



**Oxford Road 16 Improvements
From Kintore to Zorra 31st Line
Class Environmental Assessment**

**Environmental Study
Report**

**Oxford County
21 Reeve St., P.O. Box 1614
Woodstock, ON
N4S 7Y3**

October/November 2016

Table of Contents

1.0	Introduction.....	5
1.1	Background.....	5
1.2	Study Area	5
1.3	Existing Roadway Cross Section	7
1.4	The Ontario Environmental Assessment Act (Ontario EA Act).....	7
1.5	Municipal Class Environmental Assessment Planning and Process	7
1.6	Study Process	8
1.7	Selection of Project Schedule.....	9
1.8	Preferred Solution.....	11
1.9	Appeal Process	11
1.10	Project Team.....	12
1.11	Public & Agency Consultations.....	12
2.	Phase 1 of Class EA - Problem or Opportunity	13
2.1	Collision Report.....	13
2.2	Archaeological and Built Heritage Assessments.....	13
2.3	Drainage and Drain Outlets	13
2.4	Natural Environment.....	14
2.5	Geotechnical	14
2.6	Traffic and Traffic Volumes.....	15
2.7	Socio-Economic Environment – Roadway & Adjacent Land Use	15
2.8	Classes of Soils.....	15
2.9	Utilities.....	16
2.10	Problem Statement.....	16
3.	Phase 2 of Class EA - Alternative Solutions.....	16
3.1	Opportunity for Improvement	16
3.2	Alternative Solutions.....	16
3.3	Evaluation of Alternative Solutions	17

3.4	Selection of Preferred Solution	19
3.5	Review and Confirmation of Class EA Schedule	19
3.6	Recommendation of Preferred Solution	19
4.	Phase 3 of Class EA - Alternative Design Concepts for the Preferred Solution.....	19
4.1	Phasing of Construction.....	19
4.2	Proposed New Road Cross Section	19
4.3	Potential Impacts of the Preferred Solution.....	20
5.	Public, First Nations and Agency Consultation.....	23
5.1	Public Consultation Centre No. 1	23
5.2	Public Consultation Centre No. 2.....	23
5.3	Public Consultation Centre No. 3.....	23
6.	Drinking Water Source Protection.....	24
6.1	Vulnerable Areas.....	24
6.2	Drinking Water Threats.....	24
7.	Climate Change.....	24
7.1	Greenhouse Gasses (GHGs)	25
7.2	Mitigation and Adaptation	25
8.	Statement of Environmental Values.....	26

Executive Summary

Introduction

Oxford County Public Works conducted an Environmental Assessment in accordance with the Ontario Environmental Assessment Act (EA Act) to determine the impacts of Road Improvement on part of Oxford Road 16.

The Environmental Assessment of part of Oxford Road 16 Improvements was conducted in accordance with 'Schedule C' of the Municipal Engineers Association Municipal Class Environmental Assessment process dated October 2000, as amended in 2007 & 2011.

The Municipal Class Environmental Assessment (Municipal Class EA) is one of the Class EAs planning and design process approved by the Minister of the Environment and Climate Change (MOECC).

Study Area

Oxford Road 16 has been identified as an East-West transportation corridor across the County, in conjunction with Oxford Road 6 and Oxford Road 8. The focus of this study has been on 5.8 kilometres of part of Oxford Road 16 from the eastern limit of Kintore to Zorra 31st Line. Other sections of Oxford Road 16 were previously resurfaced to 8.7 metres wide pavement. Oxford Road 6 and Oxford Road 8 are all constructed to County Standards for this class of road.

Public, First Nations and Agency Consultation

Consultation with the Public, Property Owners, First Nations, Agencies and Stakeholders was carried out in accordance with Schedule C of the Municipal Class EA.

Notice of Study Commencement and Public Consultation Centre No. 1 was published twice in the local newspaper and mailed out to Property Owners, First Nations, Businesses, Stakeholders and Agencies in November 2014. The first Public Consultation Centre was held on November 27, 2014 to give the Public an opportunity to review the study scope and provide input.

Notice of Public Consultation Centre No. 2 was published twice in the local newspaper and mailed out to Property Owners, First Nations, Businesses, Stakeholders and Agencies in January 2016. The second Public Consultation Centre was held on January 26, 2016 to give the Public an opportunity to review and provide input on the Alternative Solutions and the preferred Solution.

Notices were sent directly to First Nations within 100 kilometres of Oxford County. Copies of the responses/comments are included in Appendices E and F.

Notice of Study Completion will be published twice in the local newspaper and mailed out to Property Owners, First Nations, Businesses, Stakeholders and Agencies after County Council has accepted the Environmental Study Report (ESR). The ESR will be placed on public record for a minimum of 30 calendar days for review by the Public, First Nations, Stakeholders and Agencies.

Phase 1 of Municipal Class EA – Problem/Opportunity Statement

Based on the review of background information, technical studies and input from the Public, the problem statement was developed:

There is a need for improved roadway and traffic operations throughout Oxford Road 16 corridor in order to improve safety for all road users;

Corridor improvements are required in order to satisfy the goals and objectives of the Transportation Master Plan as well as provide a safe access for all road users.

Phase 2 of Municipal Class EA – Alternative Solutions and Selection of Preferred Solution

In order to address the Problem Statement, alternative solutions, including ‘Do Nothing’, were identified and the impacts on the environment were evaluated. Based on the evaluations, the Preferred Solution is to: Reconstruct road to a wider two-lane rural cross section, including realignments and drainage improvements.

