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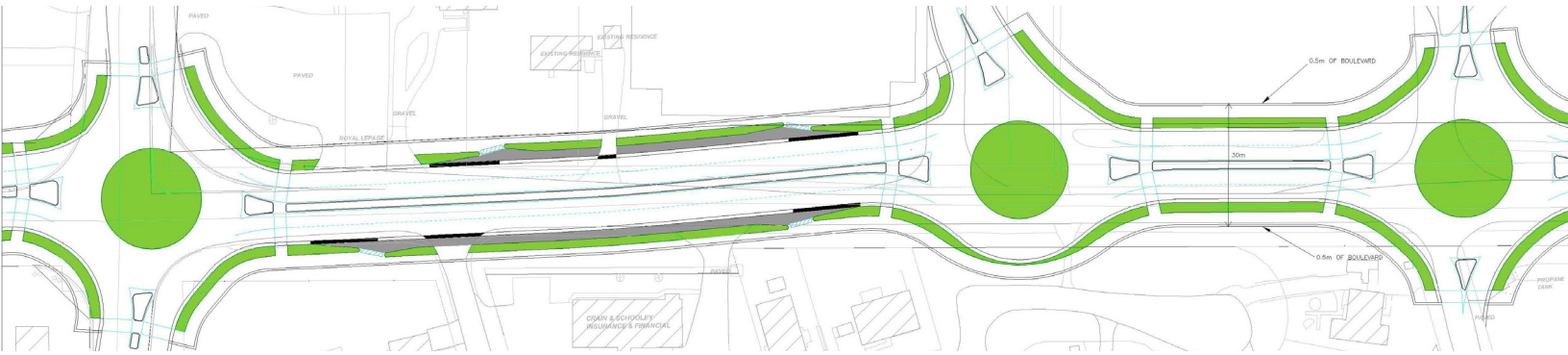
Date: May 2010

AECOM

United Counties of Leeds & Grenville

Class EA for the Four Lane Upgrade of County Road 43, Kemptville Corridor Environmental Study Report



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March 16, 2010

Les Shepherd
Director of Works, Planning Services and Asset Management
United Counties of Leeds and Grenville
25 Central Avenue West, Suite 100
Brockville, Ontario K6V 4N6

Dear Mr. Shepherd:

Project No: 108480
Regarding: Class EA for the Four Lane Upgrade of County Road 43, Kemptville Corridor –Environmental Study Report

The Class EA for the four lane upgrade of County Road 43, Kemptville Corridor began in early 2009. Since this time the study has progressed in accordance with the 'Schedule C' requirements outlined in the "Municipal Class Environmental Assessment October 2000, as amended in 2007".

The Technical Steering Committee (TSC) was made up of representatives from United Counties of Leeds and Grenville, Municipality of North Grenville, Ministry of Transportation, Rideau Valley Conservation Authority and AECOM.

During the study the TSC identified three specific features of the corridor for which alternatives should be considered for:

- The typical cross section for the corridor,
- The intersection control for the centre corridor (CR44 to James Street), and
- The CR43 bridge crossing of the South Branch of the Rideau River (Kemptville Creek).

A number of alternatives for each feature were considered and evaluated. From the evaluation, the TSC chose a technically preferred alternative design for the corridor which has been shared with the public and appropriate agencies. The technically preferred alternative design of the corridor includes a 30m wide corridor with bicycle paths and sidewalks, a complete roundabout corridor with a 2m wide median and a new two lane, three span bridge to the south the of the existing bridge.

A number of comments were received by both the public and agencies which have since been addressed by the TSC. In reviewing these comments the TSC has made added new items to the list of mitigation measures but has not amended the technically preferred alternative corridor plan.

The following environmental study report is the final report in the study and documents the entire study. It should be read in conjunction with the previous documents that have been made available throughout this study including the *Study Design Report, Report on SDR and PIC No.4, Existing Conditions Report, Report on Analysis and Evaluation of Alternatives and Selection of Technically Preferred Alternative, and Report on PIC No.5.* The previous reports are appendices of this report.

Should you have any enquiries please contact Shane Gray or the undersigned.

Sincerely,
AECOM Canada Ltd.

Guy Laporte, P.Eng
Project Manager,
Guy.Laporte@aecom.com

GML:sg

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Guy Laporte, P.Eng.
Project Manager

Class EA for the Four Lane Upgrade of County Road 43, Kemptville Corridor - Environmental Study Report

Executive Summary

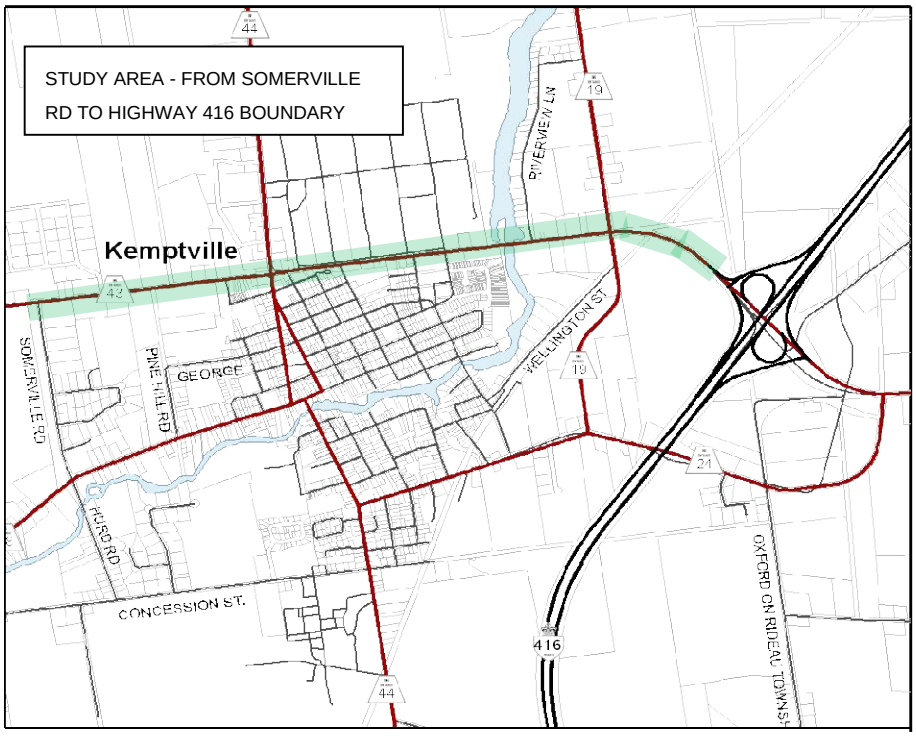
This Environmental Study Report (ESR) was prepared in accordance with Schedule "C" of the *Municipal Class Environmental Assessment, October 2000, as amended in 2007* that has been accepted by the Ministry of the Environment (MOE) and approved by the Government of Ontario for projects of this type. This study is a continuation of work that was undertaken by the United Counties of Leeds and Grenville in 2005/06.

Background:
In April of 2006 the United Counties issued a report entitled *United Counties of Leeds and Grenville, County Road 43 Corridor Master Plan*. The purpose of the Master Plan was to address transportation needs associated with a rapidly growing and developing corridor.

The Master Plan provided a sufficient level of planning to meet environmental assessment (EA) requirements for all Schedule 'B' projects in the Study Area. Various alternative solutions were considered to address the corridor's evolving transportation needs (Phases 1 and 2 of the Municipal Class EA process).

The study concluded with a decision by the Technical Steering Committee (TSC) to widen the corridor to four through lanes in the Kemptville urban area (from Highway 416 westerly to Somerville Road). That decision put this segment into the Schedule 'C' Municipal Class EA category. Schedule 'C" projects require a more detailed environmental assessment. The objective of this study is to complete the Schedule C environmental assessment in accordance with the Master plan recommendation. Recommendations for the remainder of the corridor (from Highway 416 easterly to South Gower Drive) do not involve widening and will consist of a series of Schedule 'A' projects. Schedule 'A' projects are pre-approved and can proceed without further study. For example construction of a roundabout is a Schedule 'A' project and may proceed at any time. Projects which are approved under the Planning Act may proceed without an environmental assessment.

Figure E-1.1: Study Area



The Master Plan also looked in detail at alternative intersection controls, as these have significant impact on overall corridor requirements. With strong public support, the Master Plan recommended that CR43 between Somerville Road and Highway 416 be developed as a four lane roundabout corridor.

This Study:
In general, it was not the intent of this study to revisit the recommendations of the Master Plan. This study picks up at Phase 3 of the Municipal Class Environmental Assessment, considering alternative design concepts for the Corridor Cross-Section Features, Centre Corridor Intersection Control and the CR43 Bridge.

Study Commencement:
As this is a continuation of the Master Plan study the public information centre held in February 2009 was named PIC No.4 as there were three public information centres held in the first study.

The public consultation process for this project was initiated immediately at the project outset, with publication of a Notice of Study Commencement and the upcoming Public Information Centre (PIC). The Notice advised availability of a *Study Design Report* (SDR) and solicited early public input on the project. Additionally the SDR was sent with a letter to a large number of agencies that may be interested in the study. Public Information Centre No.4 (PIC No.4) was held on March 5, 2009 in the Municipality of North Grenville's municipal centre and presented the public with background information in an effort to obtain early public input into the design planning process. Following this a report named *Report on SDR & PIC No.4* was completed which documents the Study Commencement, the PIC and resulting public and agency correspondence.

Existing Conditions:
After PIC No.4 the study progressed, and team of technical specialists were assembled to provide an inventory of existing corridor features and to consider how different designs would impact important features. Each specialist produced a report which has been compiled into an *Existing Conditions Report - August 2009.* The Existing Conditions Report documents the specialists' work for the following environments – bridge feasibility, stormwater, geotechnical, natural environment, traffic and transportation, noise, social and cultural environment and archaeological. The information in this report was used to assist the TSC in assessing the alternative design concepts during its evaluation of alternatives.

Evaluation:
As a consequence of the recommendation to widen the corridor to four lanes, the TSC identified three major aspects of the corridor which have environmental impacts. These are the corridor cross-section, the centre corridor intersection control and the CR43 Bridge configuration. All had a number of alternatives with different environmental impacts. The TSC evaluated the possible alternatives over three meetings before identifying and recommending the following technically preferred alternatives for the corridor: A *Report on Analysis and Evaluation of Alternatives and Selection of Technically Preferred Alternative – December 2009 (Evaluation Report)* has been produced. The *Evaluation Report* documents the evaluation and analysis process the TSC underwent to determine the technically preferred alternatives.

Technically Preferred Design:
From the three aspects of the corridor the following technically preferred alternatives have been chosen:

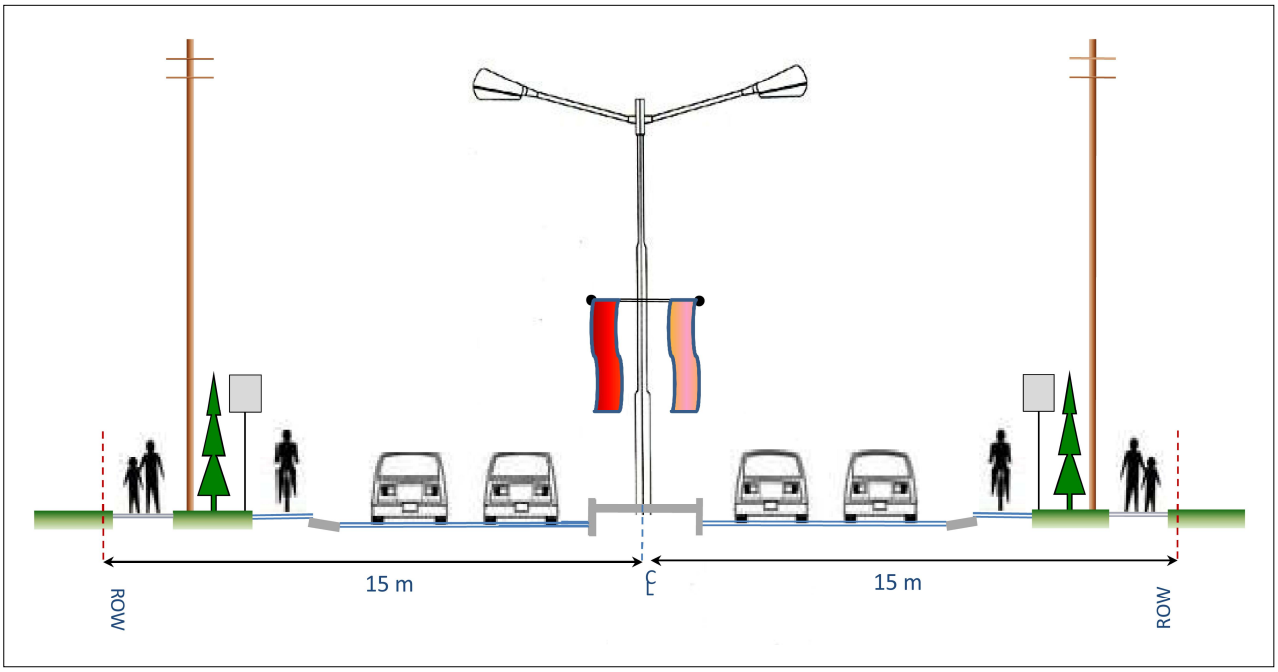
Alternative 5 for the corridor cross-section features – This alternative utilises a 30m corridor to contain a 2m wide centre median, 3.5m wide driving lanes and a landscaped boulevard separating the bicycle path (which is behind the curb) and a 1.5m wide sidewalk set 0.5m from the property line. The corridor is symmetrical.

The 2m wide centre median allows architectural street lighting. The location of the bicycle lane behind the curb was preferred because it is away from flowing traffic but still maintains its intended function. The bicycle lane can also be used as a snow

storage area in the winter. The 1.95m wide boulevard is large enough and far enough away from the salt spray that it can be landscaped. Street signs and utilities can be placed in the boulevard. The 1.5m sidewalk and 0.5m setback from the property line are maintained in this alternative which maintains good pedestrian access throughout the corridor.

The chief drawback of this alternative is the need for widening of the existing corridor. The existing corridor is generally 26m wide and will require widening to 30m to accommodate this cross section. The TSC has approved a preliminary design that entails widening mostly to the less developed north side of the corridor.

Figure E-1.2: Technically Preferred Corridor Cross-Section

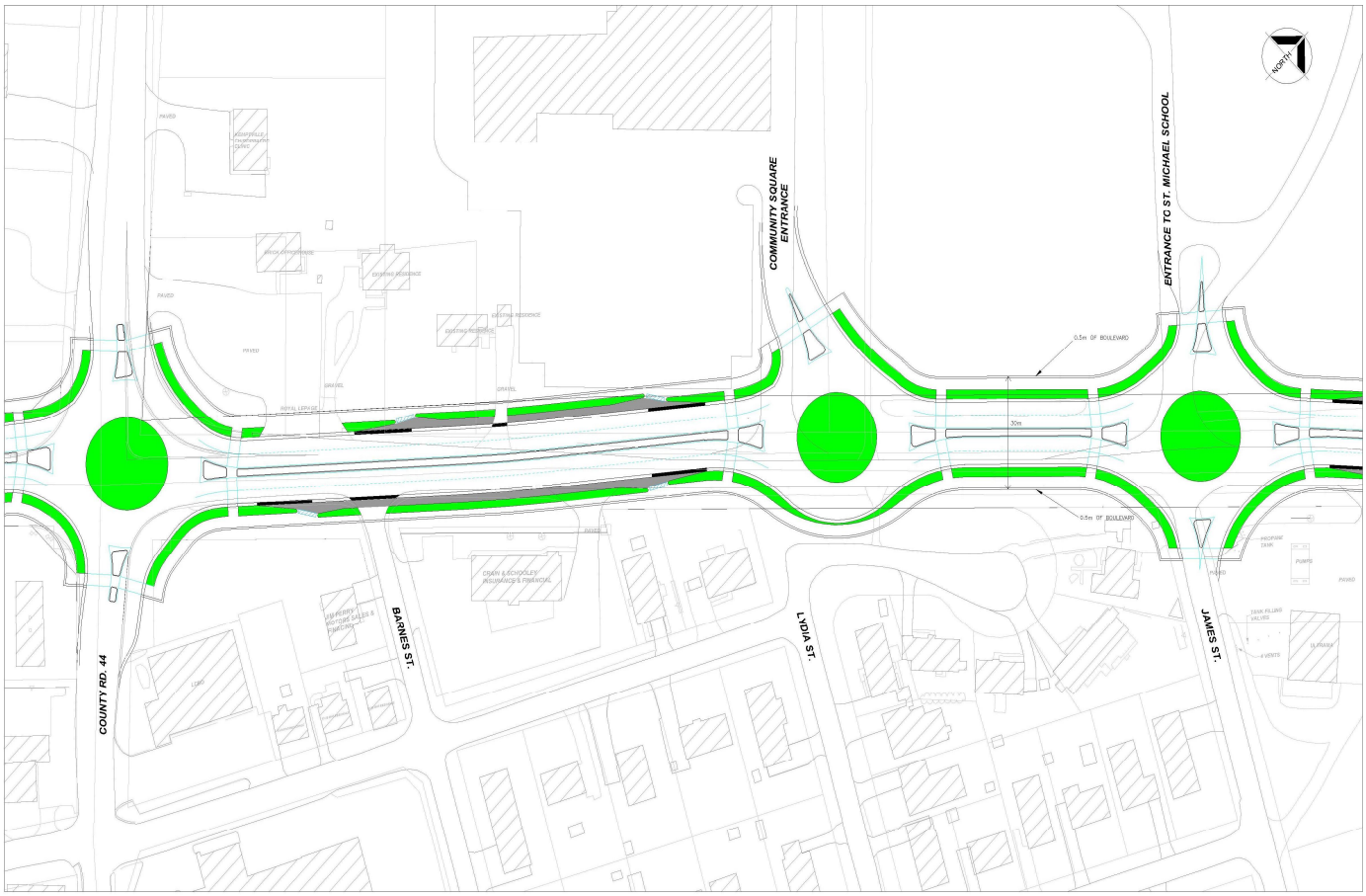


Option 1 for the centre corridor intersection control – This alternative results in a complete roundabout corridor where all major intersections are controlled by roundabouts including the CR43/CR44 intersection, the community square intersection and the James St (St Michael's) intersection. This alternative is consistent with the philosophy set by the CR43 corridor Master Plan.

The preferred option has been evaluated against a "do nothing" option that involves continued use of traffic signals. However, it must be emphasized that "do nothing" does not mean continued use of the existing intersections. For all evaluated options the existing intersections must be reconstructed to four lanes. Options that include traffic signals would also require turning lanes. Allowing that the installation of roundabouts would only take place when CR43 is widened to four lanes, the cost of roundabout construction is comparable to the cost of reconstruction as a signalized intersection.

All alternatives for the centre corridor intersection control were evaluated against the following environmental factors – air quality, accessibility, safety, pedestrians and cyclists, spacing of intersections, travel time, business impacts, roundabout corridor, capital cost, operating cost and property acquisition. In this evaluation, the roundabout option scored best on 7 out of 10 criteria which resulted in a total score that was much higher than the second best. This is considered a "very robust" result.

Figure E-1.3: Technically Preferred Centre Corridor Intersection Control



Option 6 for the CR43 Bridge – This alternative maintains the existing two-lane bridge while constructing a new, two-lane, three-span bridge to the south.

The TSC considered over one hundred options for widening of the existing crossing at Kemptville Creek, including all feasible combinations of:

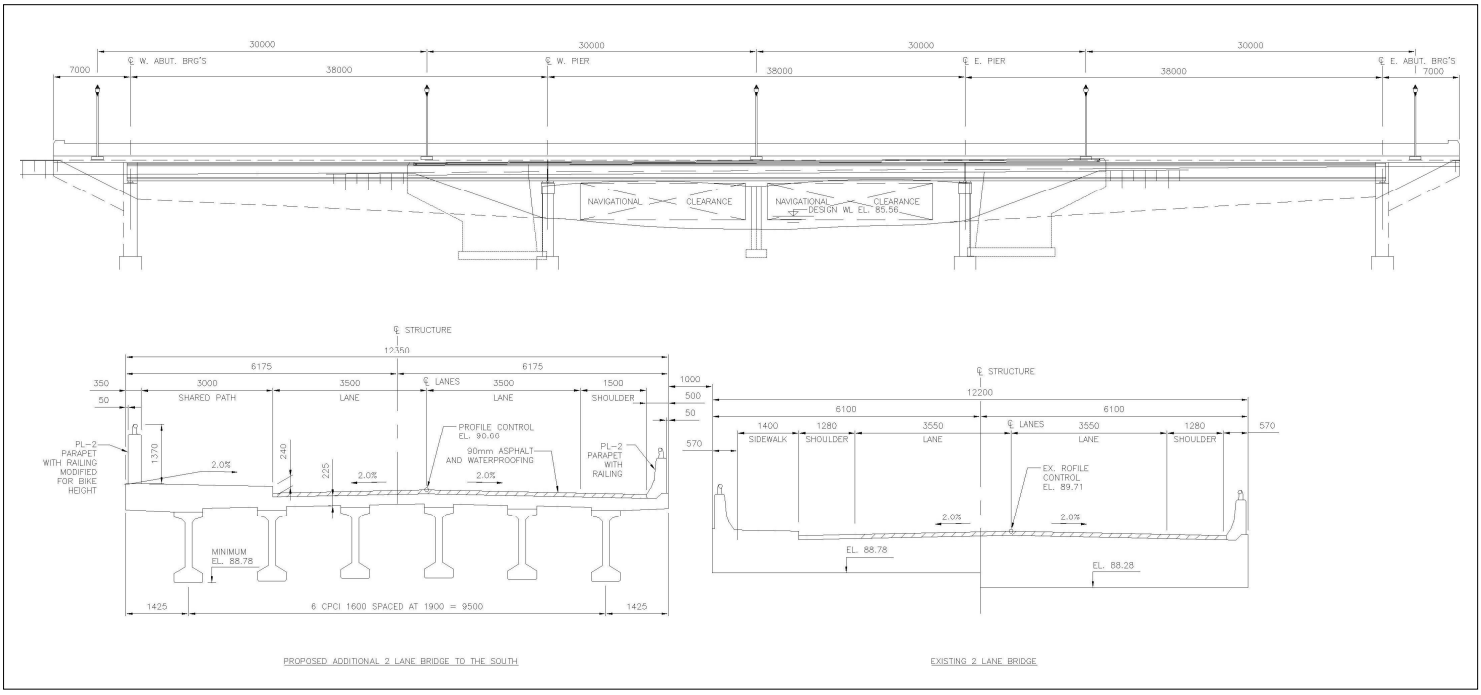
- Alternate alignments – north, south or centered on existing bridge
- Alternate bridges – widening of existing two lane bridge, new two lane bridge to north or south with preservation of existing bridge, or new four lane bridge
- Alternate spans and lengths – one, two and three span bridges were considered
- Alternate navigable clearance – existing clearance of 3.35m, Rideau Canal standard of 6.7m, or intermediate level of 4.9m, and
- Alternate construction techniques – pre-cast or cast-in-place.

The committee applied scoping criteria to eventually get the number of evaluated alternatives down to a manageable number. The technically preferred alternative involves scheduled major rehabilitation of the existing structure that will extend its life for another 25 years. The existing bridge will have to be modified to move the sidewalk to the north side with a shift in the driving lanes. A new two lane bridge will be built to the south.

The new bridge will be a separate two-lane, three-span precast concrete structure. The new bridge will be wide enough to maintain a 3m wide shared pedestrian/bicycle pathway, and adhere to current design guidelines. The bridge is intended to span the majority of the provincially significant wetlands to minimize impacts to the wetland and to quality fish habitat. In addition, the roadway approaches to the new bridge will be shorter than for the existing bridge and will be constructed with reinforced earth vertical retaining walls. This design will minimize impacts to the wetland.

The recommended bridge design will maintain the current navigational clearance under the bridge which will make the new bridge 0.9m higher than the existing bridge. As a result of being on the south side of the existing bridge, this alternative will not affect the current UNESCO designation of the Rideau Canal. This alternative has the lowest impacts to the natural, social and cultural environments, and has low property and construction impacts.

Figure E-1.4: Technically Preferred Bridge Design and Location



Principal Environmental Impacts and Proposed Mitigation Measures:
During both the existing conditions studies and the evaluation process a number of permanent impacts and temporary construction impacts were identified. For the assessment of alternatives, it was assumed that mitigation measures will be undertaken. The mitigation measures are an important component of the Technically Preferred Alternative. At the end of this study, when the recommended solution is endorsed by the United Counties Council, the mitigation measures become commitments that are binding on the United Counties, Municipality, design consultants and contractors.

It is recommended that the environmental commitments be incorporated into the detail design and contract documents as appropriate, so that contractors are aware of the requirements prior to tendering. Monitoring of construction activities must ensure that all environmental standards and commitments for construction are met.

The **Table E-1-1** of Environmental Effects and Mitigation Measures has been amended to include changes recommended by the TSC following public consultation on the Technically Preferred Alternatives.

Table E-1-1: Environmental Effects and Mitigation Measures

ISSUE	MITIGATING MEASURE
Traffic & Transportation	
The continual growth in traffic and proposed widening has impact on accessibility	The United Counties is committed to working with the United Counties and Municipality of North Grenville Accessibility Committees to mitigate impacts to the extent feasible.
Pedestrian safety procedures and devices should be implemented	The United Counties will adhere to recommendations of the Ontario Traffic Conference when its new manual "Pedestrian Control and Protection" is issued in the near future which will include recommendations on roundabouts. Considerations for pedestrian safety devices will include but not limited to: Pedestrian Crossovers (not overpass), HAWK Beacons, Detectible surfaces, staggered crossings, Enhanced street signage, Widening the refuge area
Construction activities will impede traffic	Two lanes of traffic on CR43 will be maintained at all times, to the extent practical.
Emergency vehicle access to businesses and institutions will be affected by construction	A single lane access to all businesses & institutions will be maintained at all times, to the extent practical
Some people still find it difficult to navigate and negotiate roundabouts	The United Counties will conduct an ongoing public education program to help promote roundabout knowledge
Social and Cultural	
Stage 1 Archaeological Assessment has identified areas of moderate potential	The United Counties will undertake a Stage 2 Archaeological Assessment in advance of construction
The north face of the existing bridge is within the UNESCO designated Rideau Canal World Heritage Site	The United Counties will commit to working with Parks Canada to ensure preservation of the national historic features of the Rideau Canal.
The new road will require illumination	Directional lighting will be used to minimize light pollution but maintain vehicle and pedestrian safety.
Construction activities will be noisy	Adherence to municipal noise by-law will be required Unnecessary equipment noise caused by faulty or non-operating components will be prohibited Duration of construction equipment idling will be restricted to the minimum time necessary to complete the specific task All of the above will be contract requirements and will be enforced by contract administrator
Minor Aesthetic Features to the Bridge will enhance the bridge greatly and can increase community pride	Complete minor aesthetic features during design & construction phases, promote community feedback.

Table E-1-1: Continued

Natural Environment	
Widening of bridge over South Branch Rideau River (i.e. Kemptville Creek) will require construction in fish habitat	The United Counties will negotiate a compensation agreement with the appropriate authority, the Department of Fisheries and Oceans south of the bridge or Parks Canada north of the bridge. In water construction will not be allowed during spawning season, March 15 to June 30. Access for fish to pass under CR43 will be maintained at all times.
Stormwater quality impacts	Best available technology economically achievable (BATEA) will be used – Level II treatment New bridge deck drains will be piped to storm water treatment facility. An effort will be made to pipe existing deck drains to the treatment facility. Erosion protection will be provided at all discharge points, water quality control will be provided on direct discharges to Kemptville Creek. Erosion protection to be completed where required for existing wetland areas. The municipality will continue to require storm water quality and quantity controls for new development, and in particular for development upstream of the new stormwater treatment facility.
Construction activities can result in water quality impacts	Good construction practices will be a contractual requirement
The Municipal Class EA may be complete before Federal input is received.	The United Counties will continue to work with Federal agencies to complete a screening under the Canadian Environmental Assessment Act and it is understood that this may result in refinements to the Recommended Solution.
Construction activities can result in dust and odours.	Good construction practices will be a contractual requirement

Table E-1-1: Continued

Engineering Potential impacts on underground Utilities Existing watermain servicing the Forestry Centre extends into CR43. Soft soils in vicinity of bridge may be displaced by fill material for new approaches. Soil conditions on CR43 Corridor have been found to be highly variable.	Underground utilities will be protected during construction Watermain will be re-located and replaced if required. New fills will be placed within sheet pile cofferdams to avoid disturbance of river bed. Detailed geotechnical investigations will be undertaken as part of detail design.
Economic Construction will impact access to businesses in the corridor.	The United Counties will consider incentives including night work & bonuses to ensure that impacts to businesses are kept to a minimum.

Public Consultation:

After completing its analysis and recommending the Technically Preferred alternatives for the corridor, the next stage of the public consultation process was initiated with a presentation to the United Counties of Leeds and Grenville Public Works Committee on January 6, 2010. The committee authorized AECOM to proceed with the next phase of the study – public notification and consultation.

Notices were published and forwarded to all interested parties advising of the status of the project and advising of Public Information Centre No.5. The notices also advertised availability of the *Existing Conditions Report* and Evaluation Report and solicited public input on the Technically Preferred Alternatives.

A presentation to the Municipality of North Grenville Council was completed on February 8, 2010, three days before PIC No.5. The Municipality presentation was televised to the community.

Public Information Centre No.5 was held on February 11, 2010 in the Municipality of North Grenville's municipal centre and included a presentation. It informed the public with background information on the project and roundabouts. It explained the evaluation process and Technically Preferred Alternatives. Following this a report named *Report on PIC No.5 (February 2010)* was produced which documents the consultation process and resulting public and agency correspondence.

Principal Concerns Raised by the Public:

A total of forty-three (43) submissions were received regarding the technically preferred alternatives over the course of PIC No.5. All comments received were summarised and included in the Environmental Study Report and in the *Report on PIC No.5 – February 2010*. The 11 most received comments are listed in **Table E-2**. A split of 70% in favour of roundabouts vs. 30% opposed to roundabouts was observed from the comments that expressed an opinion, which is consistent with the public support for roundabouts during the public involvement process for the Master Plan.

Each submission was discussed individually at the Technical Steering Committee meeting held on March 9, 2010. Due to the large number of comments received where many were the same, the Technical Steering Committee decided to produce a Frequently Asked Questions brochure which is included as an appendix to the Environmental Study Report. This brochure summarises the 43 submissions into 41 concerns/questions which the Technical Steering Committee has provided responses to.

This brochure was circulated to study participants so that everyone who has an interest in the study can view all of the comments and responses. It was posted on the United Counties and Municipality websites.

