Regional Municipality of Peel

Dixie Road Improvements from Queen Street to 2 km North of Mayfield Road Municipal Class Environmental Assessment Study

Environmental Study Report Volume I: Main Report

Prepared by:

AECOM

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Project Number:

60118562/110372

Date:

August 2011

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August 26, 2011

Hitesh Topiwala, MCIP, RPP
Project Manager, Transportation Program Planning
Transportation Division, Public Works
Region of Peel
9445 Airport Road
Brampton ON L6S 4J3

Dear Mr. Topiwala:

Project No: **60118562**

Regarding: **Dixie Road Improvements from Queen Street to 2 km North of Mayfield Road**
Municipal Class Environmental Assessment Study
Environmental Study Report

Enclosed please find the Environmental Study Report for the above noted project.

If you have any questions regarding the information provided herein, please do not hesitate to contact me at 905-668-4021 ext. 2251.

Sincerely,
AECOM Canada Ltd.

Brenda Jamieson, P. Eng.
Associate Vice President, Transportation
Brenda.Jamieson@aecom.com

Encl. Environmental Study Report

Distribution List

# of Hard Copies	PDF Required	Association / Company Name
1	Yes	Region of Peel
1	Yes	City of Brampton
2	Yes	Toronto Region Conservation Authority
1	Yes	Town of Caledon
1	Yes	Ministry of Environment
1	No	Review Locations

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Executive Summary

A. Background

In 2008, the Region of Peel (the Region) initiated a Schedule "C" Municipal Class Environmental Assessment (EA) for improvements on Dixie Road (RR #4) from Queen Street to Mayfield Road in order to support planned growth in the area and to provide for additional north-south road capacity in accordance with the Region's Long Range Transportation Plan (September 2005). During the public and agency consultation process it was determined that the study limits should be extended by approximately 2 kilometres (km) north of Mayfield Road to allow for the review and evaluation of potential impacts to Dixie Road from a proposed industrial development in the Town of Caledon. The Region accordingly extended the study limits to develop a comprehensive and long term solution for the Dixie Road corridor.

B. Municipal Class EA Project Schedule

As the project described in this report involves the reconstruction and widening (i.e. additional lanes) with a construction cost of over $2.7 million (Schedule C trigger) Phases 1 to 4 of the Municipal Class EA planning process were completed for this study in accordance with the Ontario Municipal Engineers Association (MEA) "Municipal Class Environmental Assessment" document (October 2000, as amended in 2007).

C. Consultation Program

Recognizing that public and regulatory agency consultation is a significant and integral part of the Municipal Class EA process, a consultation program was initiated from the outset of the study and continued throughout.

A wide range of stakeholders were identified and contacted at the outset of the Study, to 'scope' potential issues and areas of interest or concern. Interest in the project was considered to be any feedback received from a stakeholder indicating that they could be directly or indirectly affected during the planning, construction and/or operation of the proposed undertaking. A number of methods were undertaken to achieve the above-stated objectives, including:

- Placement of Notice of Study Commencement, Study Limit Extension, Public Information Centre (PIC) No. 1, PIC No. 2, as well as Study Completion within the Brampton Guardian and the Caledon Enterprise (see Notices provided in Appendix A);
- Scheduling of two Public Information Centre (PIC) events during Phases 2 and 3 of the study;
- Placement of notices, PIC boards and preliminary designs on Region's website;
- Distribution of informational mailings (e.g., Commencement/Study Limit Extension/PIC/Study Completion letters) to regulatory agencies, utilities, First Nations and the public during various stages of the study process;
- Receiving/responding to written submissions;
- Participation in meetings and telephone discussions with regulatory agencies, utilities and the public; and
- Placement of this ESR on the Public Record and provision of a Notice of Study Completion to regulatory agencies and the public during Phase 4 of the study.

D. Problem/Opportunity Statement

The completed traffic analysis and planned growth forecasts provide the basis for the need and justification for improvements to Dixie Road between Queen Street and 2 km north of Mayfield Road. The opportunities for improvement have been defined by the following issues:

- The Region of Peel will continue to experience significant population growth;

- The Provincial Places to Grow Growth Outlook for the Greater Golden Horseshoe forecasts the Region of Peel to grow to 1.49 million by 2021 and 1.64 million by 2031;
- The Regional Municipality of Peel Long Range Transportation Plan (September 2005) and City of Brampton Transportation and Transit Master Plan identifies the need to widen and improve this section of Dixie Road;
- There is not sufficient capacity on Dixie Road to accommodate the increased volumes as a result of the population growth; and
- Many of the intersecting roads and adjacent North South arterial and collector roadways have been or are scheduled to be widened in the near future.

Considering the above, the problem and opportunity statement for this Municipal Class EA study is defined as follows.

- *Based on current and projected growth for the City of Brampton and a proposed development in the Town of Caledon, improvements along Dixie Road, from Queen Street to north of Mayfield Road are required to address increased traffic congestion and deterioration of the road conditions over the next 25 years.*

In order to serve the short and long term transportation needs related to planned future growth, this study examined possible road widening and linkages, intersection improvements, pavement rehabilitation, and opportunities to facilitate public transit, bicycle traffic, pedestrian movement and active transportation.