Phase 3 of Municipal Class EA – Alternative Design Concepts for the Preferred Solution

After evaluating the alternative designs, the recommended design is to provide a 2 lane road with 3.35 metres travel lanes, 1 metre paved shoulder and 2 metres gravel shoulders. The existing pavement will be pulverized with underlying granular materials in-place to a depth of 300 millimetres (mm), excavate and widen the gravel shoulders, widen bridge structures, replace culverts, ditching, gravelling, grading and pave with 100 mm of new asphalt, topsoil and seed/mulch/sod. Improve sight line at the intersection of Oxford Road 16 and Zorra 29th Line.

Estimated Capital Construction Cost of the Preferred Solution is \$5,000,000 including property acquisitions and utility relocations.

Improvements to one Municipal drain and the Ross Award Drain 1919 are required in order to provide additional outlets required to properly drain the road and adjacent lands. The County of Oxford has submitted a petition for improved drainage in these areas pursuant to Section 4-1(c) of the Drainage Act RSO 1990.

Phasing of Preferred Solution

Depending on budgets, the road improvements may be completed in three phases as follows:

- Replacement of the drainage structure (bridge) at McCall-McCorquodale drain and Road improvement between Zorra 31st Line and Zorra 29th Line;
- Road improvement from east limit of Kintore to Zorra 25th Line; and
- Road improvement from Zorra 25th Line to Zorra 29th Line.

Potential Impacts of Preferred Solution on the Environment

Disruptions to traffic during construction: Sign and maintain detour routes if the road is closed;

Limited or no access to properties during construction: Advise property owners if there will be limited or no access to properties before access is closed;

Removal of natural features, such as, vegetation and trees: Restore disturbed areas and plant new trees in accordance with municipal Tree policy;

Removal of archaeological resources: Carry out Stage 1 or Stage 2 Archeological assessment as required to identify and protect archaeological resources;

Relocation of utilities: Electrical power may be interrupted to homes and businesses when the properties are to be connected to the new power lines. The utility company should provide power outage notices to the affected properties.

Dewatering during culvert installation and extension and/or replacement of other drainage structures: Filter pumped water before discharging into the ditches and creeks.

Phase 4 of Municipal Class EA – Environmental Study Report (ESR)

This Environmental Study Report (ESR) documents the Class Environmental process undertaken through Phases 1, 2 and 3. Following County Council approval, the ESR will be placed on public record for at least 30 calendar days for review by the public, First Nations, stakeholders and review agencies.

Phase 5 of Municipal Class EA – Implementation

Subject to comments received, the County of Oxford plans to proceed with the design and construction of the preferred solution.

Consideration of Climate Change

Climate change, mitigations and adaptations have been considered for this project. Drainage and drainage structures were reviewed. Recommendation was made to improve the pavement width to accommodate Active Transportation as per the County Cycling Strategy.

Additional Work

Additional work required to be completed before construction include but are not limited to the following:

Property acquisitions;

Detailed design of the road improvements;

Relocation of utilities that are in conflicts with the proposed roadwork;

Two Municipal Drain petitions have been filed for drainage improvements;

Extension or replacements of two (2) large drainage structures under the County Bridge Program.

Extend the current 60 km/h speed zone eastward beyond the current location at the east end of Kintore.

Install advance 'TRUCKS TURNING' signs to warn drivers of trucks slowing down to turn onto Zorra 31st Line.

Monitoring

The following items shall be monitored:

Erosion and sediment control measures during construction and for a period of one (1) year after construction;

Growth of vegetation and trees for a period of one (1) year after construction.

1.0 Introduction

1.1 Background

Oxford County commenced a Municipal Class Environmental Assessment (Class EA) in November 2014 to identify opportunities for roadway improvements on Oxford Road 16 from the east limit of Kintore to Zorra 31st Line.

This Class EA is being undertaken based on the recommendation of the *County of Oxford – 2010 Road Needs Study*, which identified the need for improvements for this section of Oxford Road 16. The 2010 Road Needs Study recommended ‘reconstruction’ for the 1 to 5 year needs.

1.2 Study Area

The location and extent of the Study Area are shown on Figures 1(a) and 1(b). The focus of this study has been on part of Oxford Road 16 from the eastern limit of Kintore to Zorra 31st Line, which is about 5.8 kilometres in length.

Figure 1(a): Study Area



Figure 1(b): Study Area Showing the East-West Connections with Road 6 and Road 8



1.3 Existing Roadway Cross Section

Oxford Road 16 is a two-lane bituminous surfaced road with rural cross section. Drainage is by open ditches and culverts which outlets into existing creek crossings and municipal drains.

The Right-of-Way (ROW) for the study area from the east limit of Kintore to Zorra 31st Line varies from 20.1 to 30 metres and the width of the bituminous surface varies from 6.8 to 7.0 metres. Other parts of the road west of Kintore and east of Zorra 31st Line have a 30 metre ROW. The parts to the east and west were resurfaced to obtain an 8.7 metre asphalt width.

1.4 The Ontario Environmental Assessment Act (Ontario EA Act)

The Ontario EA Act came into force in 1976. The purpose of the EA Act as defined in the Act is to provide for: “the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment”. Environment is applied in a broad sense and includes the Natural, Social, Cultural, Built and Economic environments.

Under the EA Act, projects must undergo environmental assessments before implementations. The different ways to comply with the EA Act are as follows:

- ask the Minister of the Environment and Climate Change for exemption;
- conduct an Individual Environmental Assessment;
- conduct a Class Environmental Assessment (Class EA).

Municipal Road, Water, Wastewater and sometimes Transit projects follow the Municipal Class Environmental Assessment Planning and Design Process. The Municipal Class Environmental Assessment (Municipal Class EA) is one of the Class EAs planning and design process approved by the Minister, and when followed will meet the requirements of the Ontario EA Act.

1.5 Municipal Class Environmental Assessment Planning and Process

Projects in the Municipal Class EA are classified according to schedules in the Municipal Engineers Association (MEA) **Municipal Class Environmental Assessment** document (October 2000, as amended in 2007 and 2011):

Schedule A:

- Generally includes normal or emergency operational and maintenance activities.
- The environmental effects of these activities are usually minimal and, therefore, these projects are pre-approved.