Table E-1-2: The Most Frequent Comments

Comments	Responses by the TSC
A lot of people don't understand the rules of roundabouts. There needs to be a local education campaign on the rules. (14)	Added to the mitigation measures is: for the United Counties to complete an education campaign once the first fully functional two-lane roundabout is operational.
Likes roundabouts (12)	A roundabout corridor was chosen in the Corridor Master Plan study partly due to a large amount of public support. Studies have concluded that roundabouts slow vehicular traffic while increasing traffic flow through an intersection. The slower speeds mean that safety is increased for both vehicles and pedestrians.
Requesting information and or requesting to be added to the mailing list. (7)	All requests have been completed.
Concern about pedestrian safety (St. Michael's students) (5)	In the five years since the Corridor Master Plan was completed, a large amount of information has been produced about pedestrian safety at two-lane roundabouts. The research information supports pedestrian safety when a number of accessibility and pedestrian guidance controls are placed. Some of these controls include properly marked crosswalks, tactile surfaces, coloured surfaces, staggered crossings, etc. As a mitigation measure, these controls and supplemental warning signs will be incorporated into the design of the roundabouts. It should be noted that pedestrians have the right of way when crossing at a legal crosswalk and all of the crosswalks at the roundabouts will be designed as legal crosswalks.
Disagree with converting the CR43 and CR44 intersection into a roundabout.(5)	A roundabout corridor was chosen in the Corridor Master Plan study partly due to a large amount of public support. Studies have concluded that roundabouts slow vehicular traffic while increasing traffic flow through an intersection. The slower speeds mean that safety is increased for both vehicles and pedestrians. Completion of this roundabout is consistent with the overriding goals of the Corridor Master Plan.
Dislikes roundabouts (5)	A roundabout corridor was chosen in the Corridor Master Plan study partly due to a large amount of public support. Studies have concluded that roundabouts slow vehicular traffic while increasing traffic flows through an intersection. The slower speeds mean that safety is increased for both vehicles and pedestrians. The current design of the corridor maintains this philosophy.
Believe that sidewalks and pedestrian facilities are vital. (4)	The current design includes a 2m wide bicycle path and 1.5m sidewalk along both sides of the corridor which allow strong east-west pedestrian movements. Crossings at every leg of each roundabout intersection allow strong north-south pedestrian movements. The preferred bridge design allows for a future recreational trail to be completed under the new bridge along the creek.
The roundabout outside the Wal-Mart is not big enough for 2 lanes and requires widening. (4)	Roundabouts are designed to slow traffic while increasing traffic flow. Roundabouts are also designed to accommodate larger transportation vehicles. In this instance the larger vehicles are expected to use both lanes.
Likes the proposed design of the corridor and/or presentation (4)	Thank you for your comment.

Table E-1-2: Continued

Concerns of roundabouts on local businesses (3)	One study has been completed on the affect of roundabouts on businesses. It concludes that business for "destination businesses" will not decline while business for "drive through businesses" may decline slightly if they are located mid block but will not if they are on the corner of a roundabout. This study is available from the United Counties and AECOM.
Requests a noise/sound barrier along the south side of CR 43 between Barnes St. and James St. Will also act as a safety barrier (3)	This comment has been forwarded to the United Counties as existing noise issues are outside the objectives of this study. A noise study has been completed as part of this study to detail any potential issues that may arise from expanding the corridor from a two lane road to four-lane road. This study concluded that this expansion will not result in any major changes to the existing noise conditions. The noise report does observe that this area (Barnes St – James St) currently has a noise level of 62dBA.

Changes to the Technically Preferred Alternative:
In reviewing all of the comments received, the TSC observed that there is good support for the Technically Preferred Alternative. The TSC recognised that there is significant concern regarding the centre corridor intersection control and in particular the proposal to install three roundabouts in close proximity. The TSC looked closely at options to reduce the number to two roundabouts, but eventually decided in favour of three. The TSC was guided by the advice of the study team's transportation engineer who provided examples of similar intersections in North America that work successfully.

In response to public input, the TSC recommended two important additions to the list of mitigation measures:

1. The Committee has included a commitment for more public education regarding the proper use of roundabouts. This is particularly important for two lane roundabouts which are new to the area.
2. The Committee has included a commitment to consider night work and bonuses to ensure expeditious completion of construction, to reduce construction impacts on businesses.

As previously noted, these two measures have been included in the above list of Environmental Effects and Mitigation Measures.

Construction Phasing and Costs:
Transportation studies undertaken for this study indicate that current traffic volumes exceed the planning capacity for CR43 between Highway 416 and Grenville Street. Traffic volumes for the entire corridor, between Highway 416 and Summerville Road, are expected to exceed the planning capacity by 2019.

Widening of the CR43 corridor will be "development driven." No firm time frame has been assigned to each phase. In general terms, widening of the bridge over Kemptville Creek should take place first, followed by widening of CR43 starting at Highway 416 and proceeding westerly. However, minor upgrades within the study area, and particularly at CR43/CR44 intersection, may be undertaken in advance of the bridge widening if future development drives that approach.

Table E-3, identifies recommended construction phasing and costs.

Table E-1-3: Preliminary Construction Phasing and Costs

PHASE	AREA	DESCRIPTION	COST
1	4	Bridge	$ 4.7M
2	5	Widen CR43 from Highway 416 extending past the Colonnade Development and CR19 to the bridge crossing Kemptville Creek. This should be completed in one stage.	$ 7.2M
3	3	Widen CR43 from the bridge up to the CR44 intersection. This will include the CR44, community square and James St intersections. This can be completed in multiple stages.	$ 10.0 M
4	2	Widen CR43 from the CR44 intersection to the Pinehill Road intersection. This will include the mall and Pinehill Road intersections.	$ 5.4M
5	1	Complete the corridor by widening CR43 from the Pinehill Road intersection to the Somerville Road intersection.	$ 5.0M
TOTAL			$ 32.3M

This price of $32.3 million includes engineering costs of 15% and contingencies of 20% but does not include property acquisition costs. Prices exclude Taxes and are based on 2010 prices.

Recommended Solution:

At its meeting on March 9, 2010 the TSC endorsed the technically preferred alternatives for the corridor cross-section, centre corridor intersection control and the bridge. The Committee endorsed the list of Environmental Effects and Mitigation Measures as amended. The technically preferred alternatives and mitigation measures (i.e. commitments) may now be described as the Recommended Solution for endorsement by Counties Council.

The Recommended Solution was presented to the United Counties of Leeds and Grenville Council at its meeting on April 22, 2010. At this meeting the council endorsed the study and recommended solution. The study team has since issued the Environmental Study Report and a Notice of Completion. If no referral requests are received within thirty days of the Notice of Completion, the United Counties can proceed with design and construction of the corridor widening and new intersection controls.

The executive summary is an excerpt from the Environmental Study Report completed for the 'Schedule C' Municipal Class Environmental Assessment for the 4 lane widening of County Road 43 through the Kemptville Corridor and is to be read in conjunction with the Environmental Study Report.

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1. Introduction and Background

1.1 Purpose of Environmental Study Report

This Environmental Study Report (ESR) documents the planning and preliminary design components of the Class Environmental Assessment (Class EA) Study for the four lane upgrade of County Road 43 from Somerville Road in the west to the MTO boundary of Highway 416 in the east. This area is also known as the Kemptville corridor. Preliminary phases of this study were undertaken for the County Road 43 Corridor Master Plan study that was completed in 2006.

This ESR has been prepared in accordance with Schedule "C" of the *Municipal Class Environmental Assessment, October 2000, as amended in 2007* that has been accepted by the Ministry of the Environment (MOE) and approved by the Government of Ontario for projects of this type. The proponent of the undertaking is the United Counties of Leeds and Grenville.

This report has been prepared by Shane Gray EIT and Guy Laporte, P.Eng. of AECOM.

1.2 Background

The United Counties of Leeds and Grenville retained AECOM in October 2008 to expand on the Corridor Master Plan study that was completed in March of 2006. The previous study examined alternative solutions for upgrades to County Road 43 between Somerville Road and County Road 22 (South Gower Drive). The goal of the Master Plan was to create a long-range (20-year) plan to meet projected transportation needs while adhering to principles of good highway design and environmental management.

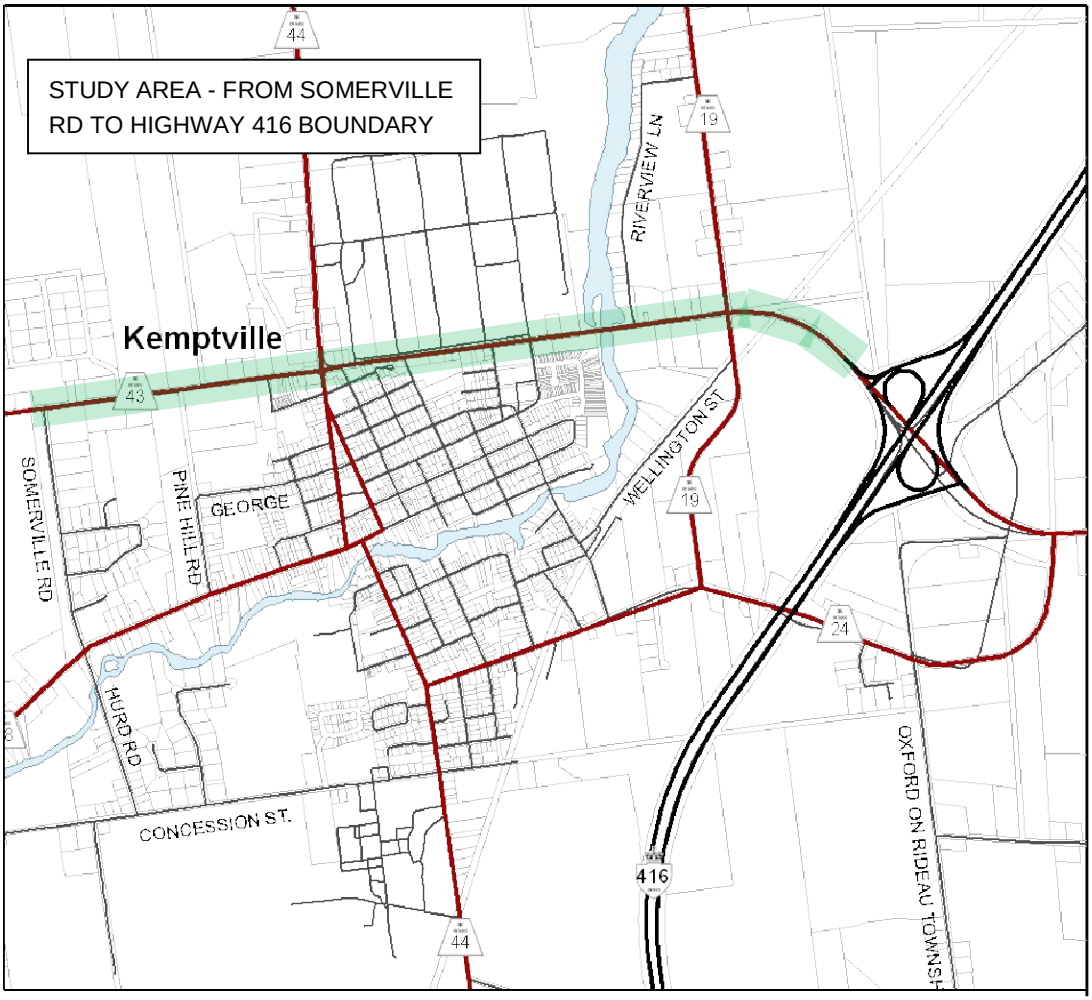
The Master Plan concluded with a recommendation by the Technical Steering Committee (TSC) to widen the corridor to four lanes in the Kemptville urban area (from Highway 416 westerly to Somerville Road) which put this portion into a Schedule 'C' Class EA category. That decision put this segment into the Schedule 'C' Municipal Class EA category. Schedule 'C" projects require a more detailed environmental assessment. The objective of this study is to complete the Schedule C environmental assessment in accordance with the Master plan recommendation. Recommendations for the remainder of the corridor (from Highway 416 easterly to South Gower Drive) do not involve widening and will consist of a series of Schedule 'A' projects. Schedule 'A' projects are pre-approved and can proceed without further study.

As this study is a continuation of the Master Plan study it was the intension of the TSC to expand on the previous study and not dwell on the existing endorsed recommended solutions. As the Corridor Master Plan study identified the problem and technically preferred solution for CR43, the purpose of this study was to determine the technically preferred design alternative for this section of roadway.

1.3 Study Location

The general study location is illustrated below in **Figure 1-1.** It includes County Road 43 from Somerville Road to the western boundary of Highway 416.

Figure 1.1: Study Area



1.4 The Class EA Process and the Selection of Schedule

The Municipal Class Environmental Assessment (EA) process includes five phases, which are:

1) Identification of the problem or opportunity;
2) Assessment and evaluation of alternative solutions;
3) Assessment and evaluation of the alternative design concepts for the preferred solution;
4) Documentation in an Environmental Study Report; and
5) Project Implementation.

These phases are illustrated in **Figure 1-2**, which has been reproduced from the Municipal Class Environmental Assessment document for convenient reference. This project picks up at phase 3 shown above. The CR43 Corridor Master Plan had previously satisfied Phase 1 and 2 requirements.

The Municipal Class EA defines three types of projects and the process required for each. The selection of the appropriate type for each project is dependent on the anticipated environmental impact. The selection of a 'Schedule C' project is recommended when major expansion or construction of a new roadway is proposed. The proposed four lane upgrade of County Road 43 between Somerville Road and the Highway 416 boundary falls into this category.

This ESR is filed with the United Counties of Leeds and Grenville, Municipality of North Grenville and the Kemptville Public Library for public review. A Public Information Center (PIC) and presentation was completed on Thursday, February 11, 2010 at the Municipality of North Grenville municipal centre to present to the public and agencies the technically preferred alternatives for the different aspects of the corridor as recommended by the Technical Steering Committee. In accordance with the Environmental Assessment Act, the ESR is subject to a thirty (30) calendar day review period. If no irreconcilable concerns are raised during that time, as determined by the Ministry of the Environment, the United Counties of Leeds and Grenville may proceed to the detail design/construction stage of the County Road 43 Four Lane Upgrade project.

These works may be constructed in phases, in accordance with both vehicular and pedestrian transportation needs as well as funding availability.

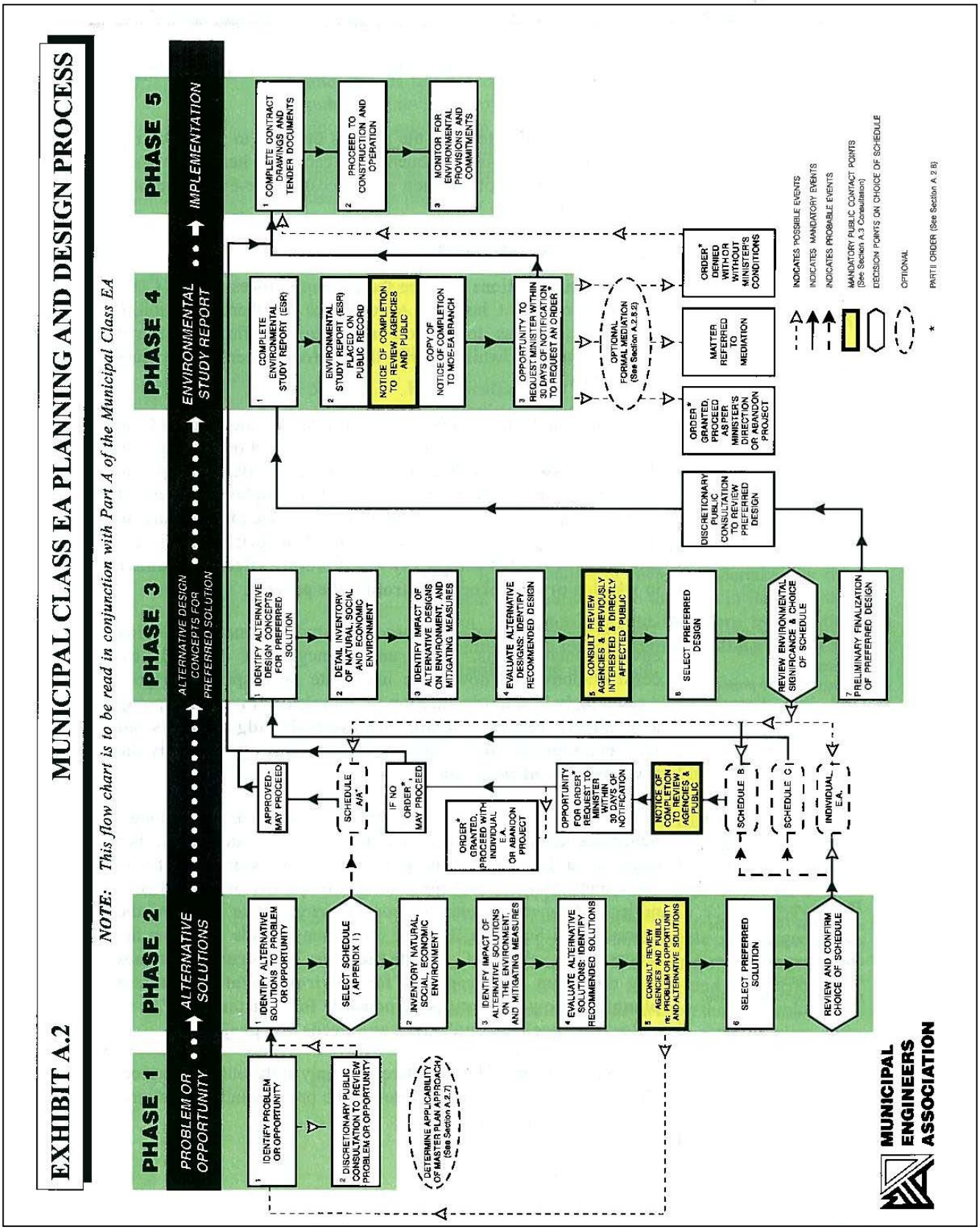


Figure 1.2: Municipal Class EA Planning and Design Process

1.5 Description of the Environmental Study Report

Based on the documentation recommendations set out in the Municipal Class EA, this ESR includes a discussion of the following:

- Background;
- Public and agency consultation process;
- Existing natural, social, cultural and economic environmental conditions;
- Alternative designs;
- Examination and selection of appropriate impact mitigating measures; and
- Recommended plan.

1.6 Project Team and Study Timeframe

The United Counties of Leeds and Grenville retained AECOM in October 2008 expand on the previous Corridor Master Plan study completed in March 2006. A Technical Steering Committee (TSC) was formed to provide direction for the study. It was comprised of representatives from the United Counties of Leeds and Grenville (UCLG), Municipality of North Grenville (MNG), the Ministry of Transportation (MTO), the Rideau Valley Conservation Authority (RVCA), and AECOM. The TSC was responsible for reviewing study materials and making decisions regarding the study.

The Technical Steering Committee (TSC) included the following people:

UCLG - Les Shepherd and
- Sandy Hay

MNG - Jeff McEwen,
- Karen Dunlop and
- Forbes Simon

MTO - Doug Boyd and
- Michael Gibbs

RVCA - Hal Stimson

AECOM - Guy Laporte and
- Shane Gray

The Class EA work was undertaken in 2009 and the early part of 2010.

2. Study Approach and Consultation Process

2.1 Purpose and Objectives of the Study

North Grenville is the fastest growing municipality in the United Counties of Leeds and Grenville, with a current population growth rate of 3.7%. This section of County Road 43 at Kemptville in the Municipality of North Grenville is expected to continue developing rapidly over the next 20 years and become the regional commercial hub for North Grenville and the surrounding area. As a result of ongoing development, the United Counties are faced with the need for planned access controls, intersection improvements and road widening.

The Master Plan study identified the transportation needs of the existing corridor and recommended the “Kemptville Corridor” be upgraded to four lanes and be developed as a roundabout corridor. The objective of this study is to determine the preferred design for this section of roadway.

2.2 Project Tasks

To ensure that the purpose and objectives of this project would be met and that the conclusions and recommendations resulting from the study would be endorsed by the United Counties, Municipality, local stakeholders, the public and affected agencies, the following tasks were undertaken:

- Preparation of a *Study Design Report* describing the planned process for the Class EA including the approach to the study, issues and concerns, work program and consultation plan. The *Study Design Report* was distributed to agencies and made available to the public for comment;
- Hosting of a Public Information Centre (PIC) to inform the public of the study and purpose of the study and to encourage early public and agency input (*Report on PIC No.4*);
- Identification of significant technical and environmental constraints as well as identification of public issues and concerns associated with the widening of County Road 43 and intersection controls (*Existing Conditions Report*);
- Identification of a broad range of alternative solutions that accommodated the various modes of travel (e.g. auto, walking, cycling) and possible designs for an aesthetically pleasing corridor;
- Completion of an assessment and evaluation of the design alternatives that incorporated the concerns and values of the public and participating agencies (*Report on Analysis and Evaluation of Alternatives and Selection of Technically Preferred Alternative*);
- Identification of measures needed to mitigate environmental and construction related impacts and public concerns associated with the technically preferred alternative;
- Preparation of a preliminary design for the technically preferred alternative (drawings are provided in Appendix A);
- Hosting of a second Public Information Centre (PIC) to present the technically preferred alternative to the public and interested agencies and to solicit feedback (*Report on PIC No.5*);
- Preparation of an *Environmental Study Report (ESR)* that documents the public and agency consultation program and complies with the requirements of the *Municipal Class Environmental Assessment, October 2000, as amended in 2007* for ‘Schedule C’ undertakings.

All reports generated by this study have been made available at the United Counties of Leeds and Grenville and Municipality of North Grenville Municipal offices, the Kemptville Library and on the both the United Counties and Municipalities websites.

2.3 The Environmental Assessment Process

As noted, the Schedule 'C' Class Environmental Assessment for the four lane upgrade of County Road 43, Kemptville Corridor has been carried out in accordance with the *Municipal Class Environmental Assessment, October 2000 (as amended in 2007)*.

The filing of the *Environmental Study Report* (ESR) completes the planning and preliminary design stage of the project. The ESR is filed with the Ministry of the Environment (MOE) in the public record and made available for review by the public for a thirty (30) calendar day review period. A public notice is published at the time of submission to MOE. Copies of the report are available for review and comment during normal business hours at the following locations:

Municipality of North Grenville Municipal Office 285 County Road 44, Kemptville Phone: (613) 258-9569	United Counties of Leeds and Grenville Municipal Office 25 Central Ave. W., Suite 100, Brockville Phone: (613) 342-3840	North Grenville Public Library Kemptville Branch 207 Prescott Street, Kemptville Phone: (613) 258-5577

If no outstanding concerns are brought forward during the review period, the United Counties may proceed to the detail design/construction stage.

The Class EA process contains a provision that allows for changing the status of a project from a Class EA to an Individual Environmental Assessment, which is called a 'Part II Order'. This replaces the previous 'bump-up' provision. Members of the public, interest groups, government agencies and others may request that an Individual Environmental Assessment be prepared for a specific project if they feel their concerns have not been addressed through the Class EA planning process. The Minister of the Environment determines whether or not this is necessary and the Minister's decision in this regard is final. If the 'Part II Order' is granted, the project cannot proceed unless an Individual Environmental Assessment is prepared. The Individual Environmental Assessment is subject to a formal government review and approval and may result in a formal public hearing.

Anyone wishing to request a 'Part II Order' of the Class Environmental Assessment for the four lane upgrade of County Road 43, must submit a written request by the end of the thirty (30) calendar day review period, to the Minister of the Environment at the following address, with a copy to the United Counties:

MOE address:

The Honourable John Gerretsen,
Minister of the Environment
12th Floor, 135 St. Clair Avenue West
Toronto, Ontario M4V 1P5

Proponent address:

Les Shepherd, P.Eng
Director of Works, Planning Services and Asset Management
United Counties of Leeds and Grenville
25 Central Avenue West, Suite 100
Brockville, Ontario K6V 4N6

2.4 External Consultation

The external ministries, municipalities, agencies, authorities, businesses and community stakeholders listed in **Table 2-1** were contacted at the project initiation stage through correspondence notifying them of the project commencement and requesting their comments on the Study Design Report. The agencies were then advised of the technically preferred alternative and were encouraged to comment on these and the study. A number of the agencies were contacted during the study for information and their expertise. A summary of comments and relevant correspondence is included in section 2.4.1.

Table 2-1: Agencies / Groups

Catholic District School Board of Eastern Ontario	Ministry of Agriculture, Food & Rural Affairs
Upper Canada District School Board	Ontario Provincial Police
Conseil des écoles publiques de l'Est de l'Ontario	Ministry of Citizenship and Immigration, Ministry of Culture, Ministry of Tourism and Ministry of Health Promotion
Conseil des écoles catholiques du Centre-Est de l'Ontario	Ontario Heritage Foundation
Separate School Board Lanark, Leeds and Grenville	Canadian Environmental Assessment Agency
Friends of the Rideau	Fisheries and Oceans Canada
Rideau Wateray Land Trust Foundation	Environment Canada- Ontario Region
Transport Canada - Prescott Base	Transport Canada - Ontario Region
Rideau Environmental Action League	Ontario Region, Environment Canada
Canadian Recreational Canoe Association	Parks Canada
Rideau River Roundtable	Ferguson Forest Centre
Indian and Northern Affairs Canada	Community Living North Grenville
Ontario Secretariat of Aboriginal Affairs	Business Network International - Kemptville Chapter
Chiefs of Ontario	Kemptville Downtown Business Association
Village of Merrickville-Wolford	North Grenville Business Builders' Association
City of Ottawa	Hydro One
Township of North Dundas	Enbridge Consumers Gas
Township of Augusta	Trans Canada Pipeline Co
Separated Town of Smiths Falls	Bell Canada
Township of Montague	United Counties Emergency Medical Service
County of Lanark	Heritage North Grenville
Ministry of Municipal Affairs and Housing Community Planning and Development	North Grenville Historical Society
Ministry of Transportation Eastern Region	Leeds, Grenville & Lanark Health Unit
Ministry of Culture	Eastern Ontario Model Forest
Ministry of Municipal Affairs and Housing	Leeds, Grenville and Lanark District Health Unit
Ministry of the Environment (MOE)	Kemptville Fire Department
Ministry of Natural Resources	Public Health Branch

As noted previously, the United Counties of Leeds and Grenville, Municipality of North Grenville, Ministry of Transportation and the Rideau Valley Conservation Authority participated on the Technical Steering Committee for the project.

2.4.1.1 Comments received prior to Report on PIC No.4

A number of comments and discussions were made throughout the project; the comments received prior to the report of PIC No.4 are as follows:

Fisheries and Oceans Canada (DFO):

- DFO want to be included in the mailing list for the study.
- Noted that they will be overlooking Parks Canada and RVCA

- Parks Canada claims ownership of the bed of the South Branch of the Rideau River (SBRR) from the bridge on CR43 to the Rideau River; work on the bridge may trigger and environmental screening under the Canadian Environmental Assessment Act.
- The Rideau Valley Conservation Authority claims ownership of the bed of the SBRR from the County Road 43 Bridge south towards Kemptville
- Prefers the name Kemptville Creek over the South Branch of the Rideau River
- Dislikes roundabouts as no one in North America knows how to use them

Transport Canada:

- Noted that any construction in a navigable body of water is subject to provisions under the Navigable Waters Protection Act, enclosed an application guide
- The application form does not need to be completed until the final design is in reach
- If a new bridge is to be built its clearance must match or exceed the existing clearance of the current bridge

Rideau Valley Conservation Authority (RVCA),

- the Conservation Authority currently reviews project proposals and only projects likely to result in a harmful alteration disruption or destruction of fish habitat are referred to DFO
- RVCA is a part of the steering committee and will be updated on all progress.
- Any amendments to the river may cause a HADD or trigger a CEAA
- Confirmed the clearance of the CR43 bridge to be approximately 3.35m or 11 feet
- Advised that a major issue with the SBRR is its depth (min. of 1.2m), this limits the size of boats able to navigate the waterway

Kemptville Fire Department:

- Noted that they would like be kept on the mailing list

Ministry of Natural Resources:

- Advised that they have received the *Study Design Report* and need at least one month to conduct the appropriate information checks and comment on the study
- They will forward comments and a report by mid April

Parks Canada:

- Advised that the navigable charts show that there are two sections of the SBRR north of the CR43 bridge which have limited depth of approximately 1.2m (4 feet) and this would limit boating activity into Kemptville
- With most other sections being a minimum 1.8m (6 feet) deep
- Confirmed that 85.5m is the correct water navigation elevation at the CR43 Bridge
- Their chart states that the SBRR should only be navigated by vessels that do not require a vertical clearance greater than 6 feet although Parks Canada have noted that this is probably due to the Bridge St Bridge rather than the CR43 bridge
- Noted that mechanically altering the water depth is not easy and dredging of the SBRR would most likely not be permitted as it would disturb the natural wetlands

Ferguson Forestry Centre (FFC):

- The Appendix A drawings from *Study Design Report* need a legend
- Concern that the expansion of CR43 may impact on the underground irrigation system for the forestry centre and the existing signage
- Interested in the ROW size of the Grenville St entrance on the FFC
- Interested in the expected timing for the project
- Concerned with the added salt drift from CR43

Bell Canada:

- Concern for existing underground and aerial Bell services, noted that relocation will be necessary
- Concern for the Bell services to be placed now for the Colonnade development

2.4.1.2 Comments received prior to PIC No.5

The majority of comments received during this part of the study were responses to questions that the study team had when investigating the existing conditions and possible alternatives.

Transport Canada – TC were contacted by AECOM regarding their preferences of the bridge alternatives including height of the Bridge. They have jurisdiction over the navigability of waterways and hence the height of bridges above the water surface. They provided some information on the navigability of the waterway but advised that they will only complete a detailed review the proposal once we have the final design concept. This will be completed at the detailed design stage.

Parks Canada – PC were contacted regarding the current bridge, creek conditions and any UNESCO issues that any bridge options to the north would cause and the possibility of dredging the creek. They advised that any bridge options to the north or replacing the existing bridge will have legal issues and will have to go through a special screening process as it is part of the Rideau Canal UNESCO designation. Any work on the north side will require a permit from PC and maybe an additional EA.

PC advised that there are two shallow areas where the water depth is only 4ft (1.2m) deep (stormwater outlets from the Ferguson Forestry Centre) and dredging would not be allowed as it would breach the federal Policy on wetland conservation and possibly the Species at Risk Act.

Rideau Valley Conservation Authority – RVCA were contacted regarding the water depth and navigability of Kemptville Creek as well as the clearance of the Bridge St Bridge and the Prescott St Bridge. It was important to investigate these details to determine the creek conditions and the size of boats that would use the creek. They advised that, “Kemptville Creek is navigable only by shallow draft vessels which do not require a vertical clearance greater than 8ft”.

Department of Fisheries and Oceans – DFO were contacted regarding the potential HADD area that the bridge footprint may create and the difference between significant wetland and water area. Mark Ferguson from DFO also attended one of the TSC meetings. He advised that PC will be the first point of federal contact.

Ministry of Natural Resources – MNR advised that Kemptville Creek is a provincially significant wetland and any work completed near or around the creek bed or shoreline will require permits and approvals. The letter from MNR discusses a number of endangered and threatened species in and around the corridor and advises that it includes identified fish nurseries.

