ten-year average, new capital projects are deemed as providing benefit to existing development rather than exclusively supporting new growth. The amount available for financing through a development charge is reduced by the extent to which an increase in LOS benefits existing development.

12.3.3 Area Specific Development Charges

The DCA allows for the development charges to be levied uniformly throughout the municipality or on an area-specific basis. Area-specific development charges are applied where capital projects confer benefit to a specific geographical area. These charges reflect a localized need for development-related capital projects to support anticipated local development. Area-specific development charges provide a mechanism for more equitable distribution of levies.

12.3.4 Proposed Development-Related Capital Projects

The County of Lennox and Addington has proposed four distinct development-related capital projects pertaining to roads and related services over the forecast period 2014 to 2033. The first development-related capital project is the construction of a new road west of County Road 41. The other three of the projects proposed deal with intersections, specifically:

- Install roundabout at County Road 2 and Potter Drive;
- Install roundabout at County Road 23 and County Road 24; and
- Install roundabout at County Road 23 and County Road 6

These projects are assumed for the purpose of these calculations but are not confirmed.

Table 12-1 provides an overview of the development-related capital projects that were examined for feasibility of funding through development charges.

Table 12-1. Proposed Development-Related Capital Projects

		Municipality	Start Date	Project Cost
Intersection Projects	Install roundabout at CR 2 and Potter Dr.	Loyalist	2023 ¹	\$ 650,000
	Install roundabout at CR 23 and CR 24	Loyalist	2027 ¹	\$ 700,000
	Install roundabout at CR 23 and CR 6	Loyalist	2027 ¹	\$ 700,000
Road Projects	Build new road west of CR 41	Greater Napanee	2033	\$ 2,700,000

Note 1: Start dates taken from Traffic Impact Studies prepared by others

Table 12-2 outlines which intersections are anticipated to be impacted by the proposed intersection projects. The new road build west of County Road 41 is anticipated to impact County Road 41 south of Advance Avenue.

Table 12-2. Intersections Impacted by Intersection Projects

Intersection Project	Intersection Impacted			
	CR 2 at School Access	CR 2 at Potter Dr	CR 23 at CR 24	CR 23 at CR 6
Install roundabout at CR 2 and Potter Dr	✓	✓		
Install roundabout at CR 23 and CR 24			✓	
Install roundabout at CR 23 and CR 6				✓

12.3.5 Development Forecast

For the purposes of analysis, AECOM constructed a development forecast for the County of Lennox and Addington and its associated lower tier municipalities based on a combination of the following data sources: 2011 Census population and private dwelling statistics; Ministry of Finance Ontario Population Projections Update (2012-2036) growth rates; 2006 Census Place of work status statistics; 2006 Census Industry statistics; and average three year historical housing starts (2011-2013). The forecast utilized for this study is based on information derived from the municipality.

The County is expected to experience modest residential and non-residential growth over the next 20 years (**Table 12-3**). The County residential population growth over the forecast period of 2014-2033 is expected to increase by 15% (6,335 people) and the number of private dwellings is projected to increase 14% (2,518 units). Non-residential growth, industrial, commercial and institutional (ICI) employment and ICI gross floor area are both expected to increase 13% by 836 ICI employees and 566,052 sq. ft. respectively.

Table 12-3. Residential and Non-Residential Growth Forecast (2014-2033)

	Residential Growth Forecast (2014-2033)		Non-residential Forecast (2014-2033)	
	Population	Private Dwellings	ICI employment	ICI Gross Floor Area (sq. ft)
Addington Highlands	220	170	31	23,407
Greater Napanee	1,503	627	323	222,049

	Residential Growth Forecast (2014-2033)		Non- residential Forecast (2014-2033)	
Loyalist Township	3,861	1,425	372	242,908
Stone Mills	750	295	110	77,688
County Total	6,335	2,518	836	566,052

As indicated by **Table 12-3** the majority of growth in the County is expected to be in Greater Napanee and Loyalist Township. Greater Napanee accounts for 24% of the County's population growth, 25% of the County's housing growth and 39% of the County's ICI employment growth and ICI gross floor area growth. Loyalist Township accounts for 61% of the County's population growth, 57% of the County's housing growth, 44% of the County's ICI employment growth and 43% of the County's ICI gross floor area growth.

Greater Napanee

Greater Napanee's total population and private dwellings are expected to grow 10% from 2014 to 2033. Population is expected to grow from 15,716 people in 2013 to 17,219 people in 2033. Private dwellings are expected to grow from 6,976 units in 2013 to 7,643 units in 2033.

By the year 2033 Greater Napanee's annual population and ICI employment growth are expected to be 67% less than 2014 levels. Greater Napanee's annual population growth is expected to fall from 135 people per year in 2014 to 45 people per year in 2033. Similarly, annual ICI employment growth is expected to fall from 29 employees per year in 2014 to 10 people per year in 2033.

Loyalist Township

Loyalist's total population and private dwellings are expected to grow 23% from 2014 to 2033. Population is expected to grow from 16,886 people in 2013 to 20,787 people in 2033. Private dwellings are expected to grow from 6,427 units in 2013 to 7,897 units in 2033.

By the year 2033 Loyalist's annual population and ICI employment growth are expected to be 49% less than 2014 levels. Loyalist's annual population growth is expected to fall from 236 people per year in 2014 to 120 people per year in 2033. Similarly, annual ICI employment growth is expected to fall from 23 employees per year in 2014 to 12 people per year in 2033.

12.3.6 Intersection Level of Service

Table 12-4 shows the ten-year average delay for each of the intersections impacted by the proposed intersection projects, the future delay resulting from implementation of these projects and the difference between the two.

Table 12-4. Ten Year Average Delay and Future Intersection Delay at Intersections Impacted by Capital Projects

	Average Intersection Delay (s) (2004-2013)		Future Intersection Delay (s) with Improvements		Change in Delay (s)	
	Peak AM	Peak PM	Peak AM	Peak PM	Peak AM	Peak PM
CR 2 at School Access	0.2	0.4	5.8	6.5	5.6	6.1
CR 2 at Potter Drive	0.2	0.2	5.8	6.5	5.6	6.3
CR 23 at CR 24	4.7	3.7	10.8	9.0	6.1	5.3
CR 23 at CR 6	9.7	12.2	8.8	8.6	-0.9	-3.6

Capital projects that result in future delays that are less than the ten-year average delay indicate that these projects confer benefit to existing users. Conversely, capital projects that result in future delays greater than the ten-year average indicate that these projects serve new developments. In order to determine the proportion of benefit intersection projects confer upon existing users, we used the criteria shown in **Table 12-5**.

Table 12-5. Difference in Delays and Corresponding Benefit to Existing Development

Difference Between Ten-Year Average Delay and Future Delay with Improvements (s)	Benefit to Conferred Existing Development
> 0	0%
0 to -5	10%
-5 to -10	20%
-10 to -15	30%

Table 12-6 presents the benefit conferred to existing development at intersections from proposed intersection projects. The proposed capital projects impacting the intersection of County Road 23 at County Road 6 results in future peak hour AM and PM delays that are less than the ten-year averages. This project confers peak hour AM and PM delay benefits to existing development. The proposed capital projects impacting intersections County Road 2 at School Access, County Road 2 at Potter Drive and County Road 23 at County Road 24 result in future peak hour delays that are more than the ten-year averages. These projects do not confer peak hour benefits to existing development.

Table 12-6. Overall Benefit to Existing Development Derived from Intersection Projects

Intersection Project	Overall Benefit to Existing Development
Install roundabout at CR 2 and Potter Dr	0.0%
Install roundabout at CR 23 and CR 24	0.0%
Install roundabout at CR 23 and CR 6	10.0%

The total cost for these projects eligible for development charge financing is subject to deduction by the proportion of benefit conferred to existing development. The installation of roundabouts at County Road 2 and Potter Drive, and County Road 23 and County Road 24 are entirely new growth related and therefore the total cost of these projects is eligible for development charge financing.

12.3.7 Road Level of Service

The future v/c ratio of County Road 41 south of Advance Avenue with the new road is 31.9% less than the ten-year average. This represents an improvement in LOS and a benefit to existing development as shown in **Table 12-7**.

Table 12-7. Ten Year Average v/c vs Future v/c on County Road 41

	Average v/c (2004-2013)	Future V/C with New Road (2033)	Percentage Change in V/C
CR 41	0.86	0.59	31.9%

12.3.8 Estimated Eligibility of Capital Projects

The proportion of project costs that serve new development are eligible for development charge financing while the proportion of project costs that benefit existing development are deemed ineligible. The costs provided are for construction costs only and do not reflect property acquisition costs or utility relocation, if required. The eligibility of each of the projects under consideration for development charge financing is presented in **Table 12-8**.

Table 12-8. Eligibility of Development-Related Capital Projects

Capital Project	Benefit to Existing Development	Related to New Growth	Total Project Cost (\$2013)	Development Charge Eligible Financing (\$2013)
Install roundabout at CR 2 and Potter Dr	0.0%	100.0%	\$650,000	\$650,000
Install roundabout at CR23 and CR 24	0.0%	100.0%	\$700,000	\$700,000
Install roundabout at CR 23 and CR 6	10.0%	90.0%	\$700,000	\$630,000
Build new road west of CR 41	31.9%	68.1%	\$2,700,000	\$1,838,700
Grand Total	19.6%	80.4%	\$4,750,000	\$3,818,700

12.3.9 Potential Development Charge Amounts

We estimated potential area-specific development charges for County of Lennox and Addington based on the eligibility of proposed projects and forecasted new development. Development charges are intended to bring in adequate funds from developers for residential and ICI construction so that sufficient funds are available in the future to finance the portion of capital projects that benefits new development. Factors that must be taken into account when calculating proposed development charges include:

- Timing of capital projects;
- Timing of development build out;
- Interest rate paid on balances of development charge reserves; and
- Estimated annual rate of inflation of project costs.

For the development charge calculations, we assumed an annual inflation rate of 2.00%; real and nominal savings rates of 0.00% and 2.00%, respectively; and real and nominal borrowing rates of 2.94% and 5.00%, respectively.

Due to the localized nature of the proposed development-related projects, area-specific development charges were deemed appropriate for County of Lennox and Addington. The three intersection projects proposed are to be located in Loyalist Township to support development within the lower tier municipality. The proposed new road built project is intended to serve future development in Greater Napanee. Both Loyalist and Greater Napanee have local municipal development charge fees.

We used the time-value of money and a discounted cash flow analysis to calculate area-specific development charges per capita and ICI employee. Within each of the two areas being considered for development charges, a capital cost allocation was calculated. This allocation compares the ratio of new population to new employment, and proportionally allocates the amount of the development charge to be funded by each. In Greater Napanee, 82.3% of the proposed capital projects will be funded via residential development and 17.7% via non-residential development. In Loyalist, 91.2% of capital projects are funded via residential development and 8.8% via non-residential development.

In Greater Napanee the residential development charge per capita is \$1,189.33 and the non-residential development charge per sq. ft. is \$1.73. In Loyalist the residential development charge per capita is \$555.21 and the non-residential development charge per sq. ft. is \$0.85. **Table 12-9** presents residential and non-residential development charge per unit for Greater Napanee and Loyalist.

Table 12-9. Greater Napanee and Loyalist Township Residential and Non-Residential Development Charges Per Unit

		People per Unit / ICI Employees per Unit	DC per Unit	
			Greater Napanee	Loyalist
Residential	Single and Semi (> 2 bedroom)	2.69	\$ 3,199	\$ 1,494
	Single and Semi (< 2 bedroom)	1.89	\$ 2,248	\$ 1,049
	Apartment (2 bedroom +)	2.16	\$ 2,569	\$ 1,199
	Apartment (bachelor, 1 bedroom)	1.49	\$ 1,772	\$ 827
	Other Multiples	2.28	\$ 2,712	\$ 1,266
Non-Residential	Non Residential (sq ft)	0.0015	\$ 1.73	\$ 0.85

12.3.10 Development Charges Comparison

Table 12-10 provides a comparison of the proposed development charges for the County of Lennox and Addington to those imposed by the City of Kingston, City of Belleville, County of Prince Edward and the City of Quinte West. These comparators were selected for their proximity to the County of Lennox and Addington and because residential, industrial and commercial development could equally likely choose to locate within any one of the listed communities. All of the development charges listed are for roads and related services only.

The City of Kingston is located east of the County of Lennox and Addington and shares a boundary with Loyalist Township. The City of Kingston has an area of 450 square kilometres and a population of 123,390 people, according to the 2011 Canadian Census. Kingston is in the process of preparing an updated development charge background study and is expected to enact the new development charge by-law in September 2014. Values in the comparison table were taken from the August 12, 2014 report to Kingston City Council regarding the new development charge by-law.

The City of Belleville is located approximately 40 kilometres west of Greater Napanee. According to the 2011 Census data from Statistics Canada, Belleville has an area of 250 square kilometres and a population of 49,450. Belleville updates their development charges annually. The most recent data available was for the development charges effective as of January 1, 2013. Belleville is in the process of preparing an updated development charge by-law and background study. A public meeting will be held in September 2014 to obtain public input regarding the proposed development charges.

Prince Edward County is located at the eastern end of Lake Ontario with an area of over 1,000 square kilometers and a population of approximately 25,000 people, according to the 2011 Census data from Statistics Canada. Prince Edward County's development charges for roads and related services covers traffic signals; intersection improvements; signalization; a bypass; new intersections; and road extensions over the period of 2013 to 2033. The development charge by-law was updated in March 2013 and then indexed in March 2014. The development charges effective from March 2014 to March 2015 are presented in **Table 12-10**.

The City of Quinte West is located approximately 60 kilometres west of Greater Napanee. According to the 2011 Census of Population from Statistics Canada, Quinte West has a land area less than 500 square kilometres, and a population of approximately 43,000 people. Quinte West's most recent development charges were calculated in August 2010 and the bylaw was passed in March 2011. The bylaw contains indexed development charges and the values for the 2014 development charges are provided in **Table 12-10**.

The City of Brockville is located in Eastern Ontario, approximately 100 kilometres east of Amherstview. According to the 2011 Census data from Statistics Canada, Brockville has a land area of 20 square kilometres and a population of 21,870 people. Brockville suspended their development charges in 2009, but they were reinstated in July 2014 with the passing of a new bylaw with updated charges.

Table 12-10. Comparison of Development Charges for Roads and Related Services

		Roads and Related Development Charge per Unit						
		Greater Napanee	Loyalist Township	Kingston	Belleville	County of Prince Edward	Quinte West	Brockville
Residential	Single and Semi (> 2 bedroom)	\$ 3,199 +\$2,168.81 local fee	\$ 1,494 +\$1,854 local fee	\$ 7,282	\$ 2,001	\$ 2,766	\$ 2,477	\$ 1,346
	Single and Semi (=< 2 bedroom)	\$ 2,248 +\$1,766.30 local fee	\$ 1,049 +\$1,854 local fee			\$ 1,944		
	Apartment (2 bedroom +)	\$ 2,569 +\$1,504.62 local fee	\$ 1,199 +\$1,279 local fee	\$ 4,659	\$ 1,418	\$ 2,221	\$ 1,578	\$ 851
	Apartment (bachelor, 1 bedroom)	\$ 1,772 +\$1,504.62 local fee	\$ 827 +\$1,279 local fee	\$ 3,233	\$ 814	\$ 1,532	\$ 907	\$ 538
	Other Multiples	\$ 2,712 +\$1,504.62 local fee	\$ 1,266 +\$1,599 local fee	\$ 5,876 (2+ bedrooms)	\$ 1,390	\$ 2,457 (2+ bedrooms)	\$ 1,563	\$ 1,018
		\$ 2,546	\$ 1,944					
Non-Residential	Non Residential (sq.ft)	\$ 1.73 +\$1.20 local fee	\$ 0.85 +\$ 0.59 (industrial) or \$1.37 (non-industrial) local fee	\$ 4.69 (non-industrial)	\$ 1.27	\$ 2.28	\$ 3.08	\$ 0.44
				\$ 2.30 (industrial)				

Table 12-10 indicates that the development charges for Greater Napanee and Loyalist are in the same range as those from similar municipalities, although the fees for Greater Napanee are higher than the other municipalities with the exception of Kingston. Comparisons with other municipalities should be for general information only because there are differences regarding the total costs for eligible development charge projects, timing of capital projects, and population growth forecasts. The development charges calculated for the County of Lennox and Addington specifically for roads and related services are comparable to the reference jurisdictions.

12.4 Summary and Recommendations

The intent of this study was to evaluate the feasibility of development charges for the County of Lennox and Addington and to determine how much of the overall cost of infrastructure could be funded through development charges. Through the analysis, it was shown that development charges are a feasible mechanism for funding projects and we have calculated the maximum development charges allowable based on the Development Charges Act and current information regarding projects and population.

A portion of the costs for installing a roundabout at County Road 2 and Potter Drive; installing a roundabout at County Road 23 and County Road 24; installing a roundabout at County Road 23 and County Road 6; and a new road built west of County Road 41 could be recovered through development charges. This analysis has demonstrated that the proposed capital projects are growth related and that the majority of the impact from these projects benefits future development. Approximately 80% or \$3,818,700 of the total cost of the County's development-related project costs is eligible for development charge financing. Alternative means of financing the County's proposed development related projects includes reserves, grants, property tax, debt or a combination of these methods.