Schedule A+:

- As part of the 2007 amendments, Schedule A+ was introduced. The purpose of Schedule A+ is to ensure some type of public notification prior to project implementation for certain projects that are pre-approved.

Schedule B:

- Generally includes improvements and minor expansion to existing facilities.
- There is the potential for some adverse environmental impacts and therefore the proponent is required to proceed through a screening process including consultation with those who may be affected.

Schedule C:

- Generally includes the construction of new facilities and major expansions to existing facilities.
- There is potential for significant environmental effects and these projects must proceed through the environmental assessment planning process outlined in the Municipal Class EA document.

1.6 Study Process

The steps undertaken for this study are described below:

- Phase 1 – Identify the problem or opportunity:
 - Distribute a notice of study commencement.
- Phase 2 – Identify alternative solutions to address the problem:
 - Inventory the natural, social, and economic environments.
 - Identify impact of alternative solutions on the environment.
 - Evaluate alternative solutions.
 - Undertake a Public Consultation Centre (PCC) to present information to-date and the preferred solution.
 - Select preferred solution and confirm Schedule of project: A, A+, B or C.
- Phase 3 – Identify alternative design concepts for preferred solution
 - Detail inventory of natural, social and economic environment
 - Identify impact of alternative designs on environment and mitigating measures
 - Evaluate alternative designs, identify preferred design
 - Undertake a Public Consultation Centre (PCC) to present information to-date and the preferred design.
 - Select preferred design
 - Preliminary finalization of preferred design
- Phase 4 – Environmental Study Report (ESR)
 - Complete ESR
 - ESR is placed on Public Record for public review after Council acceptance
 - Notice of completion to review agencies, First Nations, the public and MOECC
 - Opportunity to ask Minister within 30 days of notification for a Part II Order

- Phase 5 – Implementation
 - Complete contract drawings and tender documents
 - Proceed to construction and operation
 - Monitor for environmental provisions and commitments

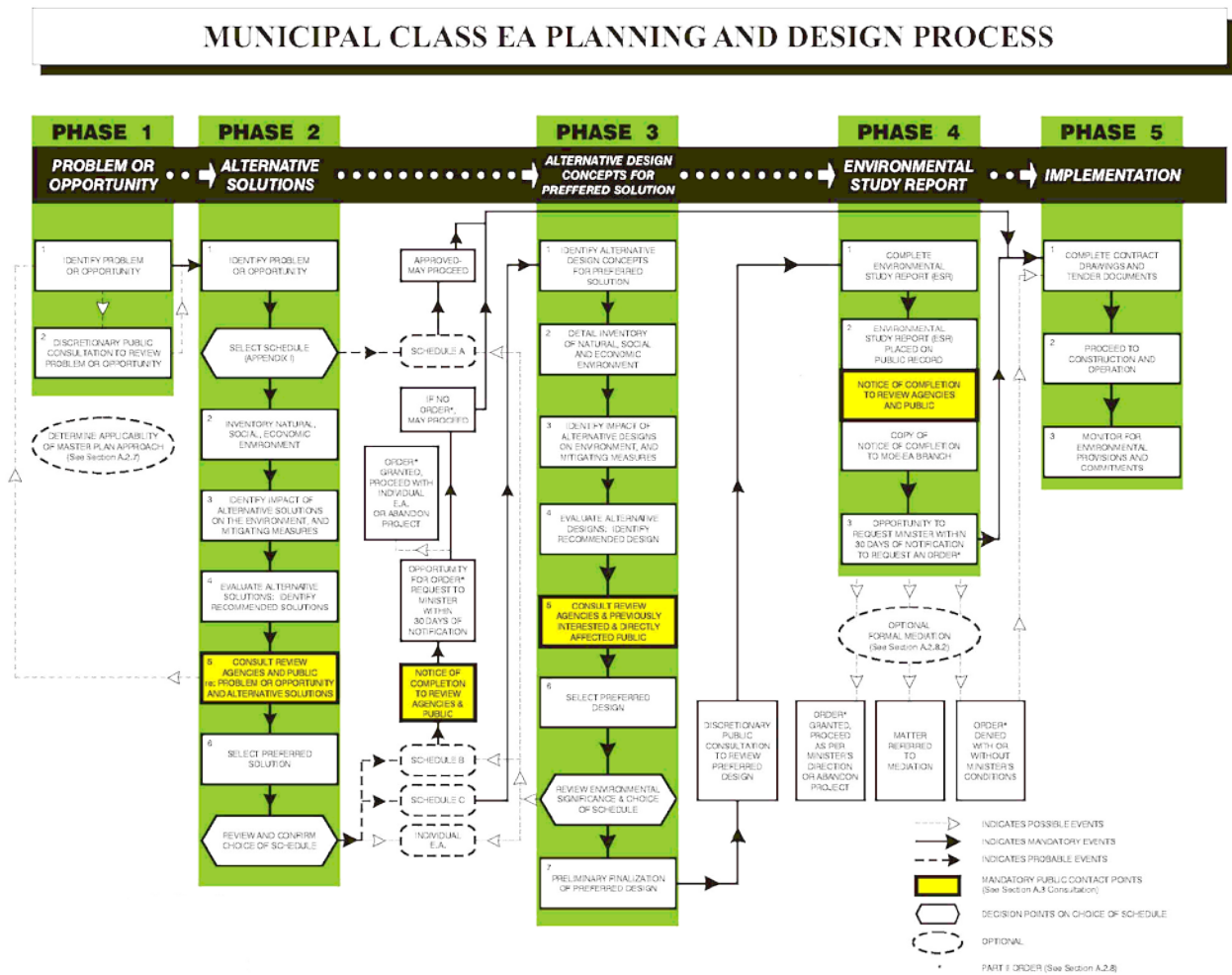
1.7 Selection of Project Schedule

In Appendix 1 of the Municipal Class EA Planning and Design Process, it states that road reconstruction or widening projects, with the addition of lane(s) or re-location of road(s), are either a Schedule B or Schedule C projects. Furthermore, projects that have an estimated value less than \$2.4 million are assigned as Schedule B projects. Projects that have an estimated value greater than \$2.4 million are assigned as Schedule C projects.