E. Alternative Solutions to the Problem

The following six alternative solutions were considered:

- Do Nothing
- Intersection Improvements
- Road Widening
- Widen Alternative Routes
- Increase Transit Use
- Provide High Occupancy Vehicle Lanes

On the basis of the comparative evaluation, the preferred alternative solution to address the anticipated traffic volumes within the project limits is to **widen Dixie Road from 4 to 6 lanes from north of Queen Street to Countryside Drive and from 2 to 4 lanes between Countryside Drive and 2 km north of Mayfield Road** to address the needs up to the 2031 planning horizon. The future needs beyond 2031 will be reviewed at an appropriate time. In addition, it was determined that intersection improvements and continued Transportation Demand Management (TDM) measures by supporting increased transit usage and active transportation to reduce demand would also be carried forward as part of the preferred alternative solution.

F. Alternative Design Concepts

The following alternative design concepts were developed and evaluated:

- Widen from the centreline
- Widen to the west
- Widen to the east
- Widen based on combined design

Based on the evaluation of alternative design concepts, Alternative 4 (widen based on combined design) was selected as the preliminary recommended design.

G. Recommended Design

The Recommended Design for Dixie Road, presented on the design drawings in **Section 10**, is to widen Dixie Road to six (6) through lanes plus turning lanes from north of Queen Street to Countryside Drive and four (4) through lanes plus turning lanes north of Countryside Drive to the northerly project limit (i.e., approximately 2 km north of Mayfield Road). Key features include; a number of new intersections, dedicated turn lanes at intersections, a center median, a 1.5 m sidewalk on both sides of Dixie Road from Queen Street to Countryside Drive, a 1.5 m sidewalk on the east side of Dixie Road north of Countryside Drive, and a 3.0 m multi-use trail on the west side of Dixie Road north of Countryside Drive.

H. Remaining Approvals

The Region of Peel will work with Toronto Region Conservation Authority and other authorities, including the Ministry of the Environment, prior to the start of construction, to ensure that the proposed works are acceptable and to obtain required permits.

I. Implementation Schedule

The Region intends to proceed to detailed design for the first section from Mayfield Road to Countryside Drive in 2012 and the second section from Countryside Drive to Queen Street in 2014, following the completion of the public review period, subject to comments received on this report, the approval of the required financing and agency approvals.

J. Mitigation Measures

The overall conclusion drawn from this ESR is that construction of the proposed improvements can be achieved with minimal disruption to and impact upon the natural, physical, socio-economic and cultural environment. The principal negative impacts will include:

- Increase in traffic noise;
- Impacts to residents and business owners during construction;
- Impacts to vegetation along the corridor;
- Permanent and temporary easements required from several property owners along both sides of the corridor; and
- Potential impacts to fisheries and aquatic habitat.

The significance of these effects can be mitigated through the measures prescribed in this Report, along with the use of standard design measures and Best Construction Management Practices. It is noted that construction of the proposed roadway improvements are not expected to have any discernable adverse impact on the environment.

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1. INTRODUCTION

1.1 BACKGROUND

In 2008, the Region of Peel (the Region) initiated a Schedule "C" Municipal Class Environmental Assessment (EA) for improvements on Dixie Road (RR #4) from Queen Street to Mayfield Road in order to support planned growth in the area and to provide for additional north-south road capacity in accordance with the Region's Long Range Transportation Plan (September 2005). During the public and agency consultation process it was determined that the study limits should be extended by approximately 2 kilometres (km) north of Mayfield Road to allow for the review and evaluation of potential impacts to Dixie Road from a proposed industrial development in the Town of Caledon. The Region accordingly extended the study limits to develop a comprehensive and long term solution for the Dixie Road corridor.

All municipal road projects in Ontario are subject to Ontario's Environmental Assessment Act (EA Act). As a result, the Municipal Engineers Association - Municipal Class Environmental Assessment document (October 2000, amended in 2007) for the planning of municipal infrastructure was developed in accordance with Ontario's Environmental Assessment Act (EA Act).

This Environmental Study Report (ESR) documents the need and justification for the project, the planning and design process undertaken to select the preferred alternative (including preliminary design) and measures to mitigate impacts, in accordance with the Municipal Class EA, for the improvements to Dixie Road from Queen Street to 2 km north of Mayfield Road.

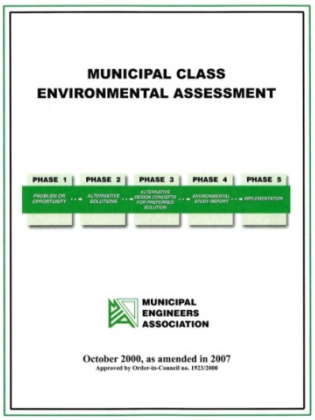
1.2 PROJECT LOCATION

The study area is centrally located in the north part of the City of Brampton and extends along both sides of Dixie Road, from Queen Street East (RR #107) northerly to 2 km north of Mayfield Road (RR #14) into the Town of Caledon. The study area corridor defined by Mayfield Road in the north and Queen Street in the south runs a distance of approximately 9 km and is illustrated in **Figure 1**.