Development charges are feasible for the County in the context of the roads projects anticipated. A Development Charges By-law study is required for the implementation of development charges and this study would need to be renewed every 5 years. There is a cost associated with implementing and maintaining a Development Charges By-Law. County finance staff, in consultation with other County departments and County Council, will need to determine if this is the right time to implement development charges in Lennox and Addington.

13. Summary of Recommendations and Implementation Timing

A summary of the recommendations and the corresponding timeline for implementation is provided below. The implementation periods are set in 5 year increments beginning in 2014 and included in the timing plan are projects that are ongoing and projects that should be implemented immediately.

The planning horizons considered within the context of this study were existing, 10 year (2024) and 20 year (2034). The road network that was analyzed for each of the planning horizons was based on the existing County road system. As major changes to the road system are implemented, the effect on adjacent roads, traffic volumes and the timing/scope of needs should be reassessed and reconfirmed. The timelines for projects may shift as changes to the road network occur and as development in the County proceeds.

Depending on the nature of the recommendation, the suggested implementation timing may relate to County administration/staff activities, planning/study requirements, or actual construction.

Table 13-1. Summary of Recommendations and Implementation Timing

Timeline	Recommendations	Cost
2014 - 2019	Infrastructure Projects	
	Install roundabout at County Road 23 & County Road 6	\$ 700,000
	Install splitter islands at County Road 1 & County Road 10	\$ 8,000
	Coordination of signals at County Road 41 & County Road 2 with signals at County Road 41 & County Road 1	\$ 5,000
	Install uninterruptible power supplies at traffic signals	\$ 10,000/intersection
	Install folding stop signs along Emergency Detour Route	\$ 5,000
	Review whether accessible pedestrian signals should be included in intersection construction	\$20,000/intersection, Total = \$220,000
	Pedestrian accommodations at County Road 8 and County Road 9	\$ 10,000
	Pedestrian accommodations at County Road 41 and Advance Avenue	\$ 5,500
	Pedestrian accommodations at County Road 2 and County Road 6	\$ 5,000
	Pedestrian accommodations at County Road 41 and Community Road	\$ 2,000
	Analyses and Policies	
	Develop roundabout policy	-
	Implement speed limit policy	-
	Adjust load restricted network	-
	Change functional classification of four County roads	-
	Develop a policy to define a County Road	-
	Review transfer to County jurisdiction of east-west road in Napanee	-
	Review permit fees	-
	Update Scope of Services for Maintenance Agreements	-
Update Maintenance Standards Document	-	

Timeline	Recommendations	Cost
	Studies	
	Revise Maintenance Agreements based on an analysis of municipal expenditures	-
	Support discussions between local municipalities and existing transit organizations	-
	Purchase collision database program to manage collision data	\$5,000 first year \$2,500 subsequent years
	Environmental Assessment for new road west of County Road 41	\$ 350,000
	Consider undertaking Development Charges By-law Study (study cost estimate \$50,000)	-
2019 - 2024	Infrastructure Projects	
	Install roundabout at County Road 23 & County Road 24	\$ 700,000
	Install roundabout at County Road 1 & County Road 10	\$ 1,000,000
	Realign intersection at County Road 1 & County Road 2	\$ 300,000
	Remove southbound right turn lane at County Road 2 & County Road 6	minimal
2024 - 2029	Infrastructure Projects	
	Reconstruct County Road 4	\$ 8,800,000
	Build new road west of County Road 41 (cost excludes property and utilities)	\$ 2,700,000
	Analyses and Policies	
	Review number of lanes on CR 41 between 401 and Goodyear	as part of next TMP update
	Studies	
	Transportation Master Plan Update	\$ 250,000
2029 - 2034	Infrastructure Projects	
	County Road 23 extension	\$ 5,300,000
Ongoing	Infrastructure Projects	
	Maintain current cross-section County Road 5	-
	Install LED traffic signal heads	In capital budget
	Continue paved shoulder trail program	\$ 22,000/km/side
	Analyses and Policies	
	Calculate road length with GIS	-
	Review the addition of accessible pedestrian signals as per the Accessible Pedestrian Signals policy whenever a request is made.	-
	Studies	
	Perform regular network screening of collisions	\$ 5,000/review

Appendix A

County of Lennox and Addington – Transportation Master Plan

- Consultation Report

County of Lennox and Addington

Consultation Round #1 and #2 Summary Report Transportation Master Plan Update

Prepared by:

AECOM

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Ottawa, ON, Canada K2H 8S9
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613 820 8282 tel
613 820 8338 fax

Project Number:

60288842

Date:

July, 2014

Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("Consultant") for the benefit of the client ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to Consultant which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by Consultant represent Consultant's professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since Consultant has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, Consultant, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

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This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

July 31, 2014

Mr. Steve Roberts, C.E.T
Manager, Roads and Bridges
County of Lennox and Addington
97 Thomas Street
Napanee, ON K7R 4B9

Dear Mr. Roberts:

Project No: 60288842
Regarding: Consultation Round #1 and #2 Summary Report
Transportation Master Plan Update

The Consultation Round #1 and #2 Summary Report for the Transportation Master Plan Update project is attached for your review. The document forms a record of the engagement to date with agencies, aboriginal groups, and the general public, as well as records of the Public Open Houses.

Sincerely,
AECOM Canada Ltd.



Vanessa Skelton, P. Eng.
Project Manager
AECOM
Vanessa.skelton@aecom.com

Encl.
cc: file

Distribution List

# of Hard Copies	PDF Required	Association / Company Name
0	1	Steve Roberts, County of Lennox and Addington

Revision Log

Revision #	Revised By	Date	Issue / Revision Description
0	D. Kielstra	October 2013	Consultation Round 1
1	D. Kielstra	July 2014	Consultation Round 2

AECOM Signatures

Report Prepared By:

 David Kielstra
 Consultation and Communication
 Coordinator

Report Reviewed By:

 Vanessa Skelton, P. Eng
 Project Manager

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Appendices

Appendix A.	Notice of Study Commencement
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1. INTRODUCTION

The County of Lennox and Addington initiated a Transportation Master Plan update in June 2013. The Transportation Master Plan provides a comprehensive assessment of the County's current and future transportation system improvement needs. The plan examines emerging trends and challenges in the County, and changes affecting the previous plan recommendations. The Transportation Master Plan was last approved in 2001.

The transportation master plan study followed with Phase 1 and 2 of the Municipal Class Environmental Assessment Planning and Design Process as a Schedule "B" project. The study involved developing, assessing, and evaluating alternatives, as well as a recommended plan to be presented to the County of Lennox and Addington. The Municipal Class Environmental Assessment process was developed by the Municipal Engineers Association (MEA) to incorporate the key principles of environmental planning under the Ontario *Environmental Assessment Act*.

Two rounds of public information centres were held during the course of the study to review and discuss the project with the Study Team and obtain feedback. The purpose of this report is to present an overview of the consultation carried out, and to document responses.

2. PROJECT LOCATION

The County of Lennox and Addington is the project area for this Transportation Master Update. All transportation corridors within the County that fall under County jurisdiction are included, while other transportation corridors such as Provincial highways are not considered as part of this environmental assessment process.

The boundaries of the County of Lennox and Addington, and roads identified as Provincial Highways, County Roads, and Municipal Roads are shown on Figure 1.

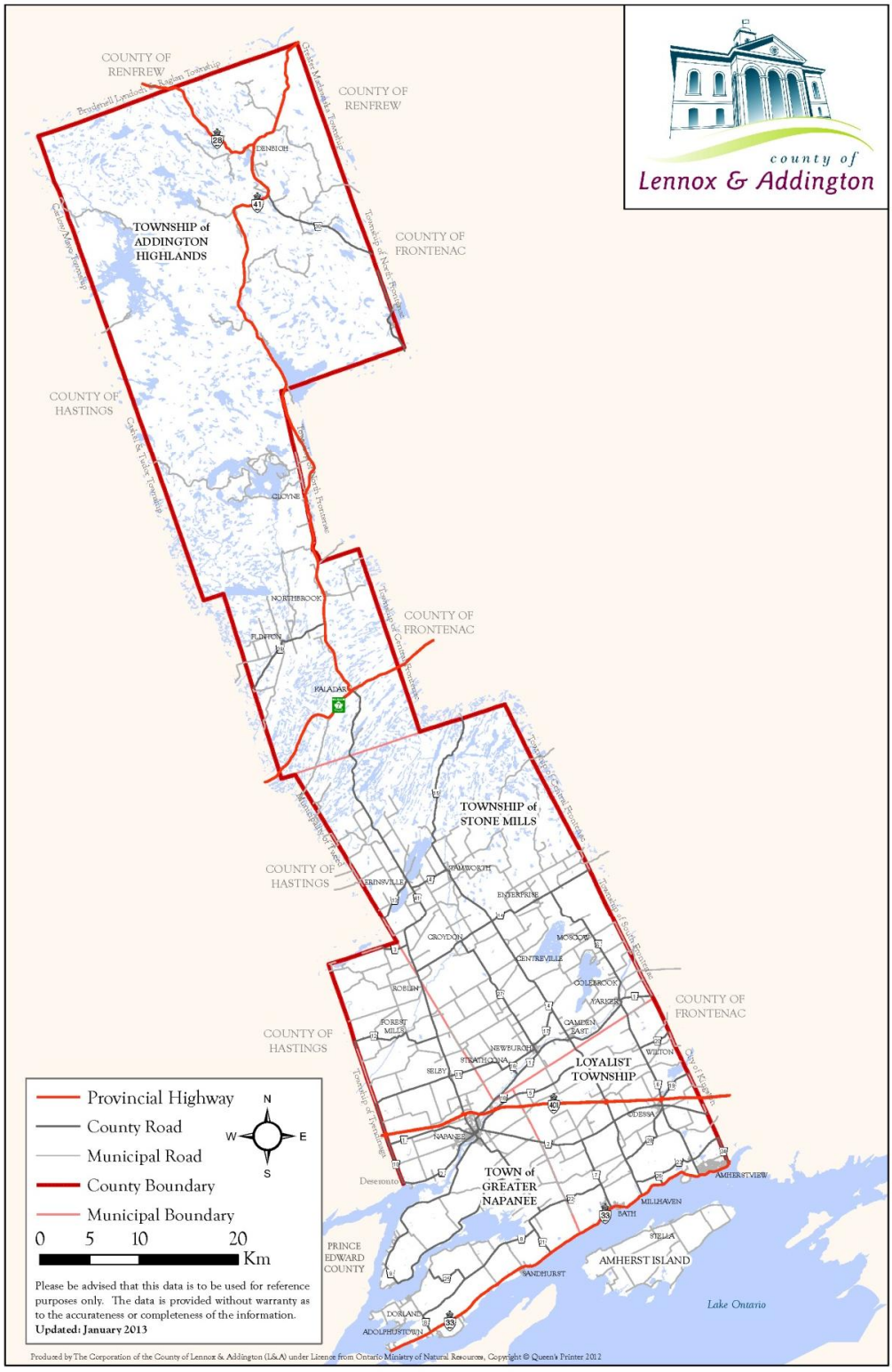


Figure 1. Study Area

3. NOTICE OF COMMENCEMENT

The notice of commencement for the Transportation Master Plan project was first issued in June 2013 across a variety of platforms to encourage community engagement:

- County Website June 5, 2013
- Napanee Beaver: June 6, 2013
- Kingston This Week: June 6, 2013
- EMC- Northeast Edition: July 4, 2013
- Twitter: June 18, 2013
- Project mailing list: June 11, 2013 (Hard copy to others: June 12, 2013)
- Aboriginal Agencies email: June 18, 2013
- Aboriginal notification letter: September 11, 2013

The Notice of Commencement can be found in **Appendix A**.

4. PROJECT WEBSITE

Project notifications are added to the County of Lennox and Addington website as they are available: <http://www.lennox-addington.on.ca/>. The website includes public notices advertising the notice of commencement and the public open house meetings. Contact information is provided on each of the notices.

5. PUBLIC INFORMATION CENTRE (PIC) #1

One of the key objectives of the environmental planning process is to provide the public, interested parties and affected agencies with opportunities for meaningful input. To ensure this objective is met, comprehensive public and agency notification of the Public Information Centre (PIC) was undertaken.

To accommodate the size of the County of Lennox and Addington, the first Public Information Centre was held in two locations in September 2013. The two meeting were held:

Monday, September 23, 2013	Thursday, September 26, 2013
Northbrook Lion’s Hall 12328 Highway 41 Northbrook, ON 5:00 P.M. to 7:00 P.M.	Strathcona Paper Centre 16 McPherson Drive Napanee, ON 5:00 P.M. to 7:00 P.M.

The notice for the Public Information Centre was issued in September 2013 and is included in **Appendix B**. The notice was made available across a variety of platforms to encourage community engagement, including:

- County Website: September 11, 2013
- Facebook: September 11, 2013
- Twitter: September 11, 2013
- Napanee Beaver: September 19, 2013
- Frontenac News: September 19, 2013
- Kingston This Week: September 19, 2013
- EMC: September 19, 2013

- Project mailing list reminder, including email to Aboriginal groups: September 19, 2013

At the Public Information Centre there was an opportunity to:

- Learn about the study scope and the need for an updated Transportation Master Plan
- Review existing conditions
- Review and comment on proposed alternative solutions
- Ask questions and discuss the project with members of the Study Team.

Display panels were prepared to aid the explanation of project progress and key issues. The panels included a map of the project area, visuals including graphs and charts to identify county growth projections and transportation study components.

The Public Information Centre provided an opportunity for members of the public to view the display material and to discuss the project with County of Lennox and Addington staff and consultant representatives. Attendees were encouraged to provide written comments. The members of the project team in attendance consisted of:

Project Team Members (both sessions)	Steering Committee Members from Addington Highlands (Northbrook session only)
<ul style="list-style-type: none"> • Steve Roberts, County of Lennox and Addington Project Manager 	<ul style="list-style-type: none"> • Royce Rosenblath
<ul style="list-style-type: none"> • Vanessa Skelton, AECOM Project Manager 	<ul style="list-style-type: none"> • Tanya Rosenblath
<ul style="list-style-type: none"> • Guy Laporte, AECOM 	

A presentation was given during the Public Information Centre which followed the format of the display material. The presentation and the displays presented at the Public Open House are provided in **Appendix C** and dealt with the following topics:

- **Welcome**
- **Transportation Master Plan**
 - Overview
 - Municipal Class Environmental Assessment Planning Process
- **Consultation Process**
- **Changes on the Horizon**
 - Changing population growth, aging, and climate change & sustainability
- **County Demographics**
- **Changes on the Horizon**
- **Scope of the Plan Update**
- **Study Issues**
- **Needs Assessment**
- **Policy and Standards Review**
- **Financial Assessment**
- **Phase 1: Transportation Problems and Opportunities**
 - Issues Identified:
 - Capacity/Level of Service
 - Safety
 - Network



- Pedestrian facilities
- **Traffic Operations Review**
- **Safety Assessment**
- **Phase 2: Alternative Solutions**
- **Next Steps and upcoming events**

A total of eight people attended first round of consultation, of which four people attended the September 23, 2013 session and four people attended the September 26, 2013 session of Public Information Centre #1.

Although no comments were received at either of the sessions, one comment was received by e-mail after the Public Information Centre. The following is a summary of verbal comments received, as well as written comments received following the Public Information Centre.

Table 1 - Summary of Discussion at the Public Information Centre Sessions #1

Summary of Discussion – Public Information Centre
Q: Roundabouts – how much property do they use?
A: Not a lot more than the existing intersection at County Road 23 and County Road 6. At County Road 2 and County Road 6 there are existing houses that would be impacted by the construction of a roundabout.
Q: Who asked for this study, who pays for it?
A: The County of Lennox and Addington is paying for the study.
Q: How do you identify high collision locations?
A: We would expect a certain number of collisions based on the type of road and traffic volumes. We identify roads that have more collisions than expected.
Q: Are there any safe bicycle lanes in Napanee?
A: The County of Lennox and Addington has developed a County Trails system. Road shoulders are paved for a width of 1.2-1.5m. An example is County Road 2 west of Napanee where shoulders are being paved as roads are resurfaced. 45% of the County Road system has paved shoulders.
Q: An individual laments the lack of cycle lanes on the west side of downtown. The narrow road and high speeds makes the individual feel unsafe.
A: Speeding is an increasing concern. The County has acquired speed indicator signs to make drivers more aware of this issue.
Q: Did you look at Highway 33?
A: No. Highway 33 is under provincial jurisdiction.
Q: May I have a copy of the presentation?
A: Yes, provide us with your email address.
Q: The Napanee Official Plan is contrary to the TMP in that the Jim Kimmitt extension was not shown in the same place. The roadway that is currently being built is not to an arterial standard because there are many entrances on the road which defeats the purpose of an arterial.
A: Without a definite plan in place, the County and Municipality will have difficulty preventing developers from building access points along a roadway. The first step is to protect the corridor for the roadway in a plan.
Q: Roundabout: The radius of the County Road 2 roundabout is too small.
A: The purpose of a roundabout is to slow vehicular traffic. The roundabout is an improvement over the previous intersection control. Another member of the public agreed that it was definitely a much better solution.