Ministry of Culture – Advised that they had received the SDR and asked a number of questions on the status of the project and the archaeological assessment. A status update was forwarded and they advised that they did receive the completed Stage 1 Archaeological Study.

Canadian Environmental Assessment Agency – Potential federal funding, land administration or federal permits, licenses or approvals trigger a federal EA. Therefore, it was important to involve CEAA early in the process to understand any concerns CEAA may have had with the potential options. They were contacted early before the evaluation of alternatives. However they advised that they generally complete their assessment after a preferred solution has been recommended, this allows them to co-ordinate their assessment with all of the other federal agencies. CEAA advised that they had responded to the notice of Study Commencement and SDR and forwarded a copy of the letter which must have been lost in the mail. This letter is dated March 7, 2010 and can be found along with this correspondence in Report on PIC No.5 in Appendix B.

Bell Canada – Bell was contacted regarding their infrastructure in the corridor and any concerns they may have with widening. They will be running additional cables to the Colonnade Centre once they receive notice that the development is proceeding. They also have a large number of poles on the south side of the road which may have to be relocated. All relocations even at the bridge will most likely be aerial.

Hydro – Hydro was contacted about infrastructure but did not have any plans available. Bell advised that the majority of Hydro infrastructure is overhead on poles on the north side with some road crossings. No plans were available.

Cogeco – Cogeco could not be contacted but Bell advised that the majority of Cogeco infrastructure is overhead and is attached to the Hydro poles.

2.4.1.3 Comments received after PIC No.5

Ontario Provincial Police (OPP):

- Updating contact information.

The North Grenville Chamber of Commerce:

- Updating Contact Information
- Advised that they will be holding a CR43 information breakfast and invited AECOM to attend.
- Later forwarded a number of comments from local business owners to AECOM

The Ferguson Forestry Centre,

- The existing watermain for the Forestry Centre will be in the road widening occurring to the north. It should be removed and relocated so it will not create any problems in the future
- The bank into the Ferguson Forestry Centre (slope from the Road) should be steepened in order to reduce the impacts on the Ferguson Forestry Centre but not too steep otherwise it will be a safety hazard during maintenance (mowing etc.)
- The Municipality will be building some equalisation ponds to the north of CR43 at Grenville Street. This will close Grenville St. The roundabout at Grenville St should be designed to ensure that there is as little intrusion on the nursery property as possible

Ministry of Agriculture, Food and Rural Affairs:

- Updating contact information

Blaney McMurtry Barristers & Solicitors:

- Advised they did not have any issues and have forwarded the letter to the Algonquin of Ontario Consultation Office in Pembroke for further handling

Embridge Gas:

- There will be conflicts between Embridge's existing infrastructure and the proposed corridor plans
- Conflicts cannot be confirmed until detailed design plans are completed for the corridor
- It is predicted that numerous mains and services will be affected and may need to be relocated
- A GIS plot of the gas mains and other infrastructure was forwarded by Embridge Gas.

Bell Canada:

- Most infrastructure is aerial on the south side of CR43. The majority of cables are copper with some fibre cables.
- Colonnade development is proceeding this year and Bell has to place additional cables (mostly overhead with some buried). Bell will be applying to the United Counties for municipal consent once plans are firm.
- The Bell pole line on the south side of the bridge will need to be relocated.

2.5 Public Consultation

Throughout the Study, the public, various interest groups, provincial ministries, municipalities, agencies and authorities, have had opportunities to make comments, identify issues and provide additional information and data. Two public information centres were held during the project and are documented in this report. By providing individuals and interest groups with the opportunity to identify their concerns and special knowledge, the TSC was able to respond to specific issues and comments. The methods of the formal contacts are identified below. A summary of all comments received over the study is provided in **Tables 2-2** and **2-3**, all comment sheets are included in the reports on PIC No.4 and PIC No.5 in Appendix B.

2.5.1 Notice of Study Commencement and Public Information Centre No. 4

The public consultation process for this project was initiated immediately at the project outset, with publication of a Notice of Study Commencement and Public Information Centre (PIC) No.4. Seeing that this is a continuation of the previous Master Plan study the public information centre held in February 2009 was named PIC No.4 as there were three public information centres held in the first study.

The Notice of Study Commencement was published once in the EMC on February 27, 2009 and can be found in the report on PIC No.4 in Appendix B. The Study Design Report was prepared to provide an overview of the study for agencies and the general public and provide an opportunity for them to supply input into the study. A flyer advertising the notice of commencement, the PIC No.4 notice and key map (found in the report on PIC No.4) was mailed to all residents within 120 m of the study area. Landowners fronting onto County Road 43 were mailed a brochure (shown in Appendix B) which included details on access management.

A generic letter was sent to all of the appropriate agencies predicted to have an influence or concerns with this project. **Table 2-1** contains a list of agencies which were contacted. A sample of the letter they were sent can be found in Report on PIC No.4. A copy of the study design report was enclosed with the agency letters which requested comments be made. All public and agency correspondence from the previous study was compiled and where possible people who made comments on the original study or who requested to be on that mailing list had the flyer distributed to them. The notices, flyers and letters advertised availability of a Study Design Report and solicited early public input on the project.

PIC No.4 was held on March 5, 2009 in the Municipality of North Grenville's municipal centre. The PIC followed a "drop in" format, where members of the community and agencies were able to come by at any time and ask questions and comment on the project. On display were 14 display boards. Representatives from the United Counties of Leeds and Grenville and AECOM, were present at the PIC to answer questions and assist in the interpretation of the material. The purpose of PIC No.4 was to:

- Introduce the project and background information;
- Explain the environmental assessment process;
- Identify the problems and opportunities;
- Obtain public and agency input.

Thirty-three (33) people signed into the PIC with a number more opting not to sign in. Seven (7) comments were received during the PIC while another six (6) comments were received after the PIC. Attendees were generally supportive of the roundabout corridor including a roundabout at the CR43/CR44 intersection. Some were concerned about pedestrians crossing roundabouts without lights or tunnels. From the thirteen (13) comments received twenty-eight (28) issues/suggestions were raised, a list of these can be found. All personal information has been removed and the comments can be found in Reports on PIC No.4 and PIC No.5 in Appendix B.

A report, *Report on SDR & PIC No.4* was completed which documents the Study Commencement, the Public Information Open House and resulting public and agency correspondence. The report was made available on the Municipality of North Grenville website and the United Counties of Leeds and Grenville website. Hard copies of the report were made available at the United

Counties of Leeds and Grenville Municipal Office, Municipality of North Grenville Municipal office and the Kemptville Public Library.

2.5.1.1 Comments

Figure 2.1: PIC No.4 Public Comments

Item No.	Comments	No. of Comments received & reference
1	Concerns with pedestrians crossing at roundabouts without lights or tunnels	3 (1, 2, 3)
2	In support of the RAB approach for the area rather than lights.	3 (5, 6, 13)
3	Support for a roundabout at intersection of 43 & 44	3 (1, 7, 14)
4	The new CR43 bridge should be constructed higher to allow for boats to pass.	2 (3, 5)
5	In support of the wide ROW and extra driving lanes for greater traffic, especially around the shopping mall	2 (5, 11)
6	Construct a second bridge.	2 (6, 11)
7	Annulus of RAB should be constructed larger to allow for all sorts of vehicles especially 18 wheel transports.	2 (9, 13)
8	Suggestion of a bypass to alleviate traffic around the area, possibly at Veterans Way.	2 (1, 11)
9	Provision for bicycle lanes along the bridge or under the bridge	1 (4)
10	Against the RA approach & would rather lights as everyone knows how to use them.	1 (10)
11	Issues with existing road grades on CR43 west of Somerville Road. Currently there is no sight distance coming over the hill and the Somerville intersection often has accidents.	1 (6)
12	No roundabout at intersection of 43 & 44	1 (6)
13	Extension of Pine Hill Road to the north & then connect it to the East to meet up with CR44.	1 (6)
14	Support the plan of a median strip in the centre of the road separating the two lanes of traffic.	1 (6)
15	Support for construction of the bicycle lane in the footpath	1 (7)
16	Existing bridge is breaking up and needs to be refurbished.	1 (1)
17	The addition of a 3rd inner lane for the shopping centre only	1 (9)
18	Concerns with small 2 lane RAB's, often lane changes occur which are more likely to cause accidents in smaller RAB's rather than large RAB's.	1 (12)
19	Support that the bridge must be widened	1 (12)
20	Against building a new higher bridge as the cost cannot be justified because Kemptville is unattractive past the CR43 bridge, parts of the creek are too shallow to allow boats, dredging of the creek would be prohibited, Bridge St Bridge is too low,	1 (12),
21	Concerned with the intersection of Rideau St & Sanders St.	1 (11)
22	Concern that there is a natural spring under Pine Hill RA which may affect the construction	1 (1)
23	Has doubts about the projected growth rates	1 (14)
24	A two lane Road with RAB's and a very wide median is sufficient enough for the vehicular and pedestrian traffic & does not require a new bridge to be constructed.	1 (14)

25	A wider median with left turn lanes allows left turns to occur more frequently and safer.	1 (14),
26	More pedestrian flashing light right of ways	1 (14)
27	Aprons maybe used in conjunction with the RA's	1 (13)
28	Concerned with drainage along the north side of CR43 from Pinehill Rd to the South Branch of the Rideau River.	1 (1)

2.5.2 Public Information Centre No. 5

The notice for Public Information Centre (PIC) No.5 was advertised in the Kemptville Advance Newspaper on Thursday January 28, 2010 and Thursday, February 4, 2010. A brochure advertising PIC No.5 was sent to all residents within a 120m radius of the corridor and all people who had previously commented on the study and/or requested to be placed on the mailing list. The brochure was double sided and included the same information as the newspaper advertisement on one side and included a map on the reverse side. These can be found in Report on PIC No.5 in Appendix B. The newspaper advertisement was placed on the United Counties website and the Municipalities website with the other reports including the Existing Conditions Report and Evaluation Report.

A generic letter was sent to all of the agencies that were previously advised of study. The letter advised of the technically preferred alternative and that copies of the existing conditions report and evaluation report could be viewed on the websites or obtained from AECOM. The agency letters requested any comments be made before February 19, 2010. While a number of agencies provided comments, the only concerns were from the Ferguson Forestry Centre and from utility companies concerned about their utilities.

The PIC followed a "drop in" format from 6:30 p.m. – 7:00 p.m. where members of the community and agencies were encouraged to come by and look at the proposed design and ask questions and comment on the project. On display were 30 display boards advising of the study, the technically preferred alternatives, as well as the proposed corridor plans showing the proposed road widening and proposed intersection control. Also on display was a large amount of roundabout information which discussed pedestrian safety concerns and included of pictures of similar corridors in North America.

A Power Point Presentation was then completed by AECOM's Guy Laporte, P.Eng (Project Manager) and Steve Sargeant, P.Eng (Transportation Engineer). The presentation took place from 7:00 p.m. – 7:40 p.m. and discussed:

- Reasons for the study,
- Master Plan,
- Corridor features,
- Mitigation measures,
- Alternatives,
- Roundabouts,
- Pedestrian safety,
- Costs and
- Land acquisition.

Questions followed the presentation for approximately 15 minutes. Following questions on the presentation everyone was encouraged to discuss any additional questions or comments they have on the display boards and corridor plans. Representatives from the United Counties of Leeds and Grenville and AECOM, were present at the PIC to answer questions and assist in the interpretation of the material. The PIC closed shortly before 9:00pm.

Forty-two (42) people signed into the PIC with a number more opting not to sign in. The presentation was completed in front of an audience of approximately fifty (50) people. Comment sheets and brochures were available, including extra copies for attendees who wanted to take them for others

Presentations were made to the United Counties of Leeds and Grenville public works committee and the Municipality of North Grenville council on January 6, 2010 and February 8, 2010 respectively. Both meetings were open to the public and the meeting with the Municipality was televised to the community.

A total of forty-three (43) public comments were received over the course of this PIC and all are included in PIC No.4 and PIC No.5 in Appendix B. Comments 1-21 were received prior to PIC No.5, comments 22-29 were received at PIC No.5 and comments 30-43 were received after PIC No.5. Before the PIC the majority of comments received before PIC No.5 came from the Neighbourhood of Glengables. An email chain was started by one of the residents of the neighbourhood who is not in favour of roundabouts. The email was sent to Les Shepherd and Guy Laporte as well as the majority of the neighbourhood. It started a debate between the residents where approximately 70% of these residents are in favour of roundabouts and the other 30% dislike them. An overall summary of all the comments found that the most received comment was that a large number of people believe that the majority of people do not know how to use roundabouts and that an education program is needed. The second most received comment was from people who like roundabouts.

A report named *Report on PIC No.5,* was completed which documents the PIC, presentation and resulting public and agency correspondence since PIC No.4. The report was made available on the Municipality of North Grenville website and the United Counties of Leeds and Grenville website. Hard copies of the report were made available at the United Counties of Leeds and Grenville Municipal Office, Municipality of North Grenville Municipal office and the Kemptville Public Library.

2.5.2.1 PIC No.5 Public Comments

A summary of the comments can be found below. As there were a number of comments received, a Frequently Asked Questions (FAQ's) document was produced by the TSC which can be found in Appendix B. The list of comments can be found below.

Figure 2.2: PIC No.5 Public Comments

Item No.	Comments	No. of Comments received & reference	
1	A lot of people don't understand the rules of roundabouts. There needs to be a local education campaign on the rules.	14	(6, 7, 8, 9, 12, 14, 15, 16, 17, 20, 34, 37, 39, 41)
2	Likes Roundabouts	12	(6, 7, 10, 11, 12, 14, 15, 19, 20, 32, 39, 41)
3	Requesting information and or requesting to be added to the mailing list.	7	(2, 4, 13, 18, 28, 31, 42)
4	Concern about pedestrian safety (St. Mike's students)	5	(7, 16, 21, 37, 40)
5	Disagree with converting the CR43 and CR44 intersection into a roundabout.	5	(8, 9, 14, 15, 16)
6	Dislikes Roundabouts	5	(1, 5, 8, 9, 40)
7	Believe that sidewalks and pedestrian facilities are vital.	4	(21, 36, 39, 40)
8	The roundabout outside the Wal-Mart is not big enough for 2 lanes and requires widening.	4	(12, 14, 16, 19)
9	Likes the proposed design of the corridor and/or presentation	4	(20, 23, 39, 41)
10	Concerns of Roundabouts on local businesses	3	(30, 32, 33)
11	Requests a noise/sound barrier along the south side of CR 43 between Barnes St. and James St. Will also act as a safety barrier	3	(22,24,29)
12	Join the high school and the Shopper's Drug Mart entrances into one entrance.	2	(5, 33)
13	The roundabouts in Kemptville are too small	2	(1, 5)
14	Decorating the roundabouts will look great.	2	(6, 37)
15	Question spending money to convert the existing traffic signals into roundabouts	2	(5, 12)

16	The existing Canadian Tire roundabout is too small and/or unsafe.	2	(12, 19)
17	Proposed roundabouts need to be designed consistently	2	(16, 19)
18	Agree with converting the CR43 and CR44 intersection into a roundabout.	2	(20, 43)
19	The CR43/CR44 Roundabout should be phase 1 in front of the bridge	1	(43)
20	Railings could be included on the median at this point to increase safety	1	(43)
21	Include a larger median at the CR43/CR44 intersection as this will be the busiest pedestrian intersection. This will allow a larger standing room.	1	(43)
22	Maintain 2m bike path and 1.5m sidewalk across bridge	1	(43)
23	Possible pedestrian tunnels and or overpasses	1	(40)
24	Proper lighting in the corridor to drivers can see pedestrians	1	(40)
25	Concerns about construction time & contractors	1	(37)
26	Concerns about the parking lots spaces at the creekside centre	1	(37)
27	The roundabouts are sized correctly - to slow vehicles	1	(37)
28	Likes the bridge option	1	(33)
29	Dislikes the advertising signs in the corridor - unaesthetic	1	(21)
30	Concerns that there is nowhere for trucks to pull over in the town	1	(21)
31	Request to be removed from the mailing list	1	(3)
32	A number Detailed Design Questions	1	(38)
33	Would rather see left turn lanes	1	(32)
34	Access and Safety concerns regarding corner properties at roundabouts	1	(30)
35	Finds Roundabouts Dangerous	1	(8)
36	Concerns about the number of proposed Roundabouts	1	(7)
37	At the Tim Hortons roundabout, the cross walk is difficult to see when the drivers are in the circle.	1	(19)
38	In the interim the green arrows at the CR44 and CR43 intersection should be enhanced as they are currently difficult to see.	1	(27)
39	There should be Park and Ride options in the Corridor near Hwy 416 for future public transportation and car pooling.	1	(26)
40	Proposed roundabout at Somerville Rd. shoul be moved to the intersection of the Oxford village subdivision and CR43. This cost can then be shared.	1	(25)
41	Pedestrian safety should be addressed in the interim for the high school, and to the mall along south side of CR43	1	(23)

2.5.3 Website

The Study Design Report, study notices, PIC Summary Reports, Existing Conditions Report and Report on Analysis and Evaluation of Alternatives and Selection of Technically Preferred Alternative were made available on the United Counties' and municipalities websites to facilitate public access and the consultation process. These websites are www.uclg.ca/en/publicnotes/index.asp and http://www.northgrenville.ca/news.cfm respectively.

2.5.4 Notice of Study Completion/Filing of the ESR

The Study team presented the recommended solution to the United Counties of Leeds and Grenville on April 22, 2010 and received authorization to proceed with the formal public review. A copy of the Council resolution is provided in **Appendix B**. Consequently, this ESR has been filed in the public record for 30 calendar days and the public notified by means of newspaper advertisements and mailings to interested individuals and adjacent property owners.

3. Need and Justification

3.1 Introduction

This study is a continuation of work that was undertaken by the United Counties of Leeds and Grenville in 2005/06. In April of 2006 the United Counties issued a report entitled “United Counties of Leeds and Grenville, County Road 43 Corridor Master Plan.” The purpose of the Master Plan was to address transportation needs associated with a rapidly growing and developing corridor.

The intent of the Master Plan was to provide a sufficient level of planning to meet environmental assessment (EA) requirements for all Schedule ‘B’ projects in the Study Area. Various alternative solutions were considered to address the corridor’s evolving transportation needs (Phases 1 and 2 of the Municipal Class EA process).

The study concluded with a decision by the Technical Steering Committee (TSC) to widen the corridor to four through lanes in the Kemptville urban area (from Highway 416 westerly to Somerville Road) which put this portion into a Schedule ‘C’ Municipal Class EA category. Schedule ‘C” projects require more detailed environmental assessments, the Master Plan includes a recommendation that this work be completed, which is the objective of this study.

The Master Plan looked in detail at alternative intersection controls, as these have significant impact on overall corridor requirements. With strong public support the Master Plan recommended that CR43 between Somerville Road and Highway 416 be developed as a four lane roundabout corridor.

It was not the intent of this study to revisit the recommendations of the Master Plan. This study resumes at Phase 3 of the Municipal Class Environmental Assessment, considering alternative design concepts for the Corridor Cross-Section Features, Centre Corridor Intersection Control and the CR43 Bridge. The object of an updated traffic study is to determine improvements associated with the widening of CR 43 to four through lanes (two eastbound and two westbound) as has previously been recommended in the CR 43 Corridor Master Plan in 2006. It was expected that the major traffic issues with the widening of CR 43 will be centred around the proposed bridge widening on CR 43 and the existing traffic signals.

The traffic study prepared for this report builds on the Master Plan and includes an update of traffic volumes and projections in the corridor. It is expected that the United Counties in conjunction with this document will develop an access management plan for the corridor in the near future.

3.2 Traffic Analysis

During the CR43 Corridor Master Plan a traffic study was completed for the entire corridor. As a result of the current study an updated traffic study was completed. This traffic study was conducted for the CR 43 corridor between Highway 416 and Somerville Road in Kemptville, Ontario. The study consisted of a review of the previous traffic studies and planning studies, confirmation of the underlying land use assumptions, collection of new traffic data at key points in the corridor, updating the future traffic projections, and evaluation of the existing traffic volumes and future projections.

The assumptions of the previous studies had not materially changed and were appropriate to use in the updated study. Land uses have remained consistent with the information that was used in the Corridor Master Plan.

New counts, conducted in April 2009, recorded a maximum one-hour directional volume of 995 vehicles immediately west of CR 19. This indicated the westbound lane is currently above the planning capacity during the PM peak hour.

Improperly utilized pedestrian controls and other crossing issues were identified in the area between James Street and CR 44.

Mainline volumes of 30,000 vehicles per day can be expected on the busiest section of CR 43 by 2029. West of Somerville Road the 2029 future projections are 14,000 vpd which can be accommodated by a two-lane cross section, depending on access locations.

The major conclusion of the updated traffic counts was that by 2019, the corridor will require two through lanes in each direction from Highway 416 to Somerville Road. The continued growth in the area will increase traffic volumes and exceed the planning criteria for the corridor.

Recommended improvements include: widening of the corridor, upgrades to the intersection control and major intersections, access management, installation of pedestrian and cyclist facilities, and installation of design elements to accommodate visual and mobility impaired pedestrians.

3.3 Existing Condition

3.3.1 Background Information and Data

A number of reference documents were used in completing this study. Standard applicable codes and government policies were followed. The following documents were used as part of the development of the study.

- *Microsimulation of a Roundabout* – A Reality Test – Keen, S; Ma, T; and Sargeant, S
- Traffic impact study for Colonnade commercial development southwest of Highway 416 by Novatec.
- *County Road 43 Corridor Study – County Road 22 to Somerville Road, Kemptville* by TSH. November 2005. Includes all of the documents referenced in the previous study.
- Previous traffic counts
- Ontario Ministry of Transportation Traffic Database

3.3.2 Traffic Counts

AECOM staff conducted site inspections on multiple occasions including April 28 and 29, 2009 when the traffic data collection occurred. Observations were recorded with video tape, photographs and field notes. The complete traffic report can be found in the *Existing Conditions Report* in Appendix C**,** it contains photos taken during the site inspection.

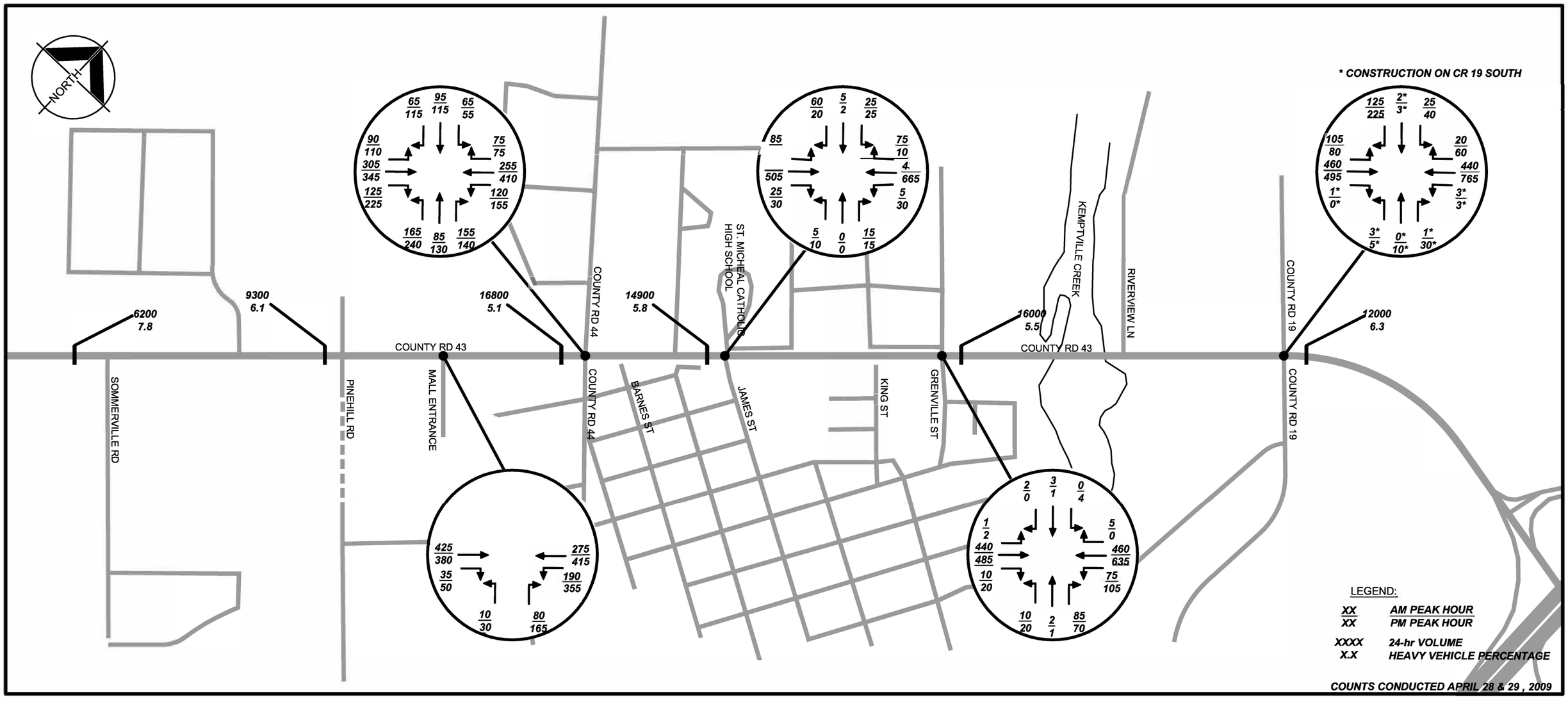
Traffic counts represent a snapshot of corridor operations. A typical operational day may include delays, lost tourists, minor accidents and/or construction. The transportation study for the CR 43 Master Plan included traffic counts at 15 intersections during June 2005. A complete reproduction of those counts was not necessary to update the traffic data. AECOM staff and the sub-consultant Ritchie Traffic Services completed counts at five key intersections and four strategic points between intersections. The counts were delayed from early April due to poor weather and the Easter holiday. During the afternoon count on the 28th it rained briefly while the other counts on the 29th had good weather. Both days were representative of typical operations in the corridor as school was in session, no major events were underway and road construction activities were at a minimum. **Figure 3-1** illustrates the peak hour counts and the daily totals for the April 2009 counts.

3.3.3 Links

The recorded link volumes in the corridor are a measure of the capacity between intersections. The CR43 Master Plan used 900 vehicles per hour (vph) as the planning level at which a single lane is considered at capacity. Each direction of the link is considered independently. That metric was also being used to evaluate link capacity for this study.

The maximum recorded one-hour directional volume was 995 vehicles immediately west of CR 19. This indicated the westbound lane is currently above the planning capacity during the PM peak hour. The peak one-hour, two-way volume was 1436 vehicles between Kemptville Mall Access and CR 44 between 4:15 and 5:15 pm.

Figure 3.1- Existing Traffic Volumes



3.3.4 Intersection Operations

The five counted intersections were analyzed using Synchro version 7 (build 614) and Sidra Intersection following the Highway Capacity Manual parameters. The existing intersection configuration was used, with traffic volumes, truck percentages and peak hour factors from the 2009 traffic counts conducted by AECOM. The Sidra Intersection and Synchro outputs include multiple measures of effectiveness including level of service (LOS) and volume to capacity ratio (v/c) for each approach and the overall intersection. LOS is defined in terms of average control delay per vehicle, according to the criteria of the Highway Capacity Manual. The LOS criteria are summarized in **Table 3-1.**

Table 3-1: Intersection Level of Service Criteria

Level of Service	Average Control Delay (Seconds per Vehicle)	
	Signals and Roundabouts	Stop Signs
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

Detailed Synchro and Sidra Intersection analysis printouts are available upon request. **Table 3-2** summarizes the analysis results in terms of a 2009 LOS and v/c for each intersection.

The intersection operations analysis showed that all of CR43's through and turning movements at these intersections are operating below capacity. The exiting left turns at the Kemptville Mall and St. Michael's High School experience long delays (LOS F) during the afternoon peak hour. During the peak periods, the minor street movements experience acceptable delays.

CR 19 - During the traffic counts the intersection at CR 19 was in a disrupted state yet continued to operate at an acceptable level of service. As part of a utility upgrade disruption, the circulating roadway and truck apron in the northwest and southeast quadrants had been excavated and backfilled with gravel. Vehicles travel more slowly than usual through the roundabout but overall capacity was not significantly impacted. The circulating roadway of that roundabout has subsequently been repaired. At the same time, the exit of the south leg of the intersection (CR 19) was closed. The overall intersection LOS during the AM peak hour was "A" with the lowest LOS being "B" for the southbound approach. During the PM peak hour the overall LOS was "B" with the lowest LOS being "C" for the southbound approach.

Grenville Street – This Stop-sign controlled intersection has no turn lanes on any of the approaches. During the AM peak hour the lowest LOS was "C" for the northbound approach. During the PM peak hour the lowest LOS was "C" for the northbound approach.

James Street/St. Michael's High School – This intersection is slightly offset. This Stop-sign controlled intersection has no turn lanes on any of the approaches. During the AM peak hour the lowest LOS was "E" for the southbound left turn. During the PM peak hour the lowest LOS was "F" for the southbound left turn. The school rush is very brief but intense enough to cause disruption to overall corridor operations.

CR 44 – The signal was operating in normal fashion. The overall intersection LOS during the AM peak hour was "A" with all turn lanes operating at LOS "A". During the PM peak hour the overall LOS was "A" with the lowest LOS being "B" for the westbound through and northbound left turn.

Kemptville Mall Entrance - This Stop-sign controlled intersection has a left turn lane on CR 43 that allows the westbound through traffic to proceed unimpeded. During the AM peak hour the lowest LOS was “D” for the northbound left turn. During the PM peak hour the lowest LOS was “F” for the northbound left turn.

The two-lane roundabout at the entrance to the Colonnade development southeast of Highway 416 is built but has not been opened to full operation.