Figure 1 Study Area

1.3 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PLANNING PROCESS

1.3.1 OVERVIEW



All municipalities in Ontario are subject to the provisions of the *Environmental Assessment Act* (EAA) and its requirements to prepare an Environmental Assessment for applicable public works projects. The Ontario Municipal Engineers Association (MEA) "Municipal Class Environmental Assessment" document (October 2000, as amended in 2007) provides municipalities with a five-phase planning procedure approved under the *EAA* to plan and undertake all municipal sewage, water, stormwater management, and transportation projects that occur frequently, are usually limited in scale, and have a predictable range of environmental impacts and applicable mitigation measures.

In Ontario, road projects are subject to the Municipal Class EA process and dependent on project classification, must follow a series of mandatory steps as outlined in the Municipal Class EA document. The Class EA consists of five phases as summarized below:

Phase 1 – Problem or Opportunity: Identify the problem or opportunity to be addressed and the need and justification;
Phase 2 – Alternative Solutions: Identify alternative solutions to the problem by taking into consideration the existing environment, and establish the preferred solution taking into account public and agency review and input;
Phase 3 – Alternative Design Concepts for the Preferred Solution: Examine alternative methods of implementing the preferred solution, based upon the existing environment, public and agency input, anticipated environmental effects and methods of mitigating negative effects;
Phase 4 – Environmental Study Report: Document, in an Environmental Study Report (ESR) a summary of the rationale, planning, design and consultation process for the project as established through Phases 1 to 3 above and make such documentation available for scrutiny by review agencies and the public; and
Phase 5 – Implementation: Proceed with detailed design, property acquisition and utility relocations prior to construction.

The Class EA process ensures that all projects are carried out with effectiveness, efficiency and fairness. This process serves as a mechanism for understanding economic, social and environmental concerns while implementing improvements to municipal infrastructure.

Mandatory Principles

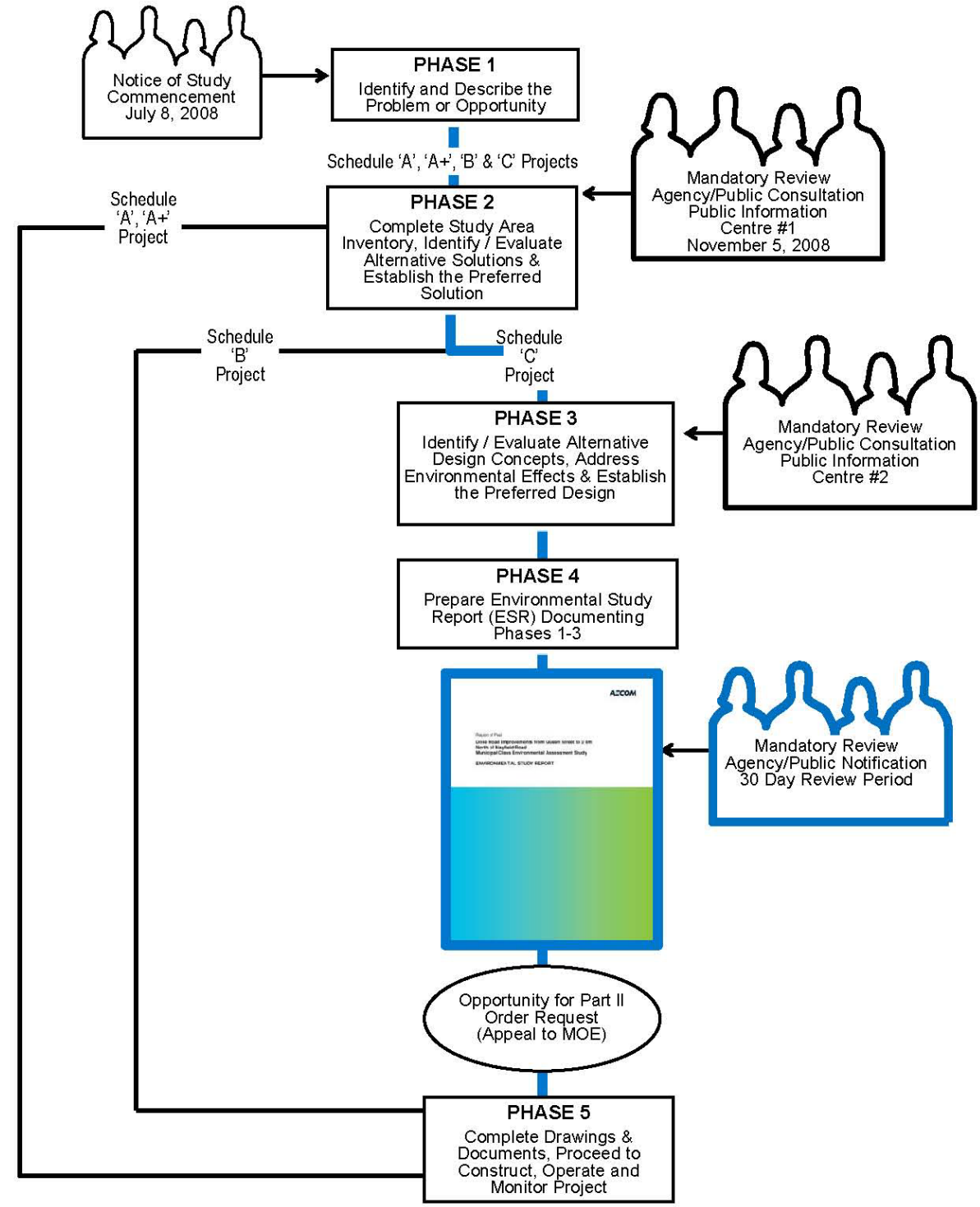
The planning process followed not only adheres to the guidelines outlined by the Municipal Class EA document but reflects the following five mandatory principals of Class EA planning under the *EAA*:

1. *Consultation with affected parties early on and throughout the process, such that the planning process is a co-operative venture;*
2. *Consideration of a reasonable range of alternatives, both the functionally different alternatives to the project (known as alternative solutions) and the alternative methods of implementing the preferred solution;*
3. *Identification and consideration of the effects of each alternative on all aspects of the environment;*

4. *Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects; and*
5. *Provision of clear and complete documentation of the planning process followed, to allow 'traceability' of decision-making with respect to the project.*

Figure 2 illustrates the process followed in the planning and design of projects covered by a Municipal Class EA, including the Dixie Road Improvements Class EA study.

Figure 2 Overview of the Municipal Class Environmental Assessment Process



Indicates where the project currently is at in Class EA Process

Project Classification

The Municipal Class EA document defines four types of projects and the planning processes required for each (referred to as Schedule A, A+, B or C). This project was completed under the Municipal Class EA **Schedule C** planning process.

The selection of the appropriate project planning schedule is dependent on the anticipated level of environmental impact and, for some projects, the anticipated construction costs. Projects are categorized according to their environmental significance and their effects on the surrounding environment. Planning methodologies are described within the Municipal Class EA document and are different according to Class type.

Schedule C: These projects have the potential for significant adverse environmental effects and must proceed under the full planning and documentation procedures (Phases 1 to 4) specified in the Municipal Class EA document. Schedule C projects require that an Environmental Study Report (ESR) be prepared and filed for review by the public and review agencies. If concerns raised cannot be resolved, a Part II Order may be requested and considered by the Minister of the Environment to elevate the project to an Individual EA. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities. Examples of Schedule C projects include construction of new roads or other linear paved facilities with a construction cost over $2.7 million, or reconstruction or widening where the reconstructed road or other linear paved facilities will not be for the same purpose, use, capacity or at the same location as the facility being reconstructed (i.e., additional lanes, continuous centre left turn lanes) and the construction cost is over $2.7 million.

1.3.2 DIXIE ROAD MUNICIPAL CLASS EA PROJECT SCHEDULE

As the project described in this report involves the reconstruction and widening (i.e. additional lanes) with a construction cost of over $2.7 million (Schedule C trigger) Phases 1 to 4 of the Municipal Class EA planning process were completed for this study.

1.3.3 CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)

The *Canadian Environmental Assessment Act* (CEAA) is intended to make sure that projects carried out, funded, permitted or licensed by the federal government are properly scrutinized by authorities and demonstrate a solid commitment to sustainable development and the promotion of a healthy economy and environment. The CEAA is also intended to prevent any projects associated with the federal government from having any adverse environmental effects outside the jurisdictions in which they are undertaken. The *Act* is administered by the Canadian Environmental Assessment Agency, an independent agency that reports to the Minister directly. Based on the project description, available data and technical studies and agency input to date, there are no CEAA triggers for a federal EA process for the Dixie Road improvements project.

1.4 PUBLIC REVIEW AND NEXT STEPS

The documentation for this Schedule C project consists of an Environmental Study Report (ESR), which is presented as this document. Placement of the ESR for public review completes the planning and preliminary design stages of the project.

This ESR is available for public review and comment for a period of 30 calendar days starting on September 1, 2011 and ending on September 30, 2011. A public notice (Notice of Study Completion)

was published to announce commencement of the review period. To facilitate public review of this document, copies are available at the following locations during regular business hours:

Region of Peel **Clerk's Department** 10 Peel Centre Drive, 5th Floor, Suite A Brampton, ON L6T 4B9 Phone: 905-791-7800	**Town of Caledon** **Clerk's Department** 6311 Old Church Road, 4th Floor Caledon, ON L7C 1J6 Phone: 905-584-2272	**City of Brampton** **Clerk's Department** 2 Wellington Street West, 1st Floor Brampton, ON L6Y 4R2 Phone: 905-874-2101
City of Brampton Library **Chinguacousy Branch** 150 Central Park Drive Brampton, ON L6T 1B4 Phone: 905-793-4636	**Town of Caledon Public Library** **Margaret Dunn Valleywood Branch** 20 Snelcrest Drive Caledon, ON L7C 1B5 Phone: 905-843-0457	

After reviewing this report, if you have questions or concerns, please follow this procedure:

1. Contact Mr. Hitesh Topiwala at the address below to discuss your questions or concerns:

Mr. Hitesh Topiwala, PMP, RPP
Project Manager, Transportation Program Planning
Region of Peel
9445 Airport Road, 3rd Floor
Brampton, ON L6S 4J3
Tel: 905-791-7800 ext. 7805; Fax: 905-791-1442
Email: hitesh.topiwala@peelregion.ca

2. Arrange a meeting with the above if you have significant concerns that may require more detailed explanations;
3. If you raise major concerns, the Region of Peel will attempt to resolve the issue(s). A mutually acceptable time period for this meeting will be set. If the issues remain unresolved, you may request the Minister of the Environment, by order, to require the Region of Peel to comply with Part II of the *EAA* before proceeding with the project; this is called a Part II Order request. The Minister may make one of the following decisions:
    - Deny the request with or without conditions;
    - Refer the matter to mediation; or
    - Require the Region of Peel to comply with Part II of the *EAA* by undertaking one of the following:
        - Set out directions with respect to preparing the Terms of Reference and an Individual EA for the undertaking; or
        - Declare that the Region (proponent) has satisfied the requirements for the preparation of a Terms of Reference, however, the proponent must still prepare an Individual EA.

Minister's Office
Ministry of the Environment
77 Wellesley Street West, 11th Floor, Ferguson Block
Toronto, Ontario M7A 2T5

A copy of the request must also be forwarded to the attention of Mr. Hitesh Topiwala at the Region of Peel at the address provided above.

If no Part II Order requests are received, the Region may proceed with detailed design and construction of the recommended works as presented in this report.

Information will be collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*. All comments, with the exception of personal information, will become part of the public record.

1.5 STUDY TEAM ORGANIZATION

The Region of Peel retained AECOM to undertake Phases 1 to 4 of the Class EA Study. The project team consisted of representatives from the Region and AECOM. The Region provided general direction for the study. Project Team meetings were held at key points in the process, as well as prior to presenting the study findings to the members of the public.

Key Staff involved include:

Region of Peel:	Hitesh Topiwala, EA Project Manager Bob Nieuwenhuysen, Roads Capital Denise Dang, Traffic Operations Ali Hashim, Traffic Development
AECOM:	Brenda Jamieson, P.Eng., Project Manager Travis Brown, PMP, Manager of Design Karl Grueneis, Senior Environmental Planner Tara Lynn Nava, Environmental Planner Jillian deMan, Terrestrial Ecologist Derek Parks, Aquatic Ecologist

Additional subject-specific expertise was provided by Timmins Martelle Heritage Consultants Inc. (archaeology), Archaeological Research Associates Ltd. (cultural built heritage) and Warmé Engineering and Biological Services (natural environment).

2. PUBLIC AND AGENCY CONSULTATION

2.1 GENERAL

Communication with the affected parties is an essential part of the planning process and provides a mechanism for the proponent to define and respond to issues before limiting decisions are made and EA documents are submitted for formal review and approval. Recognizing that public and regulatory agency consultation is a significant and integral part of the Municipal Class EA process, a consultation program was initiated from the outset of the study and continued throughout.

A wide range of stakeholders were identified and contacted at the outset of the Study, to 'scope' potential issues and areas of interest or concern. Interest in the project was considered to be any feedback received from a stakeholder indicating that they could be directly or indirectly affected during the planning, construction and/or operation of the proposed undertaking. In keeping with the spirit and intent of the Municipal Class EA, a number of methods were undertaken to achieve the above-stated objectives, including:

- Placement of Notice of Study Commencement, Study Limit Extension, Public Information Centre (PIC) No. 1, PIC No. 2, as well as Study Completion within the Brampton Guardian and the Caledon Enterprise (see Notices provided in Appendix A);
- Scheduling of two Public Information Centre (PIC) events during Phases 2 and 3 of the study;
- Placement of notices, PIC boards and preliminary designs on Region's website;
- Distribution of informational mailings (e.g., Commencement/Study Limit Extension/PIC/Study Completion letters) to regulatory agencies, utilities, First Nations and the public during various stages of the study process;
- Receiving/responding to written submissions;
- Participation in meetings and telephone discussions with regulatory agencies, utilities and the public; and
- Placement of this ESR on the Public Record and provision of a Notice of Study Completion to regulatory agencies and the public during Phase 4 of the study.

Figure 3 illustrates the planning and consultation process followed for this study and **Table 1** summarizes the consultation program activities undertaken as part of this study. Details pertaining to the consultation program are provided in the following sections.