Table 2 - Comments Received following the Public Information Centre #1

Written Comment Received:
<p>My believe (sic) is that the growth will continue in the Amherstview area and slow growth will continue in these areas. I think that improved roads should follow development and that the developer should be responsible for the costs related to road required.</p> <p>I think that as part of this study all of the road in the county should be reviewed and determine what their current status is to determine future needs and specific roads that need to be addressed in the county. There are a number of roads in the county area that are in rough condition that need to be addressed prior to the roads significantly falling apart resulting in larger long-term costs.</p> <p>We regularly use the road for walking on a daily basis and find the road crumbling at the side and the pavement breaking apart. This makes it difficult to walk or cycle on given the condition of the shoulder of the road. I am definitely a supporter of the paved shoulders on the road that significantly improve safety for people walking or cycling and keep them off the vehicle roadway.</p> <p>I don't find that the traffic in the county is of a significant nature that would require any network improvement such as a bypass given the cost related to the change and the minimal amount of traffic.</p> <p>It is somewhat disappointing that members of the community are not engaged in the process of reviewing this plan update as it could significantly impact them on their future tax requirements related to road improvements in the county.</p>

6. PUBLIC INFORMATION CENTRE (PIC) #2

One of the key objectives of the environmental planning process is to provide the public, interested parties and affected agencies with opportunities for meaningful input. To ensure this objective is met, comprehensive public and agency notification of the Public Information Centre (PIC) was undertaken.

To accommodate the size of the County of Lennox and Addington, the second Public Information Centre was held in two locations in September 2013. The two meeting were held:

Monday June 16, 2014	Wednesday June 18, 2014
<p>Loyalist Township Municipal Office 263 Main Street Odessa, Ontario 5:00 p.m. to 7:00 p.m.</p>	<p>Township of Stone Mills Municipal Office 4504 County Road 4 Centreville, Ontario 5:00 p.m. to 7:00 p.m.</p>

The notice for the Public Information Centre was issued in May 2014 and is included in **Appendix B**. The notice was made available across a variety of platforms to encourage community engagement, including:

- County Website: May 30, 2014
- Facebook: May 30, 2014
- Twitter: May 30, 2014
- Napanee Beaver: June 5, 2014
- Frontenac News: June 5, 2014
- Kingston This Week: June 12, 2014
- EMC: June 5, 2014
- Emailed to the project mailing list: May 29, 2014
- Aboriginal community letters: June 3, 2014

At the Public Information Centre there was an opportunity to review and obtain public input on:

- The Master Plan and consultation process;
- Infrastructure project recommendations;
- Recommended studies;
- Development Charges feasibility; and
- Next steps in the study.

Display panels were prepared to aid the explanation of project progress and key issues. The panels included a map of the project area, visuals including graphs and charts to identify preliminary recommended options as well as plans regarding additional studies and development charges.

The Public Information Centre provided an opportunity for members of the public to view the display material and to discuss the project with County of Lennox and Addington staff and consultant representatives. Attendees were encouraged to provide written comments. The members of the project team in attendance consisted of:

Project Team Members (both sessions)	Steering Committee Members
<ul style="list-style-type: none"> • Steve Roberts, County of Lennox and Addington Project Manager 	<ul style="list-style-type: none"> • Dave Macpherson (Loyalist Township) • Dave Thompson (Loyalist Township)
<ul style="list-style-type: none"> • Vanessa Skelton, AECOM Project Manager 	<ul style="list-style-type: none"> • Mike Garrett (Township of Stone Mills) • Jeff Thompson (Township of Stone Mills)
<ul style="list-style-type: none"> • Guy Laporte, AECOM 	

The displays presented at the Public Open House are provided in **Appendix C** and dealt with the following topics:

- **Welcome**
- **Description of Problems and Proposed Solutions**
 - County Road 23 (Taylor Kidd Boulevard) and County Road 6
 - County Road 23 (Taylor Kidd Boulevard) and County Road 24 (Coronation Boulevard)
 - County Road 1 (Bridge Street) and County Road 2 (Dundas Street)
 - County Road 1 (Belleville Road) and County Road 10 (Deseronto Road)
 - New Road West of County Road 41
 - County Road 2 (Main Street) and Potter Drive
 - County Road 4
- **Infrastructure Project Recommendations**
- **Analysis and Policy Recommendations**
- **Study Recommendations**
 - Investigate transit
 - Use collision database
 - Annual network screening of collisions
- **Development Charges**
 - Growth-related Capital Costs
 - Population, Households and Employment Growth
 - Greater Napanee and Loyalist Residential and Non-residential Development Charge per Unit
 - Alternative Financing
- **Next Steps**

A total of eight people attended the second round of consultation, held over two nights in Odessa and Centreville. Comment sheets were made available to participants, and individuals were encouraged to discuss the project with

the project team to learn more about the Transportation Master Plan Update, as well as to leave any written comments for the project team to consider. Topics of discussion related to benefits of roundabouts, safety issues at the County Road 10/County Road 1 intersection, and snow removal.

The following is a summary of the written comments received at the Public Information Centre #2:

Table 3 - Summary of Discussion at the Public Information Centre Sessions #2

Comment – Public Information Centre #2
Comment: I am not in favour of a reduction of functional classification for the major roads in the County. It's important that it be maintained.
Comment: Build more roundabouts. They work well.

7. COMMENT LOG

Agency, Aboriginal and stakeholder groups were notified for this project as part of the project mailing list. Over the course of the project, comments received by email or telephone were recorded in a comment log and project team responses are found in **Appendix D**. The mailing list provides the organizations, aboriginal communities and groups provided with the notices. The mailing list is found in **Appendix E**.

Agencies

Comments from agencies pertained to letters explaining information about their jurisdiction in relation to environmental assessments. As this Master Plan provides overall guidance to transportation development rather than specific construction activities, no further action was required for these letters. Future projects resulting from the Master Plan will warrant further environmental assessments.

Aboriginal Communities

Hiawatha First Nation and Alderville First Nation thanked the project team for providing information, but deemed the project to have minimal potential impact. The communities asked to continue to receive notifications, and to forward any additional information such as archaeological reports. No archaeological studies were required for this project.

The Mohawks of the Bay of Quinte provided comments dated June 26, 2014 (letter received by AECOM on August 6, 2014), seeking further information about the project, and identifying their aboriginal interests in the area. The letter makes a number of general information requests regarding the project, seeking information on potential adverse impacts on the land and the affected community, archaeological reports and assessments, any comments or review-type documentation provided by involved government parties, and the County's decision to install either a splitter island or roundabout at the intersection of County Road 1 (Belleville Road) and County Road 10 (Deseronto Road).

The project team will be preparing a response with the requested information for the First Nation community, and will work with the community to address any issues or interests that they express in relation to the proposed Master Plan project.

First Nations and Métis groups continued to stay on the project mailing list throughout the project and received notifications. No further aboriginal interests or comments were obtained from these other groups.

General Public

Comments from members of the general public related to public transportation in Bath, general public transportation plans, safety features such as paved shoulders, poor pavement road conditions, as well as pedestrian and cycling activities. Some residents also identified concerns about specific locations such as increased traffic at the County Road 23 and County Road 24 intersections causing collisions, the feasibility of road access at Weslemkoon Lake, and possible consideration of Amherst Island. Project team responses to these issues are included in the comment log.

8. NOTICE OF COMPLETION

The Notice of Completion for the County of Lennox and Addington Transportation Master Plan Update will be posted on the County website along with a copy of the Final Report. The notice will be circulated to the project mailing list, and will also be available locally during business hours at:

- **County of Lennox and Addington:** 97 Thomas Street East, Napanee, Ontario, K7R 4B9
- **Town of Greater Napanee:** 124 John Street, Napanee, Ontario, K7R 3L4
- **Township of Addington Highlands:** 72 Edward Street, Flinton, Ontario, K0H 1P0
- **Loyalist Township:** 263 Main Street, Odessa, Ontario, K0H 2H0
- **Township of Stone Mills:** 4504 County Road 4, Centreville, Ontario, K0K 1N0


The Notice of Completion is found in **Appendix E**.

9. CONCLUSION

The County of Lennox and Addington Transportation Master Plan project was well-received and covered a wide range of interests. The main points of discussion at the Public Information Centres were safety (vehicle collisions, speed and protection of pedestrian and cyclist safety), and infrastructure (bicycle lanes and roundabouts). Other comments received throughout the project reflected similar themes, particularly the identification of areas where safety or infrastructure improvements could be considered. Comments about the consideration of lake access or the transportation needs on Amherst Island provided an opportunity to explain the jurisdiction of those access points and decision making considerations.

The project team encouraged participation through public notices, consultation events, social media updates, mailing list notifications and the availability of email and telephone contacts throughout this project. Although there was a small turnout for both consultation events, the quality of questions and the interest of those present was a positive indicator of the importance of transportation issues within the County of Lennox and Addington.

APPENDIX A: NOTICE OF COMMENCEMENT



TRANSPORTATION MASTER PLAN NOTICE OF STUDY COMMENCEMENT

The County of Lennox and Addington is beginning a Transportation Master Plan (TMP) study to guide the County's transportation programs and road infrastructure investments for the next twenty years. The goal of the study is to assess the transportation needs within the County of Lennox and Addington.

We want the transportation infrastructure to meet the needs of residents and visitors for the coming years. This study is being carried out in accordance with the requirements of Phases 1 and 2 of the Provincial Municipal Class Environmental Assessment process in a way that offers many opportunities for public input.

Do you have an interest in any of the following issues? We need your input!

- Rural and urban transportation issues
- Traffic safety/ operations
- Truck traffic
- New road links
- Commuter traffic
- Cycling and walking
- Traffic calming
- Population or economic growth effects on transportation

Get involved and help plan Lennox and Addington's future...

Public input is key to the success of the TMP. Members of the public are encouraged to comment on the project at any time during the study.

There are many ways to get involved:

- Attend and provide comments at the Public Information Centres (PICs). The first will occur in the fall.
- Read notices, study newsletters, and project information on the County's website: www.lennox-addington.on.ca.
- Follow the County's Twitter feed, or become a Facebook friend.

If you have any questions or comments, please contact the project team:



<p>Mr. Steve Roberts, C.E.T. Manager, Roads and Bridges County of Lennox and Addington 97 Thomas Street East Napanee, ON K7R 4B9 Tel: (613) 354-4883 ext. 230 Fax: (613) 354-3112 Email: sroberts@lennox-addington.on.ca</p>	or	<p>Ms. Vanessa Skelton, P. Eng. Project Manager AECOM 1150 Morrison Drive, Suite 302 Ottawa, ON K2H 8S9 Tel: (613) 820-8282 Fax: (613) 820-8338 Email: vanessa.skelton@aecom.com</p>
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www.facebook.com/LennoxAndAddington

[@BestDayEverLnA](https://twitter.com/BestDayEverLnA)

www.lennox-addington.on.ca

APPENDIX B: PUBLIC INFORMATION CENTRE NOTICES

**THE COUNTY OF LENNOX AND ADDINGTON
TRANSPORTATION MASTER PLAN
NOTICE OF PUBLIC INFORMATION CENTRE**

The County of Lennox and Addington initiated a Transportation Master Plan (TMP) in March 2013 to help guide the County's transportation programs and road infrastructure investments for the next twenty years. The goal of the study is to assess the transportation needs within the County of Lennox and Addington.

We want the transportation infrastructure to meet the needs of residents and visitors for the coming years. This TMP will identify existing and anticipated future transportation needs and deficiencies, while developing a practical and financially achievable implementation plan that supports economic and environmental sustainability. This study is being carried out in accordance with the requirements of Phase 1 and 2 of the Provincial Municipal Class Environmental Assessment process in a way that offers many opportunities for public input.

You are invited to attend the first of two Public Information Centres (PIC) scheduled for this study. The purpose of the first PIC is to present and obtain public input on:

- The Master Plan and consultation process;
- Traffic data and analysis;
- Existing conditions;
- Problems and opportunities; and
- Next steps in the study.

The PIC will include a presentation at 5:30 PM followed by a moderated roundtable discussion session. Presentation boards will be available for viewing. Representatives of the County of Lennox and Addington and AECOM will be in attendance to answer questions about the project.

The first round of PIC's will be held on:

<p>Monday, September 23, 2013 Northbrook Lion's Hall 12328 Highway 41 Northbrook, ON 5:00 p.m. to 7:00 p.m.</p>	<p>Thursday, September 26, 2013 Strathcona Paper Centre 16 McPherson Drive Napanee, ON 5:00 p.m. to 7:00 p.m.</p>
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We are interested in receiving any comments or concerns that you may have with this project. Any comments received pertaining to the study will be collected under the *Environmental Assessment Act* and, with the exception of personal information, will become part of the public record.

For further information on the project, or to be added to our mailing list, please contact either of the Project Team members listed below.

<p>Mr. Steve Roberts, C.E.T. Manager, Roads and Bridges County of Lennox and Addington 97 Thomas Street East Napanee, ON K7R 4B9 Tel: (613) 354-4883 ext. 230 Fax: (613) 354-3112 Email: sroberts@lennox-addington.on.ca</p>	or	<p>Ms. Vanessa Skelton, P. Eng. Project Manager AECOM 1150 Morrison Drive, Suite 302 Ottawa, ON K2H 8S9 Tel: (613) 820-8282 Fax: (613) 820-8338 Email: vanessa.skelton@aecom.com</p>
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**THE COUNTY OF LENNOX AND ADDINGTON
TRANSPORTATION MASTER PLAN
NOTICE OF PUBLIC INFORMATION CENTRE**

The County of Lennox and Addington initiated a project to update their Transportation Master Plan (TMP) in March 2013 to help guide the County's transportation programs and road infrastructure investments for the next twenty years. The goal of the study is to assess the transportation needs within the County of Lennox and Addington.

The transportation infrastructure should meet the needs of residents and visitors now and in the future. This Transportation Master Plan will identify existing and anticipated future transportation needs and deficiencies, while developing a practical and financially achievable implementation plan that supports economic and environmental sustainability. This study is being carried out in accordance with the requirements of Phase 1 and 2 of the Provincial Municipal Class Environmental Assessment process in a way that offers opportunities for public input.

Two rounds of Public Information Centres (PICs) were scheduled for this study. The first PICs were held in September 2013. You are invited to attend the second round of PICs, the purpose of which is to present and obtain public input on:

- The Master Plan and consultation process;
- Infrastructure project recommendations;
- Recommended studies;
- Development Charges feasibility; and
- Next steps in the study.

The PIC will include a presentation at 5:30 p.m. followed by a moderated roundtable discussion session. Presentation boards will be available and representatives of the County of Lennox and Addington and AECOM will be in attendance to answer questions about the project.

The Public Information Centres will be held:

Monday June 16, 2014
Loyalist Township Municipal Office
263 Main Street
Odessa, Ontario
5:00 p.m. to 7:00 p.m.

Wednesday June 18, 2014
Township of Stone Mills Municipal Office
4504 County Road 4
Centreville, Ontario
5:00 p.m. to 7:00 p.m.

We are interested in receiving any comments or concerns that you may have with this project. Any comments received pertaining to the study will be collected under the *Environmental Assessment Act* and, with the exception of personal information, will become part of the public record.

For further information on the project, or to be added to our mailing list, please contact either of the Project Team members listed below.

Mr. Steve Roberts, C.E.T.
Manager, Roads and Bridges
County of Lennox and Addington
97 Thomas Street East
Napanee, ON K7R 4B9
Tel: (613) 354-4883 ext. 3230
Fax: (613) 354-3112
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or

Ms. Vanessa Skelton, P. Eng.
Project Manager
AECOM
1150 Morrison Drive, Suite 302
Ottawa, ON K2H 8S9
Tel: (613) 820-8282
Fax: (613) 820-8338
Email: vanessa.skelton@aecom.com

APPENDIX C: DISPLAY MATERIALS

Welcome



County of Lennox and Addington Transportation Master Plan Update Public Information Centre # 1

Monday, September 23, 2013
5:00 P.M. to 7:00 P.M.
Northbrook Lion's Hall
12328 Highway 41
Northbrook, ON

Thursday, September 26, 2013
5:00 P.M. to 7:00 P.M.
Strathcona Paper Centre
16 McPherson Drive
Napanee, ON

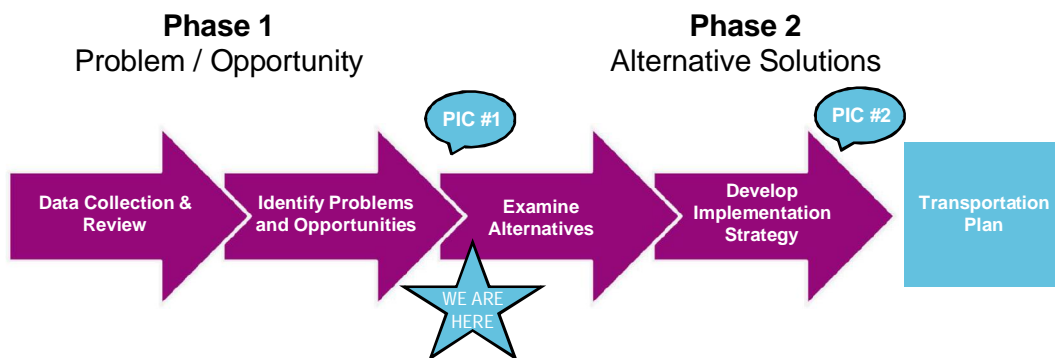


Transportation Master Plan

What is it?

- The Transportation Master Plan provides a comprehensive assessment of the County's current and future transportation system improvement needs. The Transportation Plan was last approved in 2001.
- This study will look to update the Transportation Plan based on emerging trends and challenges in the County and changes affecting the previous plan recommendations.