Table 3-2: 2009 Level of Service

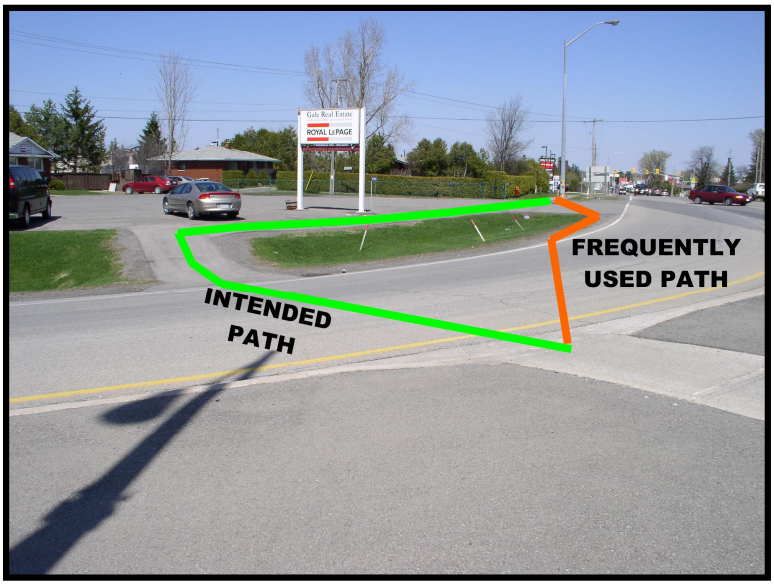
Intersection	Control Type	Approach or Lane	Peak Hour			
			AM		PM	
			LOS	v/c	LOS	v/c
County Road 19	One-lane roundabout (south leg partially closed due to construction)	Eastbound	A	0.47	A	0.50
		Westbound	A	0.46	A	0.76
		Northbound	B	0.04	B	0.09
		Southbound	B	0.25	C	0.69
		Overall	A	0.47	B	0.76
Grenville Street	Stop Sign North and South	Eastbound	A	0.00	A	0.00
		Westbound	A	0.08	A	0.08
		Northbound	C	0.24	C	0.24
		Southbound	C	0.03	C	0.03
James Street/ St. Michael’s School	Stop Sign North and South	Eastbound	A	0.09	A	0.02
		Westbound	A	0.01	A	0.03
		Northbound	C	0.08	D	0.15
		Southbound Left	E	0.23	F	0.27
		Southbound Right	B	0.12	B	0.05
County Road 44	Traffic Signal	Eastbound Left	A	0.24	A	0.41
		Eastbound Through	A	0.49	A	0.05
		Eastbound Right	A	0.09	A	0.16
		Westbound Left	A	0.34	A	0.31
		Westbound Through	A	0.40	B	0.60
		Westbound Right	A	0.05	A	0.05
		Northbound Left	A	0.43	B	0.57
		Northbound Through	A	0.15	A	0.21
		Northbound Right	A	0.11	A	0.10
		Southbound Left	A	0.17	A	0.13
		Southbound Through	A	0.17	A	0.19
		Southbound Right	A	0.05	A	0.08
		Overall	A	0.46	A	0.59
Kemptville Mall Access	Stop Sign South	Eastbound	A	0.29	A	0.27
		Westbound Through	A	0.20	A	0.27
		Westbound Left	A	0.18	B	0.36
		Northbound Left	D	0.07	F	0.48
		Northbound Right	B	0.15	B	0.29

The counts recorded 5.0% medium heavy trucks and 0.7% large heavy trucks. All indications are that these percentages will remain constant over time. The corridor is designated as an oversized truck route within the United Counties.

3.3.5 Other Traffic Within The Corridor

The conducted counts included tracking of pedestrians within the corridor. The only location that had more than five pedestrians in any hour was the signalized intersection of CR 43 and CR 44. These pedestrians were high school students on their lunch break. Compliance with the pedestrian signals was poor and students also crossed outside of the crosswalk area.

Photograph 3-1: Intended Path Versus Frequently Used Path



Facilities for pedestrians in the corridor are limited to segments of sidewalk on the north side of CR43 from CR44 to the community centre intersection and on the south side of CR43 from CR44 to the mall entrance. At the traffic signal at CR 44, there are pedestrian signal heads on the south and east crosswalks with none on the west and north legs due to a lack of sidewalks in the northwest quadrant. The pedestrian crossing on the bypass lane is correctly unmarked and is not used by the students as intended.

During the counts there were no cyclists recorded. This is not an indication of true demand as there is a lack of cycling facilities in the corridor. The high volumes and lack of shoulders or sidewalks along the entire length makes cycling within the corridor an unpleasant option.

3.4 Bridge Report

3.4.1 Existing Bridge Background

Kemptville Bridge was constructed in 1955 and is a two span, concrete rigid frame bridge carrying two lanes of traffic over the South Branch of the Rideau River (Kemptville Creek) at a 0° Skew. It is located on CR43, approximately 1 km west of Highway 416. CR43 is classified as an urban arterial undivided road and is posted with a speed limit of 60 km/h over the bridge. The roadway has an asphalt surface and is approximately 9.7 m wide between the curbs.

The length of the bridge measured face to face of the abutments is 36.6 m. The intermediate pier consists of a solid concrete wall parallel to the abutments. Each span is approximately 17.8 m.

The north side of the bridge is the boundary of Parks Canada's jurisdiction which is also the boundary of the UNESCO designation as part of the Rideau Canal system. Any work on this side of the bridge, including any amendments to the current

visual impact of the bridge is subject to scrutiny by Parks Canada and the UNESCO committee. The Rideau Valley Conservation Authority (RVCA) has authority of the southern portion of the creek which starts from the north face of the CR43 Bridge.

3.4.2 Structural Assessment

A *Condition Survey and Structural Evaluation* of the bridge was undertaken by Harmer Podolak Engineering in 2008. A copy of the report is included in the Existing Conditions Report in Appendix C.

3.5 Future Conditions

3.5.1 Traffic Volumes Projections

The planned development for the area has remained relatively constant from 2005 to 2009. As such, there are no new major developments that were not considered in the Master Plan study. To determine the future volumes in the corridor, the Master Plan Study involved an extensive consideration of future developments, historic trends and land use in the corridor. It was recognized that growth in the corridor would be non-linear with much of the growth occurring in the first 10 years of the 20-year planning window. The 2009 counts indicate that the growth over the past four years has averaged 3.7% per year. The amount of development that has been completed since 2005 plus the growth in background traffic corresponds to observed growth. Therefore, we are confident the previous projections were valid and can be built upon.

Since the traffic counts and study was completed the extension of Pinehill Road was completed. This provides a new route for residents wishing to access the corridor and/or the Kemptville Mall. As such, any changes in traffic patterns in this area haven't been analysed and are not included. The other major, approved projects in the corridor are the Oxford Village subdivision and the Colonnade commercial development. Both of these projects will create major increases to corridor volumes.

3.5.2 Links

Mainline volumes of 30,000 vehicles per day can be expected on the busiest section of CR 43 by 2029. The absence of alternate east/west corridors in the area reduces the possibility of drivers choosing alternate routes once volumes increase. West of Somerville Road the 2029 future projections are 14,000 vpd which can be accommodated by a two-lane cross section, depending on access locations.

The mid-term projections (2019) show volumes that cannot be accommodated by the existing two-lane cross-section. As noted in Section 3.4, there are already segments of the corridor that have demands above the 900 vph planning capacity. Before 2019, the corridor will require two through lanes in each direction from Highway 416 to Somerville Road. The 2005 study identified that need to be required prior to 2015 and our analysis indicates that the widening could commence immediately to accommodate the existing demand.

3.5.3 Intersection Operations

The growth along the corridor will create additional operational problems at the key intersections and at minor access points. As mainline volumes increase there are fewer gaps available for vehicles to make turns. On a two-lane roadway with no turn lanes, vehicles waiting to make a turn block all of the vehicles behind them. This is already occurring during peak hours at the Stop-sign controlled intersections in the corridor.

3.5.4 Pedestrians and Cyclists

The completion of the Oxford Village Subdivision residential development will introduce more pedestrians and cyclists to the area, particularly the west end of the corridor. Continued development of commercial parcels will create additional destinations for

these pedestrians and cyclists. As long as the urban form of the new developments is conducive to pedestrian and cyclist use, CR 43 will require a network that services the growing demand.

3.6 Potential Improvements

3.6.1 Intersections

Widening of the corridor will necessitate upgrading the traffic control at all of the major intersections. Each of the intersections that currently have roundabouts as their control device are either built to their ultimate two- lane configuration (Colonnade Development Access) or can be expanded to a two-lane operation (CR 19 and Pinehill). The Stop-sign controlled intersections at Somerville Road, Oxford Subdivision, Kemptville Mall, James Street, Grenville Street and Riverview Lane all can be upgraded to two-lane roundabout control. The existing traffic signals at CR 44 and at Community Square commercial plaza cannot accommodate the future demand without major upgrades including pole relocation/replacement, new control hardware and additional signal hardware.

The following section describes the potential improvements at each major intersection in the corridor.

Colonnade Development Access west of Highway 416 – The long-term intersection design was completed as part of the new commercial development located to the south. Minor changes to signing and striping may be required when the north leg of the intersection is constructed.

County Road 19 – Upgrade to a two-lane roundabout and replace the asphalt truck apron with a design that corresponds to the state of the practice. Install pedestrian crossings.

Riverview Lane – Relocate slightly to the east and construct major entrance into parcels to the south. Control of this intersection should be a two-lane roundabout to provide U-turn opportunities for the properties to the east of Riverview Lane.

Grenville Street – Upgrade traffic control to two-lane roundabout. Install pedestrian crossings.

King Street – Restrict to right-in/right-out only through the installation of a raised median on CR 43.

Barnes Street – Upon redevelopment of the properties adjacent to Barnes, close the street south of CR 43 and relocate access points. In the interim, as part of the widening of CR 43, install a raised median on CR 43 which will restrict movements to right turns only. This is consistent with the Master Plan report.

James Street/St. Michael's High School – see Section 3.6.2.

Community Square entrance – see Section 3.6.2.

County Road 44 – see Section 3.6.2.

Kemptville Mall Entrance – Upgrade traffic control to a two-lane roundabout and align future access on north side. Install pedestrian crossings.

Pinehill Street – upgrade to a two-lane roundabout when volumes dictate.

Oxford Village development access – Construct the ultimate two-lane roundabout with planning for an interim configuration that can be used until widening of CR 43 is completed. Install pedestrian crossings.

Somerville Road – Upgrade traffic control to a roundabout.

Other entrances – Consistent with the United Counties access control plan, if available. Otherwise limit all new access to only right-in/right-out movements. If roundabouts exist, access points should be located a reasonable distance upstream and downstream of the intersection control.

3.6.2 Central Segment

The recommendations from the Master Plan traffic report included traffic signals at two intersections: James Street and CR 44. However, the assumption of a signal at James Street assumed the old pedestrian signal would be relocated to James Street. Prior to completion of the final Master Plan report, it was decided that the intersection of James Street would become a roundabout and a new traffic signal was installed at the entrance to the Community Square commercial plaza. The Community Square access also provides a connection to the Municipality of North Grenville municipal centre. The old pedestrian signal was replaced with the Community Square signal.

The lead author of the Master Plan traffic report was not prepared to support two-lane roundabouts in an area with high pedestrian demand. At the time of the issuance of the traffic report there was little documentation on operations at North American installations of two-lane roundabouts. However, in the four years since the completion of the Master Plan there have been multiple professional papers and studies addressing that issue. As such, the recommendations pertaining to the segment of the corridor impacted by the decision to install traffic signals over roundabouts was reviewed. The review of this "central segment" included,

1) Determination if roundabouts are an appropriate traffic option, and,
2) Which configurations are possible given any changes from 2004.

The segment that was reviewed included the three intersections of CR 44, Community Square and James Street. The upstream and downstream design implications of the control choice (median or turn lane) were included.

AECOM staff has been closely involved with roundabout research and policy development and is confident that two-lane roundabouts are appropriate for the subject locations. This recommendation is based on the corridor's volumes, percentage of heavy vehicles, design speed, anticipated pedestrian volumes, and adjacent land uses. Roundabouts are an efficient and safe traffic control device and with proper design consideration, pedestrian issues can be addressed in an effective manner.

As mentioned earlier, all of the existing traffic controls require major modification/reconfiguration as part of the corridor widening. Therefore, all intersection control options are available at each of the intersections. Based on the inclusion of roundabouts as a viable control option, four alternative configurations were recommended in the traffic report to be considered for the central segment:

Do nothing – Signals at CR44, Signals at Community Square, and roundabout at St Michaels High School – This is the configuration if the original recommendation Master Plan report is followed.

Option 1 – Two-lane roundabouts at all three intersections. Replace all controls with two-lane roundabouts and no turn restrictions. This is in line with the corridor Master Plan philosophy.

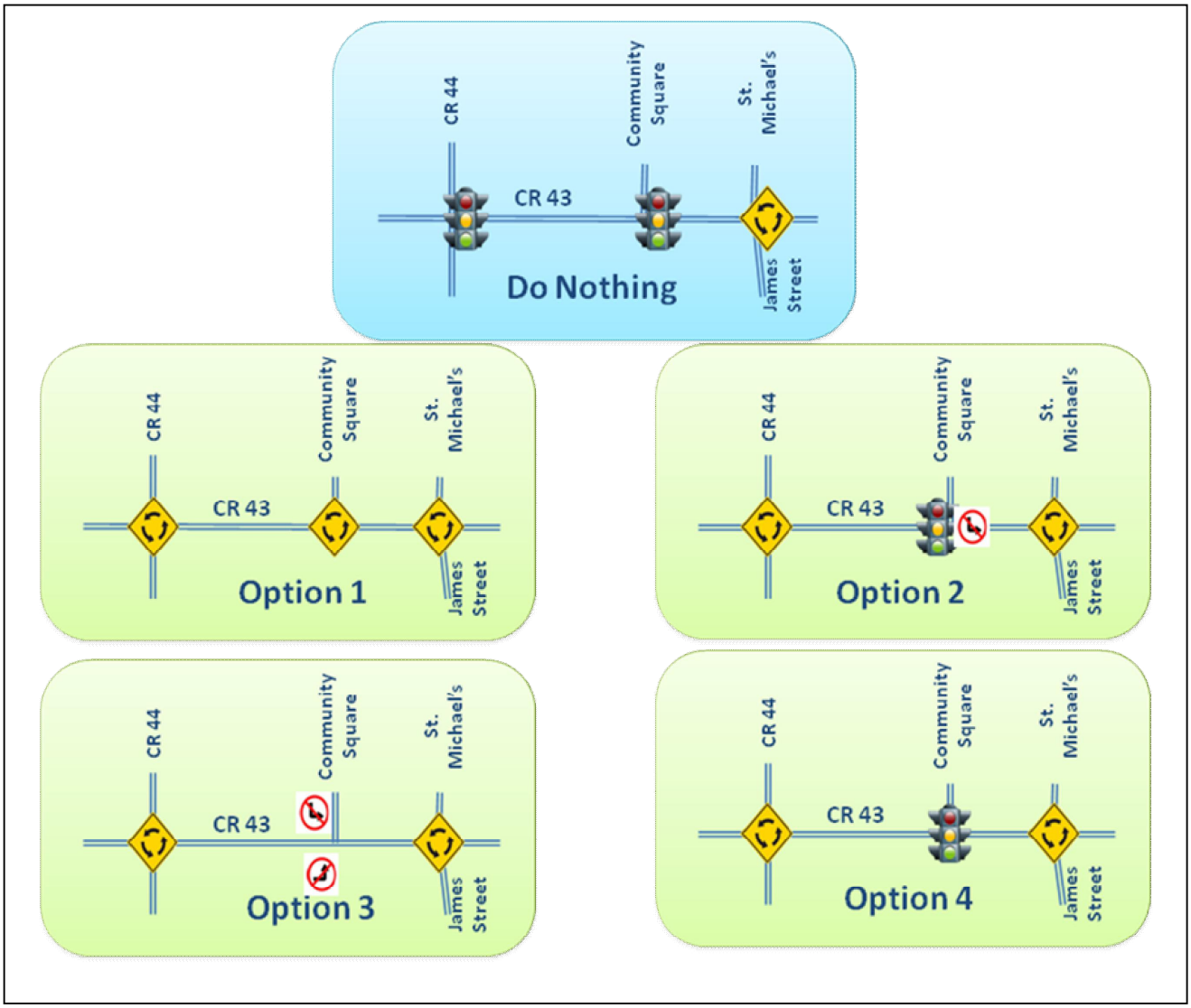
Option 2 – Roundabout at CR44, partial signals at Community Square, roundabout at St. Michaels High School. No southbound left turns would be permitted with the design. Pedestrian crossing would be signalized.

Option 3 – Roundabout at CR44, median at Community Square, roundabout at St. Michaels High School. Replacement of controls with roundabouts and restriction of Community Square to right-in/right-out movements only. This is the configuration that would have been recommended in the Master Plan report if two-lane roundabouts had been considered appropriate.

Option 4 – Roundabout at CR44, complete signals at Community Square, roundabout at St. Michaels High School. This configuration allows all current turning movements at the Community Square intersection to be retained and has a signalised crosswalk.

As a result of the other recommendation to consider other options within the central segment of the corridor, the TSC evaluated the four options and the 'Do Nothing' option. This evaluation can be found in Section 5.3. A diagram showing the options can be found below in **Figure 3-2**.

Figure 3.2: Possible Centre Corridor Intersection alternatives Diagram



3.6.3 Pedestrians

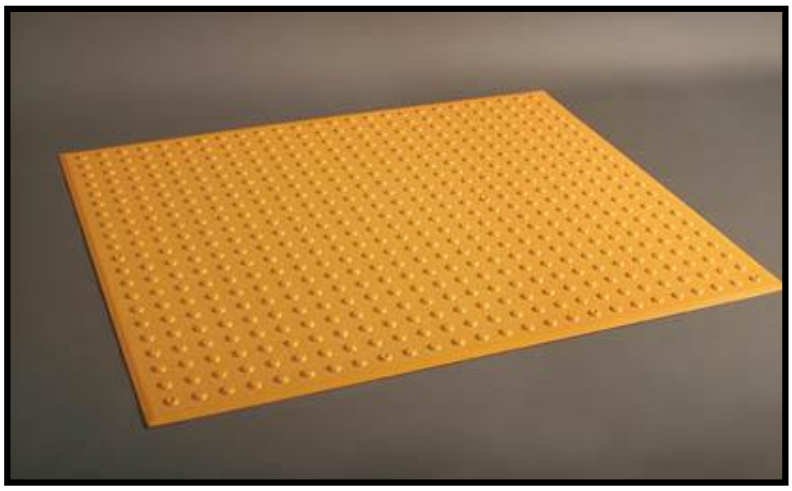
Any improvements for pedestrians will be significant as there currently is an absence of facilities. All of the intersections in the corridor should be designed with pedestrian crosswalks that are wheelchair accessible and contain design elements for the visually and mobility impaired.

The Ontario Traffic Conference (OTM) is currently preparing Book 15 of the Ontario Traffic Manual which is titled *Pedestrian Control and Protection*. This is a new document that will address pedestrian issues including design and warranting of facilities. That document will be the primary reference upon its completion. In the absence of a completed reference document, practitioners should continue to use the best available professional information.

Considerations for the corridor may include:

- Pedestrian crossovers (not to be confused with an overpass)
- HAWK beacons (**H**igh-Intensity **A**ctivated cross**W**al**K**) which provide signalized pedestrian crossings
- Designs being considered by the OTC committee
- Detectible surfaces using truncated domes/cones (see Photograph 3-2)

Photograph 3-2: Truncated Domes on Reflective Surfaces



3.6.4 Cyclists

With almost no existing facilities, all improvements for cyclists represent major progress for the cycling mode. The recommendations do not make any changes to the recommendations from the Master Plan report which included provision for bicycle facilities (on-street or off-street). Where on-street facilities are included adjacent to two-lane roundabouts, bike ramps must be designed into the intersection. This will provide the safest opportunities for cyclists to exit the roadway, dismount and negotiate the two-lane roundabouts as pedestrians.

3.6.5 Signing

The corridor currently has a mix of old and new signs. Guide signs, advisory signs and regulatory signs should be inventoried and removed/replaced as necessary. Superfluous signs (advertising, yard sales, private signs, etc.) should be removed from the public right of way.

3.7 Conclusions and Recommendations

The update to the Master Plan traffic study indicated that the previous study was developed upon solid assumptions and data. No significant changes to growth rates or patterns are expected in the CR 43 corridor.

Widening of the bridge is critical to enabling traffic to flow east/west through the corridor. Currently that section of CR 43 is over the planning capacity during the evening peak hour.

Two major points that have not changed since the original study are the need to build and connect pedestrian facilities throughout the corridor and the need to build and connect cycling facilities in the corridor. Pedestrian facilities can be staged with development.

4. Existing Environmental Conditions

The following discussion is organized to correspond to the following components of the environment considered during the environmental assessment process.

- Natural Environment
- Drainage
- Social – Economic
- Noise Sensitive Areas
- Archaeological

Other components considered in the EA process include engineering and costs. These are discussed in Chapter 6 of this report.

4.1 Natural Environment

An environmental site evaluation report was completed by Mary Alice Snetsinger of Ecological Services and is dated June 17, 2009. This is included in the *Existing Conditions Report* found in Appendix C. This evaluation included a field study which was completed May 12, 2009 and correspondence with various agencies including the Ministry of Natural Resources. The Municipality is joined to the Rideau River by the South Branch of the Rideau River (Kemptville Creek).

The natural environment area was split into four sections:

Section A – Somerville Road to County Road 44
Section B – County Road 44 to Kemptville Creek
Section C – Kemptville Creek
Section D – Kemptville Creek to MTO boundary of Highway 416

Using the Ecological Land Classification system, developed for Southern Ontario by Lee *et al.* each section was assessed. The following **Figures 4-1 – 4-4** detail Sections A, B, C and D. It was found that there were no major ecological issues or concerns with Sections A, B and D. The majority of area is cultural land and cultural meadow with minor areas of cultural plantation, cultural thicket, black ash organic deciduous swamp and shallow marsh. These land types are common in built up area.

It was found that section C is a major area of concern. The Kemptville Creek is classed as a Provincially Significant Wetland and along with the usual cultural meadow and cultural thicket this section is largely characterised by natural communities. Each side of the current bridge contained different wetland and water features. To the north of the bridge is predominately water and fish habitat. The area to the south is predominately wetland and contains various fauna and flora species. These include free-floating wetland, submerged wetland, robust emergent wetland and tall shrub wetland. There was a large amount of flora and fauna found within these wetland areas which included submerged and floating aquatic plant life, cattails, large shrubs / small trees, fish nurseries and painted turtles. A report from MNR advised that there could also be a number of other turtles within the area and possibly butternut trees. As such, an additional butternut tree survey was completed in early fall 2009 which concluded that there were no butternut trees with in the vicinity of the existing bridge and possible right of way alignments crossing the creek.

There were no species at risk reported in the wetland evaluation and none were observed during field work. This does not mean that none are present in the area. Typically, impacts to provincially significant wetlands are not permitted.

Definitions for **Figures 4-1 – 4-4** can be found in **Table 4-1** on page 32.

Figure 4.1: Natural Environment Area A

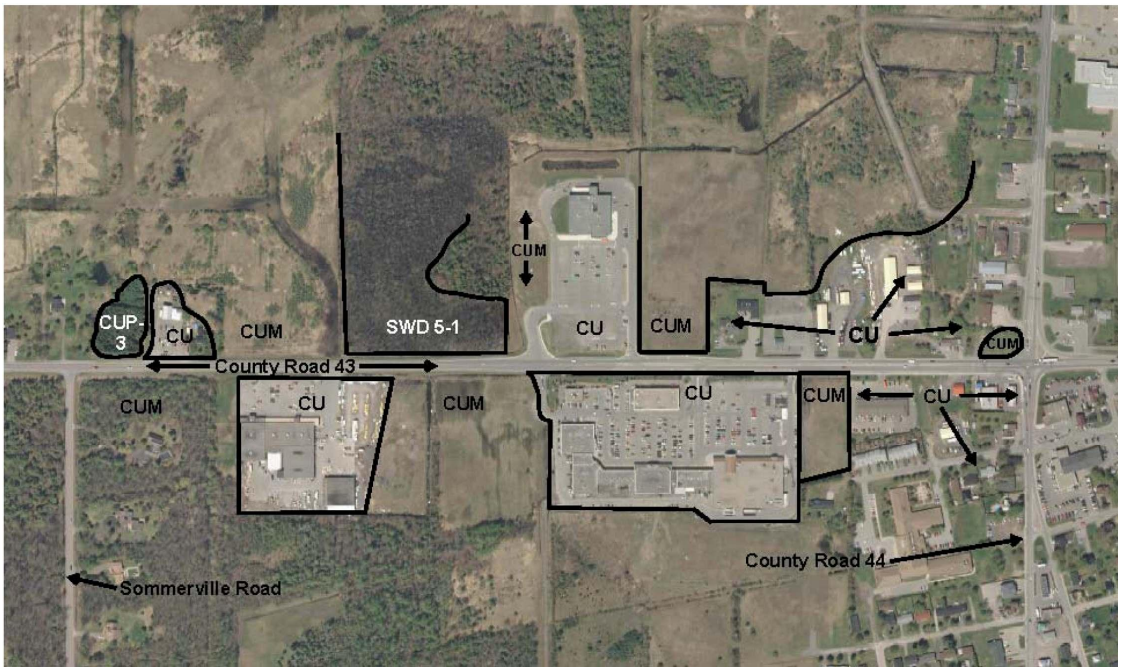


Figure 4.2: Natural Environment Area B

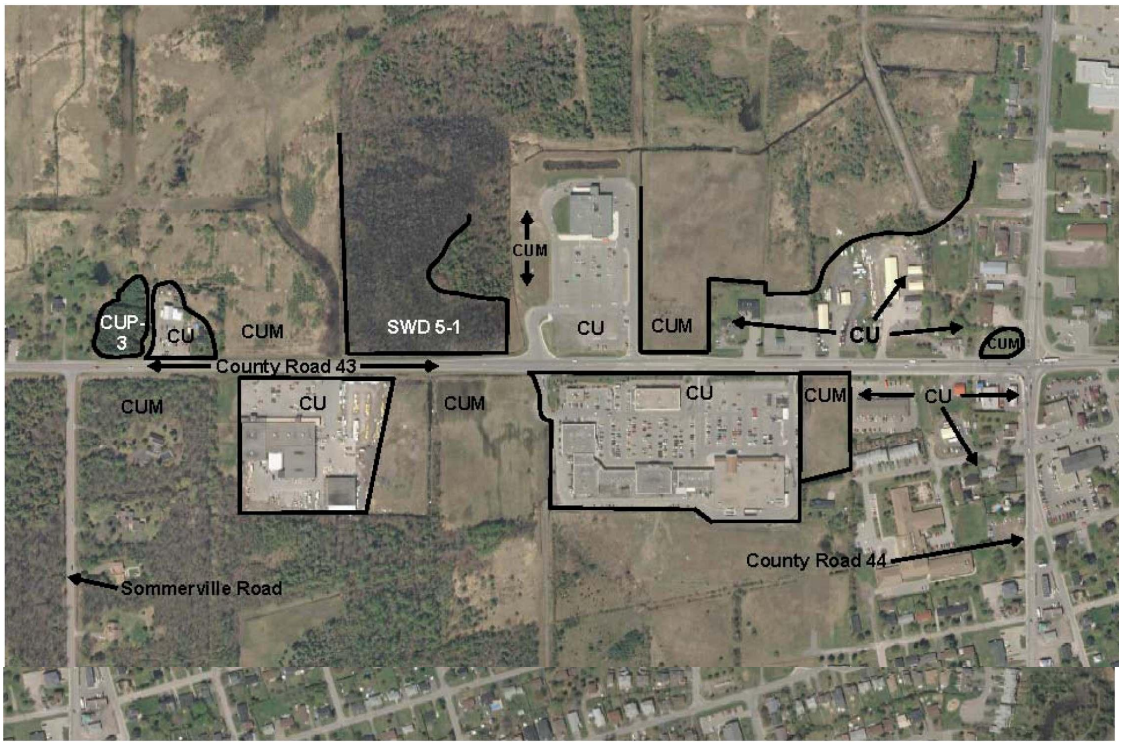


Figure 4.3: Natural Environment Area C

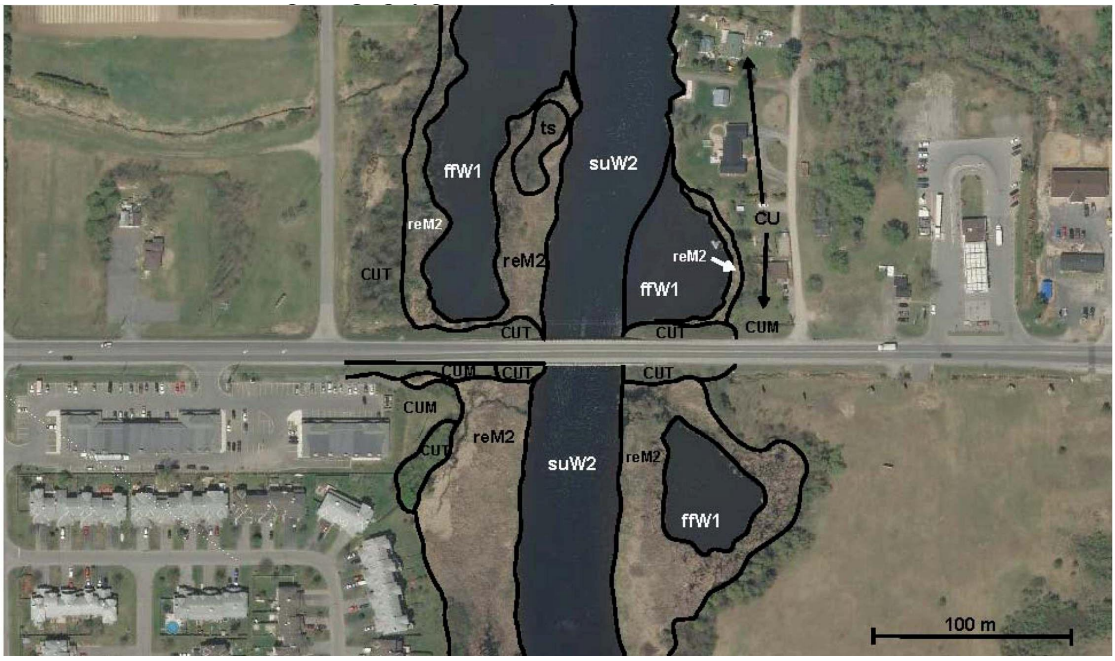


Figure 4.4: Natural Environment Area D

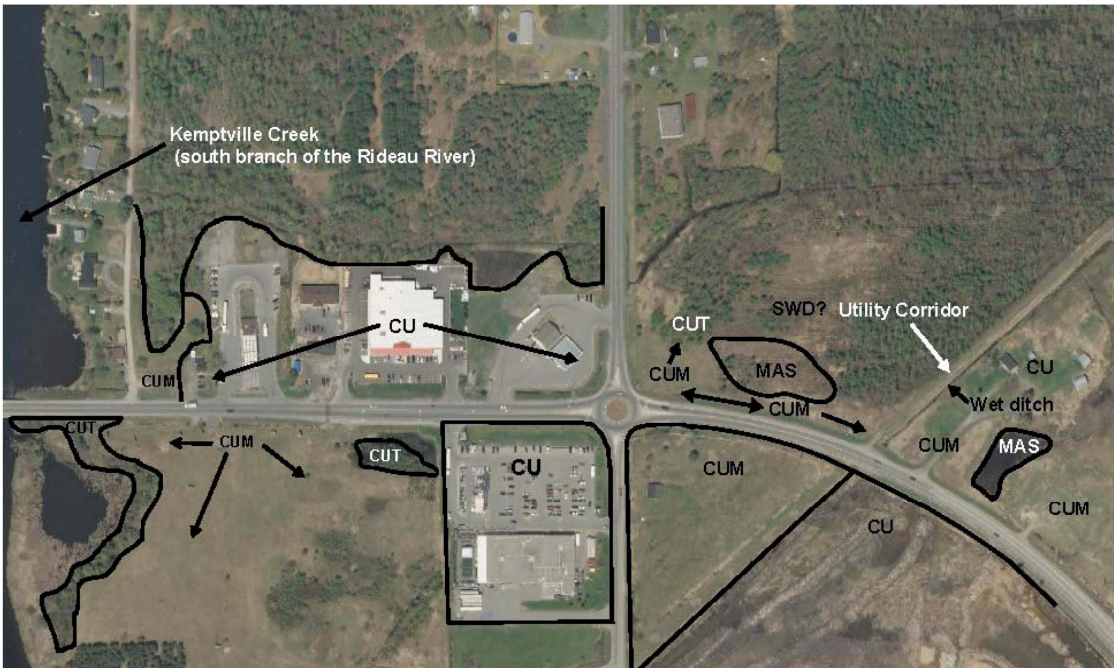


Table 4-1: Definitions

CU	Cultural land	Areas with essentially no vegetation cover but hardened (paved) surfaces and buildings.
CUM	Cultural Meadow	Areas characterised by tree and shrub cover of less than 25%.
CUP-3	Cultural plantation	Has greater than 60% tree cover, but is a community resulting from human disturbance.
CUT	Cultural thicket,	Areas with tree cover of 25% or less and shrub cover greater than 25%
SWD 5-1	Black ash organic deciduous swamp	Has over 25% tree and shrub cover and is dominated by water tolerance species.
ffW1	Free-floating wetland,	Consists of free floating aquatic plants
suW2	Submerged wetland,	Consists of emergent and floating aquatic plants
reM2	Robust emergent wetland and	Robust emergent cattails, with ground cover vegetation below.
ts	Tall shrub wetland	Area dominated by tall shrubs and small trees

4.1.1 Watercourse and Fish Habitat

The Department of Fisheries and Oceans (DFO) was contacted regarding the potential HADD area that the bridge footprint may create and the difference between significant wetland and water area. Mark Ferguson a representative from DFO also attended one of the TSC meetings. He advised that Parks Canada will be the first point of federal contact. DFO and the RVCA both advised that a detailed fish assessment will have to be completed before DFO will conduct their assessment on the technically preferred bridge solution.