Figure 3 Planning and Consultation Process

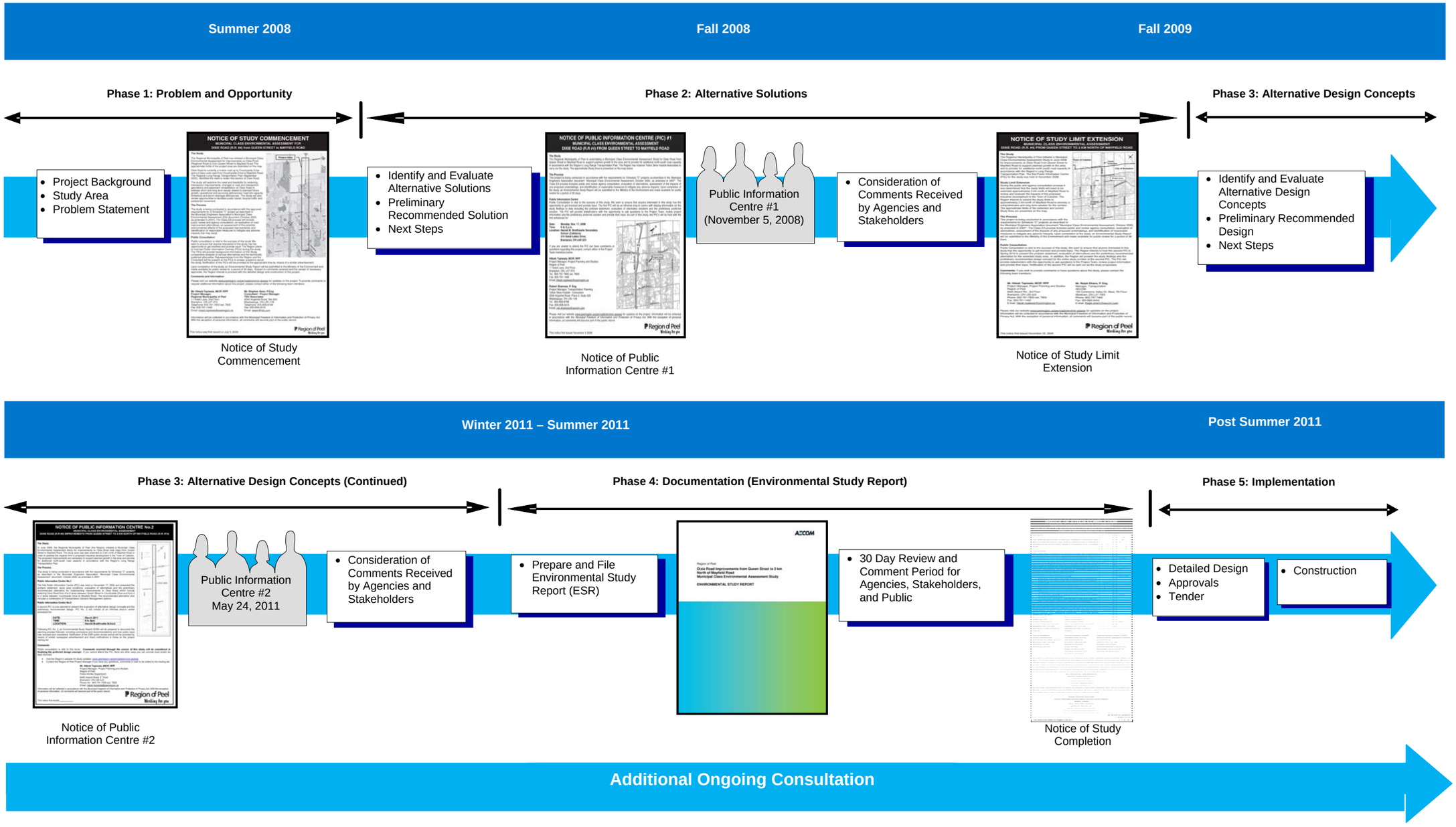


Table 1 Consultation Program Activities

EA Phase 1 – Notice of Study Commencement		
July 8, 2008	Newspaper Advertisement	Brampton Guardian
July 10, 2008	Letter/Notice	Property Owners, Regulatory Agencies, First Nations and Utilities
August 25, 2008	Hand Delivery to Residents	
EA Phase 2 – PIC No.1 and Study Limit Extension		
November 5, 2008	Letter/ Notice of PIC No.1	Property Owners, Tenants, Regulatory Agencies, First Nations and Utilities.
November 5 and 16, 2008	Newspaper Advertisements	Brampton Guardian
November 5 and 15, 2008	Newspaper Advertisements	Caledon Enterprise
November 17, 2008	PIC No. 1	All Interested Parties
November 24, 2009	Letters/Notice of Study Limit Extension	Property Owners, Tenants, Regulatory Agencies, First Nations and Utilities
EA Phase 3 – PIC No. 2		
May 6, 2011	Letters/Notice of PIC No.2	Property Owners, Tenants, Regulatory Agencies, First Nations and Utilities
May 6 and 18, 2011	Newspaper Advertisements	Brampton Guardian
May 10 and 19, 2011	Newspaper Advertisements	Caledon Enterprise
May 24, 2011	PIC No. 2	All interested Parties
EA Phase 4 – Notice of Study Completion and Filing of ESR		
August 15, 2011	Letters	Property Owners, Tenants, Regulatory Agencies, First Nations and Utilities
August 31 and September 16, 2011	Newspaper Advertisements	Brampton Guardian
September 1 and 13, 2011	Newspaper Advertisements	Caledon Enterprise
September 1, 2011	File ESR	Peel Region, City of Brampton, Town of Caledon, Brampton / Caledon Public Libraries
September 30, 2011	End of ESR Public Review Period	

2.2 EA PHASE 1 CONSULTATION

Based on available municipal property ownership/assessment roll information, a list of approximately 700 landowners abutting the Dixie Road corridor as well as residents located 100-200 metres on side streets, was compiled in July 2008. A letter was distributed on July 10, 2008 to all those listed (see **Appendix A**) informing them of the study and soliciting their comments and interest in participating in the Municipal Class EA process.