This Transportation Plan is being developed in accordance with the planning and design processes of the Municipal Class Environmental Assessment and incorporates the key principles of environmental planning under the Ontario Environmental Assessment Act. The master plan study will follow Phases 1 and 2 of the Class Environmental Assessment process.



The master planning process identifies a recommended 'set' of proposed works and the rationale for their implementation.

For some infrastructure projects identified in the Transportation Master Plan additional phases of the Municipal Class Environmental Assessment process will be required. The level of complexity of an individual project and the potential impacts of that project on the environment determines which phases need to be addressed, the level of details required to be examined, and the extent of mitigation that may be required in future work.

Consultation Process

- Notice of commencement issued:
 - County Website / Facebook / Twitter: June 5th
 - Napanee Beaver: June 6th
 - Kingston This Week: June 6th
 - EMC – Northeast Edition: July 4th
- Public input is key to the success of the Transportation Master Plan. Members of the public are encouraged to comment on the project at any time during the study. There are many ways to get involved:
 - Attend and provide comments at Public Information Centres.
 - Read notices and project information on the County's website: www.lennox-addington.on.ca
 - Follow the County's Twitter feed or become a Facebook friend.
- Public Information Centre #1: Two meetings

Monday, September 23, 2013
 5:00 P.M. to 7:00 P.M.
 Northbrook Lion's Hall
 12328 Highway 41
 Northbrook, ON

Thursday, September 26, 2013
 5:00 P.M. to 7:00 P.M.
 Strathcona Paper Centre
 16 McPherson Drive
 Napanee, ON

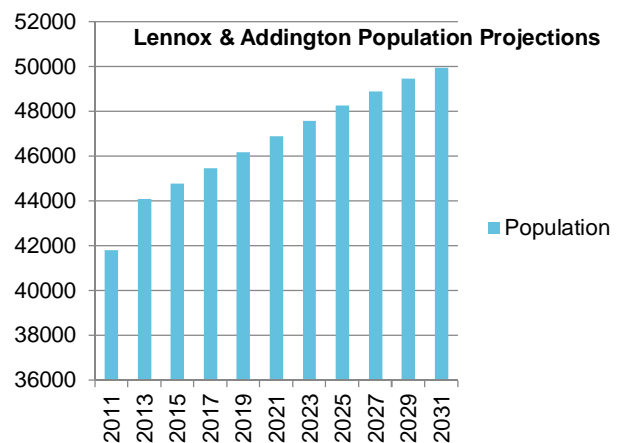
- A second Public Information Centre will take place in Winter 2014

Changes on the Horizon

Communities which are successfully improving the sustainability of their transport networks are doing so as part of a wider program of creating more vibrant, livable and sustainable cities.

Considerations in developing the Transportation Plan include:

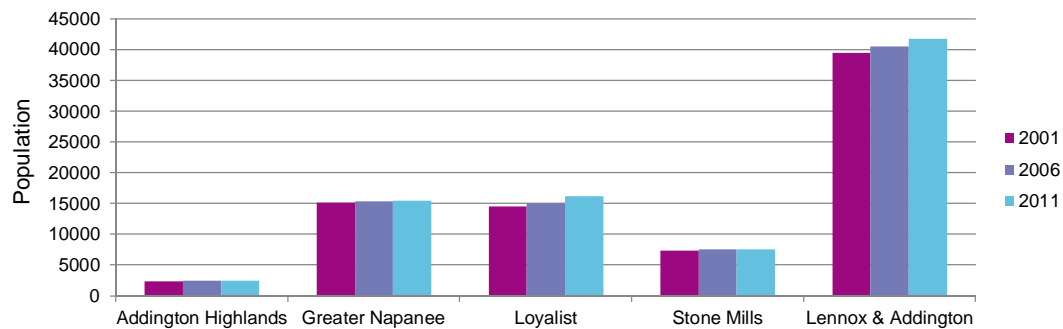
- Population growth
 - Population and employment growth in the County and surrounding areas will result in increases to commuter and visitor trips to and from the area
- An aging population
 - A significant increase in the adult population aged 65 or more will place new and growing demands on transport systems.
- Climate change & sustainability
 - Consider policy changes that can encourage a more sustainable transportation system and improve mobility choices.
 - Consider planning and design standards for infrastructure that lessen adverse environmental impacts



Source: Statistics Canada estimates, 2007, and projections of Ontario Ministry of Finance

County Demographics

	Township of Addington Highlands	Town of Greater Napanee	Loyalist Township	Township of Stone Mills	County of Lennox & Addington
Population in 2011	2,532	15,511	16,221	7,560	41,824
Population in 2006	2,512	15,400	15,062	7,568	40,542
Population in 2001	2,402	15,132	14,590	7,337	39,461
Population in 1996	2,429	14,994	14,551	7,229	39,203
'06 to '11 pop change	0.8%	0.7%	7.7%	-0.1%	3.2%
'01 to '06 pop change	4.6%	1.8%	3.2%	3.1%	2.7%
'96 to '01 pop change	-1.1%	0.9%	0.3%	1.4%	0.6%
Total private dwellings (2011)	2,067	6,885	6,174	3,169	18,295
Population density per sq. km	1.9	33.6	47.6	10.7	14.7
Land area (sq. km)	1,329.93	461.31	341.04	708.83	2,841.1



Source: Statistics Canada Census (1996-2006)

Changes on the Horizon

- Communities designed around the auto
 - Auto use dominates in most County municipalities given the trip distances and convenience of travel.
 - What measures are practical in rural municipalities to provide choices for travel?
- Changing economic climate
 - Municipalities continue to face budget constraints and cannot keep pace with infrastructure needs
 - Quality of transportation infrastructure and travel efficiency are key factors influencing an area's future economic capabilities including growth, productivity and competitiveness.
- Energy supply & costs
 - Rising fuel costs could cause people to drive their cars less frequently, carpool more often, reconsider where they live and work, or choose other methods of travel if available
 - Limited infrastructure and services in rural areas
- Community health
 - There is a growing recognition of the health benefits of more active lifestyles and how transportation infrastructure decisions can support healthy communities



Scope of the Plan Update

While many of the short term recommendations from the current transportation plan have been implemented, a number of the longer term improvement recommendations are not yet initiated and will be subject to review as part of this plan update. This is the first update of the existing County of Lennox and Addington Transportation Master Plan.

The County is inviting the public and other stakeholder groups to participate in the study and to assist the team in updating the plan to address changing trends, emerging needs, and new opportunities. The review will focus on a review and update of:

- Infrastructure Needs – short and long term needs
- Network Analysis – what improvements best address needs?
- Policy & Standards – review and update
- Financial Plan – affordability, priorities, and funding opportunities

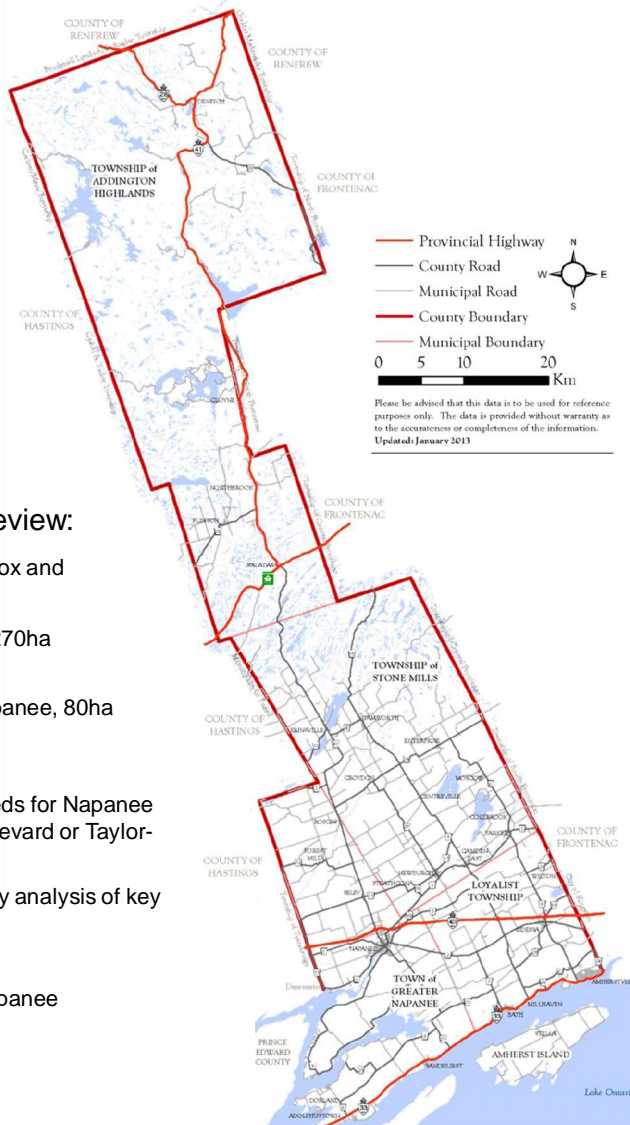
Study Issues

The Network Analysis work will identify long term (2033) improvement needs.

- Development of various improvement scenarios for deficiency areas
- An assessment of environmental conditions and other constraints
- An evaluation of the potential impacts and benefits of each alternative

Key issues included in review:

- New developments in Lennox and Addington:
 - Loyalist Township, 270ha development
 - Town of Greater Napanee, 80ha development
- Review previous work / needs for Napanee By-Pass, Jim Kimmett Boulevard or Taylor-Kidd Boulevard extensions
- Traffic operations and safety analysis of key intersections
- Emergency Detour Routes
- Pedestrian strategies in Napanee



Needs Assessment

Reviewing existing information and conditions

- Traffic counts
- Collision data and trends
- Relevant background documents

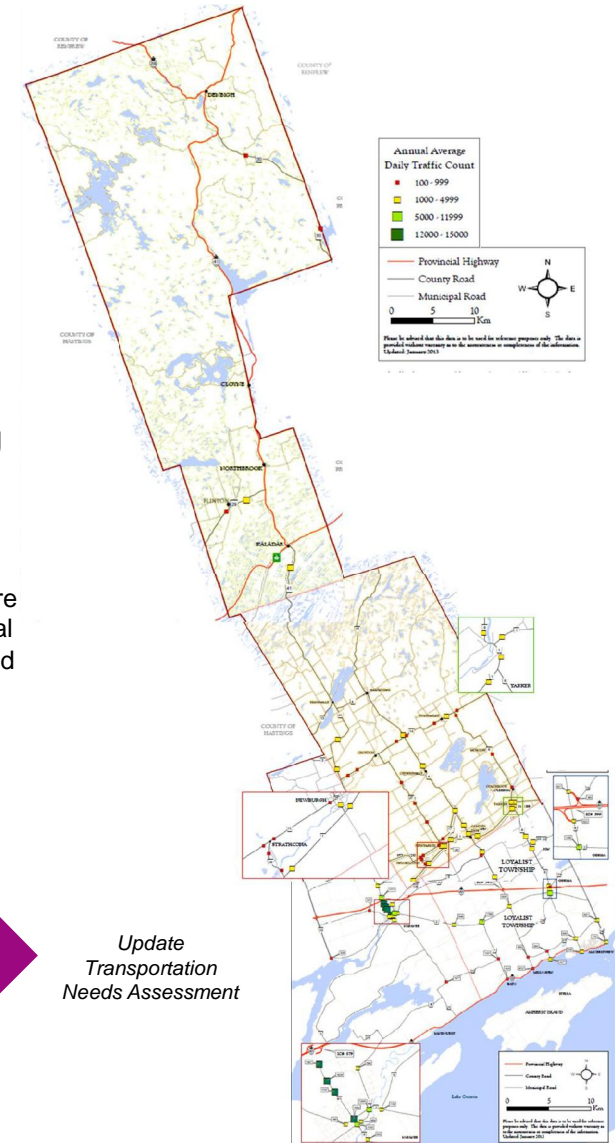
Forecasting future demands – identifying deficiencies

- Integration with development plans
- Prepare forecasts of future travel demand on the rural County Road Network and assess capacity deficiencies
- Consider County road rehabilitation needs

Identify what has been done and what has changed from previous 2001 Transportation Master Plan



Update Transportation Needs Assessment



Policy and Standards Review

Speed Limit Policy

- It is important for the County to have a speed limit policy
 - Changes can be made to the existing posted speeds when needed.
- Determines whether a locale has a legitimate need for change in posted speed limits
 - A review process should be implemented to evaluate all requests for speed limit changes.
- The ideal speed is determined based on the typical functions of arterial, collector and local roads
 - The public's expectations are taken into consideration
 - A systematic evaluation of risks should be performed pertaining to the geometry and traffic criteria of the roadway
 - Will allow for the determination of a recommended posted speed
- Follow Transportation Association of Canada - Canadian Guidelines for Establishing Posted Speed Limits



Financial Assessment

- The financial assessment will include a review of the timing for improvement projects identified in the County's Transportation Master Plan
 - Opportunities to align works and priorities will be sought where feasible
- The County Roads and Bridges Department will help to identify planned rehabilitation needs and the associated costs based on available data / current asset management data
- Assess financial implications of rehabilitation and recommended capital expansion projects versus historical funding levels and federal provincial funding sources



Phase 1: Transportation Problems and Opportunities

Issues identified in the Lennox and Addington transportation network:

- Capacity / Level of Service
 - County Rd. 41 (Centre St.) at County Rd. 1 (Bridge St.)
 - County Rd. 41 (Centre St.) at County Rd. 2 (Dundas St.)
 - County Rd. 41 (Centre St.) at Jim Kimmett Blvd. / Richmond Blvd.
 - County Rd. 23 (Taylor-Kidd Blvd.) at County Rd. 24 (Coronation Blvd.)
 - County Rd. 23 (Taylor-Kidd Blvd.) at County Rd. 6 (Wilton Rd.)
 - County Rd. 1 (Bridge St./Camden Rd.) at County Rd. 2 (Dundas St.)
 - County Rd. 2 (Main St.) at County Rd. 6 (Wilton Rd.)
- Safety
 - County Rd. 1 (Belleville Rd.) at County Rd. 10 (Deseronto Rd.)
- Network
- Pedestrian facilities such as a sidewalks or paved boulevard to be considered in urban areas at locations on the following County Roads
 - County Rd. 41 (Centre St.) south of Highway 401
 - County Rd. 8 (Hamburgh Rd.) south of Palace Rd.
 - County Rd. 2 near Palace Rd. intersection
 - County Rd. 6 (Wilton Rd.) in Odessa

Traffic Operations Review

Roundabouts, stop control or signals were considered as traffic control alternatives at several intersections

Future PM conditions are indicated in the table below (10 to 20 year time horizon)

Intersection	Signalized		Stop Controlled		Roundabout	
	Overall Delay	LOS	Overall Delay	LOS	Overall Delay	LOS
County Rd. 1 at County Rd. 10	-	-	5.1	A	6.1	A
County Rd. 2 at County Rd. 6	25.9	C	-	-	13.9	B
County Rd. 23 at County Rd. 6	15.0	B	55.8	F	8.6	A
County Rd. 23 at County Rd. 24	21.1	C	Intersection failure	F	9.0	A

LOS – Level of Service is a measure used to determine the effectiveness of an intersection

A – free flow operation

B – reasonably unimpeded operation

C – stable operation

D – less stable condition, small increases in volume cause substantial delay

E – unstable operation and significant delay

F – flow at extremely low speed, high delay, extensive queuing

Source: Highway Capacity Manual 2010



County Rd. 2 at County Rd. 6
Main St. at Wilton Rd.



County Rd. 23 at County Rd. 6
Taylor-Kidd Blvd. at Wilton Rd.

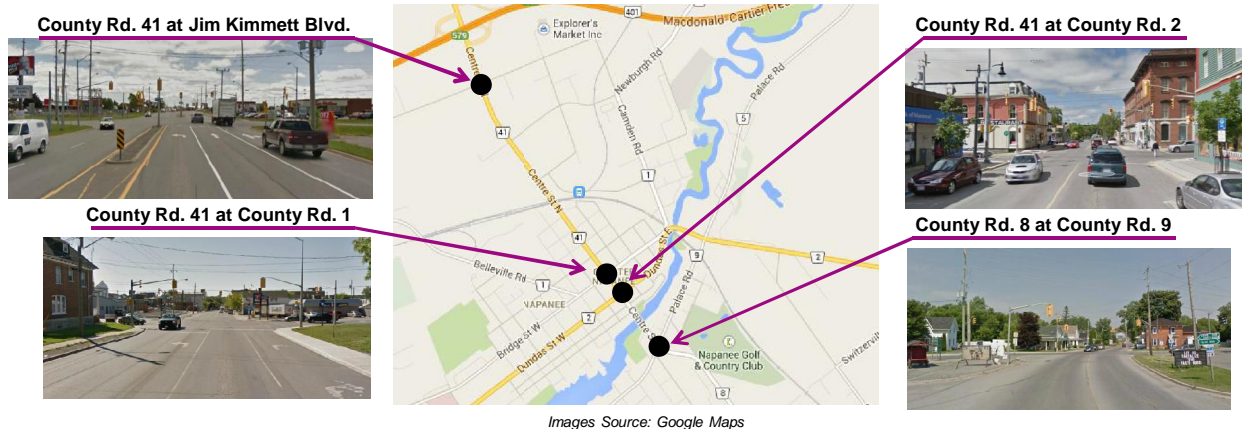


County Rd. 23 at County Rd. 24
Taylor-Kidd Blvd. at Coronation Blvd.