4.1.2 Recommendations

The natural environmental site evaluation report recommended that a more detailed Environmental Impact Statement (EIS) be conducted on the Kemptville Creek to demonstrate the appropriateness of the proposed development. Other recommendations included:

- The bridge widening has the potential to cause development or site alteration within a provincially significant wetland, in contravention of the Provincial Policy Statement
- Design road and bridge upgrades to avoid or minimize the loss of wetland vegetation
- Implement erosion and sediment control measures, as appropriate
- Ensure that no in-water work is undertaken between March 15 and June 30, as recommended by MNR (2009)
- Minimize the bridge clearance, as this will encourage access by larger boats, which leads to disturbance of the creek habitat and species. It is noted that the existing clearance permits fairly large boats to enter the creek from the main Rideau River, and that the shallow depths in the creek may limit an increase in the size of watercraft entering. Species such as Map Turtles, if present, may be adversely affected by an increase in boat traffic. Many midland painted turtles were observed during the field work
- The bridge widening will likely result in harmful alteration, disruption or destruction of fish habitat (a HADD) if any part of the bridge results in in-filling of fish habitat (including piers, footings, abutment or approaches below the high water level) or if there is any realignment of the channel itself. If bridge design cannot avoid such impact there will be a requirement for compensation (creation or enhancement of fish habitat). A number of impacts to be avoided are the design should mitigate additional shoreline hardening, disturbance to bank stability, loss of riparian or wetland vegetation, obstructions that might impede fish migration, runoff from the widened road and bridge, etc.
- Implement standard mitigation measures, as appropriate, including but not necessarily limited to: compressing the work schedule to minimize the time period of disruption, selecting the least harmful materials and construction methods,

ensuring fish passage around any temporary obstructions, ensuring in-stream flow rates are maintained as appropriate, and controlling siltation or sedimentation

- Confirm that no butternut trees will be affected once before construction starts.

4.2 Drainage

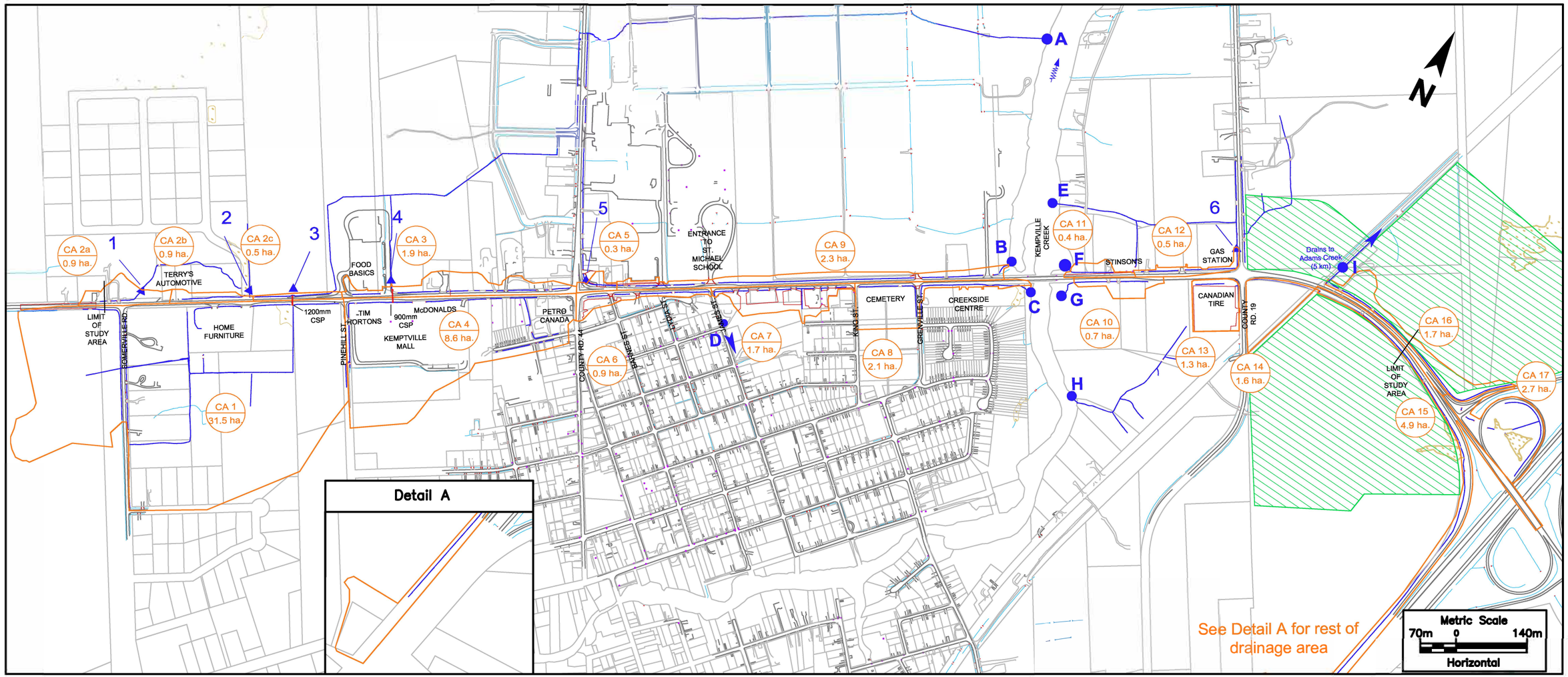
The CR43 Corridor Master plan recommended that the Kemptville Corridor from Somerville Road to Highway 416 be upgraded to a four lane urban corridor including curb and gutter and storm sewers. Consequently, a large amount of additional impervious area will be produced which will increase stormwater runoff. The need for stormwater management, to mitigate the impacts of upgrading a two lane rural cross section to a four lane urban cross section (storm sewer + curb + gutter), has been assessed. Existing roadway drainage outlets to Kemptville Creek have been inventoried and future roadway drainage conditions have been assessed with respect to water quality and water quantity impacts on both the offsite ditches that convey flow from the roadway to Kemptville Creek, as well as on Kemptville Creek itself.

4.2.1 Existing Conditions

The majority of CR43 between Somerville Road and Highway 416 is drained entirely by roadside ditches that outlet either directly to Kemptville Creek or discharge to offsite ditches/storm sewers that eventually outlet into Kemptville Creek north of the bridge. None of these outlets currently have erosion protection to minimize impacts on Kemptville Creek. These ditches also convey flow from adjacent lands. The drainage outlets and their existing catchments have been identified. Stormwater flows have been calculated using the rational method and can be found in the *Existing Conditions Report* in Appendix C. A summary of where the existing outlets are located can be found in **Table 4-2**; this is to be used in conjunction with the locality sketch in **Figure 4-5**.

Table 4-2: Drainage Outlet Summary

Outlet	U/S catchment	Drainage Comment
1:A	CA2a	Road drainage only - small
2:A	CA2b	Road drainage + some adjacent lands
3:A	CA2c	Road drainage + some adjacent lands
3:A	CA1	Road + large u/s drainage area - d/s of existing 1200mmCSP
4:A	CA3	Road + adjacent lands–confirm ditch size/cross road sewer
4:A	CA4	Kemptville Mall outlet
5:A	CA5	Road + adjacent lands – to ditch
D	CA6	Road + adjacent lands – to stormsewer outlet
C	CA7	Road + adjacent lands – (to Kemptville Creek direct)
C	CA8	Road + adjacent lands - (to Kemptville Creek direct)
B	CA9	Road (to Kemptville Creek direct)
F	CA11	Road + adjacent lands (to Kemptville Creek direct)
G	CA10	Road + adjacent lands (to Kemptville Creek direct)
6:E	CA13	Road + adjacent lands (Canadian Tire)
6:E	CA12	Road drainage
I	CA14 thru CA17	To Adams Creek via railside ditch and adjacent wetlands



COUNTY ROAD 43 EXISTING DRAINAGE PLAN
June 2009

- Drainage Sub Catchment Area
- Drainage Stream
- Future Development
- Catchbasin
- Drainage Outlet - Ditch
- Drainage Outlet - Creek

4.2.2 Future Conditions

The proposed widening will have an urban cross section with storm sewer and curb and gutter roadway treatment. The anticipated roadway drainage will outlet to Kemptville Creek via the storm sewer.

The flow comparison between the existing conditions and future conditions has been summarized in **Table 4-3**. It suggests the impacts of increased CR43 imperviousness due to the road widening will not have an identifiable impact on Kemptville Creek flows. Therefore, increases in flows to Kemptville Creek outlets may be considered negligible when compared to the magnitude of flows in Kemptville Creek. It has been confirmed that the offsite ditches that convey flow to Kemptville Creek will have sufficient capacity to convey increased flows to Kemptville Creek. The anticipated roadway drainage outlets to Kemptville Creek are at sites A, B (including C), F (including G), E and D (via existing stormsewer).

Table 4-3: Existing and Future Flows at Kemptville Creek

Outlet	2 Year		5 Year		25 Year	
	Existing (m^3/s)	Future (m^3/s)	Existing (m^3/s)	Future (m^3/s)	Existing (m^3/s)	Future (m^3/s)
A	0.94	1.15	1.28	1.54	1.72	2.12
B	0.07	0.18	0.1	0.24	0.13	0.34
C	0.07	0.11	0.1	0.15	0.13	0.25
D	0.05	0.07	0.07	0.09	0.1	0.13
E	0.18	0.22	0.25	0.31	0.35	0.42
F	0.02	0.03	0.03	0.04	0.04	0.06
G	0.01	0.02	0.01	0.03	0.02	0.04
I	0.27	0.34	0.36	0.46	0.49	0.65
Total	1.63	2.12	2.2	2.86	2.98	4.01
Kemptville Creek		52.3		67.9		85.2

4.2.3 Stormwater Quality

Comparison of the 2 year flows for the roadway outlets (total) and Kemptville Creek suggests that there would be a negligible increase in overall water quality impacts in the offsite ditches and Kemptville Creek. However, local impacts to the environmentally sensitive wetlands in Kemptville Creek may exist and quality measure should be implemented. There will be an overall improvement in water quality from the study area, if Oil/Grit Separators (OGS) were installed at outlets near the CR43 bridge. The need for an OGS at the outlets further north of the bridge will not be required as the water quality treatment will occur in the two ditches which are 1.5km and 0.5km respectively.

4.3 Socio-Economic Environment

4.3.1 Review of Background Studies and Secondary Source Information

A number of secondary information sources (e.g. maps, reports) were used to characterize the Study Area Corridor. Many of the datasets collected were obtained from the municipalities. Sources consulted included:

- Aerial photography
- United Counties of Leeds and Grenville Official Plan
- Municipality of North Grenville Official Plan

4.3.2 Regional Setting, Economy and Population

The Municipality of North Grenville has a land area of 350 km² and a population of 14,198 (Statistics Canada, 2007) which is projected to grow to 16,891 in 2021, and 18,810 in 2031 (J.L. Richards & Associates Ltd, 2008). It is noted that the United Counties had a total population of 99,206 in 2006 (Statistics Canada, 2007) which is projected to grow to 110,400 in 2021 and 115,400 in 2031 (J.L. Richards & Associates Ltd, 2008). In North Grenville, the median family income in 2006 was $31,799 (Statistics Canada, 2007). **Table 4-4** summarizes employment in North Grenville by industry, where business and other services provide 46.3% of the employment in the community.

Table 4-4: Employment by Industry (Statistics Canada, 2006)

Industry	
Total Experienced Labour Force 15 years and over	7,820
Agriculture and other resource-based industries	3.6%
Construction and Manufacturing	13.7%
Wholesale and Retail Trade	15.2%
Finance and Real Estate	4.0%
Healthcare, social and educational services	17.0%
Business and other services	46.3%

In 2001, 43.7% of the resident labour force worked outside of the Municipality (Statistics Canada, 2007). The majority of those residents working outside of the Municipality commuted to Ottawa, Merrickville-Wolford and Gatineau/Hull.

4.3.3 Existing Land Uses

On April 17, 2009, a site visit was completed to determine the existing land uses along the corridor. The socio-economic report can be found in Appendix C (part of the *Existing Conditions Report*). This document provides an overview of the corridor and the existing land uses along the corridor.

During the site reconnaissance the following key features were identified.

- Four (4) hardware/building/farming supply stores and one (1) lumber storage yard.
- Two (2) grocery stores.
- Two (2) automotive dealers, one (1) auto parts business and one (1) automotive service.
- Four (4) gas stations.
- Six (6) restaurants.
- Four (4) shopping centres, including: Kemptville Mall, Corner Stone Mall, Community Square and Creekside Centre.
- One (1) Insurance broker, real estate agent, dentist and a number of small businesses.
- One (1) LCBO.
- One (1) canoe and kayak rental near the Kemptville Creek Bridge.
- Four (4) residential properties were identified and a number of vacant development properties at the east and west end of the corridor.
- The Forest Ferguson Centre is located between St. Michael Catholic High School and Grenville Street. It is a not for profit corporation that provides nursery stock to the community.
- A cemetery on King Street near CR 43.

- A sidewalk on south side of CR 43 between east end of Kemptville Mall and CR44 and a sidewalk on north side of CR 43 between east end of Community Square (at lights) and CR 44. There is also a sidewalk on the south side of the Kemptville Creek bridge.
- Hydro lines follow along the south side of CR 43 from Somerville Road to just west of CR 44 then crosses diagonally through a Building Supply store. There are hydro lines along north and south side of CR 43 from east of CR 44 to eastern limits of study area.
- Speed limit drops to 40 km (when lights flashing) for the St. Michael Catholic High School zone, between a restaurant and the Community Square shopping centre.

The Municipality of North Grenville has a waste water treatment plant on the north side of the CR 43, west of the Kemptville Creek Bridge.

4.3.4 Planning Policies and Designated Land Uses

4.3.4.1 Provincial Planning Policies

The Planning Act

The *Planning Act* (2005) sets out the ground rules for land use planning in Ontario and describes how land uses may be controlled, and who may control them. Pursuant to the *Planning Act*, the Province of Ontario is the primary planning authority in Ontario. The *Planning Act* enables the Province to delegate some of its planning authority to the upper-tier municipalities (e.g., counties and regional/district municipalities, as well as planning boards) while retaining control through the approval process. Municipalities must conform to approved policies of the Provincial government and its agencies.

Provincial ministries, municipal councils, planners and other stakeholders implement the *Act* when such actions include:

- Preparing Official Plans and planning policies that guide future development considering provincial interests, such as protecting and managing natural resources; and
- Regulating and controlling land uses through zoning by-laws and minor variances.

Provincial Policy Statement

The *Provincial Policy Statement* (PPS) is the complimentary policy document to the *Planning Act* (2005). Issued under the authority of Section 3 of the *Planning Act*, the PPS provides direction on matters of provincial interest related to land use planning and development and promotes the provincial “policy-led” planning system that recognizes and addresses the complex inter-relationship among environmental, economic and social factors in land use planning (MMAH, 2005).

The *Planning Act* requires that the PPS be reviewed periodically to ensure its policies are still effective. The new PPS (2005) took effect on March 1, 2005 and provides for enhanced protection of the environment by identifying the significance of the natural heritage system and water resources, including natural hazards and water quality, air quality and energy use. The new policies provide for intensification and brownfields development to ensure the maximum use of sewer, water and energy systems, roads and transit. The PPS provides for more transit-friendly land use patterns using intensification and more compact, higher density development, as a means of bringing more people closer to the transit routes (MMAH, 2005).

4.3.4.2 Municipality of North Grenville

Official Plan

The Municipality of North Grenville completed its Five Year Official Plan review as mandated by the Province under the provisions of Section 26(1) of the *Planning Act*. The last Official Plan review was conducted in 1998-99, and the previous Official Plan came into effect on June 2, 2000. The current Official Plan was adopted by Council on May 11, 2009.

The underlying community values of the Official Plan state that:

- North Grenville is comprised of supportive, caring, and friendly people – which is reflected in local organizations;
- North Grenville believes in economic self-sustainability of community; and
- Environmental sustainability is a core value of the North Grenville Community.

The study area is located in the *Schedule 'B' – Urban Service Area* where the majority of residential, commercial and business growth and development in the Municipality will take place (See the *Socio-Economic report* in Appendix C). This *Urban Service Area* will ensure sustainable growth by providing a commuter community for the Ottawa-Carleton Region, and reduce the pressure for rural non-farm development in rural areas.

Land use in the study area is primarily designated *Highway Commercial*, with pockets of residential areas between CR 44 and the south branch of the River Rideau, and agricultural land uses on the north side of CR 43 between James Street and the south branch of the River Rideau. Land use adjacent to the Kemptville Creek is designated as *Floodplain Hazards* and is designated a Provincially Significant Wetland (PSW).

4.3.4.3 Future Development

Section 10.9 Special Study Area – CR 43 and 44 Corridor, provides urban design guidelines for development proposals along the CR 43 corridor. These guidelines include:

- Road widening right-of-way dedications;
- Sidewalk dedication;
- Appropriate entrances and exits;
- Landscaping provisions;
- Un-intrusive signage;
- Placement of utilities underground; and
- Appropriate roadway illumination and traffic control lights.

4.3.5 Recreation Trails

North Grenville has a variety of trails throughout the community. The North Grenville Trail system has 150 kilometres of existing rails, urban streets, rural roads and waterways. The trails consist of walking and hiking trails, and well maintained roads that can be used for horseback, bicycle, and automobile. The North Grenville Trail system is made up of:

- Ferguson Forest Centre Management Trail;
- Limerick Forest Chalet Trail,
- Rideau Canal Lockstation – Burrits Rapids Tip-to-Tip Trail; and
- University of Guelph – Kemptville Campus Agroforestry Trail.

At the east end of the study area, the County Road 19 paved trail intersects with County Road 43 at the roundabout and continues southwards to Vanburen Street. The Turtle walking trail intersects County Road 43 near the water treatment plant. It provides a connection to the paved trails of County Road 44 (through the Management Trail) and County Road 18. The County Road 44 paved trail intersects County Road 43 and follows the roadway westwards to the Pinehill walking trail and then heads south connecting to County Road 18. Both trails are marked with directional signage.

The Planning Department for the Municipality of North Grenville does not have planning guidelines for the North Grenville trails system but is reviewing the implementation of sidewalks along the outer urban streets and within future residential developments.

4.3.6 Emergency Service Providers

Emergency services in the Municipality of North Grenville include police, fire and ambulance coverage. Police services are provided by the Ontario Provincial Police (OPP) and are located on CR 44 to the north of CR 43.

The Fire Department is located on CR44, and is comprised of 38 volunteers and one full time fire chief. The department services a 415 km² area including the Municipality of North Grenville and adjacent communities.

Ambulatory services are provided by the United Counties of Leeds and Grenville. The Kemptville District Hospital is located on Concession Road and the emergency services garage is located at County Road 44 approximately 1 km north of CR43.

4.3.7 Schools

St. Michael Catholic High School is located on CR 43 near James Street and is one of two high schools located in the community. The high school is buffered from CR 43 by a long entrance way and recreational field.

4.4 Noise Sensitive Areas

Section 12.14 of the draft Official Plan describes residential areas as noise sensitive areas (NSA's). It further states that the appropriateness of the development of any proposed major source of noise (non-residential) in close proximity to existing residential development will be considered.

Land uses designated as noise sensitive by the MTO directive QST A-1 consist of the following:

- Private homes such as single family residences
- Townhouses
- Multiple unit buildings, such as apartments with Outdoor Living Areas (OLAs) for use by all occupants
- Hospitals, nursing homes for the aged, where there are OLA's for the patients

Land uses that do not qualify as noise sensitive by the MTO directive QST A-1 consist of the following:

- Apartment balconies above ground floor
- Educational facilities (except dormitories with OLA's)
- Churches
- Cemeteries
- Parks and picnic areas which are not inherently part of a NSA
- Day care centres
- Commercial and industrial

There are a number of residential noise sensitive areas (NSAs) within the study area. **Figures 4-6 to Figure 4-9** below identify receptor locations along CR43 which were assessed. Other dwellings with similar setback and orientation to the roadway will receive similar sound exposures and associated noise impacts. Dwellings located further away from the roadway will receive reduced sound exposures due to increased distance attenuation.

Figure 4.6: NSA Area A

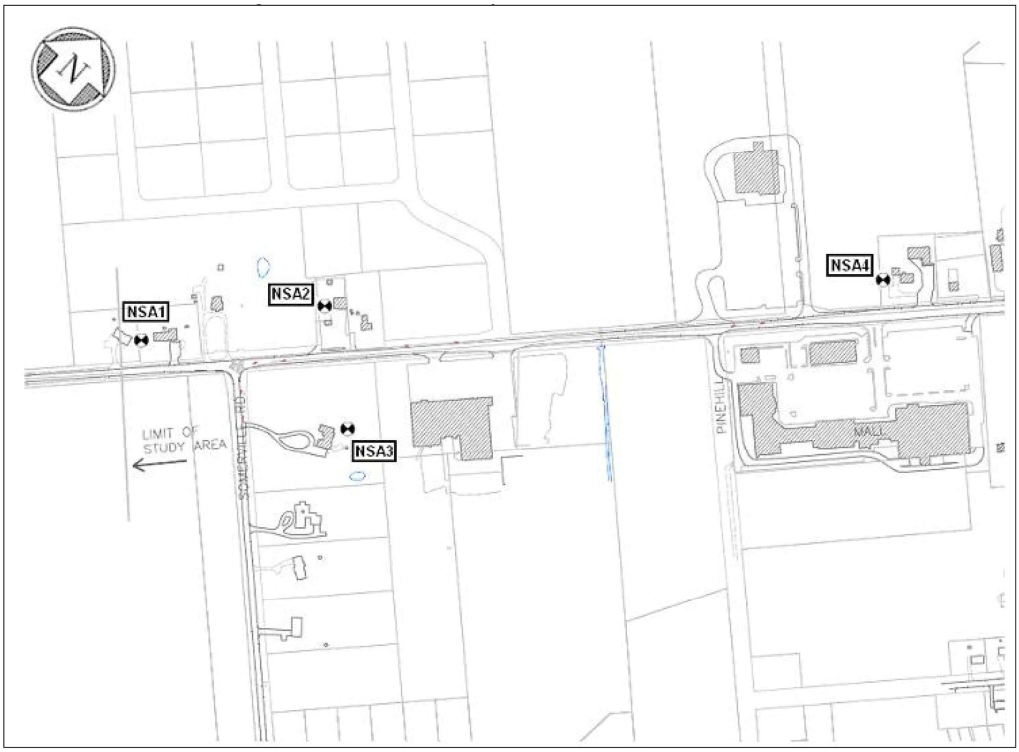


Figure 4.7: NSA Area B

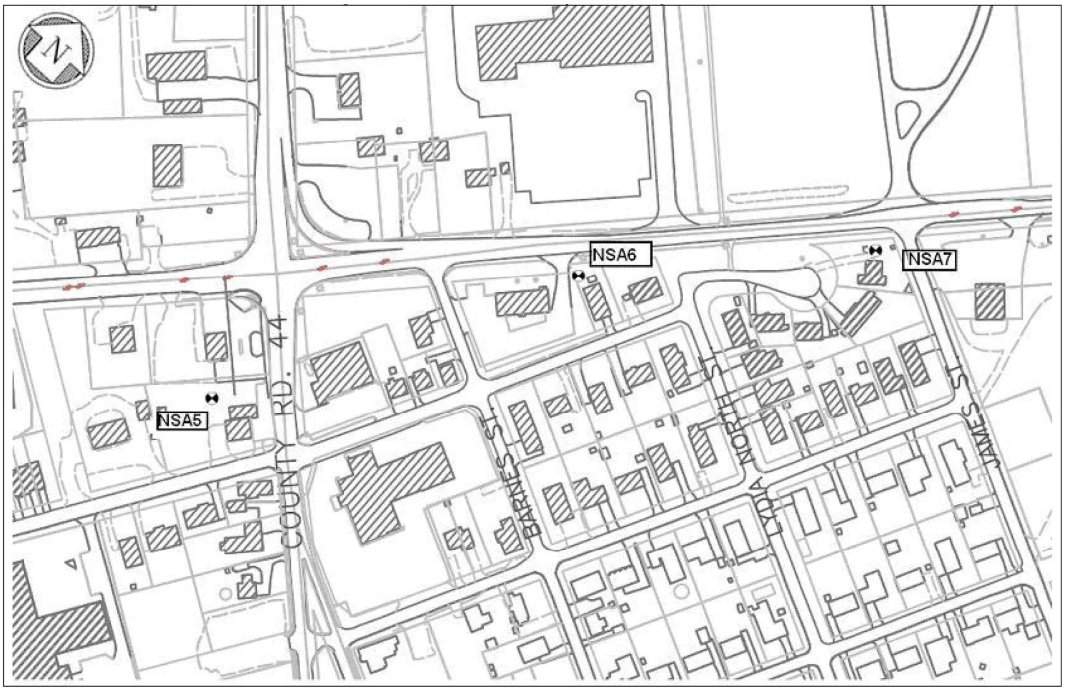
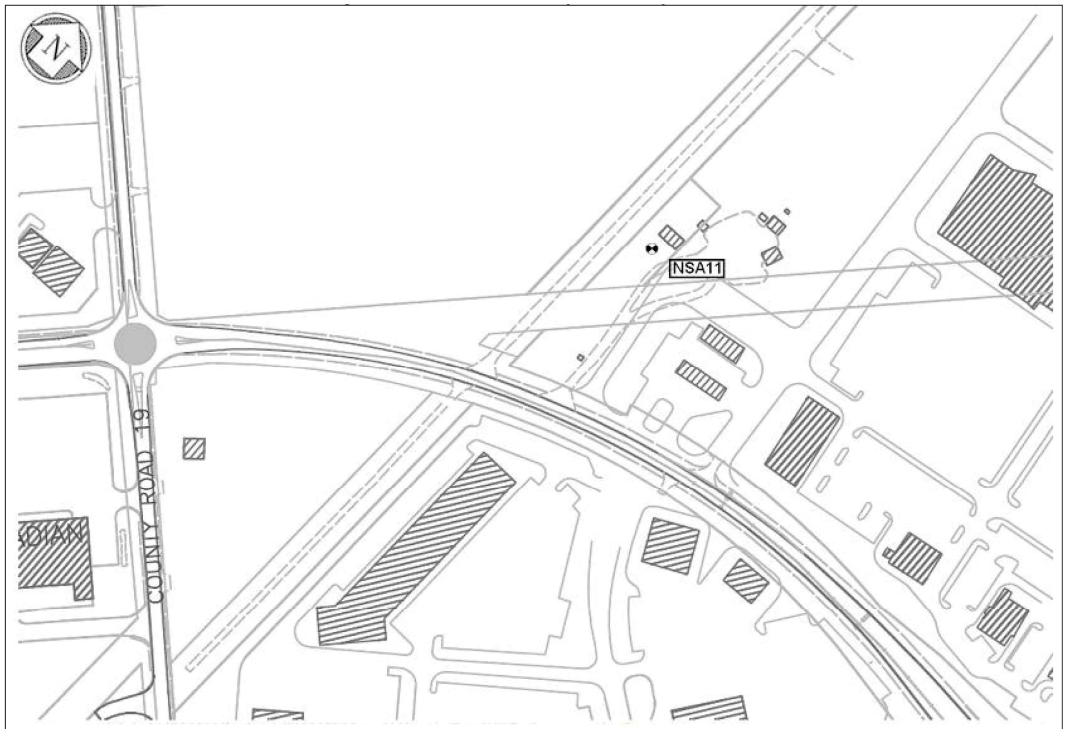


Figure 4.8: NSA Area C

Figure 4.9: NSA Area D



4.4.1 Noise Study

A noise study was completed where the purpose of the study was to assess the resulting noise impact of widening CR43 from two lanes to four between Somerville Road and Highway 416.

The MOE/MTO protocol states that if the expected impact (change in noise level above ambient) of implementing roadway improvements is expected to be within 0-5dB no mitigation effort is required. However, if the change in noise level above ambient is expected to be greater than 5dB investigation of mitigation effort is required. The objective sound level is specified as the greater of the predicted future "Do Nothing" ambient or 55 dBA. **Tables 4-5** and **4-6** below represent the mitigation effort required based on the expected noise impact of implementing any proposed roadway improvements.

Table 4-5: MTO/MOE Protocol for Dealing with Noise Concerns

Change in Noise Level Above Ambient	Mitigation Effort Required
– 5 dB change	None
5 dB change	Investigate noise control measures on Right-of-way. If project cost is not significantly affected introduce noise control measures within the right-of-way. Noise control measures, where introduced, should achieve a minimum of 5 dB attenuation, over first row receivers. Mitigate to ambient, as administratively, economically, and technically feasible.

According to QST A-1, Outdoor Living Areas (OLAs) are typically used as points of assessment for NSA's. OLAs include an area at ground level, adjacent to the wall of a building associated with an identified NSA which accommodates outdoor living activities. Additional NSAs of interest which do not represent the typical scenario were also included to address potential noise concerns due to the impact of the proposed roadway. These additional NSAs have been included since secondary locations that may act as OLAs (side yards) exist due to the size and configuration of the properties.