2.2.1 REGULATORY AGENCY INVOLVEMENT

A list of regulatory agencies was complied in July 2008 including emergency services and local municipal departments, provincial ministries/agencies, federal department/agencies, Toronto Region Conservation Authority (TRCA) and various utility companies (see contact list provided in **Table 2**). This list was continuously updated throughout the study to ensure that it remained current and the project team had the most appropriate contact information.

Table 2 Agency Contact List

Provincial Agencies	
• Ministry of the Environment • Ministry of Tourism and Culture • Ministry of Municipal Affairs & Housing • Ministry of Agriculture, Food and Rural Affairs	• Ministry of Natural Resources • Ministry of Transportation • Government of Ontario, Management Board • Ministry of Aboriginal Affairs • Ontario Realty Corporation
Federal Departments	
• Environment Canada • Industry Canada • National Heritage Information Centre • Department of Fisheries and Oceans • Transport Canada • Indian and Northern Affairs	• Specific Claims Branch • Ontario Research Team • Comprehensive Claims Branch • Litigation, Management and Resolution • Lands and Trust Services • Environment Unit
Municipalities	
• Region of Peel Environmental Health • City of Brampton – Mayor and Council – Planning , Design and Development – Heritage Board – Community Services – Fire and Emergency Services – Brampton Transit	• Town of Caledon – Mayor – Regional Council – Area Council – Transportation Planning • Peel Regional Paramedic Services • Peel Regional Police Services
Utilities	
• Bell Canada • AT&T Canada • Telus Communications • Enbridge Gas Distribution • Hydro One • Ontario Power Generation	• Enersource Hydro • Ontario One Call • Rogers Cable TV Ltd. • Trans Northern Pipelines • Microcell • GO Transit
Other Stakeholders	
• Toronto and Region Conservation Authority • Dufferin Peel Catholic District School Board • Peel District School Board • Greater Toronto Airport Authority • Trout Unlimited	• The Humber Watershed Alliance • Caledon Countryside Alliance • Halton/North Peel Naturalists • Brampton Environmental Community Advisory Panel • Brampton Board of Trade

Regulatory agencies were contacted by letter in July 2008 (see **Appendix A** for a copy of the letter). The purpose of this initial mailing was to inform them of the study, solicit their comments on issues they felt should be addressed throughout the Class EA process, and request any information from each respective agency that may have relevance to this project.

2.2.2 FIRST NATION CONSULTATION

A notification letter was mailed out to the Ministry of Aboriginal Affairs (MAA), Ministry of the Attorney General and Indian and Northern Affairs Canada (INAC) in July 2008, informing them about the project and to solicit their respective input. Below is the list of First Nations and First Nations organizations that were contacted as part of the study.

First Nation Unions and Associations	
• The Chiefs of Ontario • Anishinabek Nation/Union of Ontario Indians, Nippising • Association of Iroquois and Allied Indians • Six Nations Council - Land and Resources • The Metis Nation of Ontario • Founding First Nation Circle	• Ontario Federation of Indian Friendship • Mississaugas of New Credit First Nation • Mississaugas of the Scugog Island • Curve Lake First Nation • Alderville First Nation • Hiawath First Nation

2.3 PHASE 2 CONSULTATION

2.3.1 PUBLIC INVOLVEMENT

The first Public Information Centre (PIC) was held on Monday November 17, 2008 from 6:00 pm to 8:00 pm at the Harold K. Braithwaite Secondary School. The PIC was structured as a drop in centre with project information displayed on information boards and representatives from the Region and AECOM addressed questions and comments.

The purpose of PIC #1 was to obtain public input following presentation of the problem statement, background information, existing conditions, evaluation criteria, planning alternatives and the preferred planning alternative.

The notice of the first PIC was published in the Brampton Guardian on Wednesday November 5, 2008 and Sunday November 16, 2008 and in the Caledon Enterprise on Wednesday November 5, 2008 and Saturday November 15, 2008. The notice was also posted on the Region's website at http://www.peelregion.ca/pw/roads/environ-assess/dixie-road-mayfield.htm. In addition to the newspaper notice, an invitation letter was mailed out on November 5, 2008 to all stakeholders. Sample letters and a summary of the PIC are provided in **Appendix A.**

The attendance record shows that 31 people officially attended the PIC. A total of 22 Public Comment Sheets were received during PIC #1 and a total of 10 emails were received as a result of either the notification of project start-up or the notification of PIC #1.

Issues/Concerns Raised at PIC #1

Staff responded to verbal questions and comments received during the meeting. In general, the comments expressed concern with the potential increase in volume of traffic, proximity of the required widening to adjacent properties, traffic safety as a result of increased traffic and wider pavement, and noise as a result of increased traffic. Specific comments were received with respect to the inclusion of turn lanes at entrances to ensure safe turns. Key issues raised during Phase 2 Consultation have been documented and are included in **Appendix A.**

2.3.2 FIRST NATION CONSULTATION

Direct notification, including information regarding the PIC on November 17, 2008, was distributed during the week of November 5, 2008, inviting all First Nations groups as identified in section 2.2.2.