Traffic Operations Review

Operations at signalized intersections along Centre Street were reviewed according to existing conditions and predicted traffic conditions in 2023 and 2033.

Intersection	Overall Level of Service			Overall Delay (s)		
	2013	2023	2033	2013	2023	2033
County Rd. 41 (Centre St.) at Jim Kimmett Blvd.	B	C	C	17.1	20.7	20.9
County Rd. 41 (Centre St.) at County Rd. 1 (Bridge St.)	B	B	C	13.2	19.9	20.5
County Rd. 41 (Centre St.) at County Rd. 2 (Dundas St.)	B	B	B	12.9	18.7	19.5
County Rd. 8 (Hamburgh Rd.) at County Rd. 9 (River Rd.)	B	B	B	11.9	15.0	15.4



Images Source: Google Maps

Safety Assessment

- Intersection collisions were studied using data from 2001-2010.
- The following intersections were assessed for safety concerns:

Intersection	Intersection
County Rd. 1 and County Rd. 10	County Rd. 41 and Advance
County Rd. 1 and Jim Kimmett Blvd.	County Rd. 41 and County Rd. 1
County Rd. 1 and John St.	County Rd. 41 and County Rd. 2
County Rd. 1 and Robert St.	County Rd. 41 and Graham
County Rd. 2 and County Rd. 6	County Rd. 41 and Industrial Ave.
County Rd. 2 and Factory St.	County Rd. 41 and Isabella
County Rd. 2 and John St.	County Rd. 41 and Jim Kimmett Blvd.
County Rd. 8 and Mill St.	County Rd. 41 and Thomas

- County Road 1 at County Road 10 was the only intersection that was identified with a safety issue.
- There are several possible countermeasures that can be implemented at the intersection of County Road 10 and County Road 1. In order to address the specific problem at this intersection, it is important to define the relevant issues. It would appear through a preliminary review of collisions that the majority of collisions relate to drivers that stop at the STOP sign and then pull out into the intersection. Countermeasures should therefore be selected to mitigate this type of collision.

Countermeasure
Detection and dynamic messaging
Innovative signs
Enhanced signing
Roundabout
Splitter islands
Stop bar
Larger warning signs
Rumble strips
Markings for major road continuity
Supplementary STOP signs
Supplementary pavement marking messages
Beacons (overhead or adjacent to signs)

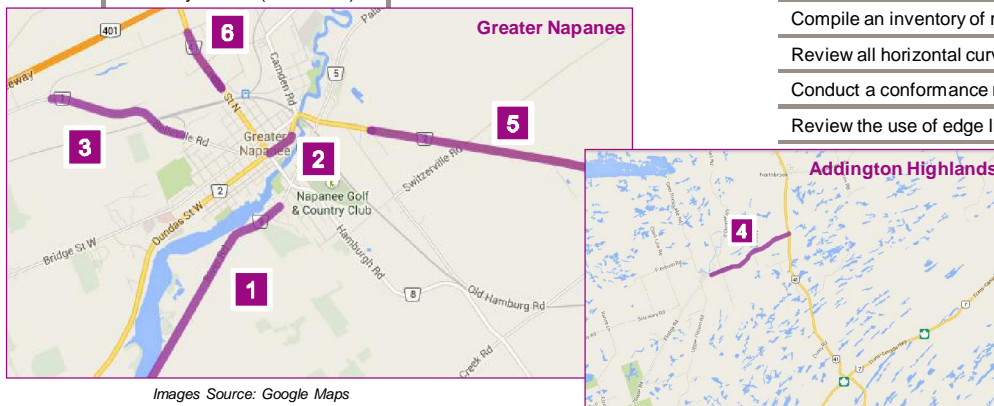
Safety Assessment

- Segment collision rates were studied using data from 2001-2010.
- Segments with fatalities were reviewed, yet no indication of a consistent safety issue was found
- All segments in the County with data available were studied; the following six segments had higher than expected collisions:

Rank	Street	Location
1	County Rd. 9 (River Rd.)	West of Southcrest Dr.
2	County Rd. 2 (Dundas St.)	County Rd. 41 – Adelphi St.
3	County Rd. 1 (Belleville Rd.)	Jim Kimmitt Blvd. – Enviro Park Ln.
4	County Rd. 29 (Flinton Rd.)	Highway 41 – Pineview Dr.
5	County Rd. 2	Oke Rd. – Townline Rd.
6	County Rd. 41 (Centre St.)	Jim Kimmitt Blvd. – Advance Ave.

- Potential countermeasures to aid in the reduction of collision frequencies are listed in the following table.

Countermeasure
Review sight distance requirements
Reapply centre lines and edge lines on a regular basis
Review shoulder conditions annually
Compile an inventory of roadside hazards
Review all horizontal curves
Conduct a conformance review of all warning signs
Review the use of edge lines and centre lines



Images Source: Google Maps

Phase 2: Alternative Solutions

- Alternatives to address the identified problems and opportunities will be identified in the next phase of the study
- The Transportation Master Plan Study will then identify and review the effects of the proposed alternative solutions based on readily available information
- To be considered, all solutions must address the identified transportation problems and opportunities
- The evaluation of alternative solutions will have a qualitative emphasis. It will be conducted in a traceable and objective manner and to a level of detail sufficient to compare the various alternatives
- The evaluation will focus on comparing the advantages and disadvantages of the various alternatives in order to select a preferred alternative
- The compliance requirements used to select a preferred alternative will be based on:
 - Government legislation, policies and guidelines
 - Municipal policy
 - Input from the Public, Agencies, Consultation Groups and other stakeholders
 - Technical findings
- General evaluation criteria:
 - Transportation service
 - Natural environment
 - Economic environment
 - Social/Cultural Environment
- Mitigation measures will be identified and documented to be carried forward to any subsequent project-specific class environmental assessments (Schedule B and C projects)

Next Steps

- Review public comments
- Identify long term network improvements
- Review rehabilitation schedule and asset management system
- Develop an implementation plan to support the development of the ten and twenty year capital program
- Hold Public Information Centre #2 to present draft findings (Winter 2014)
- Update Transportation Master Plan including final road network recommendations

Comments / Questions

Your comments are welcome and very important to this study.

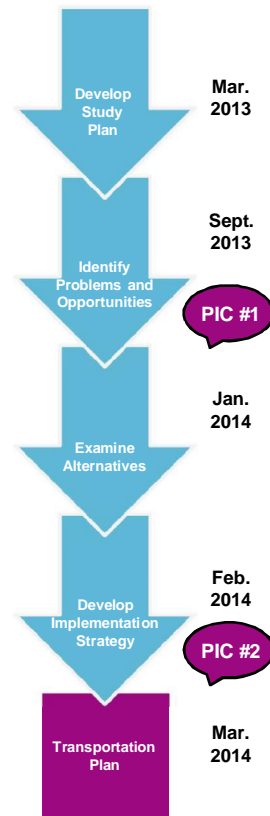
Please fill in a comment sheet and deposit in the comment box.

Alternatively, you can send your comments by mail, fax or email to:

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Comments are requested by **October 18, 2013.**



Welcome



County of Lennox and Addington Transportation Master Plan Update Public Information Centre # 2

Monday, June 16, 2014
5:00 P.M. to 7:00 P.M.
Loyalist Township Municipal Office
263 Main Street
Odessa, ON

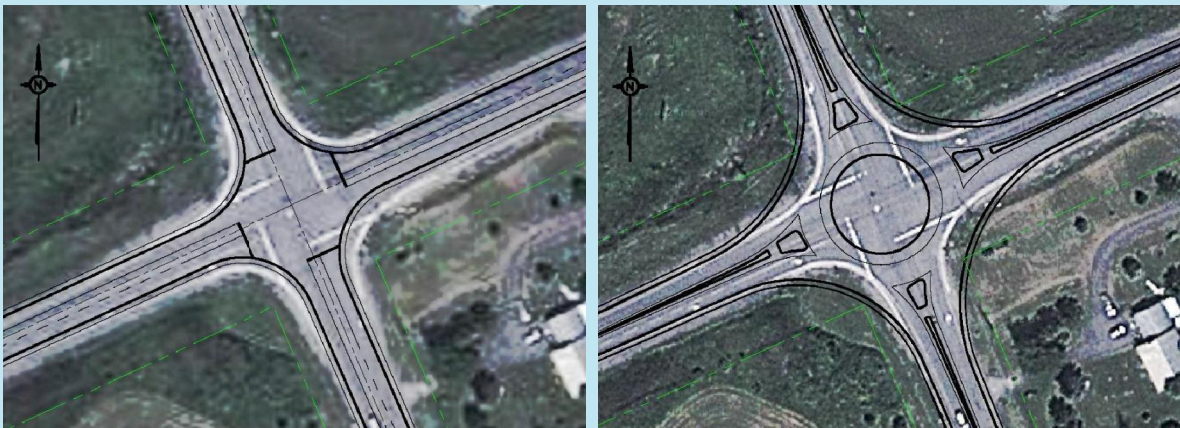
Wednesday, June 18, 2014
5:00 P.M. to 7:00 P.M.
Township of Stone Mills Municipal Office
4504 County Road 4
Centreville, ON



County Road 23 (Taylor Kidd Blvd) & County Road 6

Description of Problem

The current traffic control at the intersection will not function adequately given projected traffic volumes for 2024 and 2034 horizons.



Alternatives

	Install Traffic Signals	Install Roundabout
Cost	\$ 905,000	\$ 700,000
Recommendation	A roundabout is suggested at this intersection due to the fact that a roundabout is expected to operate below capacity and with minimal delay. The conversion of an all-way STOP intersection to a roundabout could result in a decrease in severity in collisions. There are no property impacts and cost of the roundabout is expected to be less than a signalized intersection.	

County Road 23 (Taylor Kidd Blvd) & County Road 24 (Coronation Blvd)

Description of Problem

The current traffic control at the intersection will not function adequately given projected traffic volumes for 2024 and 2034 horizons.



Alternatives

	Install Traffic Signals	Install Roundabout
Cost	\$ 770,000	\$ 700,000
Recommendation	A roundabout is suggested at this intersection. A roundabout is expected to operate below capacity with minimal delay. Several movements are approaching capacity ($v/c > 0.90$) in the future horizons with a signalized intersection. Installation of a roundabout at an existing two-way STOP controlled intersection is expected to reduce the number of collisions by 71%, as per Highway Safety Manual, 1st Edition, Volume 3.	

County Road 1 (Bridge St) & County Road 2 (Dundas St)

Description of Problem

The current intersection at County Road 1 and Alma St. features two offset T-intersections. The eastbound and westbound approaches on County Road 1 have STOP signs as does Alma St. while the northbound approach is uncontrolled. The existing intersection may create confusion regarding right-of-way due to the unconventional layout and traffic control.



Alternatives

	Realign Intersection with One Signalized Intersection	Realign Intersection with Two Signalized Intersections
Cost	\$ 300,000	\$ 450,000
Recommendation	The realignment facilitates traffic movement through the intersections and provides a standard intersection layout at County Road 1 and Alma St. The operational evaluation at both intersections indicated that there was a good level of service in the PM peak hour. It is recommended that the County plan to reconfigure the intersections with one signalized intersection. This alternative provides an acceptable level of service at both intersections, and is the more cost-effective solution.	

County Road 1 (Belleville Rd) & County Road 10 (Deseronto Rd)

Description of Problem

Between 2000 and 2010 there were 20 collisions at this intersection: 13 injury-related collisions, 6 property damage collision and 1 fatal collision. Many of these collisions were due to drivers failing to stop at the stop signs on the minor approach or drivers stopping and then pulling out into the intersection.



Alternatives

	Install Splitter Islands	Install a Roundabout
Cost	\$ 8,000	\$ 700,000
Recommendation	The most effective countermeasures are the installation of a roundabout or the addition of splitter islands. Splitter islands can be installed on the minor approaches to an intersection to emphasize to the drivers the presence of an intersection, the presence of STOP signs and the difference between the minor road and the major road. The addition of splitter islands on the minor approaches to the intersection are a less expensive measure than the roundabout while still providing a potential reduction in collisions. During the course of this study the County has implemented additional stop signs and "STOP AHEAD" markings. It is recommended that splitter islands be installed as an interim measure, with the ultimate goal of installing a roundabout.	

New Road West of County Road 41

Description of Problem

A review of the existing and projected travel demands along County Road 2 (Dundas St) and County Road 41 (Centre St) indicate that the existing County and local municipal road system will not be able to accommodate long term travel demands associated with future growth in the western parts of Greater Napanee.

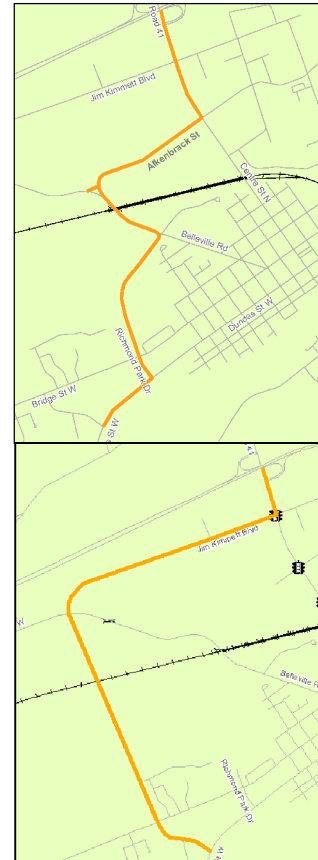
Based on visual observations and review of current travel demands, the existing County Road 41 (Centre St) is "busy" but not yet at capacity. Even though the current road system is functioning reasonably, this is not anticipated to last indefinitely.

Alternatives

	Encourage drivers to use existing road network more effectively	Widen County 41 between County Road 2 and railway underpass	Jim Kimmett Extension	Alkenbrack Street Extension
Cost	Minimal cost	\$ 3,500,000*	\$6,500,000*	\$ 2,700,000*

* These costs do not include the cost to acquire property or to move utilities, both of which have not been determined. The Jim Kimmett Extension cost does not include the \$5M to \$7M required to build a new overpass.

The recommended alternative is to extend Alkenbrack Street from its current location to County Road 1 (Belleville Rd). Another road will connect County Road 1 at Enviro Park Lane with County Road 2 (Dundas St) at Richmond Park Drive. This road will be effective in reducing travel demands on County Road 41, will have less impact than improving existing roads and will provide a shorter connection between County Road 41 and County Road 2 than the Jim Kimmett Extension. Also, the construction cost estimate is less expensive than the Jim Kimmett Extension or the road widening options.



County Road 2 (Main Street) & Potter Drive

Description of Problem

The current intersection at County Road 2 and Potter Dr. in Odessa features two offset T-intersections. The northbound (Potter Dr.) and southbound (Ernestown Secondary School entrance) approaches are stop-controlled. The development of a subdivision to the south of Potter Dr. will increase traffic at the intersection, potentially causing delays at the two intersections.

Recommendation The intersection is under evaluation by the developers and a plan for intersection design and control will be part of the site development. The County will be a participant in the site plan approval process and will be able to comment on the plans through those means.

County Road 4

Description of Problem

County Road 4 is a concrete road that was constructed in the late 1960's. This road would have been designed for a maximum service life of 50 years. County Road 4 has served for the past 45 years and has reached the end of its useful life. A partial reconstruction with milling of the concrete and an asphalt overlay of the road was begun in 2012 and will continue each year until 2016.

Alternatives

	Ongoing Maintenance	Reconstruct the Road	Partial Reconstruction of the Road
Time until reconstruction	-	10 years	15 years
Cost	\$ 1,600,000	\$ 8,800,000	\$ 8,900,000
Recommendation	The recommendation is for a full reconstruction of County Road 4 in 10 years. The current program to mill the concrete and place an asphalt overlay will be monitored for long-term effectiveness after the application. Reconstruction may be deferred or moved forward in timeline, depending on the effectiveness of the current rehabilitation program.		

Infrastructure Project Recommendations

Recommendation	Timeline	Cost
Upgrade the signal phasing at the intersection of County Road 41 (Centre St) & County Road 1 (Bridge St)	2014 – 2019	\$ 25,000
Coordinate the traffic signals at County Road 41 (Centre St) & County Road 2 (Dundas St)	2014 - 2019	\$ 5,000
Install LED traffic signal heads at all signalized intersections	Ongoing	In capital budget
County Road 2 (Main St) & County Road 6, Odessa, southbound right turn lane removal	2019 - 2024	minimal
Install uninterruptible power supplies at signalized intersections	2014 - 2019	\$ 10,000 / intersection

County Road 23 (Taylor Kidd Blvd) Extension

Timeline: 2029 - 2034

Cost: \$ 6,300,000

Recommendation that the County continue planning to extend County Road 23. Construction will be expected by the 2029 – 2034 horizon or earlier as dictated by development construction.

Install Accessible Pedestrian Signals

Timeline: 2019 - 2024

It is recommended that the County review whether accessible pedestrian signals should be included when construction of a new intersection or the reconstruction of existing intersections is undertaken. The County will undertake this review as per the County Accessible Signal Policy. This is in accordance with Ontario Regulation 413/12, Section 80.28 (1) of the Accessibility for Ontarians with Disabilities Act (AODA).

Currently the County is responsible for eleven intersections with traffic signals.

Infrastructure Project Recommendations

Pedestrian Accommodations

Local municipalities are responsible for sidewalk construction and maintenance but projects could be coordinated with County road infrastructure projects under the capital projects budget with local municipalities contributing to the cost.