This project has been identified as a Schedule C Class EA as the improvements on part of Oxford Road 16 may require horizontal and vertical re-alignments and it is estimated to be over \$2.4 million. Schedule C projects have potential for adverse environment impact(s); therefore, a public consultation is required to provide an opportunity for the Public, Review Agencies, First Nations and Stakeholders to provide their inputs. This study has been carried out in accordance with the Schedule C of the Municipal Class EA process.

The documentation for a Schedule C project consists of an Environmental Study Report (ESR) which is presented in this document. The placement of the ESR for public review completes the planning and preliminary design stages of the project. The ESR is available for public review a minimum of thirty (30) calendar days from the date of publication of the Notice of Completion.

Figure 2: Municipal Class EA Planning and Design Process



1.8 Preferred Solution

The following improvements have been recommended in the Class EA for part of Oxford Road 16:

- Maintain a two-lane rural road cross section but widen the existing lane widths to improve safety and reduce maintenance;
- Widen granular shoulders to allow a recovery zone and emergency stopping;
- Increase sight lines and stopping distances;
- Improve drainage.

1.9 Appeal Process

If after reviewing the Environmental Study Report (ESR), you have questions or concerns, please follow this procedure:

- 1) Contact the following County staff to discuss your questions/concerns:

Dadean Assam, P.Eng.
Manager of Construction
Oxford County
21 Reeve Street, PO Box 1614
Woodstock ON N4S 7Y3
Tel: 519-539-9800 ext 3117
Fax: 519-421-4711
Email: dassam@oxfordcounty.ca

- 2) Arrange a meeting with the above if you have significant concerns that may require more detailed explanation;
- 3) If you raise major concerns, the County will attempt to negotiate a resolution of the issues. A mutually acceptable time period for this negotiation will be set. If the issues remain unresolved, you may request the Minister of the Environment and Climate Change, by order, to require the County to comply with Part II of the Environmental Assessment Act before proceeding with the project. Requests must be submitted in writing to the Minister of the Environment and Climate Change at the following address within the 30-calendar day review period:

The Minister/Ministry of Environment and Climate Change
77 Wellesley St. West, 11th Floor
Toronto, Ontario M7A 2T5
Fax: 416-314-8452

A copy of the letter to the MOECC must also be sent to the attention of Mr. Robert Walton, P.Eng., Director of Public Works (to the County address provided above).

1.10 Project Team

According to the EA Act, the Proponent means “a person who **carries out or proposes to carry** out an undertaking, or is the owner or person having charge, **management or control of an** undertaking”.

The proponent is Oxford County, c/o Public Works Department. The project team members were:

- Robert Walton, P.Eng., Director of Public Works;
- Dadean Assam, P.Eng., Manager of Construction;
- Melissa Abercrombie, P.Eng., Manager of Roads and Facilities;
- Frank Gross, C.Tech., Supervisor of Engineering Services.

1.11 Public & Agency Consultations

Public and agency consultation ensure that all stakeholders are given the opportunity to provide input to the project in a meaningful way. The goal of the consultation program is to have stakeholders help the project team by providing input into the definition of problems/opportunities, identification and evaluation of alternative solutions, and the selection of the preferred solution. The project team consisted of Oxford County staff.

The project team sought the involvement of residents/public, stakeholders, review agencies and First Nations by circulating newspaper advertisements, notices and notifications of upcoming Public Consultation Centers (PCCs). General notification points are summarized in Table 1.

Table 1: Study Notifications

Notification	Delivery Method	Date
Notice of Commencement and Public Consultation Centre #1	Newspaper Advertisements in Oxford Review	November 6 & 20, 2014
	Hand Delivery to Residents	November 4, 2014
	Mail-out to First Nations, Review Agencies and Property Owners	November 4, 2014
Notice of Public Consultation Centre #2	Newspaper Advertisements in Oxford Review	January 7 & 14, 2016
	Hand Delivery to Residents	January 6, 2016
	Mail-out to First Nations, Review Agencies and Property Owners	January 6, 2016
Notice of Public Consultation Centre #3	Newspaper Advertisements in Oxford Review	October 20 & 27, 2016
	Mail-out to First Nations, Review Agencies and Property Owners	Week of October 17, 2016

Presentation to Township of Zorra Council		November 15, 2016
Class EA Acceptance by Oxford County Council	Council Report No.:	December 14, 2016
Notice of Study Completion	Newspaper Advertisements in Oxford Review	
	Mail-out to First Nations, Review Agencies and Property Owners	

A number of agencies were contacted for the purpose of study notification, meeting notification and general information exchanged. The contact lists of First Nations and agencies are included in Appendix A. Due to privacy issues, the contact information of property owners are not included in this report.

By providing the public, review agencies and First Nations the opportunity to identify their concerns, the project team was able to respond to the specific issues and comments.

2. Phase 1 of Class EA - Problem or Opportunity

2.1 Collision Report

Police collision records from 2006 to 2014 were reviewed. A total of thirty five (35) collisions were reported to the Police. Twenty (20) collisions were single vehicle accidents due to loss of control of vehicle. Eight (8) were with animals and seven (7) involved two vehicles.