The MTO/MOE protocol recognizes that an important assessment criterion for existing dwellings is the change in sound exposure above ambient sound levels. Any change between 0-5dB requires no mitigation effort; whereas, any change greater than 5dB requires further investigation of noise control measures. **Table 4-6** complements the MTO/MOE protocol and represents the perceived impact of changes in sound level.

Table 4-6: Perceived Impact of Increased Sound Levels

Increase Sound Level Above Ambient (dB)	Perception	Perceived Impact
0 to 3	No change	Nil
4 to 5	Perceptible change	Low
6 to 9	Almost twice as loud	Medium
10 and Greater	Twice as loud or greater	HIgh

4.4.2 Traffic Data

Traffic information for the roadway widening project was provided in the form of Average Annual Daily Traffic (AADT) for the existing roadway conditions as well as the future "With Improvments" scenario. Additionally, the future "Do Nothing" traffic volumes were projected from existing values to the year 2029 using a 2.3% growth rate (adopted from the Corridor Master Plan) producing AADT2029 estimates. It is understood that a 10% increase in road traffic volume is expected during summer months.

AADT volumes were increased by 10% to estimate the summer average daily traffic volumes (SADT) which represent the worst case traffic volume scenario.

Medium trucks represent 5% of the SADT and heavy trucks represent 0.7% of the SADT. Truck percentages are not expected to change over time. Traffic counts on CR43 indicate that 94% of the daily traffic occurs between the hours of 0700 and 2300 (Daytime) and the remaining 6% occurs between the hours of 2300 and 0700 (Night time).

4.4.3 Procedure

Sound exposures were calculated using STAMSON V5.04-ORNAMENT, which is a prediction model produced and accepted by the MOE. To assess the noise impact, the predicted future "Do Nothing" sound exposures (year 2029) were compared to those of the predicted future "With Improvements" sound exposures (year 2029).

Ambient sound levels in the vicinity of the noise sensitive areas are dominated by road traffic noise from CR43, all other noise sources were ignored in the ambient sound level calculations. This is a conservative approach since, in the noise impact assessment; any secondary sources would tend to reduce the significance of sound exposure changes (i.e. impact) due to CR43.

Table 4-7 shows for each identified receptor, the existing (2009) sound exposures, the future (2029) sound exposures with and without the proposed road improvements, and the resulting noise impact (i.e. change between scenarios). The NSA location map in **Figures 4-6 to 4-9** show the location of the NSA's which were assessed.

Table 4-7: Unmitigated Noise Assessment Results

Location	Existing Leq, Day (dBA)	Future Leq, Day (dBA)		Noise Impact (dB)	Preceived Noise Impact
		"Do Nothing"	"With Improvements"		
NSA1	54	56	57	1	Nil
NSA2	55	57	58	1	Nil
NSA3	50	52	53	1	Nil
NSA4	57	59	60	1	Nil
NSA5	52	53	54	1	Nil
NSA6	62	64	65	1	Nil
NSA7	62	64	55	1	Nil
NSA8	63	65	65	0	Nil
NSA9	53	55	56	1	Nil
NSA10	49	51	51	0	Nil
NSA11	49	51	53	2	Nil

In many cases the sound exposures are above the 55dBA objective limit set by the MTO/MOE guideline with the implementation of the proposed road widening. Seeing that the noise impact at all NSAs is expected to be less than 5 dB, no mitigation effort is required. Additionally, the perceived impact as defined in **Table 4-2** at all NSAs would be considered nil when compared to the future "Do Nothing" scenario. **Table 4-8** below summarizes the results of assessing noise impact and mitigation needs.

Table 4-8: Noise Assessment Results

Location	Fufure (2029) "Do Nothing" Leq.Day(dBA)	Future (2029) "With Improvements" Leq.Day(dBA)		Noise Impact [(2)](dB)		Recommended Mitigation Measures	Perceived Noise Impact with Mitigation Measures[(3)]	Noise Reduction Achieved[(4)] (dB)
		No Mitigation	Mitigated[(1)]	No Mitigation	Mitigated[(1)]			
NSA1	56	57	-	1	-	None	-	No Mitigation Required
NSA2	57	58	-	1	-	None	-	No Mitigation Required
NSA3	52	53	-	1	-	None	-	No Mitigation Required
NSA4	59	60	-	1	-	None	-	No Mitigation Required
NSA5	53	54	-	1	-	None	-	No Mitigation Required
NSA6	64	65	-	1	-	None	-	No Mitigation Required
NSA7	64	65	-	1	-	None	-	No Mitigation Required
NSA8	65	65	-	0	-	None	-	No Mitigation Required
NSA9	55	56	-	1	-	None	-	No Mitigation Required
NSA10	51	51	-	0	-	None	-	No Mitigation Required
NSA11	51	53	-	2	-	None	-	No Mitigation Required

Notes: **1.** Mitigated value is not shown if mitigation is not recommended. Calculations showing the effects of mitigation for all NSAs are presented in Traffic Noise report in the Existing Conditions Report found in Appendix C.

2. The noise impact was calculated by subtracting the [Future (2029) "Do Nothing"] sound level from the [Future (2029) "With Improvements" - Mitigated] sound level.

3. The perceived noise impact, as per Table B (Appendix C), with mitigation installed where indicated.

4. Noise reduction is calculated by subtracting the [Future (2029) "With Improvements" - Mitigated] sound level from the [Future (2029) "With Improvements" - No Mitigation] sound level. A minimum acceptable noise reduction of 5 dB must be achieved for a sound barrier to be considered effective enough to justify construction.

4.4.4 Noise Mitigation

All of the noise sensitive areas considered in the study have a nil impact when comparing the noise levels of the future "Do Nothing" and future "With Improvements" scenarios. The resulting noise impact is predicted to be less than 5dB for all NSAs and therefore no noise mitigation is necessary according to the MTO/MOE protocol.

4.4.5 Construction Noise

Construction noise is temporary and unavoidable. The effect of construction noise at all NSAs is dependent on various factors such as time of operation and size of equipment. Recommendations relating to the management of construction noise include:

- Adherence to applicable local bylaws. Instances where adherence to the local bylaws is not possible and mitigation is not feasible an exemption should be obtained from the municipality before construction.
- Construction equipment noise emissions should comply with MOE guideline NPC-115.
- Contract documents provided to the contractor should contain general noise control measures to mitigate the noise impact at noise sensitive areas including two standard clauses regarding equipment noise:
- Unnecessary noise caused by faulty or non-operating components must be addressed by regularly maintaining all equipment.
- Duration of construction equipment idling is to be restricted to the minimum time necessary to complete the specific task.
- A noise complaint process may be set in place similar to the MTO directive QST A-1:
- Any initial complaint from the public will require verification by the County that all noise control measures to be applied are in effect. The United Counties will investigate any noise concerns, advise the contractor of any problems, and enforce its contract.
- Notwithstanding compliance with any noise control measures identified in the contract documents, a persistent complaint will require the County to undertake a field investigation to determine noise level emissions. Where noise level emissions, for that construction equipment in use, exceed the sound level criteria for construction equipment contained in the MOE Model Municipal Noise Control Bylaw, the County shall require the contractor to comply with the sound level criteria where quieter alternative equipment is reasonably available. When this occurs, the County shall pay the contractor for costs incurred. Where a quieter alternative is not reasonably available, the equipment in use will be accepted.

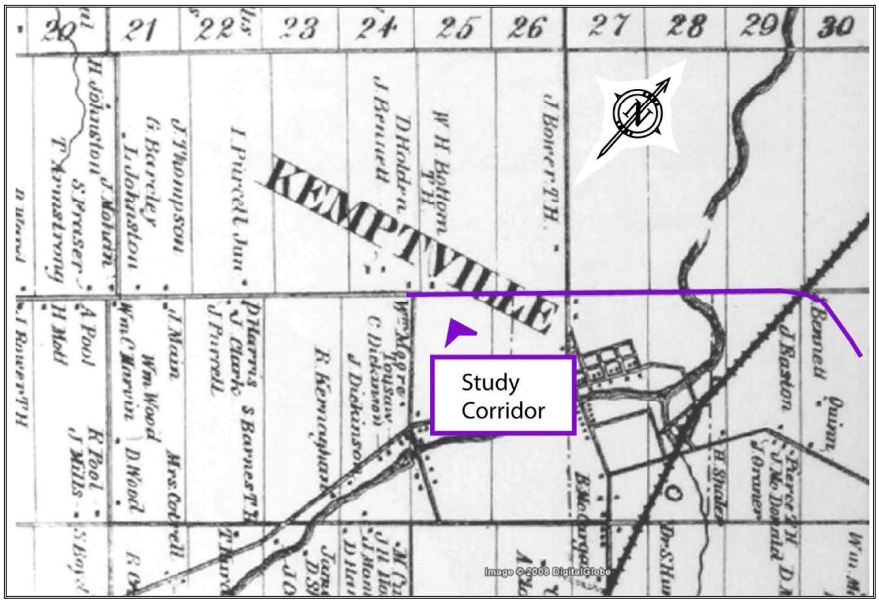
4.5 Archaeological and Built Heritage Resources

Archeoworks Inc. undertook the Stage 1 Archaeological Assessment along the CR43 corridor. The final report of the Stage 1 Archaeological Assessment can be found in Appendix C as part of the Existing Conditions Report. This report was completed by Kim Slocki and is dated July, 2009 and included a field study which was completed during the late winter months when snow still covered the ground. The report was completed in accordance with the Ontario Heritage Act (1990). The assessment studied the various databases and agencies including the Ministry of Culture.

The assessment investigated archaeological potential based on environmental factors such as proximity to water, soil type and nature of the terrain as they can sometimes predict where human occupation may have occurred in the past.

The report identifies two existing archaeological sites within two kilometres of the corridor which have been registered with the Ministry of Culture. These sites both have the cultural affiliation of Euro-Canadian. A historical map shown in **Figure 4-10** has been provided, which illustrates four structures within 100m from the corridor. Included in the Archaeological Assessment is a table which shows the history of occupation in southern Ontario.

Figure 4.10: Historical Map of Study Area



The report concluded that this site has features which indicate archaeological potential and a resultant Stage 2 Archaeological assessment is required. These features include:

- Registered archaeological sites within 250m,
- Presence of primary water course within 300m,
- Presence of secondary water course within 200m,
- Features indicating past presence of water source within 300m,
- Pockets of sandy soil in a heavy soil or rocky area,
- Evidence of early Euro-Canadian settlement within 300m,
- Associated with historic transportation route (railway, roadway).

4.5.1 Recommendations

A large area of the study corridor has been determined as undisturbed and is recommended for further study. A detail of drawing of this can be found in the final report in Appendix C. This additional study would be a stage 2 archaeological assessment which would include a more detailed site evaluation and minor excavations. A stage 2 assessment is to occur prior to any construction works.

It has been noted that this Stage 1 assessment was conducted while snow still covered the ground and hence the recommended additional study may be reduced during the Stage 2 assessment.

5. Alternate Solutions

5.1 Background

The Technical Steering Committee (TSC) met on two occasions to evaluate a number of alternatives which had arisen from the technical specialists. On August 11, 2009 and September 8, 2009 the committee considered alternatives for three aspects of the corridor - Corridor Cross-Section Features, Centre Corridor Intersection Control and the CR43 Bridge. Due to the large number of alternatives for these three aspects, the evaluation process was stretched out over the two meetings and a technically preferred solution for each aspect was found.

During a summary and endorsement meeting on October 20, 2009 the TSC endorsed the two-lane bridge option to the south but recommended that further options with respect to approach fills be considered. The TSC scored harmful alteration, disruption or destruction (HADD) of fish habitat as a major criterion ahead of cost which suggested that further options to reduce HADD area should be considered. A third alternative selection and evaluation meeting was held on November 24, 2009. This meeting evaluated four additional two lane bridge structures to the south of the existing bridge to determine if there was a better alternative which would decrease HADD area at an 'acceptable cost'.

Attendees at the meetings included the following people from the TSC:

August 11, 2009 meeting TSC attendees:

Les Shepherd,	United Counties of Leeds & Grenville
Sandy Hay,	United Counties of Leeds & Grenville
Jeff McEwen,	Municipality of North Grenville
Forbes Simon,	Municipality of North Grenville
Doug Boyd,	MTO
Mike Gibbs,	MTO
Hal Stimson,	RVCA
Guy Laporte,	AECOM
Shane Gray,	AECOM

September 8, 2009 meeting TSC attendees:

Les Shepherd,	United Counties of Leeds & Grenville
Jeff McEwen,	Municipality of North Grenville
Karen Dunlop,	Municipality of North Grenville
Doug Boyd,	MTO
Mike Gibbs,	MTO
Hal Stimson,	RVCA
Guy Laporte,	AECOM
Shane Gray,	AECOM

November 24, 2009 meeting TSC attendees:

Les Shepherd,	United Counties of Leeds & Grenville
Sandy Hay,	United Counties of Leeds & Grenville
Jeff McEwen,	Municipality of North Grenville
Karen Dunlop,	Municipality of North Grenville
Mike Gibbs,	MTO
Hal Stimson,	RVCA
Guy Laporte,	AECOM
Shane Gray,	AECOM

The TSC received specialist advice to assist it with its consideration of alternatives. This advice is summarized in the Existing Conditions Report which includes specialist studies on:

- Stormwater Management
- Bridge design and engineering alternatives
- Waterway Navigability
- Environment Site Evaluation
- Geotechnical
- Traffic
- Traffic Noise
- Socio-Economic and
- Archaeological

Presentations of these specialist reports were conducted at the two TSC meetings prior to the August 11, 2009 meeting. To answer any additional enquiries the TSC may have while deciding on the preferred alternative AECOM's transportation engineer was present at all three evaluation meetings and AECOM's road designer was present at the first two meetings. They did not participate in the scoring of alternatives.

5.2 Corridor Cross-Section Features

A number of preliminary cross-section features and drawings were discussed during the Corridor Master Plan study. These features included a 1m centre median to separate the two directions of traffic, pedestrian and bicycle facilities, 3.5m wide driving lanes etc. These preliminary drawings of the corridor can be found in the Master Plan. The preliminary cross-sections from the master plan are shown in Appendices in the *Evaluation Report*. The *Evaluation Report* can be found in Appendix D of this report.

The TSC recognised that there are alternatives for the size and location of various corridor features identified within the Master Plan. While the Master Plan identified a number of features it did not detail the corridor in depth and did not include additional features such as landscaping and the aesthetics of the corridor.

The public were urged to comment on features during the Public Information Centre No.4 in early March 2009. Comments on the possible inclusion of bicycle lanes within the road or a multiuse pathway were encouraged as well as any additional comments or recommendations they may have on the corridor features and the study.

5.2.1 Features

This section identifies the various features and alternatives of the corridor that were proposed and the recommended cross-section. The TSC considered a number of features for the corridor including:

- Bicycle lanes within the road
- Sidewalk within the boulevard
- Shared multiuse pathway in the boulevard
- Separate bicycle lane and sidewalk within the boulevard
- A small 1m wide centre median to separate traffic
- A large 5.5m wide centre median which included landscaping
- A smaller 2m wide centre median which includes street lighting and possibly planter boxes
- Location for utilities and street signage
- Corridor width

From the various features identified above, AECOM's road designer provided the TSC with four additional alternative cross-sections for the corridor. These can be viewed as Figure 2 and Figure 3 in Appendices in the *Evaluation Report*. The *Evaluation Report* can be found in Appendix D of this report.

5.2.2 Alternatives

The TSC chose to evaluate these five alternatives

Alternative 1 – This alternative is from the Master Plan and includes a 26m Right of Way (ROW). It contains a 1m wide concrete centre median, all driving lanes to be 3.5m wide, a 1.5m wide bicycle lane extended from the roadway pavement, a 1.75m wide boulevard (includes street signs and utilities), a 1.5m wide sidewalk and a 0.5m buffer. All curbs are to be barrier curb.

Alternative 2 – This alternative increases the corridor ROW to 30m. It contains a 5.5m wide landscaped centre median, all driving lanes to be 3.5m wide, a 1.5m wide bicycle lane extended along the roadway pavement, a 1.3m wide boulevard (includes street signs and utilities), a 1.5m wide sidewalk and a 0.5m buffer. All curbs are to be barrier curb.

Alternative 3 – This alternative uses the smaller corridor ROW of 26m. It contains a 3.4m wide centre median which can include planter boxes but cannot be directly landscaped, the left hand driving lane to be 3.5m wide and right hand driving lane to be 4.25m (this includes a bicycle allowance), a 0.8m wide paved boulevard (includes street signs and utilities), a 1.5m wide sidewalk and a 0.5m buffer. All curbs are to be barrier curb.

Alternative 4 – This alternative uses the larger corridor ROW of 30m. It contains a 2m wide centre median, all driving lanes to be 3.5m wide, a 1.35m wide paved boulevard (contains street signs), a 2m wide paved bicycle lane, a 1.5m wide concrete sidewalk 50mm higher than the bicycle path and a 1.5m buffer (includes utilities). All curbs are to be barrier curb.

Alternative 5 – This alternative also uses the larger corridor ROW of 30m. It contains a 2m wide centre median, all driving lanes to be 3.5m wide, a 2m wide paved bicycle lane separated from the roadway by a 0.8m wide mountable curb, a 1.95m wide boulevard (contains street signs and utilities), a 1.5m wide concrete sidewalk and a 0.5m buffer. The median curb is to be barrier curb the curb along the bicycle path is to be mountable curb.

5.2.3 Evaluation of Alternatives

Alternatives 1, 2 and 3 were presented by AECOM in the meeting held on August 11, 2009. During this meeting the TSC agreed it was more practical to discuss and choose the various features and alternatives rather than using a scoring system. As a result the TSC discussed the various features of each cross-section and their advantages and disadvantages. Eventually the TSC requested preliminary drawings of two additional cross-sections. Alternatives 4 and 5 were then presented to the TSC during the September 8, 2009 meeting. The discussions on the corridor features included:

Centre median width – Due to salt spray, the centre median would need to be at least 5m wide if it were to be landscaped. The TSC decided that it was more important to landscape the boulevards than the centre median, and the additional property and cost required to landscape and maintain both sections could not be justified. It was agreed that the centre median should contain some aesthetical feature that did not require large amounts of maintenance. The preferred alternative was to place architectural street lighting in a 2m wide concrete median, planter boxes could also be placed if required during the summer months. This feature was then included in Alternatives 4 and 5 for confirmation from the TSC.

Pedestrian and bicycle facilities – These facilities were recommended in the Master Plan and were commented on again within the updated traffic report. TSC discussions with AECOM's road designer and transportation engineer revealed that a multiuse pathway would be beneficial to the community but would still require an additional bicycle lane to be included in the roadway for experienced riders. Iit was decided that the pedestrian and bicycle facilities should be separated. Although alternatives 1, 2 and 3 show separate bicycle lanes within the roadway which is acceptable, the TSC wished to view other options for the separated bicycle lanes (paths) within the boulevard area behind the curb to increase safety. Alternatives 4 and 5 show bicycle lanes within

the boulevard area. Bicycle lanes in these situations will join both the road, and the sidewalk prior to entering the roundabout. This will allow cyclists to negotiate the roundabout as a vehicle or as a pedestrian. Alternative 5 was preferred as it separated the pedestrians and cyclists while also separating the cyclists from the vehicles.

Utility location – Discussions were held during the August 11, 2009 meeting regarding the possibility of placing the current utility services underground as they will need to be relocated anyway. The TSC agreed that although it would be aesthetically pleasing, the additional cost required to relocate the services underground is extremely large and cannot be justified. As a compromise, it was decided it would be valuable to re-locate all utility overhead road crossings underground. All other utilities can be relocated within the boulevard and extend parallel to the road.

Boulevard size – The TSC recommended that the boulevard area should be large enough to be landscaped and used for snow storage in winter. When the boulevard is generally less then 1.5m wide it is paved for maintenance purposes. The steering committee agreed that a 0.5m minimum buffer should always be maintained between the sidewalk and the property line.

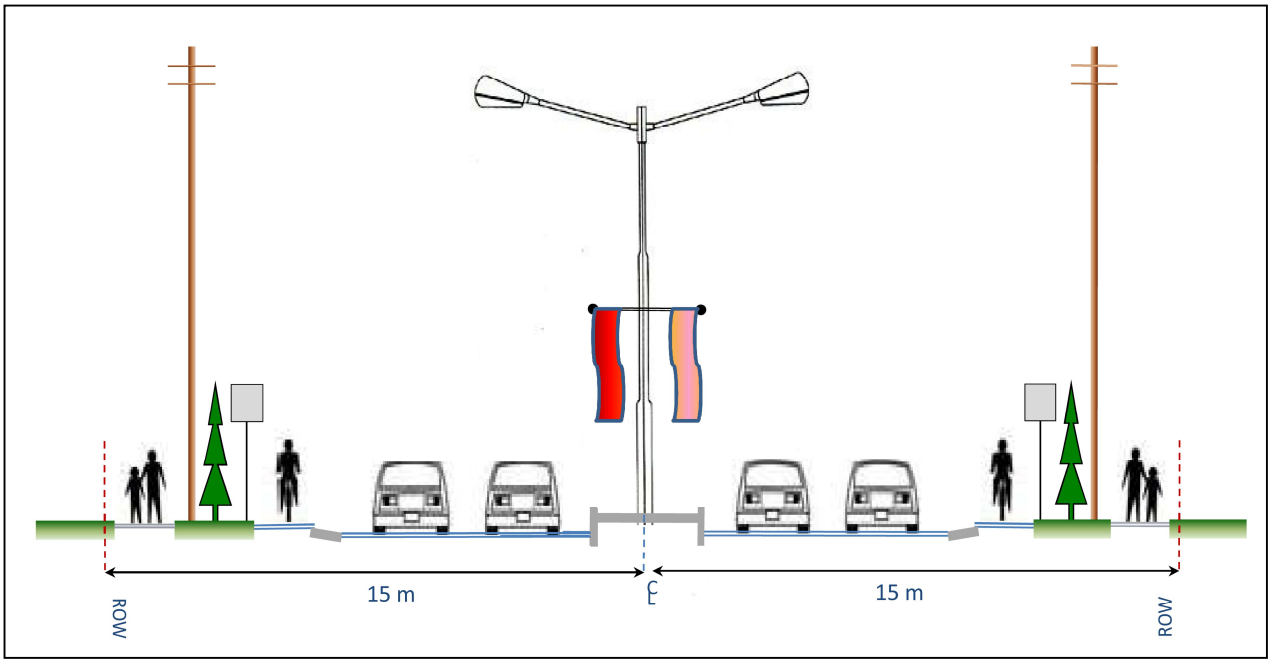
ROW width – The Master Plan made a number of recommendations for certain features to be included within the corridor ROW. The preliminary cross-section drawing in the Master Plan aimed to limit the ROW width by minimising the width of features such as the boulevard and the centre median. When discussing corridor features in the August 11, 2009 meeting the TSC were supplied with a plan of the corridor showing the existing residences and possible 26m and 30m ROW options. The TSC decided that because the additional 4m of land can, in most cases, be acquired with minimal impact on current uses, the 30m ROW offers more advantages and was recommended for Alternatives 4 and 5. There was an understanding that it may not always be possible to obtain the 4m widening without unfairly impacting current uses, in those cases the road designer will need to consider compromises to the proposed cross section.

5.2.4 Technically Preferred Alternative

During the September 8, 2009 meeting, after considering all five (5) alternatives and discussing the recommended features, '**Alternative 5**' was chosen as the Technically Preferred Alternative. This alternative includes a 2m wide centre median with street lighting. This option includes a 2m wide paved bicycle lane is located directly behind the mountable curb. The location of this bicycle lane is preferred because it is away from flowing traffic but still maintains its intended function. It can also be used as a snow storage area in the winter. The 1.95m wide boulevard is large enough and far enough away from the salt spray that it can be landscaped. Street signs and utilities can be placed in this area. The 1.5m sidewalk and 0.5m buffer from the property line are maintained in this alternative. This alternative requires widening of the existing road right-of-way from 26m to 30m.

A preliminary design of the corridor was completed and presented to the TSC at both the October 20, 2009 meeting and the November 24, 2009 meeting. These corridor plans can be found in Appendix A. The full cross-section can be found in **Figure 5-1** and was presented to the public at PIC No.5.

Figure 5.1: Technically Preferred Alternative Corridor Cross-Section



5.3 Centre Corridor Intersection Control

The centre area of the corridor extends from County Road 44 to St Michael's High School (James Street). This area was being re-assessed as part of this Environmental Assessment because the Master Plan recommended that the CR43 corridor be constructed as a roundabout corridor. However, when that study was completed, there was not a lot of information on pedestrian safety for two-lane roundabouts in Canada. As a result of the traffic and pedestrian demand within this centre corridor area, traffic signals were recommended for the CR43 – CR44 intersection and for a pedestrian crossing adjacent to St Michaels High School.

Over the past four (4) years more data has been collected and analysed on two-lane roundabouts in Canada. In particular a lot more data has been analysed on high pedestrian demand, safety and movements at two-lane roundabouts. The traffic report within the *Existing Conditions report* commented that the existing traffic signals at CR44 and at the community square entrance "cannot accommodate the future demand without major upgrades including pole relocation/replacement, new control hardware and additional signal hardware". As a result of the recommended upgrades and new data, the traffic report revisited the original decision to install traffic signals over roundabouts within this area.

5.3.1 Alternatives

Five (5) alternative configurations of intersection control for the centre area of the corridor were selected by the TSC for evaluation. These include:

Do Nothing – Signals at CR44, Signals at Community Square, and roundabout at St Michaels High School (i.e. as recommended by the Corridor Master Plan). This options still requires signals to be replaced and intersections upgraded.

Option 1 – Roundabout at CR44, roundabout at Community Square, roundabout at St. Michaels High School

Option 2 – Roundabout at CR44, partial signals at Community Square, roundabout at St. Michaels High School

Option 3 – Roundabout at CR44, median at Community Square, roundabout at St. Michaels High School

Option 4 – Roundabout at CR44, signals at Community Square, roundabout at St. Michaels High School

A recommendation for the preferred option was not completed in the traffic report. The traffic report and further discussions at the TSC meetings with the Transportation Engineer did support that roundabouts are a safe intersection control for both vehicles and pedestrians at these two hotspots. However, the final decision for the preferred option was left to be made by the TSC.

During the August 11, 2009 meeting a preliminary analysis of the 'Do Nothing' option and Options 1, 2, and 3 was presented to the TSC. This was initially completed by AECOM and was scored against eleven environmental factors using a basic scoring system. In this scenario 'Option 3' scored the highest while 'option 1' was scored second. Both the 'Do Nothing' option and 'Option 2' scored equal lowest. Score sheet No.1 is shown in appendices in the *Evaluation Report*. The *Evaluation Report* can be found in Appendix D of this report.

The TSC discussed each option and after further discussions the TSC determined that 'option 3' was not a fair or viable option as it impeded vehicular access to the community square. Consequently it was decided to remove this option from the list but included 'Option 4' which incorporates a full set of traffic signals at Community Square.

A second score sheet was then produced for the September 8, 2009 meeting. This score sheet included the 'do nothing option', 'option 1', 'option 2' and 'option 4' and it was decided to use the weighted additive method to compare alternatives. The score sheet was updated to include measurements which illustrate whether the options are better or worse when compared to the 'do nothing' scenario. The first step in the evaluation process is to score each alternative for each factor and then score each environmental factor. A copy of this score sheet is included in **Table 5-1**.

A weighted score was then calculated using these values. The preferred alternative is the alternative with the largest average score calculated from the scores of the members of the TSC.

ALTERNATIVES SCORE SHEET No.2

Factor	Discussion	Do Nothing Signals at CR44 Signals at Community Square RAB at St. Michael School	Option 1 RAB at CR44 RAB at Community Square RAB at St. Michael School	Option 2 RAB at CR44 Partial Signals at Community Square RAB at St. Michael School	Option 4 RAB at CR44 Signals at Community Square RAB at St. Michael School
Air Quality	A roundabout with 25,000 daily entering vehicles can reduce fuel consumption by 227,000 Litres per year compared to a signal	NO CHANGE	MUCH BETTER	BETTER	BETTER
Score					
Vehicle Access	Is access maintained to current standard	NO CHANGE	MUCH BETTER	WORSE	BETTER
Score					
Safety	Introducing a roundabout will reduce collisions	NO CHANGE	MUCH BETTER	BETTER	BETTER
Score					
Pedestrians & Cyclists	Traffic signals may be more pedestrian and bicyclist friendly than a 2-lane roundabout	NO CHANGE	MUCH WORSE	WORSE	WORSE
Score					
Travel Time	Roundabouts improve travel time through reduction of queuing	NO CHANGE	MUCH BETTER	BETTER	BETTER
Score					
Business Impacts - Access	Businesses historically have had a preference for traffic signals at their entrances	NO CHANGE	WORSE	NO CHANGE	NO CHANGE
Score					
Roundabout Corridor	Roundabouts are consistent with design philosophy that has been established for this corridor	NO CHANGE	MUCH BETTER	BETTER	BETTER
Score					
Capital	Allowing that intersections will be fully reconstructed when road is widened to four lanes, road construction costs are nominally the same for RAB's vs. signalized interesections with turn lanes. Traffic signals are an additionial cost that is not required for RAB.	NO CHANGE	MUCH BETTER	BETTER	BETTER
Score					
Operational	Operational costs are lowest for RAB's. Allow $1,500 per year for maintenance and power for each set of traffic signals.	$3,000 per year	--	$1,500 / year	$1,500 / year
Score					
Property Acquisition	Development of RAB at 44/43 will require additional property on SE corner.	NO CHANGE	WORSE	WORSE	WORSE
Score					
Score					

5.3.2 Analysis of and Evaluation of Alternatives

5.3.2.1 Environmental Factors

The first step in the evaluation process is to score each alternative for each factor. The following explains each factor and which options are ideal and which options have problems.

Air Quality
The average delay at a roundabout is significantly less than for a traffic signal. Therefore alternatives with more roundabouts have shorter delays and shorter idling times, resulting in reduced GHG emissions. A roundabout with 25,000 daily entering vehicles can reduce fuel consumption by 227,000 litres per year compared to a signal.

Accessibility
Access and egress is better with roundabouts as the slower speeds of the roundabout allow traffic to merge which reduces the delay at intersections. Roundabouts generally restrict access to right in and right out along the corridor. By maintaining a roundabout corridor where the roundabouts are positioned so that U-turns can occur frequently, good access is generally preserved. Option 2 eliminates the left hand exit from the Community Square.

Safety
Introducing roundabouts with a centre median will reduce vehicular collisions as there will be no left hand exiting or entering the corridor mid block. Vehicles will be required to complete a U-turn at the next roundabout. Speeds at roundabouts are much slower and the opportunity for head on or T-bone accidents is almost eliminated. Therefore, the severity of an accident is reduced.

Pedestrians & Cyclists
Traffic signals may be more pedestrian and cyclist friendly than two-lane roundabouts as they instruct a pedestrian or cyclist when it is safe to cross. This is a major help to those who are mobility or vision impaired. There are a number of additional pedestrian safety devices which are now being integrated with the construction of roundabouts. These include pedestrian cross-overs, HAWK beacons, detectable surfaces and other designs being considered by the OTC committee. Data is continuing to be collected on pedestrian and cyclist activity at two lane roundabouts.