County Road 8 and County Road 9 (River Rd), Napanee

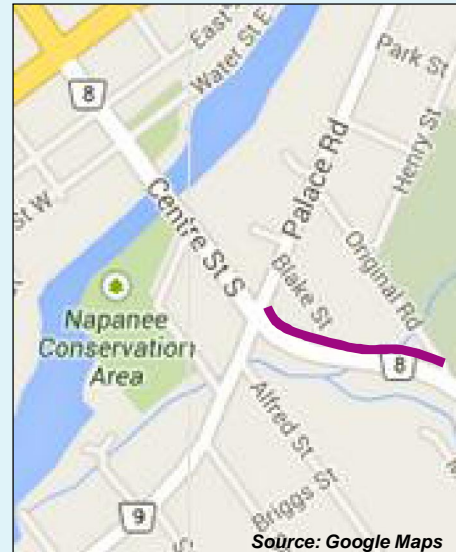
Timeline: 2014 - 2019

Total Cost: \$ 43,520

The eastern side of County Road 8 from Palace Road to Original Street has been identified as a potential location to install a sidewalk. If a sidewalk is constructed then curb ramps should be installed as part of this project. The estimated cost to construct 300 metres of sidewalk along with curb ramps is \$35,000

Currently there are curb ramps on the northeast and northwest corners of the intersection of County Road 8 and County Road 9. Curb ramps are recommended at the southwest corner. (\$520)

There are no pedestrian signal heads at the existing intersection. It is recommended that pedestrian signal heads be installed at the northeast, northwest and southwest corners to accommodate the two existing crosswalks. If a sidewalk is installed on the eastern side of County Road 8, pedestrian signal heads should be installed at the southeast corner. (\$8,000)



Infrastructure Project Recommendations

Pedestrian Accommodations

County Road 41 (Centre St): Advance Avenue to Richmond Boulevard, Napanee

Timeline: 2019 - 2024

Total Cost: \$ 55,520

A section along the eastern side of County Road 41, from Advance Avenue to Richmond Boulevard, has been identified as a potential location to install a sidewalk. The cost to install the 450 metres of sidewalk is approximately \$53,000.

There are currently six pedestrian signal heads at the intersection of County Road 41 and Advance Avenue for crosswalks on the north side, west side and east side. The west side is a driveway for the Rona parking lot. Pedestrian signal heads are not needed to cross a driveway, therefore it is recommended that the entrance to Rona be reconfigured as a roadway rather than a driveway. In addition, pedestrian signal heads should be installed on the southeast and southwest corners to provide control for a new crosswalk on the south side. (\$2,000)

The intersection of County Road 41 and Richmond Boulevard has curb ramps at the northwest and southwest corners. It is recommended that curb ramps be installed on the northeast corner of the intersection. If the sidewalk is installed on the eastern side of County Road 41, curb ramps should also be installed at the southeast corner. If a sidewalk is not built, it is recommended curb ramps be installed on the southeast corner. (\$520)



Infrastructure Project Recommendations

Pedestrian Accommodations County Road 2 and County Road 6 (Main St), Odessa

Timeline: 2019 - 2024

Total Cost: \$ 36,000

There are existing pedestrian facilities (sidewalk and/or paved/gravel paths) at the southeast and southwest corners of the intersection.

Curb ramps are only available at the southwest corner of this intersection. There are utility poles at the southeast corner, making it difficult to connect to the existing pedestrian facility to the east. Therefore it is recommended that a corner sidewalk area be added at the southeast corner with curb ramps for accessibility.

Depending on future development, a sidewalk should be considered along the eastern side of County Road 6, extending 175 metres north of County Road 2 to the OPP station. If sidewalks are installed, it is recommended that curb ramps also be included in the design. (\$32,000)

There are currently no pedestrian signal heads at this intersection. It is recommended that pedestrian signal heads be installed at the southeast and southwest corners to provide signals for the existing crosswalk on the south side of the intersection. If a sidewalk is constructed at the northeast corner it is recommended that pedestrian signal heads be installed at that corner to provide signals for all crosswalks. (\$4,000)



Infrastructure Project Recommendations

Pedestrian Accommodations County Road 41 and Community Road, Napanee

Timeline: 2019 - 2024

There are currently pedestrian signal heads with pushbuttons located on the northeast, southeast and southwest corners of this intersection. There are no sidewalks within the vicinity of the intersection so it is recommended that corner sidewalk pedestrian refuge areas be installed at northeast, southeast and southwest corners of the intersection.



County Road 2, Napanee

Timeline: 2019 - 2024

Cost: \$ 20,000

There are currently no sidewalks on the south side of County Road 2 between County Road 9 and the skateboard park. This location has been identified as a potential location for new sidewalks to provide pedestrian access for users of the park. (\$ 20,000)



Infrastructure Project Recommendations

Maintain Current Cross-Section on County Road 5 (Palace Rd), Napanee

County Road 5 from Highway 401 to County Road 2 has both a rural cross-section and a cross-section with a mountable curb. Modification of existing roadway cross-section from rural cross-section to a cross-section with a mountable curb will have no effect on road capacity or operations.

Currently there is a paved shoulder in the rural section of the road; the addition of a mountable curb allows an asphalt path to be constructed for pedestrians. There is no appreciable difference for pedestrians between an asphalt path and an asphalt shoulder.

There is no definitive increase or decrease in safety with regard to the addition of a curb on an arterial road. There is, however, a trend indicated in the Highway Safety Manual of an increase in collisions on 4-lane undivided roadways where curbs are installed rather than a paved shoulder.

The decision whether to add curbs to the roadway should be based on drainage requirements as there is no compelling reason from a transportation perspective to include curbs on County Road 5.

Install Folding Stop Signs Along Emergency Detour Route

Timeline: 2014 - 2019

Cost: \$ 5,000

Emergency Detour Routes for Highway 401 through Lennox and Addington were reviewed for potential areas of improvement.

On average, Highway 401 has 11 times more daily traffic than the County roads used for Emergency Detour Routing. If these vehicles are re-routed onto roads not built to sustain high volumes there will be delays and congestion. The following locations are recommended for installation of folding stop signs to help traffic flow when an Emergency Detour Route is used:

- County Road 10 and County Road 1
- Industrial Blvd. and Advance Ave. (intersection is under Town of Greater Napanee jurisdiction)
- County Road 1 and Camden Road
- County Road 5 and County Road 2

Analysis and Policy Recommendations

Review Number of Lanes on County Rd. 41 Between Highway 401 and Goodyear Rd.

Timeline: 2024 - 2029

Cost: As part of next TMP update

Development could be anticipated north of the 401 in the area near Goodyear Road that could have an impact on County Road 41. It is in the County's five year plan that improvements will be made to the intersection of County Road 41 and Goodyear Road.

An acknowledgement that development pressures could necessitate additional lanes on County Road 41 will be included in the final TMP report. It is recommended that an in depth review take place in conjunction with the next TMP update.

Jurisdictional Classification

Timeline: 2019 - 2024

To assess and confirm the appropriate jurisdiction for the existing County Roads and major local municipal roads, a selection of roads were evaluated using weighted criteria, set by the Ontario Good Roads Association (OGRA).

Although Richmond Road, Industrial Blvd. and Jim Kimmett Blvd. all met the criteria in the second stage of evaluation, they serve similar needs and functions as current county roads.

Consideration could be given to changing Jim Kimmett Blvd. to County jurisdiction. If this is to occur then consideration should be given to transferring County Road 1 (Belleville Rd) between Jim Kimmett Blvd. and County Road 41 (Centre St) to the local municipality.

Recommended that the County have a policy to define what is a County Road, that also includes a statement that any additions to the County Road system should meet OGRA criteria. This would apply to new roads and roads affected by developmental growth.

Analysis and Policy Recommendations

Develop Roundabout Policy
Timeline: 2014 - 2019
Develop a policy that states that a roundabout and new traffic signals will both be considered if an intersection meets the warrants for signalisation
Functional Classification
Timeline: Now
The functional classifications of 'connecting link' and 'urban collector' are identical making it redundant to use both classifications. Therefore, it is recommended that following two County Roads change functional classifications from 'connecting link' to 'urban collector':
<ul style="list-style-type: none"> • County Road 2 (Dundas St) through the urban area of Napanee (Hessford Street to Bridge Street) • County Road 41 (Centre St) from Richmond Boulevard to County Road 2
Roads classified as 'rural arterial' allow more entrances than those classified as 'major arterial'. Therefore it is recommended that the following roads change functional classifications from 'major arterial' to 'rural arterial':
<ul style="list-style-type: none"> • County Road 4 – south of Highway 401 to Highway 33 • County Road 6 – south of Highway 401 to Shane Street

Analysis and Policy Recommendations

Implement Speed Limit Policy	
Timeline: 2014 - 2019	
It is important the County have a speed limit policy so that changes can be made to the existing posted speeds when needed. Recommendation is to implement a speed limit policy.	
Calculate Road Length with GIS	
Timeline: Ongoing	
Since migrating data to WorkTech from the SAMS database, incremental modifications have been made to the lengths of specific road sections as those sections have undergone changes in their limits.	
As road sections are changed, the lengths of new sections have been established using GIS-based measurements of the two-dimensional length of the new road section line segments.	
It is recommended that the County continue to revise road section lengths in the WorkTech Asset Manager database to reflect two-dimensional GIS lengths on an incremental basis.	
Continue Trail Program	
Timeline: Ongoing	Cost: \$ 22,000/kilometre/side
The County has a trail program that evaluates whether the shoulders of a road should be paved during reconstruction or resurfacing. It is recommended that this program continue in the future.	
Accessible Pedestrian Signals	
Timeline: Ongoing	
The County will review the addition of accessible pedestrian signals as per the Accessible Pedestrian Signals policy whenever a request is made.	

Analysis and Policy Recommendations

Adjust Load Restricted Network

County Road 8 and County Road 21 (map 1)

Removing load restrictions between County Road 2 and Highway 33 would allow heavy traffic on Highway 33 to have a more direct route into Napanee.

County Roads Bordering the County of Frontenac (map 2)

Multiple County roads have seasonal restrictions that continue into the County of Frontenac, including:

- County Road 1, County Road 14, County Road 19, County Road 20

In the County of Frontenac these roads have no restrictions, so drivers who leave Frontenac find themselves on roads with restrictions.

It is recommended that County Road 1, County Road 19 and County Road 20 between the County boundary and County Road 6, and County Road 14 between the County Boundary and County Road 41 have the load restrictions removed.

County Road 6 (map 3)

Currently the segment of County Road 6 from Highway 33 to Chipmunk Ridge Road has no restrictions.

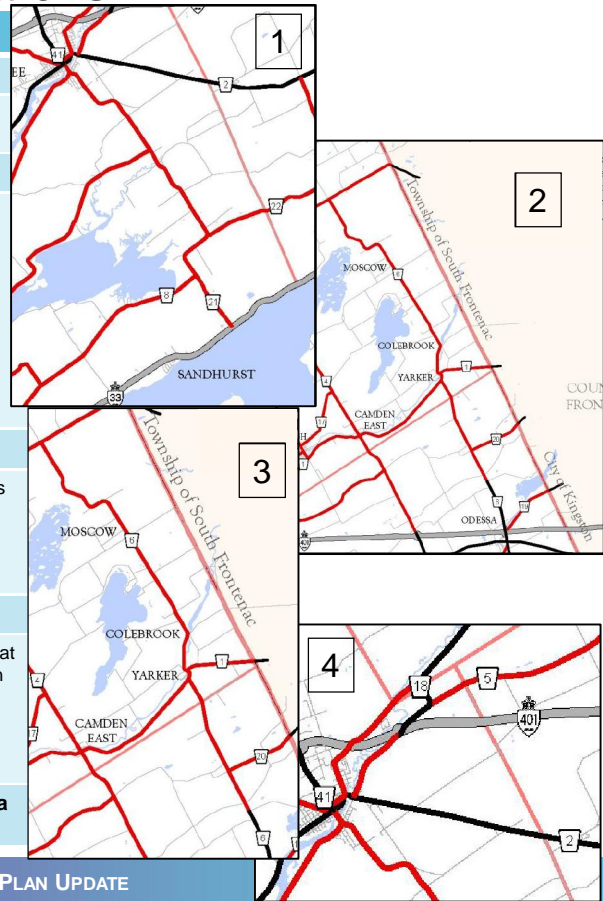
It is recommended that the section of County Road 6 with no load restrictions be extended to include the length of road between Highway 33 and County Road 1.

County Road 5 (map 4)

Since a portion of County Road 5 already has no restrictions on it, it is recommended that the restrictions be removed along County Road 5 from Highway 401 until its intersection with County Road 2.

This would allow for truck traffic travelling on Highway 401 and into Napanee to have an alternative route to use, as currently the only option is County Road 41.

It is recommended that a geotechnical investigation be performed before a road is removed from the Load Restricted Network



Study Recommendations

Investigate Transit

Timeline: 2014 - 2019

Deseronto Transit provides service from Napanee to Belleville with a stop in Deseronto.

With the proposed Trans-Canada plant construction expected to be ready for commercial operation in 2017, a large number of construction workers will need access to the site.

To alleviate traffic congestion issues, the expansion of the transit service may be considered as a temporary measure. Discussions with Deseronto Transit and Kingston Transit are suggested.

Use Collision Database

Timeline: 2014–2019

Database Cost
\$5,000 first year, \$2,500 subsequent years

GIS Add-On Cost
\$3,000 first year, \$1,500 subsequent years

A cursory investigation of three collision database software was undertaken as part of the Study. It is recommended that the County use a collision database.

Annual Network Screening of Collisions

Timeline: 2014 - 2019

It is recommended that the County perform an annual network screening of collisions. This process would review all collisions in the County in the previous year, and rank intersections or road segments according to their observed collisions versus expected collisions, as per the *Highway Safety Manual, 2010*. This would determine problem areas and allow the County to prioritize these locations for adjustments in order to improve safety.

Development Charges Introduction

- Development charges assist with financing of capital projects required to meet increased need for services resulting from growth and development
- *The Development Charges Act, 1997 (DCA)* and Ontario Regulation 82/98 (O. Reg. 82/98) provide a framework for conducting a development charges background study which municipalities must perform in order to implement development charge by-laws
- Development Charges Background Study requirements include:
 - Identification of costs and growth estimates
 - Examination for each service involved of the long term capital and operating costs for capital infrastructure required, identification of costs to be incurred during the term of the by-law
 - Various cost allocations

Growth Related Capital Projects

The following development-related capital projects were examined for feasibility of funding through development charges

		Municipality	Start Date	Project Cost
Intersection Projects	Roundabout at CR2 / Potter St	Loyalist	2023	\$650,000
	Roundabout at CR23 / CR24	Loyalist	2027	\$700,000
	Roundabout at CR23 / CR6	Loyalist	2027	\$700,000
Road Projects	New road west of CR41	Greater Napanee	2033	\$2,700,000

Examined four growth related road improvement projects

- Three intersection improvements
- One new road development

Population, Households, and Employment Growth

L&A is anticipated to experience modest residential and non-residential growth over the next 20 years.

- The County population is anticipated to increase 15%
- Number of private dwellings is projected to increase 14%
- Industrial, commercial and institutional (ICI) employment and gross floor area expected to increase 13%

	Residential Growth Forecast (2014 – 2033)		Non-residential Forecast (2014 – 2033)	
	Population	Private Dwellings	ICI Employment	ICI Gross Floor Area (sq.ft)
Addington Highlands	220	170	31	23,407
Greater Napanee	1,503	627	323	222,049
Loyalist	3,861	1,425	372	242,049
Stone Mills	750	295	110	77,688
County Total	6,335	2,518	836	566,052

Greater Napanee and Loyalist Residential and Non-residential Development Charge per Unit

In Greater Napanee the residential development charge per capita could be as much as \$1,189.33 and the non-residential development charge per sq. ft. could be as much as \$1.73. In Loyalist the residential development charge per capita could be as much as \$555.21 and the non-residential development charge per sq. ft. could be as much as \$0.85.

	People per unit	DC per Unit	
		Greater Napanee	Loyalist
Single and semi (> 2 bedroom)	2.69	\$ 3,199	\$ 1,494
Single and semi (< 2 bedroom)	1.89	\$ 2,248	\$ 1,049
Apartment (2 bedroom +)	2.16	\$ 2,569	\$ 1,199
Apartment (bachelor, 1 bedroom)	1.49	\$ 1,772	\$ 827
Other multiples	2.28	\$ 2,712	\$ 1,266
		DC per Unit	
	ICI Employees per Unit	Greater Napanee	Loyalist
Non residential (sq. ft)	0.0015	\$ 1.73	\$ 0.85

Alternative Financing

- Property Taxes
- Debt
- Reserves
- Grants
 - Local roads and highway projects are eligible for grants under the federal Gas Tax Fund (GTF)
 - Since 2005 the GTF has provided \$13 billion to assist municipalities with their infrastructure projects and will provide another \$21.8 billion over the next ten years
 - 28% of GTF grants have been spent on local roads and bridges
- Federal Programs
 - New Building Canada Fund – Small Communities Fund
- Provincial Programs
 - Small Rural & Northern Municipal Infrastructure Fund

Development Charges Conclusions

- Imposing development charges to cover for a portion of the Lennox and Addington's County's proposed development-related capital projects is feasible based on the current information concerning infrastructure project needs and population and employment growth.
- Approximately 80% or \$3,818,700 of the total cost of the County's development-related project costs is eligible for development charge financing.
- Alternative means of financing Lennox and Addington's proposed development-related projects includes reserves, grants, property tax, debt or a combination of these.