2.2 Archaeological and Built Heritage Assessments

The County retained AMICK Consultants Ltd. to carry out Stage 1 archaeological assessment of the study area. Some archaeological potential exist on the undisturbed portions of the existing right of way.

Stage 2 Archaeological Assessment is recommended to be completed if road work will be done on the undisturbed areas of the right of way.

A Built Heritage Assessment Checklist has been completed as required by Ministry of Tourism, Culture and Sport (MTCS). There were no built heritage resources identified along this portion of Oxford Road 16.

The complete Archaeological and Heritage Reports are included in Appendix B.

2.3 Drainage and Drain Outlets

There are five municipal drains (Henderson Drain, Borland Drain, Roefs Drain, McCall-McCorquodale Drain and the Ross Award Drain) and one creek crossing (Nissouri Creek), all flowing from north to south.

There are drainage ditches on both sides of the road that drains into the culverts, municipal drains, private drain and the creek.

The County of Oxford has identified road drainage/flooding in the areas of the Borland Drain crossing and the Ross Award Drain. The County requested a meeting with the Township of Zorra and the landowners on the drains to discuss possible improvements. This meeting occurred on September 30, 2016. The Township of Zorra is the municipality responsible for drainage under the sphere of influence under the Municipal Act, RSO 2001.

A petition signed by the Director of Public Works for the County has been submitted pursuant to Section 4-1 (c) of the Drainage Act, RSO 1990 for drainage improvements.

The County is concerned about the capacity of the Ross Award Drain which is apparently 100 years old. The Borland Drain has rock weir constructed by the landowner downstream of the road which causes flooding.

2.4 Natural Environment

The County retained Natural Resource Solutions Inc. (NRSI) to assess the natural environment of the study area.

Nine (9) Species at Risk (SAR) and eleven (11) Species of Conservation Concern (SCC) were identified as "having records from within the vicinity (within 10 km) of the study area.

No Significant Wildlife Habitats (SWH) were confirmed within the study area.

Significant Woodlands are associated with the McCal-McCorquodale Drain and the Nissouri Creek.

Significant Valleyland features are associated with the Pearson & Cuskey Drain, McCall-McCorquodale Drain, and Nissouri Creek floodplains.

Fish habitat is present in Pearson & Cuskey Drtain, McCall-McCorquodale Drain and Nissouri Creek.

The complete Natural Environment screening report by Natural Resource Solutions Inc. (NRSI) is included in Appendix C.

2.5 Geotechnical

Oxford County retained EXP Services Inc. to perform geotechnical investigation to determine the subsurface conditions at the project site and provide recommendations for the pavement design.

The boreholes were carried out to a sampling depth of 2.0 metres. The existing road consists of 75 mm to 225 mm of asphalt, 300 mm to 700 mm of granular materials and sandy silt below. The geotechnical report can be found in Appendix D.

2.6 Traffic and Traffic Volumes

Traffic Volume

The Average Daily Traffic (ADT) from the traffic count in 2012/2013 was 2,483 vehicles per day. The traffic counts were done in the Fall and Spring times. Heavy Trucks (trucks) were not counted separately but are included in this count. It is common to assume 12% truck traffic. Assuming 1.5% increase in vehicle traffic per year, the traffic volume in 20 years is estimated to be 3,344 vehicles per day.

Trucks Turning

Comments were received from the public that at Zorra 31st Line, commercial trucks turning onto Zorra 31st Line need to slow down (brake) to make the turns safely. At times, vehicles following the commercial trucks may not realize this maneuver and will brake suddenly, creating a situation that may lead to loss of vehicle control and/or collision. Installation of advance warning signs, such as, 'TRUCKS TURNING' will warn drivers of trucks slowing down to turn onto Zorra 31st Line. This can be implemented under Roads Operation and Maintenance program.

Reduce Speed

Requests were received to extend the current 60 km/h speed zone eastward beyond the current location at the east end of Kintore. Implementation of this request will require a Report to County Council and a by-law for a change in 'Speed Zone'. This can also be implemented under Roads Operation and Maintenance program. No horizontal realignment will be done in this area.

2.7 Socio-Economic Environment – Roadway & Adjacent Land Use

Oxford Road 16 is an east-west rural arterial roadway under the jurisdiction of Oxford County.

Except in the Village of Kintore, the roadway currently operates with a posted speed of 80 km/h.

Adjacent land use within the study area can be characterized as rural agriculture and rural residential development.

2.8 Classes of Soils

The Agriculture and Agri-Food Canada (Government of Canada) classified soils as Class 1 to Class 7.

Class 1: Soils in this Class 1 have no significant limitations in use for crops.

Class 2: Soils in this Class 2 have moderate limitations that restrict the range of crops or require moderate conservation practices.

2.9 Utilities

Oxford County is aware of the following utilities that will be impacted by the proposed work:

- Hydro One (electricity supply)
- Bell Canada (telephone and internet service), partly overhead and partly buried.
- Natural gas at the east end of Kintore.

2.10 Problem Statement

After completing a review of relevant background information and reviewing the technical studies and traffic operations, the problem statement can be identified as follows:

There is a need for improved roadway and traffic operations throughout the Oxford Road 16 corridor in order to improve safety for road users travelling along the roadway.

Corridor improvements are required in order to satisfy the goals and objectives of the Transportation Master Plan, as well as provide a safe access for all road users.

3. Phase 2 of Class EA - Alternative Solutions

3.1 Opportunity for Improvement

A number of alternatives were considered in order to improve future operating conditions of the corridor while concurrently improving geometrics, drainage, and safety.