Spacing of Intersections
There may be some conflicts between intersection operations in the future at the CR44 and Community Square signals. These conflicts will be reduced by removing the full intersection at Community Square. These intersections are ideally spaced for roundabouts.

Travel Time
Roundabouts improve travel time through reduction of queuing. Roundabouts have slower speeds which allow traffic to merge easier and quicker which reduces the delay at intersections.

Business Impacts
Businesses traditionally have a preference for traffic signals at their entrances. Signals are a standard form of intersection control in Canada and they are generally well understood.

Roundabout Corridor
Traffic signals can delay movement through a roundabout corridor as they disrupt the flow of traffic travelling through the other roundabouts. This corridor design is consistent with design the philosophy that has been established for this corridor.

Capital Cost

Allowing that the existing intersections will be fully reconstructed when the road is widened to four lanes, intersection construction costs are nominally the same for roundabouts vs. signalized intersections with turn lanes. The construction of the actual traffic signals is an additional cost that is not required for roundabouts therefore making roundabouts a cheaper alternative.

Operation Cost

Roundabouts have low operating costs and have lower maintenance costs than traffic signals. Allow $1,500 per year for maintenance and power for each set of traffic signals.

Property Acquisition

Property requirements are slightly higher for roundabouts as they require a larger area immediately at the corner. The turning lanes required for traffic signals means that there will be property requirements when upgrading the existing signals to a four lane road.

5.3.3 Technically Preferred Alternative

The weighted scores when averaged found that the TSC believed safety to be the most important factor and property acquisition to be the least important factor. The results of the evaluation are found below. Option 1, the roundabout option, scored best with a score of 738.5 out of a possible 900. Option 2 was scored second best at 614.6.

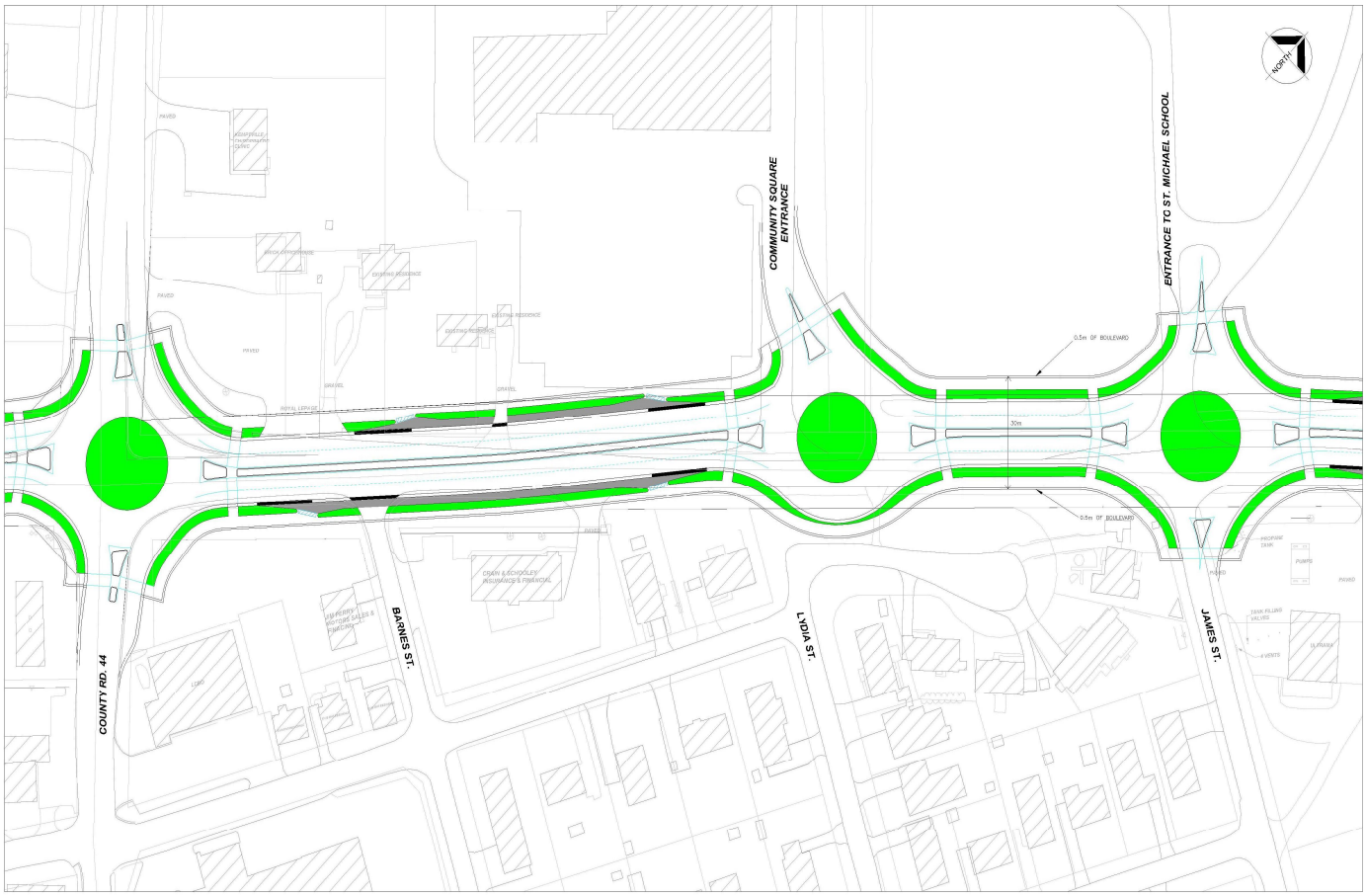
Sensitivity testing was performed after the scoring for each alternative was completed. Sensitivity testing involves eliminating individual criteria, or groups of criteria, to determine if the highest scoring alternative changes when specific criteria are removed. If this is the case, the TSC can be asked to reconsider a smaller group of alternatives to ensure that they have selected the best criteria. In this evaluation, the roundabout option scored best on 7 out of 10 criteria which resulted in a total score that was much higher than the second best. This was considered a “very robust” result. Further evaluation was not needed. The results are shown in **Table 5-2** and the proposed intersection layout is shown in **Figure 5-2**.

Table 5-2: Evaluation Results

Factor	Do Nothing -Signals at CR44 -Signals at Community Square -RAB at St. Michael School	Option 1 -RAB at CR44 -RAB at Community Square -RAB at St. Michael School	Option 2 -RAB at CR44 -Partial Signals at Community Square -RAB at St. Michael School	Option 4 -RAB at CR44 -Signals at Community Square -RAB at St. Michael School
Air Quality	38.6	77.4	60.6	57.1
Vehicle Access	41.3	76.3	46.6	58.1
Safety	84.5	171.0	126.8	115.9
Pedestrians & Cyclists	64.8	40.9	65.8	53.9
Travel Time	38.0	77.5	63.3	54.1
Business Impacts - Access	49.5	37.5	39.8	47.9
Roundabout Corridor	50.6	98.1	83.1	75.0
Capital	48.1	90.5	69.6	67.1
Operational	23.1	53.9	36.6	34.8
Property Acquisition	36.5	15.5	22.5	20.0
Total Score	475.0	738.5	614.6	583.9
Rank	4	1	2	3

Legend: Blue shading indicates top ranked on that line

Figure 5.2: Proposed Centre Corridor Roundabout layout



5.4 CR43 Bridge Crossing the South Branch of the Rideau River (Kemptville Creek)

The County Road 43 Bridge is arguably the most significant and largest part of this Municipal Class Environmental Assessment as it deals with environmentally sensitive areas.

5.4.1 Background

The CR 43 Bridge, crossing the South Branch of the Rideau River (Kemptville Creek) was constructed in 1955 by the Ministry of Transportation Ontario (MTO) and has since been handed over to the United Counties of Leeds and Grenville.

The two-lane concrete bridge spans approximately 36m across the creek and contains a central concrete pier halfway along which extends to bedrock. The abutments are concrete and extend along the water's edge and it is assumed that these extend to bedrock. The bridge, arches between the abutments and the pier and has a clearance at the top of the arch of 3.35m (11 feet) above the average water elevation of the creek. The approaches to the bridge are constructed from unknown fill material and are approximately 55m long (each side) with 1.5:1 (H:V) grassed slopes supporting the CR43 roadway. With the scheduled major rehabilitation, the existing bridge has over 20 years of life left, but is too narrow for the current demand of the corridor and for this reason the crossing needs to be upgraded to include four lanes.

The challenge with the bridge is that the creek is a Provincially Significant Wetland where despite there being no species of risk found in the area during the site evaluation, no work causing impact is to be completed. There is a larger area of wetland to the south of the bridge which contains various flora and fauna, while to the north of the bridge there is a larger area of water which contains fish spawning and habitat areas.

The north side of the bridge is the boundary of Parks Canada's jurisdiction, which is also the boundary of the UNESCO designation as part of the Rideau Canal system. Any work on this side of the bridge including any amendments to the current visual impact of the bridge is subject to scrutiny by Parks Canada and the UNESCO committee. The Rideau Valley Conservation Authority (RVCA) has authority of the southern portion of the creek which starts from the north face of the CR43 Bridge.

The type, size, cost and location for either expanding the existing bridge, constructing a second two-lane bridge or constructing a brand new four-lane bridge creates a vast number of alternatives. The TSC was able to screen the possible alternatives from 162 to 11 before undertaking the first detailed analysis.

5.4.2 Alternatives

As mentioned previously there were a large number of possible alternatives for the CR43 Bridge. The various options for each feature of the bridge are described in the following sections:

5.4.2.1 Alignment

- Construct the additional two-lanes immediately to the north of the existing bridge
- Construct the additional two-lanes immediately to the south of the existing bridge
- Construct the additional two lanes so that there is one lane immediately on each side of the existing bridge

The Master Plan recommended that the corridor be widened from two lanes to four lanes. The current traffic information indicates that the link which includes the CR43 bridge is currently over its planning capacity during the afternoon peak hour and requires widening. It is the TSC's desire to accommodate the necessary widening of the corridor so that it has as little impact as possible on the existing environment.

In addition to the natural environment, there is one major property impact. It is foreseen that this impact is to the existing residential property on the north eastern side of the bridge. This property is only affected if the bridge extends to the north. There should be only minor impacts to the properties on the other corners of the bridge. Properties on the north western and south eastern corners of the bridge are currently undeveloped and the United Counties have previously purchased land on the south western corner of the bridge adjacent to the commercial development.

5.4.2.2 Bridge

- Widen the existing two-lane bridge.
- Construct a second two-lane bridge adjacent to the existing bridge.
- Replace the existing bridge with a new four-lane bridge.

The existing bridge is due for a major rehabilitation. With this maintenance the United Counties can expect well over 20 years of service. Given that the existing bridge is in good condition, options that included retaining this bridge were included.

Widening an existing bridge is an accepted practice but can be much harder and time consuming than building a new bridge. There are issues, such as differential settlement, that make tying into an existing structure difficult. After discussions with the bridge engineers it was decided that it was not necessary to look at options that involved widening the existing bridge by two lanes. It would be easier and less costly to build a separate two lane bridge. Therefore, options that involved construction of a

new two lane bridge to the north or south were carried forward. These options include renovation of the existing bridge to include relevant features of the new corridor.

The option of expanding the existing bridge by one-lane to each side was included as it allows the existing bridge to be maintained and widened along its current alignment. This is a more economical option than building a new one lane bridge on each side of the existing bridge. However, this option reduces traffic flow to one lane while construction of the first side is being completed.

Replacing the existing bridge with a brand new four lane bridge is a viable option as it allows the entire four-lane structure to be of the same age. This also allows the alignment of the corridor to be maintained or expand the additional two lanes to the north or south. This option reduces traffic flow to one lane while removal of the first half of the bridge and construction of the first two lanes is being completed. This alternate will incur costs for the removal of the existing bridge.

5.4.2.3 Spans

- Construct the new bridge or section of bridge to the same standard as the existing bridge i.e. two span
- Construct the new bridge or section of bridge to span the creek and adopt the same size and type of approaches i.e. one span
- Construct the new bridge or section of bridge to span the creek in one span and span the majority of the approaches i.e. three span

As noted above, the existing bridge is a two-span bridge, supported by an abutment on each side of the creek and a pier in the centre of the creek. A two lane alternative was included as it would allow any additional widening or structure to replicate the existing structure. This option affects more HADD area due to the extra in water works for the centre pier.

A single span alternative was included as it allows the removal of the existing pier and reduces the in water works and HADD affected area. This option is a more economical option than the two-span option as it does not involve the extra cost of constructing the centre pier.

The three-span option was considered as it allowed the HADD impacts to be greatly reduced. The 3-span option would contain two piers spaced at 36m (minimum) apart on either side of the creek. The bridge would then span an additional 27m from the piers to the approaches. The additional spans would reduce the HADD impacts as the approaches would not need to be as long, the approach fill areas will then be reduced. The down side to this option is that it is more expensive to construct the longer bridge than the approaches.

5.4.2.4 Clearance

- Construct the new bridge or section of bridge to the same height as the existing bridge i.e. 3.35m (11 feet) clearance
- Construct the new bridge or section of bridge to the same clearance height as the Rideau Canal standard i.e. 6.7m (22 feet) clearance.
- Construct the new bridge or section of bridge to a clearance height of somewhere between 3.35m and 6.7m. Therefore a clearance height of 4.9m (16 feet) was adopted.

During the Public Information Centres during the Corridor Master Plan and PIC No.4 there was a number of comments received requesting that the clearance of the bridge be increased. Increasing the clearances would allow larger boats to pass under and travel to downtown Kemptville. The TSC decided to investigate the possibility of larger bridge heights and whether they can be justified.

Transport Canada was contacted to confirm the requirements of a new structure under the Navigable Waters Act. Transport Canada advised that the standard clearance height of the Rideau Canal is 6.7m but this would not have to be met as South

Branch of the Rideau River (Kemptville Creek) is not part of the main channel. Any additional structure or amendments to the existing structure would have to ensure that the existing clearance of 3.35m is maintained. The 2005 navigational charts for this creek indicate there are two shallow sections downstream of the bridge which impedes larger boats from reaching the CR43 Bridge. These charts advise that Kemptville Creek is to be “navigable only by shallow draft vessels which do not require a vertical clearance greater than 8 feet”.

By increasing the heights of the bridges, the approach heights increase; thereby increasing the fill areas and increasing the HADD affected area. As a result, this option was looked at in depth and the above three heights were evaluated by the TSC.

5.4.2.5 Construction Technique

- Precast Concrete structure
- Cast *in-situ* structure

Both precast and cast *in-situ* (cast in place) structures were discussed with the bridge engineers. While both work effectively it was decided that any widening of the existing bridge would have to be completed as cast *in-situ.* This would be the same standard as the existing bridge and would allow the widening to be tied in and attached much more effectively. There is more in-water works associated with constructing *in-situ* structures as there are large amounts of formwork that need to be constructed.

Precast concrete structures were assumed for any of the new bridges as they are more economical, quicker to build and have less in water works. Steel and truss type bridges were not looked at as they are expensive and require a lot of maintenance.

5.4.3 Analysis and Evaluation of Alternatives

The analysis and evaluation of the above alternatives took place over two meetings on August 11, 2009 and September 8, 2009. From the 162 possible alternatives that these five features create, the committee narrowed the number of alternatives down to 46 feasible/practical alternatives. The TSC were shown the 46 feasible alternatives during the August 11, 2009 meeting; these options are shown in Bridge score sheet 1 in Appendices in the *Evaluation Report*. The Evaluation Report can be found in Appendix D of this report. The table shows the 46 alternatives against the various environmental factors that affect their evaluation.

The factors were placed in the following major categories:

- Natural Environment,
- Social and Cultural Environment,
- Land Use and Property and
- Engineering.
- Transportation

During this meeting the TSC discussed the various alternatives and determined that there were too many to score correctly and that the number of alternatives needed to be reduced.

5.4.3.1 Removal of Alternative Heights

The South Branch of the Rideau River (Kemptville Creek) is a provincially significant wetland which is only travelled by smaller fishing and fibre glass boats which can easily navigate under the County Road 43 Bridge. Larger boats do not access the creek as they are discouraged by shallow water depths (1.2m) where stormwater runoff discharges into the creek at the Ferguson Forestry Centre downstream of the bridge. Dredging the creek would allow more boats to access the creek, however Parks Canada has advised that dredging would not be permitted as it is a provincially significant wetland. The natural environment study

recommended that the clearance of the bridge should not be increased as this may promote more boat activity in a provincially significant wetland and disrupt the current ecosystem.

The TSC considered this downstream water depth to be a limiting factor that restricted the majority of larger boats (greater than 3.35m clearance) from reaching the bridge. Additionally the small number of boaters that the additional clearances would benefit, would be restricted by the Bridge Street Bridge only 820m further up the creek and would still not be able to access downtown Kemptville. Larger structures have a number of significantly greater environmental impacts and a greater cost – the higher structures require higher and wider approaches that have wetland and property impacts.

Transport Canada has indicated that the current height of the CR43 Bridge is acceptable and given the other constraints on the navigability of Kemptville Creek, raising the clearance of the CR 43 Bridge would appear to have limited benefit. Therefore, the TSC deemed that the benefits did not offset the impacts associated with the higher clearances and the TSC decided to remove the alternatives with bridge clearances greater than the existing 3.35m. The removal of alternatives with clearance heights of 4.9m and 6.7m reduced the number of alternatives from 46 to 16.

It was found that the grades and alignment differences between the remaining alternatives had no impact on the analysis and therefore the major category of Transportation was not included in the second score sheet. It was found that the potential for archaeological impacts was the same for each item and could be removed as it would not separate the alternatives.

5.4.3.2 Removal of Two span Alternatives

The number of alternatives was further reduced by removing the 2-span alternatives. The 2-span option is always more expensive than the single span option as it is an additional cost to construct a centre pier and the inclusion of a pier affects a greater HADD area. Therefore all 2-span alternatives were removed, reducing the number of alternatives from 16 to 11.

5.4.3.3 Scoring

The TSC felt that eleven options were manageable and could be scored. They felt that the measurements of the HADD areas should be split into areas of water HADD and wetland HADD as the two have different and unique properties. The number of alternatives was reduced and there were changes to the environmental factors. Therefore, it was decided to update the score sheet and score it at the next meeting.

At the September 8, 2009 meeting the updated score sheet (score sheet No.2) was provided by AECOM. The score sheet used the weighted additive method to compare alternatives. This score sheet can be found below in Appendices in the *Evaluation Report* found in Appendix D.

The first step in the evaluation process was to score each alternative for each factor. Each alternative is scored out of 9 for every factor, where the best option for an environmental factor gets a high score and the worst option gets a low score.

As some environmental categories are more important than others it is vital that they are weighted against each other. Therefore the second step in the evaluation process was to assign a weight to each environmental category. TSC members assigned a weighting out of 100 to each of the 4 categories.

The third step is to weigh each factor within a category against the other factors within that category. TSC members assigned a weighting out of 100 to the factors in each category. These weighting score sheets can be found in Appendices in the Evaluation Report. The Evaluation Report can be found in Appendix D of this report.

To produce a weighted score for each alternative, the alternatives score is multiplied by the equivalent weighted factor and weighted category score divided by 1000. The total weighted score for an alternative is the sum of all of these values. The preferred alternative is the alternative with the largest average score taken from all of the members of the TSC.

The following mitigated environmental factors and environmental categories were weighted and scored by the TSC. Each factor is placed in a category.

5.4.3.4 Natural Environment

HADD Permanent Water Impacts
The HADD area is equal to the water area that is permanently impacted and lost by the construction of both the bridge and approaches. These areas are classed as HADD areas because they include fish spawning and habitat areas. Alternatives extending to the north of the existing bridge and the single span options have larger impacts on this factor. This factor is measured in square metres.

HADD Permanent Wetland Impacts
This HADD area is equal to the wetland area that is permanently impacted and lost by the construction of both the bridge and approaches. The creek is a provincially significant wetland that contains a large number of wetland flora and fauna. Alternatives extending to the south of the existing bridge and the single span options have larger impacts on this factor. This factor is measured in square metres.

Wetland/Water Construction Impacts
This factor is rated from high to low and is based on the temporary construction impacts to the existing wetland and water area around the bridge. This has been included as some alternatives have a larger impact during construction then others. Widening the existing bridge has a higher impact as it is cast *in-situ* and part of the existing bridge is being removed. The single span alternatives have an average impact as they affect a larger HADD area and as a result will be subject to greater construction impacts than a 3-span bridge which is low.

Connectivity Without Additional Structure
Currently the abutments of the existing bridge are located along the water's edge. This restricts the movement of animals along the side of the creek and forces them to either enter the creek or cross the CR43 roadway. The alternatives for a new four-lane, 3-span bridge will allow connectivity from one side of the bridge to the other without crossing CR43. All other options that include the existing bridge or a single span bridge do not allow connectivity without attaching an additional structure to the abutments. The new 2-lane, 3-span options do not allow connectivity now as the existing bridge is being maintained but do allow connectivity in the future when the existing bridge is replaced. This factor compares the alternatives by identifying if the alternative will allow connectivity or not.

5.4.3.5 Social and Cultural Environment

Recreational Trail Below
This factor is much the same as the connectivity factor above. The municipality has expressed interest in providing a recreational trail along the creek. This factor compares the alternatives by identifying if the alternative will allow a future recreational trail to be constructed along the creek bank without attaching an additional structure to the abutments. The alternatives for a new four-lane, 3-span bridge will allow a trail to continue along the bank while all other options require a structure to be attached to the abutments.

Visual Aesthetics
While this factor is opinion based, the visual aesthetics of each alternative is to be evaluated against each other and to ensure that the current aesthetics of the creek are not reduced. The TSC evaluated that a new bridge has better aesthetics then the old bridge and a 3-span bridge with small approaches has better aesthetics then a single span bridge with large approaches.

Possible UNESCO issues

The Rideau Canal is a UNESCO World Heritage Site which includes the Parks Canada administered property along the Canal. This affects the location of the bridge as the Parks Canada property extends from the Rideau River (Canal) to the north face of the CR43 Bridge. Any work on the north side of the existing bridge would be subject to considerable scrutiny to ensure it supports and enhances the UNESCO designation. There would be a number of legal issues with this work as all of the legal deeds and documents refer to the north face of the current bridge. While the World Heritage Site does include a 30m buffer past the Parks Canada boundary it is envisaged that the alternatives which retain the existing bridge and construct a new bridge to the south will not be affected.

5.4.3.6 Land Use and Property

Impacted Residence

It is foreseen that the only residence that will be potentially impacted is the existing residential property on the north eastern side of the bridge and this property will only be affected if the bridge extends to the north. There should be little impact to the other properties on the other corners of the bridge. The properties on the north-western and south-eastern corners of the bridge are currently undeveloped and the United Counties own a portion of land on the south-western corner of the bridge adjacent to the commercial development.

Property Requirements

The existing corridor through this area is 20m wide which is narrower than the bridge cross-sections for any of the proposed alternatives. As a result, all of the alternatives require a portion of private property to be acquired. This factor details whether the requirements for property are high or low. As the United Counties own portions of land to the south, any alternatives to the south will have a lower score then bridge design alternatives that extend to the north.

5.4.3.7 Engineering

Construction Traffic Impacts

The 2009 updated traffic report noted that the westbound lane (immediately west of CR19) is currently above the planning capacity during the PM peak hour. Consequently, the TSC wish to minimise as many disruptions as possible to the existing commuter traffic in the corridor. The comparison for this factor is based upon whether the traffic disruptions for each alternative will be high or low. Alternatives that retain two lanes of through traffic until two additional lanes can be built will have low disruptions. Alternatives that require the existing bridge to be modified or partly removed and only retain one lane of traffic will have high disruptions.

Maintainability

This factor details whether the alternative bridge crossing can be maintained easily and economically. Alternatives that expand the existing bridge to both sides have poor maintainability because it creates an old bridge fixed in between two new bridges. They will have different life cycles and the old bridge will be hard to maintain and replace. A new two lane bridge to the north or south of the existing bridge will have good maintainability as they are smaller bridges and are separated from each other. Replacement of one of the bridges can be easily and economically achieved. A new four lane bridge has been given a measurement of just below good. While it is a new bridge, it is larger than a two lane bridge and is harder to maintain and eventually replace.

Construction Cost (Bridge and Approaches)

This is the estimated overall cost to construct or expand the bridge and approaches. It includes the cost for materials, labour, machinery, replacement of service/utility crossings, traffic control etc.

Life Cycle Cost (Bridge Only)

This is the estimated life cycle cost of the proposed bridge only.

Construction Schedule

The typical time for the construction of a new 2-4 lane bridge is one construction season. As all of the alternatives require the existing bridge to maintain a minimum of one lane of traffic until the additional two lanes are built, it will take all alternatives at least one season to complete construction. The alternatives that construct a separate two-lane bridge have the least construction time as it will take one season to construct the bridge and approximately a fifth of a season to make repairs and rehabilitate the existing bridge. All other alternatives have a two season construction schedule as they will have to build either one or two lanes at a time.

5.4.3.8 Discussion Points

During the evaluation of this score sheet the TSC decided to remove the factor "**Potential for future HADD impacts**". This was originally included for the new four-lane, 3-span bridge alternatives as removal of the existing structure could potentially allow erosion of the wetland area to occur. The TSC removed this criterion and added a mitigation measure to maintain erosion protection of the current wetland area.

AECOM was responsible for organising the scores and providing the results. During the collection and calculations of the results there was found to be an error in the measurements of three of the factors. A third scoring sheet was re-issued to the TSC by AECOM via email. Only the members who were present at the September 8, 2009 meeting and scored the bridge alternatives were allowed to score these three factors again. Both the construction costs and life cycle costs of the score sheet were amended as the costs for the 3-span bridges were incorrect and the life cycle cost for the majority of bridges was incorrect. Amendments were also made to the UNESCO factor on the new four-lane bridge.

The score sheet No.3 can be found in **Table 5-3**, as noted above score sheets 1 and 2 can be found in the *Evaluation Report* in Appendix D.

BRIDGE SCORE SHEET No.3

Option No.	1	2	4	11	13	20	22	29	31	38	40
EXISTING BRIDGE	Maintain Existing Bridge					Replace Existing Bridge					
WIDENING	both sides	widen to north		widen to south		widen to both sides		widen to north		widen to south	
NAVIGATIONAL CLEARANCE	3.35m	3.35m		3.35m		3.35m		3.35m		3.35m	
NUMBER OF SPANS	2	1	3	1	3	1	3	1	3	1	3

CRITERIA & DESCRIPTION	UNITS										
Natural Environment											
HADD - permanent *water* impacts	m^2	324	945	406	284	0	324	06	602	270	255	0
	Score											
HADD - permanent *wetland* impacts	m^2	825	481	270	296	690	825	458	415	84	877	493
	Score											
wetland/water construction impacts	low/high	HIGH	AVG	LOW	AVG	LOW	AVG	LOW	AVG	LOW	AVG	LOW
	Score											
Connectivity without additional structure	yes/no	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	YES
	Score											
Social and Cultural Environment											
Recreational trail below	yes/no	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	YES
	Score											
Visual Aesthetics	yes/no	NO CHANGE	NO CHANGE	BETTER	NO CHANGE	BETTER	NO CHANGE	MUCH BETTER	NO CHANGE	MUCH BETTER	NO CHANGE	MUCH BETTER
	Score											
Possible UNESCO impacts	yes/no	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
Land Use & Property											
Impacted Residence	#	WORSE	MUCH WORSE	MUCH WORSE	NO CHANGE	NO CHANGE	WORSE	WORSE	MUCH WORSE	MUCH WORSE	NO CHANGE	NO CHANGE
	Score											
Property Requirements	low/high	AVG	A-H	A-H	LOW	LOW	AVG	AVG	A-H	A-H	LOW	LOW
	Score											
Engineering											
Construction Traffic Impacts	low/high	HIGH	LOW	LOW	LOW	LOW	HIGH	HIGH	LOW	LOW	LOW	LOW
	Score											
Maintainability	poor/good	POOR	GOOD	GOOD	GOOD	GOOD	A-G	A-G	A-G	A-G	A-G	A-G
	Score											
Construction cost (Bridge & Approaches)	$	5.0M	2.2M	3.2M	2.2M	3.0M	3.3M	5.4M	3.1M	5.2M	3.1M	5.2M
	Score											
Life Cycle cost (Bridge only)	$	4.6M	2.0M	4.0M	2.0M	4.0M	3.1M	5.5M	2.9M	5.3M	2.9M	5.3M
	Score											
Construction Schedule	# years	2	.2	.2	.2	.2	2	2	2	2	2	2
	Score											

5.4.4 Technically Preferred Alternative

Each TSC member present during the September 8, 2009 meeting scored both the weighting and alternative score sheets. Based upon the revised score sheets a two-lane, 3-span bridge to the south of the existing bridge scored best at 68.1 points out of a possible 90. Second best is a two-lane, single span bridge to the south, at 64.7 points. Although the single span option scored best on engineering factors – the cost of a single span is $2.2M vs. $3.0M for the three span option - the 3-span option scored better on environmental impacts.

The outcome of this evaluation was not considered robust as the highest scoring alternative did not score 10% better than the second highest scoring alternative. Sensitivity testing was completed to determine if the scoring had been biased by over-weighting on any specific factor. Sensitivity testing showed that the 3-span bridge to the south scored well (first or second place) when any of the four evaluation criteria categories was removed. The two-lane, single span bridge to the south scored best only when the natural environment score was removed. Clearly, the TSC had placed a high value on the natural environment.

From the evaluation it can be noted:

- Options to widen the existing bridge to both sides did not score well and need not be considered further.
- Options to construct a two-lane bridge to the north scored better on environmental impacts but this benefit was offset by land use and property scores - the TSC gave significant importance to impacts to the home on River Road and to property requirement issues associated with widening to the north.
- The 3-span options evaluated best on environmental impacts because they require less than half of the in water/wetland work.
- Single span options evaluated best on engineering criteria because they cost less.

The evaluation results from Score Sheet No.3 can be found in **Table 5-4**.