Next Steps

- Review public comments
- Update Transportation Master Plan report including final road network recommendations

Comments / Questions

Your comments are welcome and very important to this study.
Please fill in a comment sheet and deposit in the comment box.
Alternatively, you can send your comments by mail, fax or email to:



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Comments are requested by July 11, 2014.

AECOM

APPENDIX D: COMMENT LOG AND CORRESPONDENCE

Comment Tracking Table

Project Name: L & A Transportation Master Plan

Project Number: 60288842

#	Date of Comment	Comments	Date of Response/ Action	Project Team Response/Action
1	June 10, 2013	The resident is a senior and she is concerned that when she is unable to drive, she will need to leave the community because there is no public transportation. She commented that the county should consider ways to run a minivan through Bath every hour to either Napanee or Kingston. A large bus isn't needed, but a mini-van would be sufficient.	June 18, 2013	Thank you for your interest in the Lennox and Addington Transportation Master Plan. We will review and consider all comments received as part of the study. Your specific interest will form part of the analysis of transportation needs.
2	June 18, 2013	Transport Canada wrote to provide information on the Acts that they are responsible for, including the Navigable Waters Protection Act and the Railway Safety Act. They provided a document identifying when approvals are needed, and the information required to obtain approvals. An application form was provided for the Navigable Waters Protection Act Request for Work Approval, if necessary.	n/a	
3	July 5, 2013	This stakeholder was looking for more information regarding Open Houses.	July 5, 2013	Steve Roberts spoke with the stakeholder and let her know that more information would be forthcoming when it was available.
4	July 8, 2013	MNR Peterborough District responded to the Notice of Commencement that it received June 11, 2013. MNR provided information about natural heritage and natural resources data availability, general information about MNR approvals and related Acts, as well as the need for other approvals from municipal, provincial or federal authorities. MNR recommended that the project team should contact the local Conservation Authority, DFO, MOE, MTCS, and others. MNR File No. 13-000-LNA-EAE-1667 for future correspondence.		The information was taken under advisement.
5	July 10, 2013	A representative from L&A Seniors Outreach Services (SOS) provided information on what the SOS provides and would be interested in expanding transportation services	July 10, 2013	Steve Roberts met with the representative to discuss the transportation services that SOS provides.
6	July 15, 2013	Ministry of Tourism, Culture, and Sport (MTCS) provided comments regarding the Notice of Commencement. MTCS asked for further information on how archaeological resources will be identified and assessed as part of the above-noted Class EA (eg. Timing of archaeological assessments). MTCS also provided a standard checklist for determining whether a heritage impact assessment (HIA) is to be undertaken. If it is	n/a	Comment received and added to the consultation log.

		required, the report should be forwarded to the local municipality and its Municipal Heritage Committee for review and comment. The report and recommendations should be considered in the EA process. The report should be made available, upon request, to local heritage organizations, and MTCS should be notified of cultural heritage resources of potential provincial significance.		
7	August 27, 2013	The Ministry of Environment identified that the Director, Environmental Approvals Branch must be contacted if a project may adversely affect an Aboriginal or treaty right, or if a Part II Order Request is anticipated. The Ministry will then determine whether the Crown as a Duty to Consult. Aboriginal consultation information was provided.	n/a	Comment received and added to the consultation log.
8	September 5, 2013	Deseronto Transit wrote that they are interested in understanding the transportation needs and future goals of Greater Napanee. They want to know the best way to stay up to date on the project, and asked if they can be added to the project mailing list.	September 5, 2013	Vanessa Skelton wrote back and identified the dates of the Public Information Centres to be held on September 23 and September 26. Notices will also be placed in the newspaper, on the county website, and the County facebook page. Deseronto Transit was added to the mailing list.
9	September 16, 2013	Hiawatha First Nation thanked the County of Lennox and Addington for contacting them. The community identified that the proposed project is deemed to have a minimal potential to impact the community, but asked to be appraised of any updates, archaeological findings or environmental impacts should they occur. They also requested that any maps pertaining to the project be sent as a shape file.	n/a	There is no archaeological component to the Transportation Master Plan Update project. The original notice sent a map with the boundaries for Lennox and Addington County. Should any changes occur, maps and updates can be sent to the community. The community will continue to receive updates about the project.
10	September 27, 2013	Aboriginal Affairs and Northern Development Canada (AANDC) advised that they do not become involved in Environmental Assessments pertaining to projects off-reserve, and requested to be taken off the mailing list.	September 27, 2013	AANDC contacts were removed from the contact list.
11	September 30, 2013	“My belief is that the growth will continue in the Amherstview area and slow growth will continue in these areas. I think that improved roads should follow development and that the developer should be responsible for the costs related to road required. I think that as part of this study all of the road in the county should be reviewed and determine what their current status is to determine future needs and specific roads that need to be addressed in the county. There are a number of roads in the county area that are in rough condition that need to be addressed prior to the roads significantly falling apart resulting in larger long-term costs. We regularly use the road for walking on a daily basis and find the road crumbling at the side and the pavement breaking apart. This makes it difficult to walk or cycle on given the condition of the shoulder of the road. I am	September 30, 2013	Thank you for your comments. We appreciate your participation in the consultation process and we will keep you informed of future project updates.

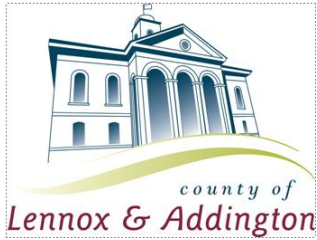
		<p>definitely a supporter of the paved shoulders on the road that significantly improve safety for people walking or cycling and keep them off the vehicle roadway. I don't find that the traffic in the county is of a significant nature that would require any network improvement such as a bypass given the cost related to the change and the minimal amount of traffic.</p> <p>It is somewhat disappointing that members of the community are not engaged in the process of reviewing this plan update as it could significantly impact them on their future tax requirements related to road improvements in the county."</p>		
12	October 1, 2013	<p>Alderville First Nation thanked the County of Lennox and Addington for contacting them. As per the Alderville First Nation Consultation Protocol, the proposed project is considered a level 3, having minimal potential impact to the First Nations' rights. It asked to be kept informed of any archaeological findings, burial sites, or environmental impacts, should they occur.</p>	n/a	<p>There is no archaeological component to the Transportation Master Plan Update project. The original notice sent a map with the boundaries for Lennox and Addington County. Should any changes occur, maps and updates can be sent to the community. The community will continue to receive updates about the project.</p>
13	October 18, 2013	<p>Stock Transportation: Concerns were expressed about the corner of County Road 23 (Coronation Blvd) and County Road 24 (Taylor-Kidd Blvd). This intersection is close to the school bus yard, and traffic seems to be increasing likely due to new home construction in Amherstview, Westbrook, and Woodhaven subdivisions.</p> <p>Busses exiting Coronation Blvd take time to speed up, and traffic on Taylor-Kidd is on the bus in seconds. Several accidents have occurred at the corner, including an injured bus driver.</p>	October 21, 2013	<p>The intersection is under joint jurisdiction since it is a boundary between Kingston and Lennox and Addington County. County staff will now contact Kingston staff to advise them of your concerns and begin discussion of an operational review. This review will consider the traffic patterns, physical features/devices and any other contributing aspects at the intersection that may impact safe operation. The review may result in consideration of alternative measures beyond traffic signals which are determined by compliance with traffic signal warrants dictated by the Ontario Traffic Manual assessing specific traffic characteristics. We will also consult with the local police authorities to obtain their input.</p> <p>Please note that the County is currently undertaking an update to its Transportation Master Plan which includes a task to review operational concerns at specific county road intersections so we will contact the consultant providing the update to assess operations at this intersection as well.</p> <p>In addition your concerns will be raised at an upcoming meeting of the County's Technical Advisory Committee which consists of County and local municipality road authority staff (Loyalist Township in this case) to raise their awareness of your concerns and receive their input.</p> <p>In conclusion, thank you again for bringing your</p>

				concerns forward for our awareness and consideration.
14	June 11, 2014	Alderville First Nation responded to the notice of the Public Information Centre #2 and indicated that the project would have minimal impact and asked for copies of any archaeological reports if they are completed. They asked to be informed about future notices.	n/a	Alderville First Nation is already on the mailing list, and no archaeological studies are performed as part of this project.
15	June 11, 2014	A letter was sent from a cottage owner on Weslemkoon Lake regarding lake road access limitations. The individual identifies that the two existing road access points are off of Highway 62 and Highway 28, while highway 41 is much closer "as the crow flies." The individual proposes an extension of an existing cottage road in the area to provide access to Weslemkoon Lake from highway 41, noting that some logging activity may have enabled much of the basic road building already. Additional benefits from the road extension would be to provide additional access for business and services near highway 41, and to provide access in the event of a forest fire, flood, or for emergency vehicles.	June 23, 2014	Thank you for your interest in the County of Lennox and Addington Transportation Master Plan. The construction of a new road to connect to local cottage roads is a project that would fall under the jurisdiction of the local municipality. I have sent your comment to the Transportation Master Plan steering committee representatives from the Township of Addington Highlands.
16	June 10, 2014	Hiawatha First Nation responded to the notice for the second public open house and stated the project is deemed to have no impact on Hiawatha First Nation's traditional territory and/or rights. It asked to be appraised of any updates, archaeological findings or environmental impacts should they occur. Any archaeological findings or reports should be sent to the community.	n/a	No archaeological studies will be undertaken for this project.
17	June 17, 2014	The representative from Ministry of Tourism, Culture and Sport was unable to attend the Public Information Centre this week, but asked to have a copy of the display materials.	June 17, 2014	An email was sent to the individual identifying the location of the display materials:
18 a	June 23, 2014	The individual asked for an electronic copy of the transportation master plan materials from the public information open houses. She indicated that she is interested in any impact on Amherst Island including roads near the ferry access on the mainland.	June 23, 2014	An email link was sent to the individual, showing the location of the public notices for the transportation master plan, as well as a link to the Open House boards. The following response was also provided: "The road at the ferry access to Amherst Island is a provincial highway (Highway 33) and is therefore not in the scope of this project. There is some information about County Road 4 in the Open House boards which may be of interest to you. If you have any comments, please let us know. Thanks for your interest in this project."
18 b	June 23, 2014	A follow up was provided to the project team response to the individual: "Thanks for the quick response. Did the County do a whole Transportation Master Plan without mentioning the Island?"	June 25, 2014	The following response was provided: "The Lennox and Addington Transportation Master Plan is a study by the County to assess the County's current transportation network and evaluate the operational needs and demands. The ferry and Highway 33 are under provincial jurisdiction so the County is not in the position to

			<p>review the operations or make recommendations regarding either of these facilities. There are no County roadways on the island.</p> <p>A steering committee was formed as part of this study with representation from all four of the municipalities that are part of the County of Lennox and Addington. No issue was raised by the representatives from Loyalist Township concerning transportation on the island.”</p>
19	May 30, 2014	<p>A resident provided the following comment: I live in Bath but due to previous commitments I cannot attend the "THE COUNTY OF LENNOX AND ADDINGTON TRANSPORTATION MASTER PLAN" Meeting on June 16.</p> <p>However I do have a comment I wish to bring to the Project's attention.</p> <p>Preface:</p> <ul style="list-style-type: none"> • Bath does not have any public transportation. • Bath has many seniors living here. • Bath is wonderful place to live but for many shopping and entertainment venues we have to go elsewhere. <p>That means as soon as we seniors can no longer drive, we must move to Kingston or somewhere that has public transportation.</p> <p>Why couldn't we have some type of minivan whose route would drive all around Bath (wouldn't take long) and would drive to Kingston (and back) once an hour? We don't need a big bus but do need public transportation.</p>	<p>Thank you for your comments regarding the Lennox and Addington Transportation Master Plan. Transit services were considered during the development of the Transportation Master Plan, however, the provision of transit services are a responsibility of the local municipality rather than the County.</p> <p>We will send you notification regarding the completion of the project.</p>
20	June 26, 2014	<p>A letter from the Mohawks of the Bay of Quinte provided information about the legal Duty to Consult and Accommodate, and asked for further information to help determine the level of interest of the community in participating in the project.</p> <p>The Chief asked the project team to provide:</p> <ul style="list-style-type: none"> • A 1-2 page summary of the proposed project, including potential adverse impacts to the land and affected community; • Archaeological reports and assessments; • Any comments or review-type documentation 	<p>Lennox and Addington will be preparing the requested information and working with the community regarding the issues raised, and meet with the community if requested.</p>

		<p>provided by involved government parties (ie. the Ministry of Natural Resources, Ministry of the Environment, Ministry of Transportation, Environment Cnaada, AANDC, etc.</p> <ul style="list-style-type: none">• The County's decision to install either a splitter island or roundabout at the intersection of County Road 1 (Belleville Road) and County Road 10 (Deseronto Road).		
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APPENDIX E: NOTICE OF COMPLETION



THE COUNTY OF LENNOX AND ADDINGTON TRANSPORTATION MASTER PLAN NOTICE OF COMPLETION

The County of Lennox and Addington has completed a Transportation Master Plan update. The purpose of the Transportation Master Plan update is to guide the County's transportation programs and road infrastructure investments for the next twenty years.

The Master Plan Update followed the requirements of the Municipal Class Environmental Assessment (Class EA) and satisfies Phases 1 and 2 of the planning and design process. This involved investigating The County of Lennox and Addington's existing transportation capacity, identifying and evaluating potential alternatives, and recommending implementation options. The Master Plan update included two rounds of Public Information Centres (PICs) held in September 2013 and June 2014, as well as input from agencies, local stakeholders, and aboriginal communities. These engagement opportunities contributed to the development and evaluation of alternatives.

The Transportation Master Plan update report will be available for review on the County website at <http://www.lennox-addington.on.ca/roads-and-bridges.html>

The report will also be available at the following locations:

- **County of Lennox and Addington :**
97 Thomas Street East, Napanee,
Ontario, K7R 4B9
- **Township of Addington Highlands:**
72 Edward Street, Flinton, Ontario,
K0H 1P0
- **Loyalist Township:** 263 Main Street, Odessa,
Ontario, K0H 2H0
- **Township of Stone Mills:** 4504 County Road 4,
Centreville, Ontario, K0K 1N0
- **Town of Greater Napanee:** 124 John Street,
Napanee, Ontario, K7R 3L4

For further information, please contact:

Mr. Steve Roberts, C.E.T.
Manager, Roads and Bridges
County of Lennox and Addington
97 Thomas Street East
Napanee, ON K7R 4B9
Tel: (613) 354-4883 ext. 3230
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or

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Appendix B

County of Lennox and Addington – Transportation Master Plan

- County Road Jurisdictional Review

County Road Jurisdictional Review - Stage 1 Criteria

Criteria	Score	Description
Urban Centre Connector	3	Does the road connect two or more urban centres
Kings Hwy/Upper Tier Connector	2	Does the road connect to a Kings Highway (Highway 7, Highway 33) or another Upper Tier Highway (Highway 401)
Heavy Industry Service	2	Does the road connect to areas with heavy industry
Barrier Service	1	Does the road provide access across major barriers, such as a river or a railroad
Resort Criterion	1	Does the road provide a service to public recreation areas, such as resorts or provincial parks
Urban Arterial Extension	3	Is the road an extension of a major arterial road from an adjacent urban centre with an AADT larger than 700
Posted Speed	1	Is the speed limit 80 km/h along the majority of the road
Road Surface	0.5	Does the road have an asphalt surface
AADT	0.5	Are the traffic volumes greater than 1000 vehicles per day
ROW	1	Does the road have at least a 66-foot wide right-of-way

County Road Jurisdictional Review - Stage 1 Evaluation

Road	From	To	Urban Centre Connector	Kings Hwy/Upper Tier Connector	Heavy Industry Service	Barrier Service	Resort Criterion	Urban Arterial Extension	Posted Speed	Road Surface	AADT	ROW		Total	Pass Through to Stage 2 Evaluation
			1	2	3	4	5	6	7	8	9	10			
			Score = 3	Score = 2	Score = 2	Score = 1	Score = 1	Score = 3	Score = 1	Score = 0.5	Score = 0.5	AADT	Score = 1		
Potential Transfer to County Road															
Jim Kimmett Blvd.	County Rd. 41	County Rd. 1	0	1	1	0	0	0	0	1	1	6628	1	6	Yes
Amherst Dr.	County Rd. 6	County Rd. 24	0	0	0	0	0	0	0	1	1	4385	1	2	No
Little Creek Rd.	County Rd. 2	County Rd. 9	0	0	0	1	0	0	0	1	0	516	1	2.5	No
South Shore Rd.	County Rd. 8	County Rd. 25	0	0	0	0	0	0	0	1	0	416	1	1.5	No
Richmond Blvd.	County Rd. 41	County Rd. 1	0	1	1	0	0	0	0	1	1	6500	1	6	Yes
Camden Rd.	Richmond Blvd.	County Rd. 1	0	0	1	0	0	1	0	1	1	4051	1	7	Yes
Matawachan Rd.	County Rd. 30	County Boundary	0	0	0	0	0	0	1	1	0	235	1	2.5	No
Industrial Blvd.	County Rd. 41	County Rd. 1	0	1	1	0	0	0	0	1	1	2993	1	6	Yes
Lake Rd.	County Rd. 14	County Rd. 4	1	0	0	0	0	0	1	1	0	726	1	5.5	No
Centreville Rd.	County Rd. 41	County Rd. 4	0	1	0	0	0	0	1	1	0	340	1	4.5	No
Goodyear Rd.	County Rd. 41	County Rd. 11	0	1	1	0	0	0	1	1	0	796	1	6.5	Yes
Mountain Rd.	County Rd. 15	County Boundary	0	0	0	0	0	0	1	1	0	700	1	2.5	No
Deseronto Rd.	County Rd. 11	County Rd. 12	0	0	0	1	0	0	1	1	0	757	1	3.5	No
Potential Transfer to Municipal Road															
County Rd. 26	County Rd. 23	Highway 33	0	1	1	0	0	0	0	1	0	726	1	5.5	No
County Rd. 25	County Rd. 8	South Shore Rd.	0	0	0	0	0	0	1	1	0	124	1	2.5	No
County Rd. 12	Deseronto Rd.	County Rd. 41	0	1	0	1	0	0	1	1	0	169	1	5.5	No
County Rd. 27	County Rd. 14	County Rd. 17	0	0	0	0	0	0	1	1	0	214	1	2.5	No
County Rd. 3	County Rd. 41	Cold Water Rd.	0	1	0	0	0	0	1	1	0	835	1	4.5	No
County Rd. 13	County Rd. 41	Youngs Rd.	0	1	0	0	0	0	1	1	0	529	1	4.5	No