3.2 Alternative Solutions

- 1) **Do Nothing:** Status quo with no improvements to corridor operations. This alternative is used as a “benchmark” in which all other alternatives are compared. This alternative does not address the identified issues along the corridor.
Estimated Capital Construction cost = \$0
- 2) **Rehabilitate existing road and maintain existing road width and alignments:** This alternative consists of removal of the existing asphalt from the road down to the granular base and placement of two layers of new asphalt, or recycle the existing asphalt and overlay with new asphalt.
Estimated Capital Construction cost = \$3,500,000.
- 3) **Reconstruct and maintain existing road width and alignments:** This alternative consists of removal of existing asphalt and granular material to native soil and rebuilding the roadway with new granular materials and asphalt.
Estimated Capital Construction cost = \$3,900,000
- 4) **Reconstruct road to a wider 2 lane rural cross-section, including re-alignments and drainage improvements:** This alternative consists of widening the existing travelled lane widths and gravel shoulders. Realigning the horizontal and vertical curves

where required. Improve drainage and improve sight line at the intersection of Oxford Road 16 and Zorra 29th Line.

Estimated Capital Construction cost = \$5,000,000, including property acquisitions and utility relocations.

3.3 **Evaluation of Alternative Solutions**

In order to evaluate the alternatives, evaluation criteria which reflects the study goals and objectives was developed. The evaluation criteria are summarized as follows:

- **Transportation Environment** – impact on traffic operations, ability to improve safety for all roadway users, and ability to maintain adequate local access;
- **Social Environment** – land requirements, and impact to adjacent residential and agriculture properties;
- **Natural Environment** – removal/disturbance to vegetation, storm water/drainage and noise impacts;
- **Cost** – construction and maintenance costs.

The reasoned argument evaluation method has been used in order to select a preferred alternative by highlighting the differences in net impacts associated with the various alternative solutions and in determining the advantages and disadvantages of those impacts. The evaluation has been based on feasibility, constructability, conformity to County policies and comments and concerns received during public consultation.

The evaluation of the alternatives is summarized in Table 2.

Table 2: Evaluation of Alternative Solutions

Evaluation Criteria and Sub-Factors		Alternative Solutions			
		Alternative 1: Do Nothing	Alternative 2: Rehabilitate Existing Road Surface	Alternative 3: Reconstruct Road with no Alignment and Drainage Improvements	Alternative 4: Reconstruct Road with New Cross-Section including Alignment and Drainage Improvements
Transportation Environment	Traffic Operations				
	Safety				
	Road Geometry				
Social Environment	Impact to Rural Residential Properties				
	Impact to Rural Agricultural Properties				
Natural Environment	Impact to Vegetation/Trees				
	Stormwater/ Drainage				
	Noise Impacts				
Cost	Construction	\$0	\$3,500,000	\$3,900,000	\$5,000,000
	Maintenance				
Summary					

Range Indicator



3.4 Selection of Preferred Solution

Based on the preliminary evaluation of the alternative solutions, and keeping in context with the study goals and objectives, it was concluded that **Alternative 4 - Reconstruct Road to a new 2 lane rural cross section with wider pavement, including realignment and drainage improvements** as the preferred alternative based on the following rationale:

- The ability to achieve improved sightlines, improved stopping distance, improved driving cross-section, along the length of the corridor;
- The ability to provide improved drainage along the roadway and prevent negative impacts on adjacent agriculture and residential lands.
- Although this is the highest cost option evaluated, the proposed construction is in keeping with the existing cross section of other parts of Oxford Road 16 to the east and west of the study area.

3.5 Review and Confirmation of Class EA Schedule

Based on the criteria used to evaluate and select the Preferred Solution, the status of this Class EA was confirmed to be Schedule C.

3.6 Recommendation of Preferred Solution

A report to County Council will recommend Alternative 4 to **improve Oxford Road 16 within the study area with a 2-lane rural cross-section with wider pavement widths, including realignments where required and drainage improvements**. This alternative consists of increasing the width of the paved road, adding wider granular shoulders, realigning vertical and horizontal curves, and installing adequate drainage along the roadway. For the preferred solution, some utilities (hydro poles, natural gas mains and telephone cables) will be relocated.

4. Phase 3 of Class EA - Alternative Design Concepts for the Preferred Solution

4.1 Phasing of Construction

Depending on budgets, the road improvements may be completed in three phases as follows:

- Replacement of the drainage structure (bridge) at McCall-McCorquodale drain and Road improvement between Zorra 31st Line and Zorra 29th Line;
- Road improvement from east limit of Kintore to Zorra 25th Line, and
- Road improvement from Zorra 25th Line to Zorra 29th Line.

4.2 Proposed New Road Cross Section

- Two - 3.35 metre wide paved travel lanes;
- Two - 1.0 metre wide paved shoulders;
- Two - 2.0 metre wide gravel shoulders; drainage ditches on both sides with side slopes of 2 horizontal to 1 vertical or flatter.

4.3 **Potential Impacts of the Preferred Solution**

Transportation Environment: During construction, the road will be closed during excavation for structure replacement. Detours will be signed and communicated to the Public.

Proposed construction detour routes are shown on Figures 3(a), (b) and 4.

Economic Environment: There are farm lands adjacent to the road. During construction, local access will be maintained for access to the farmlands, except when work is directly in front of the entrance.

Cultural Environment: Stage 1 Archaeological Report recommended that Stage 2 Archaeological Assessment be carried out on areas where deep excavations have not been previously done. Road widening on acquired properties, such as, farmlands may require Stage 1 and Stage 2 Archaeological Assessments.

Social Environment: The adjacent lands are mostly residential and agriculture properties. Local access to these properties will be maintained during construction. During construction, noise from construction equipment may be noticeable and the hours of construction will be according to Municipal by-law. Dust will be created when vehicles travel on unpaved (gravel) surfaces. Calcium and water should be used to control dust.

For 2012/2013 traffic volume of 2,483 vehicles per day and assuming 1.5% annual increase in traffic, noise impacts due to potential increase in traffic will be minimal.