Table 5-4: Bridge Evaluation Results No.1

Option No.	1	2	4	11	13	20	22	29	31	38	40
EXISTING BRIDGE	Maintain Existing Bridge					Replace Existing Bridge					
WIDENING TO	Both	North		South		Both		North		South	
NUMBER OF SPANS	2	1	3	1	3	1	3	1	3	1	3
Overall Score	31.0	49.1	53.8	64.7	68.1	41.2	51.0	44.6	54.2	54.2	64.1
Overall Rank	11	8	6			10	7	9	4	4	
Natural Environment Score	11.5	13.0	21.3	12.4	20.7	12.5	23.9	15.5	27.3	14.0	25.4
Natural Environment Rank	11	8	4	10	5	9		6		7	
Social and Cultural Score	5.1	5.0	6.7	8.8	10.5	5.0	12.1	5.0	12.0	5.3	12.4
Social and Cultural Rank	11	8	6	5	4	10		8		7	
Land Use and Property Score	7.4	2.7	2.7	15.2	13.8	7.4	7.4	2.7	2.7	13.6	13.9
Land Use and Property Rank	5	8	8	4		5	5	8	8		
Engineering Score	6.9	28.3	23.1	28.3	23.2	16.2	7.6	21.4	12.2	21.4	12.4
Engineering Rank	11		4			7	10	5	9	5	8
Everything but Natural Environment	19.5	36.0	32.5	52.3	47.5	28.6	27.1	29.1	27.0	40.2	38.7
Rank	11	5	6			8	9	7	10		4
Everything but Social and Cultural	25.8	44.1	47.1	55.9	57.7	36.1	39.0	39.6	42.2	48.9	51.7
Rank	11	6	5			10	9	8	7	4	
Everything but Land Use and Property	23.5	46.3	51.1	49.5	54.3	33.7	43.6	41.9	51.5	40.6	50.2
Rank	11	6		5		10	7	8		9	4
Everything but Engineering	24	20.8	30.8	36.4	44.9	25.0	43.5	23.2	42.0	32.8	51.7
Rank	9	11	7	5		8		10	4	6	

5.4.5 Additional Technically Preferred Alternative Options

At the meeting on October 20, 2009 the TSC endorsed that the best option would entail construction of a new two-lane bridge to the south of the existing bridge. However, because the evaluation came down to in-water impacts vs. cost, the committee was not certain if any of the evaluated alternatives were best. The TSC at this meeting decided that other two-lane bridges to the south should be looked at to determine the best option.

After the options were narrowed down to a two-lane bridge south of the existing bridge, criteria such as alignment, bridge, clearance and construction techniques were removed from the scoring process. All of the remaining options scored the same on these criteria.

5.4.5.1 Number of Spans

The major feature which needed to be confirmed was the number of spans. It was clear that as the number of spans increased so did the cost. The cost dramatically jumped when another span was added as it would require an additional pier and footing. However, increasing the number of spans had the benefit of decreasing the HADD area.

A new field survey and more current aerial photography were used to accurately determine HADD areas for various bridge lengths. In which an ideal bridge length of 125m was determined. To span this distance the bridge engineers were consulted for their input. Three concrete girder sizes were chosen, these are shown in **Table 5-5**.

Table 5-5: Bridge Girder Dimensions

Girder size (depth in mm)	Maximum Span (m)
1600	38
1900	42
2300	45

As the current navigational clearance is to remain the same (3.35m), the larger girders would increase the elevation of the deck of the bridge. Using a 1600mm girder the total depth of the deck on the existing bridge is approximately 0.9m less than the total depth of a new bridge. The larger girders will increase the deck size. It should be noted that the navigational clearance of 3.35m is only over the water area (navigable area) and not over the wetland area. However, the cost rises considerably with an increase in girder size.

5.4.5.2 HADD Areas

The amount of harmful alteration, disruption or destruction (HADD) of fish habitat decreases when the number of spans increases. Therefore, the TSC looked at the various bridge options with respect to the HADD area. The majority of the HADD area is caused by the approaches and their slope area. Therefore, it was decided to look at options which would decrease the approach slope and decrease the HADD area.

The previous options used a 1H:1V rock fill slope as this is maximum slope allowed for rock fill. The option of an earth slope was not considered as it is required to be a 2H:1V slope which would increase the HADD area. During the evaluation it was decided that retaining walls (reinforced earth) should be evaluated as they provide a vertical wall and dramatically reduce the HADD area.

5.4.5.3 Options

From these possible girder lengths six viable options were compiled. These options were:

Option 1 – Single span bridge with rock fill slopes on the approaches. This is the same as Option No.11 from the original evaluation which was the second highest scoring alternative.

Option 2 – Three span bridge with rock fill slopes on the approaches. This is the same as Option No.13 from the original evaluation which was the highest scoring alternative.

Option 3 – Three span bridge which maximises the bridge size before expanding to another span. It maintains a lower height by using a 1600mm girder over the creek but extends further by using 2300mm girders over the HADD areas.

Option 4 – Single span bridge to mimic Option 1 but with vertical retaining walls to reduce HADD.

Option 5 – Adopts the maximum 2-span bridge using a 1600mm girder. This option includes a centre pier in the creek and uses vertical retaining walls to reduce HADD.

Option 6 – Adopts the maximum 3-span bridge using a 1600mm girder only. This option includes vertical walls to reduce HADD.

Options which included the 1900mm girder and 2300mm girder were not used for spans extending across the creek as this would increase the cost and height of the bridge. It was preferred to keep the bridge deck as low and close to the height of the existing bridge as possible for aesthetics and to reduce the cost of the approaches. Therefore, it was decided that the additional length the larger girders provided, and the small reduction of HADD they gained, did not offset the increased cost of the girders or the reduction in aesthetics due to the increase in height.

5.4.5.4 Criteria

During the first and second evaluations of the bridge alternatives, four (4) environmental categories were identified each with its own environmental factors. Overall, there were fourteen (14) environmental factors which the alternatives were evaluated against to separate the alternatives and find the technically preferred alternative. By recommending a two-lane bridge to the south, the majority of these environmental factors could now be removed as they no longer provided any help in separating the remaining alternatives. As such the number of environmental factors were reduced to five (5) and were not categorised. These remaining environmental factors were then weighted out of 100.

The following environmental factors were used to evaluate the alternatives:

HADD - permanent impacts

This HADD area is equal to the total water and wetland area that is permanently impacted and lost by the construction of both the bridge and approaches. The wetland and water areas are classed as HADD areas because they include fish spawning and habitat areas as well as wetland flora and fauna. Alternatives with rock fill approaches and single span options have larger impacts on this factor. This factor is measured in square metres. It should be noted that the HADD areas in Score Sheet No.4 are slightly different to the areas used in the previous score sheets as an updated field survey was completed of the wetland area for this evaluation. The wetland and water HADD areas were not separated from each other as all of these options are to the south of the existing bridge.

Wetland/water construction impacts

This factor is rated from high to low and is based on the temporary construction impacts to the existing wetland and water area around the bridge. This has been included as some alternatives have a larger impact during construction then others. Alternatives which have larger approaches have a higher impact as there will potentially be more construction activity in the wetland area. Low impacts are better than high impacts.

Connectivity

This option joins the two previous environmental factors "Connectivity Without Additional Structure" and "Recreational Trail Below" as categories were removed and these two factors both deal with access under the bridge. This factor has been slightly modified to compare alternatives which allow for access under the bridge in the future when the existing bridge is upgraded. This is assuming that the upgraded bridge will be identical to the new bridge.

Visual Aesthetics

While this factor is opinion based, the visual aesthetics of each alternative is to be evaluated against each other. Generally, the TSC evaluated that bridges with more spans and less approaches are more aesthetically pleasing. It was evaluated that retained earth (retaining wall) approaches are better than a rock fill slope.

Construction cost

This is the estimated overall cost to construct or expand the bridge and approaches. It includes the cost for materials, labour, machinery, replacement of service/utility crossings, traffic control etc.

5.4.6 Final Bridge Preferred Option

During the November 24, 2009 meeting the TSC scored six (6) additional bridge alternatives and weighted the environmental factors. The scores were determined and Option 6 scored best at 73.2 points out of a possible 90. Option 6 was a new alternative which included maximising the length of a three-span bridge using a 1600mm girder. This option included retaining walls on the approaches to reduce the amount of HADD area. Bridge score sheet No.4 can be found in **Table 5-6**. It was scored in exactly the same way as score sheet No.3.

Table 5-6: Bridge Score Sheet No.4

Option No.			1	2	3	4	5	6
NUMBER OF SPANS			1	3	3	1	2	3
TOTAL SPAN			36	90	126	36	76	114
APPROACH CONSTRUCTION			1:1			REINFORCED EARTH		
No	**CRITERIA & DESCRIPTION**	**UNITS**						
1	**HADD - permanent impacts**	**m^2**	1487	782	303	658	435	273
		Score						
2	**wetland/water construction impacts**	**low/high**	high	low	low	high	avg	low
		Score						
3	**Allows connectivity of wildlife and recreational trail below in the future without an additional structure**	**yes/no**	NO	YES	YES	NO	YES	YES
		Score						
4	**Visual aesthetics**	**worse/better**	No Change	Better +2	Better +3	Better +1	Better +2	Better +3
		Score						
5	**Construction cost (bridge & approaches)**	**$**	2.0M	2.9M	4.0M	2.4M	2.9M	3.4M
		Score						

While this option was one of the more expensive alternatives and scored second lowest in the cost criteria, it was preferred over the other alternatives on all of the other criteria. It scored 14% higher than Option 5, the second place alternative. Option 5 was a two-span bridge with retaining walls. Therefore, it was the preferred alternative and was considered a robust result.

This result was discussed with the TSC and the TSC considered this to be the correct result and endorsed Option 6 as the Technically Preferred Alternative.

The preliminary design and general arrangement drawings of this alternative have been completed and are included in **Figure 5-3**. These drawings were presented to the public at Public Information Centre No.5.

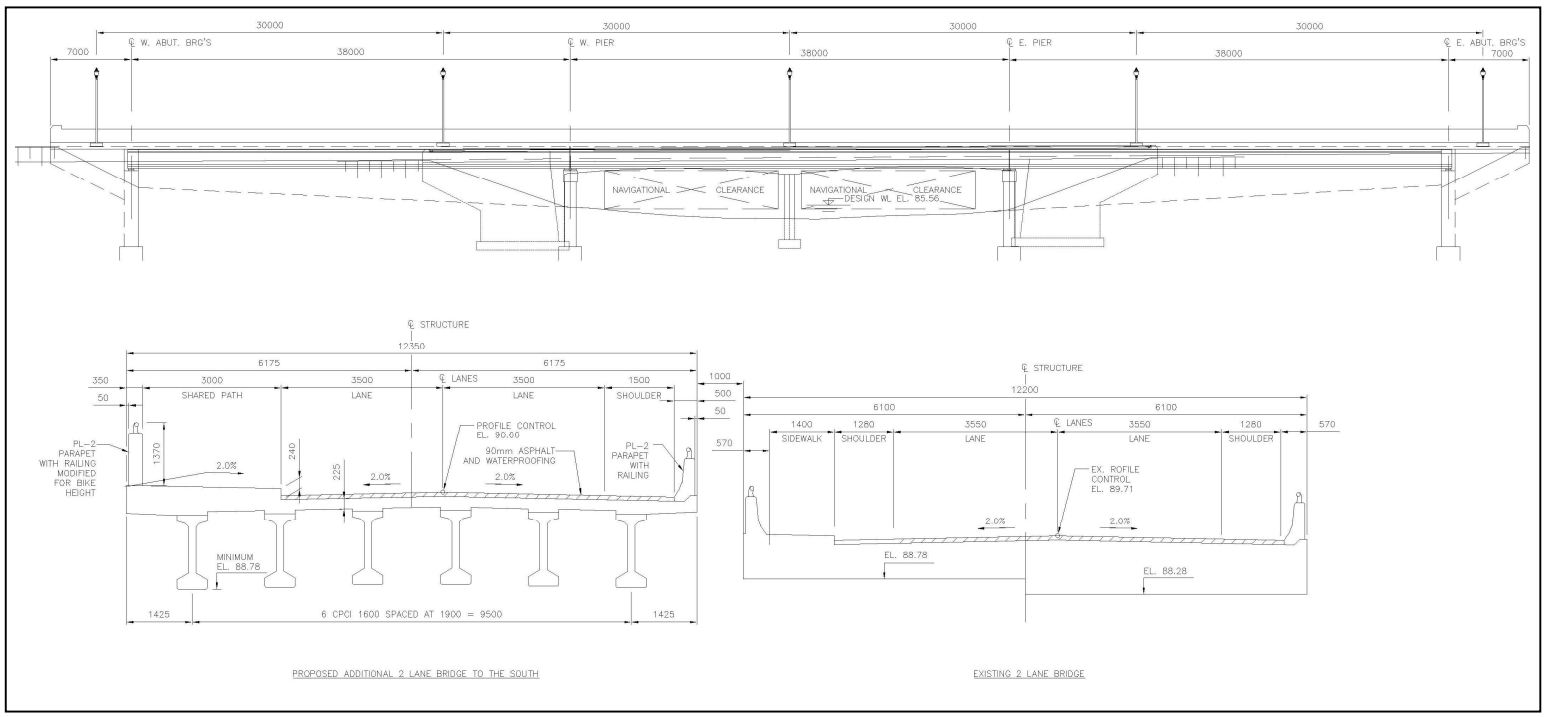
Table 5-7: Bridge Evaluation Results No.2

	Average					
Option No.	1	2	3	4	5	6
Number of Spans	1	3	3	1	2	3
Total Bridge Length	36	90	126	36	76	114
Fill Slopes	1:1			R. EARTH		
CRITERIA						
HADD - permanent impacts	3.0	12.6	24.5	14.6	21.1	27.0
wetland/water construction impacts	3.7	11.8	13.9	3.7	8.4	14.5
Connectivity	2.5	11.5	11.5	2.5	10.9	12.1
Visual Aesthetics	4.1	7.9	9.0	4.6	8.3	9.8
Construction cost	24.5	14.9	3.6	21.1	14.9	9.8
Totals	37.8	58.6	62.5	46.6	63.5	73.2
Rank	6	4	3	5	2	1

Legend:

Highest ranking
2nd highest ranking
3rd highest ranking

Figure 5.3: Bridge General Arrangement Drawing



5.5 Mitigation of Impacts

Impacts to the corridor (permanent impacts or temporary) will be mitigated to the extent possible. For the assessment of alternatives, it was assumed that mitigation measures will be undertaken. The alternatives under consideration were the mitigated alternatives.

Table 5-8 summarises impacts and their proposed mitigation measures. As the entire corridor is being widened, the majority of mitigated impacts listed apply to all construction within the corridor. Therefore, they are not analysed in all of the following sections. There are site specific mitigated impacts which deal specifically with different areas of the corridor.

The mitigation measures are an important component of the Technically Preferred Alternative. At the end of this study, when the recommended solution is endorsed by the United Counties Council, the mitigation measures become commitments that are binding on the United Counties, Municipality, design consultants and contractors.

5.5.1 Monitoring During and After Construction

Many of the environmental concerns related to the project have been mitigated through the process by which the recommended design was selected, as described above.

The United Counties of Leeds and Grenville will work with the RVCA and other authorities, prior to the start of construction to ensure that the proposed works are acceptable and to obtain required permits.

Potential environmental impacts related to construction activities and long-term impacts, along with recommended mitigation measures, are tabled in **Table 5-8**. It is recommended that the environmental commitments be incorporated into the detail design and contract documents as appropriate so that contractors are aware of the requirements prior to tendering. Monitoring of construction activities must ensure that all environmental standards and commitments for construction are met.

Table 5-8: Environmental Effects and Mitigation Measures

ISSUE	MITIGATING MEASURE
Traffic & Transportation	
The continual growth in traffic and proposed widening has impact on accessibility	The United Counties is committed to working with the United Counties and Municipality of North Grenville Accessibility Committees to mitigate impacts to the extent feasible.
Pedestrian safety procedures and devices should be implemented	The United Counties will adhere to recommendations of the Ontario Traffic Conference when its new manual "Pedestrian Control and Protection" is issued in the near future which will include recommendations on roundabouts. Considerations for pedestrian safety devices will include but not limited to: Pedestrian Crossovers (not overpass), HAWK Beacons, Detectible surfaces, staggered crossings, Enhanced street signage, Widening the refuge area
Construction activities will impede traffic	Two lanes of traffic on CR43 will be maintained at all times, to the extent practical.
Emergency vehicle access to businesses and institutions will be affected by construction	A single lane access to all businesses & institutions will be maintained at all times, to the extent practical
Some people still find it difficult to navigate and negotiate roundabouts	The United Counties will conduct an ongoing public education program to help promote roundabout knowledge
Social and Cultural	
Stage 1 Archaeological Assessment has identified areas of moderate potential	The United Counties will undertake a Stage 2 Archaeological Assessment in advance of construction
The north face of the existing bridge is within the UNESCO designated Rideau Canal World Heritage Site	The United Counties will commit to working with Parks Canada to ensure preservation of the national historic features of the Rideau Canal.
The new road will require illumination	Directional lighting will be used to minimize light pollution but maintain vehicle and pedestrian safety.
Construction activities will be noisy	Adherence to municipal noise by-law will be required Unnecessary equipment noise caused by faulty or non-operating components will be prohibited Duration of construction equipment idling will be restricted to the minimum time necessary to complete the specific task All of the above will be contract requirements and will be enforced by contract administrator
Minor Aesthetic Features to the Bridge will enhance the bridge greatly and can increase community pride	Complete minor aesthetic features during design & construction phases, promote community feedback.

Table 5-8: Continued

Natural Environment	
Widening of bridge over South Branch Rideau River (i.e. Kemptville Creek) will require construction in fish habitat	The United Counties will negotiate a compensation agreement with the appropriate authority, the Department of Fisheries and Oceans south of the bridge or Parks Canada north of the bridge. In water construction will not be allowed during spawning season, March 15 to June 30. Access for fish to pass under CR43 will be maintained at all times.
Stormwater quality impacts	Best available technology economically achievable (BATEA) will be used – Level II treatment New bridge deck drains will be piped to storm water treatment facility. An effort will be made to pipe existing deck drains to the treatment facility. Erosion protection will be provided at all discharge points, water quality control will be provided on direct discharges to Kemptville Creek. Erosion protection to be completed where required for existing wetland areas. The municipality will continue to require storm water quality and quantity controls for new development, and in particular for development upstream of the new stormwater treatment facility.
Construction activities can result in water quality impacts	Good construction practices will be a contractual requirement
The Municipal Class EA may be complete before Federal input is received.	The United Counties will continue to work with Federal agencies to complete a screening under the Canadian Environmental Assessment Act and it is understood that this may result in refinements to the Recommended Solution.
Construction activities can result in dust and odours.	Good construction practices will be a contractual requirement

Table 5-8: Continued

Engineering Potential impacts on underground Utilities Existing watermain servicing the Forestry Centre extends into CR43. Soft soils in vicinity of bridge may be displaced by fill material for new approaches. Soil conditions on CR43 Corridor have been found to be highly variable.	Underground utilities will be protected during construction Watermain will be re-located and replaced if required. New fills will be placed within sheet pile cofferdams to avoid disturbance of river bed. Detailed geotechnical investigations will be undertaken as part of detail design.
Economic Construction will impact access to businesses in the corridor.	The United Counties will consider incentives including night work & bonuses to ensure that impacts to businesses are kept to a minimum.

5.6 Consideration of Public and Agency Concerns

As mentioned in Chapter 2, PIC No.5 was conducted to advise the public and agencies of the Technically Preferred Alternative. A total of forty-three (43) public comments were received over the course of this PIC No.5.

In reviewing all of the comments received, the TSC observed that there is good support for the Technically Preferred Alternative. The TSC recognised that there is significant concern regarding the centre corridor intersection control and in particular the proposal to install three roundabouts in close proximity.

The TSC previously determined that it would be unfair to the Community Centre to remove their current set of traffic signals and not replace it with a roundabout. Likewise, James Street was identified in the Corridor Master Plan as an integral link between CR43 and a major residential section of the town. Without this link the only other links south are on Grenville Street and CR44. Efforts to combine the roundabouts into one would be uneconomical and have large property impacts. The TSC looked closely at options to reduce the number to two roundabouts but again decided in favour of three.

The TSC was guided by the advice of the study team's transportation engineer who provided examples of similar intersections in North America that work fine. Such examples are:

- South Golden Road in Golden, Colorado
- Post Road and Avon Road in Avon, Colorado

In response to issues raised the Committee has recommended two important additions to the list of mitigation measures:

1. The Committee included a commitment for more public education regarding the proper use of roundabouts. This is particularly important for two lane roundabouts, which are new to the area.
2. The Committee included a commitment to look at night work and bonuses to ensure expeditious completion of construction, to reduce construction impacts on businesses.

Agency concerns about the Technically Preferred Alternative were limited to comments from the Ferguson Forestry Centre and a number of the utilities companies. The Ferguson Forestry Centre was concerned about the relocation of their existing watermain,

the limit of the slopes extending into the property and future equalisation ponds. The utilities companies (Bell and Embridge Gas) were concerned about their existing infrastructure and would like to be consulted during the design process.

A Frequently Asked Questions Brochure was distributed to everyone who provided comments on the design and study and was placed on the United Counties' website and Municipality website. Further to this, an additional two (2) comments were then received.

The first comment was from a gentleman whose business was on the corner of a proposed roundabout. He wished to clarify the extent of widening and property acquisition as well as access onto CR43. There was a minor drafting error in the corridor plans which showed that his current access would be closed. This was a drafting error and has been rectified in the attached corridor plans in Appendix A. Prior to design and construction the United Counties will negotiate with all property owners on land acquisitions. There is an understanding that it may not always be possible to obtain the 4m widening without unfairly impacting current uses, in those cases the road designer will need to consider compromises to the proposed cross section.

The second comment was from a lady who does not support a roundabout at the intersection of CR43 and CR44.

6. Description of Recommended Design

6.1 Roadway

The preliminary design corridor plans for the four lane upgrade of County Road 43 from Somerville Road to Highway 416 are provided in Appendix A. The design criterion for the road is summarized in **Table 6-1**.

Table 6-1: Preliminary Roadway Design Criteria

Parameter	Design Criteria
Roadway Classification	Urban Arterial Divided
Existing Peak Hour Traffic (one way) Existing Peak Hour Traffic (two way)	995 vehicles per hour 1436 vehicles per hour
Design Speed	80 km/h
Posted Speed	60 km/h
Roadway Cross-Section: # of Lanes Vehicle Lane width Median Bicycle lane Width (both sides) Boulevard Width (both sides) Sidewalk Width (both sides) Distance of sidewalk from property line Curb type (at median) Curb type (at bike lane)	 4 3.50 m 2.00 m 2.00 m 1.95 m 1.50 m 0.50 m Barrier Mountable
Other features: Architectural Lighting Landscaping	 Type to be confirmed by both the Municipality and United Counties roundabouts and boulevards

Ref: Geometric Design Guide for Canadian Roads, 1999 Edition, TAC
Geometric Design Standards for Ontario Highways

The preliminary design shows the preferred horizontal alignment of the corridor. The future vertical alignment of the road should be designed to the existing road elevations where possible in an effort to reduce the property impacts.

6.1.1 Water Crossings

Within the project limits, the CR43 Bridge has been identified as the only water crossing and bridge structure. From the evaluation, the Technically Preferred Alternative will maintain the existing 2-lane concrete bridge and construct a second two-lane structure to the south of the existing bridge. The new 2-lane bridge is to be a 3-span bridge expanding a total of 114m in three equal spans from abutment to abutment. The obvert (underside) of the new bridge must be no lower than the minimum obvert elevation of the existing bridge which is approximately 88.78m and maintain a 3.35m of clearance above the average water level.

The general arrangement drawings for the County Road 43 Bridge, including spans are included in Appendix A. These designs will be further discussed with the Rideau Valley Conservation Authority, Ministry of Natural Resources (Lakes and Rivers Act), Transport Canada-Marine (Navigable Waters Protection Act) and Department of Fisheries and Oceans (HADD impacts) during the detail design phase and during the Federal Environmental Assessment phase.

6.1.2 Preliminary Cost Estimate

The preliminary construction cost associated with the proposed widening and upgrades of the County Road 43, Kemptville Corridor is estimated at $32.3 million (2010 dollars) as detailed in **Table 6-2**.

Table 6-2: Preliminary Cost Estimate

PHASE	AREA	DESCRIPTION	COST
1	4	Bridge	$ 4.7M
2	5	Widen CR43 from Highway 416 extending past the Colonnade Development and CR19 to the Bridge crossing Kemptville Creek. This should be completed in one stage.	$ 7.2M
3	3	Widen CR43 from the bridge up to the CR44 intersection. This will include the CR44, community square and James St intersections. This can be completed in multiple stages.	$ 10.0 M
4	2	Widen CR43 from the CR44 intersection to the Pinehill Road intersection. This will include the mall and Pinehill Road intersections.	$ 5.4M
5	1	Complete the corridor by widening CR43 from the Pinehill Road intersection to the Somerville Road intersection.	$ 5.0M
TOTAL			$ 32.3M

This price of $32.3 million includes engineering costs of 15% and contingencies of 20% but does not include property acquisition costs. Prices exclude taxes and are based on 2010 prices.

6.1.3 Phasing

The phasing shown in **Table 6-2** is preliminary and will be dependent upon growth and development within the corridor as well as funding. The phasing is not limited to the different areas of the corridor. Phasing of different features of the corridor and intersections may be appropriate. For example, the CR43 roadway from CR19 to Highway 416 may have to be expanded to four lanes to deal with vehicular traffic demand which has increased significantly due to development further west. However, the sidewalk on the north side of CR43 from CR19 to Highway 416 may not be required until development to the north is completed and there is a demand for pedestrian facilities.

6.1.4 Construction

The United Counties will look at incentives including night work and bonuses to construction contracts to ensure impacts to businesses are kept to a minimum.

6.2 Right-of-Way Requirements

The current Right-Of-Way (ROW) width for CR 43 is 26m in most locations to the west of the bridge while only being 20m wide to the eastern side of the bridge. The technically preferred corridor cross-section requires the ROW to be increased to 30m. To minimise impacts the alignment of CR43 has been shifted to either the north or south along different sections of the corridor while still providing sufficient width for the implementation of the recommended corridor features.

All land owners along the CR43 corridor were notified of the project and of the consultation opportunities with the study team during the study. All property assessment information was provided by the Municipality of North Grenville. **Table 6-3** shows the approximate property acquisitions required for the widening of the corridor. There is an understanding that it may not always be possible to obtain the 4m widening without unfairly impacting current uses, in those cases the road designer will need to consider compromises to the proposed cross section.

Table 6-3: Property Acquisition

	Area to Be Purchased	
	North Side (m^2)	South Side (m^2)
Area 1	2969	3395
Area 2	8232	1483
Area 3	7722	944
Area 4	0	0
Area 5	1663	4596
TOTAL	20,586m2	10,418m2
	2.06Ha	1.04Ha

6.3 Canadian Environmental Assessment Agency (CEAA)

A federal Environmental Assessment may be required when a federal authority:

- Is the proponent of the project,
- Provides financial assistance to the proponent,
- Sells, leases or otherwise disposes of federal lands,
- Issues a permit, licence or any other approval as prescribed in the Law List Regulations.

As the technically preferred design includes in-water works which will be subject to approvals by federal authorities such as Transport Canada and DFO, a federal EA will be required. There is also a potential for federal funding.

The federal EA process prefers to assess a recommended alternative rather than a large number of alternatives like the Municipal EA process. During this stage, CEAA generally acts as the federal environmental assessment co-ordinator and will facilitate the involvement of the other federal authorities in a co-ordinated assessment aimed at meeting all agencies needs simultaneously. Therefore, the CEAA documents and application will only be prepared once a technically preferred design is decided on.

6.4 Access

CR 43 is to be expanded into a four lane urban arterial road, meaning its primary function is to move traffic. Controlling access along CR43 will help to improve safety and ensure that a high level of traffic service is provided. In order to achieve this control of access, it will be necessary to restrict/modify/combine the location and operations of future access points.

Historically, the approval of access has occurred on an application-by-application basis. This has resulted in a wide variety of access configurations depending on when the application was submitted. The United Counties should prepare an Access Management Plan for the CR43 corridor to provide a strategy and guidelines for evaluating new and modified accesses adjacent to the corridor. An Access Management Plan will enable development in a transparent and fair manner while protecting the integrity of the transportation network.

Access management along a corridor is a philosophical application. The Transportation Research Board has developed an excellent reference document "*Access Management Manual*" that defines access management and its purpose thusly:

> "Access management is the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway," and, "The purpose of access management is to provide vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system."

The underlying areas of interest for access management consider the users by mode, the land owners along the roadway and the guardians of the roadway (in this case the United Counties).

6.5 Geotechnical/Foundation Requirements

A geotechnical desktop study of the corridor area was completed by Inspec-sol Inc. on July 28, 2009. The desktop study includes a literature review of various photographs, surveys, plans and existing geotechnical reports for the corridor and adjacent areas. A site visit of the corridor was completed by Inspec-sol Inc.

The report details the soil types, bedrock and high water table for the corridor which differ along the corridor. Bedrock is located entirely within the Beekmantown Formation and is predicted to be high in dolostone and sandstone. The depth and quality of bedrock varies throughout the corridor. The water table is typically high within this area with water elevations ranging between close to surface level to 5m below the surface. These details are explained and categorised within the breakdown of the individual areas of the corridor in the Geotechnical Report found in the *Existing Conditions Report*.

The study found that the major issues with the corridor are organic deposits within the area of the creek and the area immediately to the east of the creek which contains silty clays and sands. These conditions combined with the high water table makes construction and foundation design difficult.

Preliminary geotechnical investigation recommendations have been included in the geotechnical report. Recommendations have also been included for construction methods within the corridor including the excavation, dewatering, bedding and backfill of services and the road features including the bridge.

During detailed design, field surveys will be undertaken, where appropriate, to confirm locations of existing groundwater wells and septic systems, which may be impacted by the proposed improvements. It is expected that there will be no current wells within the vicinity of this corridor.

Further geotechnical investigations are recommended for the entire corridor and highly recommended for the areas with noted issues such as the areas around the creek and east of the creek to CR19. These would include detailed description and recommendations.

6.6 Utilities and Municipal Services

During detail design, plans will be forwarded to utility companies and the Municipality of North Grenville to confirm the impact and relocation requirements of underground and overhead services within the construction limits. Major requirements include relocating the existing overhead power and telecommunications lines into the new boulevard area and relocating the overhead street crossings underground. Existing underground utilities will be relocated where required to make provision for storm sewers which will be constructed.

The utilities in the area are Hydro One, Embridge Gas, Bell and Cogeco. Liaison with the Municipality will need to occur as there are existing underground sanitary sewers, watermains and sanitary forcemains within the corridor.

6.7 Stormwater Management

As previously mentioned the majority of CR43 between Somerville Road and Highway 416 is drained entirely by roadside ditches that outlet either directly to Kemptville Creek or discharge to offsite ditches/storm sewers that eventually outlet into Kemptville Creek north of the bridge. None of these outlets currently have erosion protection to minimize impacts on Kemptville Creek. These ditches also convey flow from adjacent lands.

It was concluded that:

- The increase in flows from the widening of CR43 from two lane rural to four lane urban is negligible.
- The increase in flows, due to the proposed road widening, can be accommodated by the offsite drainage ditches that link roadway drainage to outlets A and E.
- A future increase in water levels and velocities in Kemptville Creek, due to the proposed road widening, is negligible.
- Any potential water quality impact on Kemptville Creek, due to the road widening, can be mitigated by the existing offsite ditch conveyance system or by Oil/Grit Separators placed where direct roadway discharge to the creek is anticipated.
- Erosion protection should be considered at outlets B and F.

Based on these conclusions, it is recommended that Oil/Grit separators be considered for water quality treatment where roadway drainage directly enters Kemptville Creek, ie. at outlets B and F, and that erosion protection for the outlets be considered at these sites, as well.