Minimum requirement to rank as a County Road =6

County Rd. 1	Jim Kimmett Blvd.	Marilyn Ave.	0	0	0	1	0	1	0	1	1	2530	1	6	Yes
County Rd. 1	Marilyn Ave.	County Rd. 41	0	1	0	0	0	1	0	1	1	7191	1	7	Yes

County Road Jurisdictional Review - Stage 2 Criteria

Criteria	Description	Measure	Now	Future
1.0 Transportation Demand				
1.1 Existing Annual Operations	Current volume (AADT). Typical volume on road sections	Volume	All sections >= 1000 = Score 1	
			Some sections >= 1000 = Score 0.5	
			No sections >= 1000 = Score 0	
1.2 Existing Summer Operations	Current volume (SADT). Typical volume on road sections	Volume	As Above	
1.3 2023 Annual Operations	2023 volume (AADT). Typical volume on road sections	Volume		As Above
1.4 2033 Annual Operations	2033 volume (AADT). Typical volume on road sections	Volume		As Above
2.0 Geometrics/Structural				
2.1 Existing Deficiencies	Geometric deficiencies affecting capacity, safety, ability to accommodate heavy vehicles, etc. (eg. Alignment, pavement width)	Yes/No	Yes = Score 0	
			No = Score 1	
3.0 Land Service				
3.1 Existing Conditions	Existing access requirements: Equal - land access and traffic movement equal Control - traffic movement is primary function	Land Access	Primary - access primary function Primary = Score 0	
			Equal - land access and traffic movement equal Equal = Score 0.5	
			Control - traffic movement is primary function Control = Score 1	
3.2 Longer Term Conditions	Future access requirements	Land Access		As Above
3.3 Access Type/Adjacent Land Use	Identification of the access to adjacent lands: rural/urban employment (RE, UE) rural/urban residential (RR, UR) *Employment includes commercial, industrial, office uses, etc.*	Access Type	RE = Score 0.5	
			UE = Score 1	
			RR = Score 0.5	
			UR = Score 0	
3.4 Access Frequency	The amount of access (points of access), i.e. Low (< 10 per km) Medium (10-30 per km) High (> 30 per km)	Access Frequency	Low = Score 1	
			Medium = Score 0.5	
			High = Score 0	
4.0 Trip Characteristics				
4.1 Existing Conditions	Existing type of vehicle trips on road: Internal - primarily local local, some external	Trip Type	Internal = Score 0	
			Internal/External = Score 1	
4.2 Longer Term Conditions	Future type of vehicle trips on road	Trip Type		As Above
5.0 Growth Potential	Potential that adjacent lands will be developing	Yes/No		Yes = Score 1
				No = Score 0
6.0 Network Connectivity	Connectivity of the road through the County and/or connecting to adjoining municipalities with a similar type of facility	Yes/No	Yes = Score 1	
			No = Score 0	
7.0 Community Servicing	The importance (e.g. need) of the roadway in providing essential transportation service to the local community (basically - no other available facility)	Yes/No	Yes = Score 1	
			No = Score 0	
TOTAL MAXIMUM SCORE			9	5

County Road Jurisdictional Review - Stage 2 Evaluation

Criteria	Jim Kimmett Blvd.	Richmond Blvd.	Camden Rd.	Industrial Blvd.	Goodyear Rd.	County Rd. 1	County Rd. 1
1.0 Transportation Demand							
1.1 Existing Annual Operations	7189	7051	4958	7189	796	2530	7191
1.2 Existing Summer Operations	7621	7474	5255	7621	884	2808	7982
1.3 2023 Annual Operations	8967	7766	4958	8967	796	2530	7191
1.4 2033 Annual Operations	9001	7755	4958	9001	796	2530	7191
2.0 Geometrics/Structural							
2.1 Existing Deficiencies	No	No	No	No	No	No	No
3.0 Land Service							
3.1 Existing Conditions	Control	Primary	Primary	Primary	Equal	Control	Primary
3.2 Longer Term Conditions	Control	Primary	Primary	Primary	Primary	Control	Primary
3.3 Access Type/Adjacent Land Use	UE	UE	UR	UE	RE	RE	UR
3.4 Access Frequency	High	High	High	High	Low	Low	High
4.0 Trip Characteristics							
4.1 Existing Conditions	Internal/External	Internal	Internal	Internal	Internal	Internal/External	Internal/External
4.2 Longer Term Conditions	Internal/External	Internal	Internal	Internal	Internal/External	Internal	Internal
5.0 Growth Potential	Yes	No	Yes	Yes	Yes	Yes	No
6.0 Network Connectivity	No	No	No	No	No	No	No
7.0 Community Servicing	Yes	No	No	No	No	No	No

Potential Transfer to County Roads

County Road Jurisdictional Review - Stage 2 Totals

Criteria	Potential Transfer to County Roads	Jim Kimmett Blvd.	Richmond Blvd.	Camden Rd.	Industrial Blvd.	Goodyear Rd.	
1.0 Transportation Demand							
1.1 Existing Annual Operations		1	1	1	1	0	
1.2 Existing Summer Operations		1	1	1	1	0	
1.3 2023 Annual Operations		1	1	1	1	0	
1.4 2033 Annual Operations		1	1	1	1	0	
2.0 Geometrics/Structural							
2.1 Existing Deficiencies		1	1	1	1	1	
3.0 Land Service							
3.1 Existing Conditions		1	0	0	0	0.5	
3.2 Longer Term Conditions		1	0	0	0	0	
3.3 Access Type/Adjacent Land Use		1	1	0	1	0.5	
3.4 Access Frequency		0	0	0	0	1	
4.0 Trip Characteristics							
4.1 Existing Conditions		1	0	0	0	0	
4.2 Longer Term Conditions		1	0	0	0	1	
5.0 Growth Potential		1	0	1	1	1	
6.0 Network Connectivity		0	0	0	0	0	
7.0 Community Servicing		1	0	0	0	0	
Total Now Score			7	4	3	4	3
Total Score		12	6	6	7	5	
Recommend Consideration for Transfer to County Road?		Yes	Yes	No	Yes	No	

Minimum requirement to be classified as a county road: Now=4 and Total =6

Appendix C

County of Lennox and Addington – Transportation Master Plan

- County Road System Classification

SCHEDULE A

County Road System Classification

County Roads are classified as follows:

Major Arterial

County Road 4	Highway 33 to Highway 401
County Road 6	County Road 23 to Highway 401
County Road 23*	County Road 4 to County Road 24
County Road 24	1125 m North of Amherst Drive to County Road 23

*Note: County Road No. 23 is designated as a Controlled Access Road. Access to County Road No. 23 from adjacent lands is restricted in accordance with the provisions of County of Lennox and Addington By-law No. 2120, as may be amended from time to time.

Rural Arterial

County Road 1:	County Road 10 to Enviro Park Lane
County Road 1:	Crouse Street to County boundary
County Road 2:	County Road 10 to West of Hessford Street
County Road 2:	East of Camden Road (County Road 1) to West limit of Odessa
County Road 2:	East limit of Odessa to County boundary
County Road 4:	Highway 401 to County Road 41
County Road 5:	East limit of the former Town of Napanee to County Road 18
County Road 6:	Highway 401 to County Road 14
County Road 7:	Loyalist Boulevard to County Road 2
County Road 8:	County Road 21 to Golf Course Lane
County Road 10:	County Road 2 to Beechwood Road
County Road 18:	County Road 5 to County Road 1
County Road 21:	Highway 33 to County Road 8
County Road 41:	Richmond Boulevard (except Highway 401 corridor) to Highway 7

Urban Arterial

County Road 1:	Enviro Park Lane to Crouse Street
County Road 2:	West limit of Odessa to County Road 6
County Road 6:	Highway 33 to County Road 23
County Road 7:	Highway 33 to Loyalist Boulevard
County Road 8:	Golf Course Lane to County Road 2
County Road 24:	Highway 33 to 1125 m North of Amherst Drive

SCHEDULE A - Continued

Rural Collector

- County Road 3: County boundary to County Road 41
- County Road 5: County Road 18 to County Road 4
- County Road 8: Highway 33 to County Road 21
- County Road 9: 1.1 km West of Southcrest Drive to the Southerly County Road 8 intersection
- County Road 10: Beechwood Road to County Road 11
- County Road 11: County Road 10 to 0.4 km West of County Road 27
- County Road 12: County boundary to County Road 41
- County Road 13: County boundary to County Road 41
- County Road 14: County Road 41 to County boundary
- County Road 15: County Road 4 to County boundary
- County Road 16: County Road 1 to County Road 11
- County Road 17: East of the easterly limit of the former Village of Newburgh to County Road 4
- County Road 19: Highway 401 to County boundary
- County Road 20: County Road 6 to County boundary
- County Road 22: County Road 8 to County Road 7
- County Road 25: County Road 8 to South Shore Road
- County Road 27: County Road 17 to County Road 14
- County Road 28: County Road 4 to County Road 6
- County Road 29: County boundary to Highway 41
- County Road 30: Highway 41 to County boundary

Urban Collector

- County Road 5: County Road 2 to East limit of the former Town of Napanee
- County Road 9: 1.1 km West of Southcrest Drive to northerly intersection with County Road 8
- County Road 11: 0.4 km West of County Road 27 to County Road 27
- County Road 17: County Road 27 to the easterly limit of the former Village of Newburgh
- County Road 27: County Road 1 to County Road 17

Connecting Link

- County Road 2: (Dundas Street) Hessford Street to Bridge Street
- County Road 41: (Centre Street) from Dundas Street to Richmond Boulevard

Appendix D

County of Lennox and Addington – Transportation Master Plan

- Traffic Growth Rates

County of Lennox and Addington - Vehicle Volume Growth Rates

Description						Growth Rate		2012			2024					2034						
Sta. ID #	Road	Classification	Lanes	Lane Capacity	DHV	Calculated	Adjusted	AA DT	Peak Hour	V/C	AA DT	Dev.	Note	AA DT (adj.)	Peak Hour	V/C	AA DT	Dev.	Note	AA DT (adj.)	Peak Hour	V/C
17-1	23	Commuter	2	800	0.094	0.03%	0.03%	4509	424	0.26	4522	4457	2	8979	844	0.53	9002	0		9002	846	0.53
18-1	6	Commuter	2	800	0.094	2.46%	2.46%	4629	435	0.27	6050	4152	2	10202	959	0.60	13013	0		13013	1223	0.76
35-1*	2	Commuter	2	800	0.094	0.04%	0.04%	4102	386	0.24	4119	0		4119	387	0.24	4134	0		4134	389	0.24
37-1*	1	Commuter	2	800	0.094	-1.16%	0.00%	7191	676	0.42	7191	1502	7	8693	817	0.51	8693	0		8693	817	0.51
39-1*	1	Commuter	2	800	0.094	1.95%	1.95%	5391	507	0.32	6668	0		6668	627	0.39	8089	0		8089	760	0.48
40-1	1	Commuter	2	800	0.094	-3.92%	0.00%	4051	381	0.24	4051	0		4051	381	0.24	4051	0		4051	381	0.24
78-1*	8	Commuter	2	800	0.094	-1.43%	0.00%	6109	574	0.36	6109	0		6109	574	0.36	6109	0		6109	574	0.36
79-1	2	Sub-Commuter	2	800	0.106	-1.20%	0.00%	7449	790	0.49	7449	777	3/4	8226	872	0.54	8226	0		8226	872	0.54
91-1	2	Commuter	2	800	0.094	2.07%	2.07%	7199	677	0.42	9022	0		9022	848	0.53	11077	0		11077	1041	0.65
93-1	2	Commuter	2	800	0.094	-0.22%	0.00%	4282	403	0.25	4282	0		4282	403	0.25	4282	0		4282	403	0.25
96-1	23	Commuter	2	800	0.094	1.46%	1.46%	3780	355	0.22	4435	5352	5	9787	920	0.57	11318	0		11318	1064	0.66
97-1	24	Commuter	2	800	0.094	-2.15%	0.00%	2755	259	0.16	2755	6016	5	8771	825	0.52	8771	0		8771	825	0.52
99-1	24	Commuter	2	800	0.094	-3.49%	0.00%	2896	272	0.17	2896	0		2896	272	0.17	2896	0		2896	272	0.17
102-1	2	Commuter	2	800	0.094	0.77%	0.77%	4304	405	0.25	4684	0		4684	440	0.28	5059	0		5059	476	0.30
105-1	2	Commuter	2	800	0.094	-2.81%	0.00%	5470	514	0.32	5470	1050	3	6520	613	0.38	6520	0		6520	613	0.38
106-1	6	Commuter	2	800	0.094	-0.72%	0.00%	6001	564	0.35	6001	3104	2/3/4	9105	856	0.53	9105	0		9105	856	0.53
107-1	6	Commuter	2	800	0.094	-1.88%	0.00%	3680	346	0.22	3680	3083	2/3/4	6763	636	0.40	6763	0		6763	636	0.40
109-1	41	Commut Rec.	2	800	0.101	-0.25%	0.00%	6784	685	0.43	6784	0		6784	685	0.43	6784	0		6784	685	0.43
115-1	6	Commuter	2	800	0.094	-0.19%	0.00%	3931	370	0.23	3931	0		3931	370	0.23	3931	0		3931	370	0.23
122-1*	2	Commuter	2	800	0.094	0.71%	0.71%	4393	413	0.26	4749	0		4749	446	0.28	5097	0		5097	479	0.30
124-1	41	Commut Rec.	2	800	0.101	1.17%	1.17%	4609	466	0.29	5237	0		5237	529	0.33	5882	0		5882	594	0.37
125-1	41	Commut Rec.	2	800	0.101	-1.21%	0.00%	3442	348	0.22	3442	0		3442	348	0.22	3442	0		3442	348	0.22
132-1*	41	Urban Commuter	2	800	0.102	0.51%	0.51%	13170	1,343	0.84	13920	0	8	13920	1420	0.89	14640	0		14640	1493	0.93
137-1*	2	Urban Commuter	2	800	0.102	0.93%	0.93%	6092	621	0.39	6745	1638	7	8383	855	0.53	9196	0		9196	938	0.59
138-1	2	Urban Commuter	2	800	0.102	-0.67%	0.00%	6952	709	0.44	6952	0		6952	709	0.44	6952	0		6952	709	0.44
141 North	41	Urban Commuter	2	800	0.102	1.01%	1.01%	7824	798	0.50	8738	0		8738	891	0.56	9661	0		9661	985	0.62
141 South	41	Urban Commuter	2	800	0.102	1.91%	1.91%	7095	724	0.45	8738	0		8738	891	0.56	10559	0		10559	1077	0.67
141 Total	41	Urban Commuter	4	800	0.102	0.90%	0.90%	14919	1,522	0.48	16456	0		16456	1678	0.52	17990	0		17990	1835	0.57
142 North	41	Urban Commuter	2	800	0.102	-0.67%	0.00%	7163	731	0.46	7163	217	1/6	7380	753	0.47	7380	0		7380	753	0.47
142 South	41	Urban Commuter	2	800	0.102	-0.22%	0.00%	7068	721	0.45	7068	209	1/6	7277	742	0.46	7277	0		7277	742	0.46
142 Total	41	Urban Commuter	4	800	0.102	0.04%	0.04%	14231	1,452	0.45	14297	426	1/6	14723	1502	0.47	14785	0		14785	1508	0.47
147-1	2	Commuter	2	800	0.094	0.38%	0.38%	4044	380	0.24	4217	0		4217	396	0.25	4381	0		4381	412	0.26
Hwy 33 - E	6	Commuter	2	800	0.094	1.69%	1.69%	5809	546	0.34	9649	907	2	9649	907	0.57	11409	0		11409	1072	0.67
Hwy 33 - W	6	Commuter	2	800	0.094	1.69%	1.69%	5404	508	0.32	8862	833	2	8862	833	0.52	10479	0		10479	985	0.62
158-1*	2	Commuter	2	800	0.094	0.00%	0.00%	5854	550	0.343923	5857	0		5857	551	0.34	5859	0		5859	551	0.34