Natural Environment: Potential impacts on the Terrestrial environment include removal of roadside vegetation and trees. Vegetation will be removed for wider road platform. Disturbed areas should be seeded, sodded or mulched as soon as possible.

Potential impacts on surface water include silt and sedimentation from construction activities. Install, inspect and maintain silt fence, straw bale during construction to mitigate silt migration to surface water. Disturbed areas should be seeded, sodded or mulched as soon as possible.

Utilities: Relocation of hydro poles and Bell cables will be required. There is no natural gas within the study area, but the natural gas company was circulated with the notice of study commencement and Public Consultation Centers.

Drainage: With a wider pavement, the drainage structures will be extended or replaced if they are near the end of their useful life. Where required, new drainage ditches will be constructed for improved drainage. The wider pavement will result in more surface runoff. However, ditches should be lined with vegetation which will provide good infiltration that will reduce the surface run off to the water bodies.

Table 3 shows the preliminary analyses of the “Surface” Drain Crossings on Oxford Road 16 within the study area. Figure 6 shows the ‘assumed’ drainage areas.

Table 3: Preliminary Analyses of Existing Drainage Systems by ‘The Rational Method’

Rational Method for drainage area up to 100 ha.

Use runoff coefficient, C = 0.2 for primarily pasture and farmlands.

Surface Drain, Culvert & Pipe Crossing Road 16 at:	Time of Concentration (minutes) – use Airport Formula for C < 0.4	Intensity for 25-year storm (mm/hr) from Woodstock, Ontario, I-D-F curves	Peak Flow, Q₂₅ (m³/s)	Check Capacity with Inlet Control method	Comments
Henderson Drain, Area = 25.8 ha; Length = 400 m; Slope = 0.62%	68.6 min	37 mm/hr	0.53	Existing 750mm CSP is adequate	450mm diam. Municipal drain below surface drain
Borland Drain, Area = 222 ha; Length = 1,300m; Slope = 0.87%	124 min	25 mm/hr	3.11	Existing 3.5m span x 1.78m rise bridge is adequate	See Bridge inspection report for bridge 843164
Ross Drain, Area = 61.7 ha; Length = 904 m; Slope = 1.38%	79.2 min	35.5 mm/hr	1.23	Existing 2-600mm CSPs are adequate	300mm diam. Municipal drain below surface drain
Roefs Drain, Area = 44.1 ha; Length = 730 m; Slope = 1.37%	71.4 min	38 mm/hr	0.94	Existing 600mm CSP is inadequate Use 750mm	400mm diam. Municipal drain below surface drain
McCall-McCorquodale Area = 959.4 ha; Length = 6,452m; Slope = 0.7%	265 min	16 mm/hr	8.6	Existing 4.25m span x 2.m rise bridge is adequate	See Bridge inspection report for Bridge #843534

Check Boreland and McCall-McCorquodale Drainage Structure capacities using Modified Index Flood Method. The drainage areas are greater than 100ha.

Surface Drain, Culvert & Pipe Crossing Road 16 at:	Soil Group	Curve Number, CN	Base/Net Watershed Classes	Class Coefficient, C	Peak Flow, Q₂₅ (m³/s)	Check with Inlet Control method
Borland Drain, Area = 222 ha (2.22 km ²); Length = 1,300m; Slope = 0.87%	C (silt loam)	76	8.5/8.15	1.84	3.35	Existing 3.5m span x 1.78m rise bridge is adequate
McCall- McCorquodale Area = 959.4 ha (9.594 km ²); Length = 6,452m; Slope = 0.7%	C (silt loam)	76	8.5/8.15	1.84	10.03	Existing 4.25m span x 2.m rise bridge is adequate

Property acquisitions:

The existing Right-of-Way (ROW) varies from 20.1 metres to 30 metres.

Table 3 of Chapter 5 of the County Official Plan recommends 31 metres of Right-of-Way for County Roads in rural areas. This requirement is to accommodate the recommended widths of travel lanes, shoulders and drainage ditches.

In the subsection titled ‘Overview of the Municipal Class EA (2000)’ in the Executive Summary, of the Municipal EA booklet, it is documented that one of the main features of the 2000 Municipal Class EA was that: “reference to property acquisitions in the process flow chart and text deleted due to changes in amended EA Act.”

Where properties are required, property acquisitions will be negotiated with property owners separately from this Class EA process. A total of about 12 acres of properties are required from adjacent property owners. Some of the properties required for this project were obtained when the project was considered in the 1980’s.

Figure 6 shows where property (land) acquisitions will be required for Alternative #4. The County is not proposing land acquisition along the forested area and will work within the existing road allowance to minimize disruption to the forest.

5. Public, First Nations and Agency Consultation

5.1 Public Consultation Centre No. 1

The first Public Consultation Centre (PCC #1) was held on November 27, 2014. The PCC was advertised two consecutive times in the local newspaper and notices were mailed out to stakeholders and also hand delivered to residents within the study area.

Newspaper advertisements, PCC #1 presentation materials, comments and notes taken at PCC #1 are included in Appendix E.

Due to privacy issues, the names, addresses, telephone numbers and emails of peoples not representing First Nations, Agencies and organizations have been blacked out from the comment sheets.

Twenty five (25) people signed the attendance sheet. However, some people that attended did not sign the attendance sheet.

Twelve (12) written and one (1) phone-in comments were received.

5.2 Public Consultation Centre No. 2

The second Public Consultation Centre (PCC #2) was held on January 26, 2016. The PCC was advertised two consecutive times in the local newspaper and notices were mailed out to stakeholders and also hand delivered to residents within the study area.

Newspaper advertisements, PCC #2 presentation materials, comments and notes taken at PCC #2 are included in Appendix F.

Again, due to privacy issues, the names, addresses, telephone numbers and emails of peoples not representing First Nations, Agencies and organizations have been blacked out from the comment sheets.

Twenty four (24) people signed the attendance sheet.

Five (5) written comments were received.

5.3 Public Consultation Centre No. 3

The third Public Consultation Centre (PCC #3) was held on November 15, 2016. The PCC was advertised two consecutive times in the local newspaper and notices were mailed out to First Nations, Agencies and property owners.

Newspaper advertisements, PCC #3 presentation materials, comments and notes taken at PCC #3 are included in Appendix G.

Again, due to privacy issues, the names, addresses, telephone numbers and emails of peoples not representing First Nations, Agencies and organizations have been blacked out from the comment sheets.

Eight (8) people signed the attendance sheet.

Zero (0) comments were received at the writing of this Report.

6. Drinking Water Source Protection

6.1 Vulnerable Areas

According to Upper Thames River Conservation Authority (UTRCA) letter dated November 14, 2014, the Assessment Report for the Upper Thames Watershed delineates three (3) types of Vulnerable Areas:

- Wellhead Protection Areas
- Highly Vulnerable Aquifers
- Significant Groundwater Recharge Areas

UTRCA further advised that the “study area contained areas identified as being a Highly Vulnerable” and the Threats are considered ‘Moderate and Low’.

6.2 Drinking Water Threats

The Clean Water Act (2006) define ‘A Drinking Water Threat’ as an “activity or condition that affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water”.

On this project, the ‘handling and storage of fuel’ during construction is identified as a Drinking Water Threat. Mitigation measures include - not to re-fuel close to water bodies. Clean up fuel spills immediately.

7. Climate Change

Consideration of Climate change is not included in the Municipal Class EA Planning and Design Process, dated October 2000, as amended in 2007 & 2011. However, some other Environmental Assessment Planning proponents are including Climate Change, Mitigation and Adaptation when preparing Environmental Assessments (EA’s) for projects.

7.1 Greenhouse Gasses (GHGs)

Greenhouse Gasses (GHGs) are gasses listed in the Kyoto Protocol which include Carbon Dioxide (CO₂), Nitrous Oxide (N₂O), Methane (CH₄), Hydrofluorocarbons (HFCs) and Sulphur Hexafluoride (SF₆).

Scientists have noted that the burning of fossil fuels from human activities have caused an increase in GHGs in the Earth’s atmosphere which lead to climate change. The use of gasoline and diesel (fossil fuels) in the operations of vehicles contribute to the generation of GHGs.

7.2 Mitigation and Adaptation

Roads will be affected by climate change from extreme weather events, such as, floods, erosions, droughts, hurricane/ tornados, extreme temperatures, snow falls, etc.

Oxford72hours.ca website lists a timeline of disasters (The Big Ones) in Oxford County. Some of the listed disasters that may affect a roadway are:

Disaster	Year(s) of Disaster
Tornados	1856, 1914, 1933, 1953, 1979, 1988 and 1998
Fires	1872, 1874, 1929, 1930, and 1935
Floods	1894, 1937 and 2000
Blizzards	1971 and 1978
Windstorms	1995,
Ice Storms	2013.

Table 4 – Activity/Risk, Mitigation and Adaptation on Climate Change

Activity/Risk	Mitigation	Adaptation
Use of fossil fuels in construction equipment during construction	Reduce idling of equipment when not in use. In-place recycling of existing asphalt to reduce emissions associated with production of new asphalt.	
Use of fossil fuels in personal and commercial vehicles.	Reduce number of trips. Maintain vehicles per manufacturers’ recommendations. Ride share/ car pool when possible. When possible, use other modes of transportation – cycling & walking. Reduce idling of vehicles when possible.	
Floods – some sections of road washed out.	Design, construct and maintain good drainage system. Read Flood Warnings issued by Agencies.	Close road and provide detour. Carry out repairs when possible.

Erosions of disturbed areas.	Plant and maintain trees and vegetation to increase the carbon sink.	
Drought – dead trees and dead vegetation.	Watering may not be practicable due to drought.	
Hurricane /Tornados – downed trees and flying objects.		Close road and provide detour. Remove dead trees when safe to do so.
Extreme Cold Temperatures – frost heave due to sub-zero air temperatures.	Design and construct road to prevent frost heaves.	Close road and provide detour.
Extreme Hot temperatures – buckling of road due to thermal expansion.		Close road and provide detour.
High Snow fall/accumulation -	Read Weather Warnings issued by Agencies.	Close road. Remove snow from road when possible.
Ice Storm -	Read Weather Warnings issued by Agencies.	
Windstorm -	Read Weather Warnings issued by Agencies.	

8. Statement of Environmental Values

Statement of Environmental Values is not included in the Municipal Class EA Planning and Design Process, dated October 2000, as amended in 2007 & 2011. However, some other Environmental Assessment Planning proponents are including Statement of Environmental Values when preparing EAs for projects.

To help support and sustain the environment, the following initiatives should be implemented on this project:

- excess soil from the project should be sent to the landfill site for use as cover material and/or to gravel pits for pit restorations. Soil should be tested for contaminations as per current Acts and Regulations before hauling to landfill and gravel pits;
- re-use existing road materials by in-place pulverizing of the existing bituminous material and underlying granular materials;
- retain the existing vegetation by stripping and salvaging vegetation and topsoil and re-use them for landscaping of disturbed areas;
- protect existing trees and vegetation by not excavating close to the tree line and avoid close cut clearing. If trees are damaged or removed, re-plant native trees in accordance with municipal tree planting program. Revegetate areas with native vegetation;

- during construction, use calcium and water to control dust generation by construction equipment from unpaved road surfaces;
- identify the Species at Risk (SAR) and their habitats and protect them as per current Acts and regulations.