In addition, notification letters were mailed out to Indian and Northern Affairs Canada (INAC), Ministry of Aboriginal Affairs (MAA) and Ministry of the Attorney General during the week of November 5, 2008, informing them about the Project and to solicit their respective input.

2.4 PHASE 3 CONSULTATION

2.4.1 PUBLIC INVOLVEMENT

Public Information Centre #2

In keeping with the Municipal Class EA process, a second PIC was held on May 24, 2011, at the Harold K. Braithwaite School between 6:00pm and 8:00pm. The purpose of the PIC was to present and receive public input on the Preliminary Preferred Design Concept (Phase 3). Also presented was the study limit extension.

A notice inviting the public to attend PIC No. 2 was published in the Brampton Guardian on Friday May 6, 2011 and Wednesday May 18, 2011 and the Caledon Enterprise on Tuesday May 10, 2011 and Thursday May 19, 2011. The notice was also mailed out to property owners and/or residents within the Study Area. The Notice of PIC #2 is provided in **Appendix A**.

The PIC utilized a drop-in format, displayed information boards that explained the project and provided participants an opportunity to ask questions. During PIC #2, property owners and other interested stakeholders were provided with an opportunity to:

- Review comments and response summary received from the last PIC;
- View the display materials, including the evaluation of the improvement options for Dixie Road;
- Discuss the analysis and recommended improvements;
- Discuss the evaluation of alternative design concepts;
- Discuss the Preliminary Preferred Design;
- Discuss the potential benefits, impacts and mitigation measures associated with the Preliminary Preferred Design;
- Ask questions and comment on the Preliminary Preferred Design;
- Review future scheduled EA activities; and
- Discuss issues and concerns related to the Preliminary Preferred Design with representatives from the Region of Peel and AECOM.

The attendance record shows that 37 people officially signed in at the PIC in addition to a number of representatives attending from the Region of Peel and AECOM.

Participants were offered and encouraged to fill in and submit a Comment Sheet to solicit feedback on the Study and progress made to date. A total of 6 Public Comment Sheets were received at PIC #2 and several additional comment submissions were received after the PIC.

Issues/Concerns Raised at PIC #2

A summary of comments received at and following the PIC is provided in **Appendix A**.

2.4.2 FIRST NATION CONSULTATION

Direct notification, including information regarding the PIC on May 24, 2011 was distributed during the week of May 2, 2011, to all First Nations groups as identified in section 2.2.2.

In addition, notification letters were mailed out to Indian and Northern Affairs Canada (INAC), Ministry of Aboriginal Affairs (MAA) and Ministry of the Attorney General during the week of May 2, 2011 informing them about the Project and to solicit their respective input.

2.5 PHASE 4 CONSULTATION

All parties previously notified throughout Phases 1 to 3 of the Study were notified by Notice that the ESR has been completed. The Notice explained that the ESR has been filed for public review at the Region of Peel Clerk's Department, as well as at the City of Brampton and Town of Caledon Clerks' Departments and the City of Brampton Four Corners Branch Library. Recipients have been asked to provide their written comments within a period of 30 calendar days from the date of the Notice. As per Municipal Class EA requirements, the Notice also indicated that the public has the right to request a Part II Order within the 30-day review period.

A formal Notice of Completion of the ESR was placed in the Brampton Guardian on August 31, 2011 and September 16, 2011 and the Caledon Enterprise on September 1, 2011 and September 13, 2011 (see copy of Notice provided in **Appendix A**). Copies were made available for public review at the respective review centres for the 30-day review period, during which time comments will be received from interested parties, regulatory agencies and the public. The Notice also indicated the public's right to request a Part II Order within the 30-day review period.

If concerns regarding this project cannot be resolved in discussion with the Region of Peel, a person or party may request that the Minister of the Environment make an order for the project to comply with Part II of the *Environmental Assessment Act* (referred to as a Part II Order). Requests for a Part II Order must be received by the Minister, at the address below, by September 30, 2011. A copy of the request must also be sent to the Region of Peel's Project Manager at the address below. If no requests are received by September 30, 2011, the Region of Peel intends to proceed with detail design and construction as outlined in the ESR.

Minister's Office
Ministry of the Environment
77 Wellesley Street West
11th Floor, Ferguson Block
Toronto, ON M7A 2T5

Hitesh Topiwala, PMP, RPP
Project Manager, Transportation Program Planning
Transportation Division
Region of Peel
9445 Airport Road,3rd Floor
Brampton, ON L6S 4J3
Hitesh.topiwala@peelregion.ca

3. TRANSPORTATION PROBLEM AND OPPORTUNITY

3.1 REGION OF PEEL'S LONG RANGE TRANSPORTATION PLAN

The Region's Long Range Transportation Plan (LRTP) study was initiated in late 2002 as part of the Regional Official Plan Strategic Update and subsequently completed in 2005. The purpose of the study was to identify and address the transportation challenges anticipated by the forecasted growth in the Region over the next 20-30 years and to develop appropriate policies, strategies and a road improvements plan to address the challenges.

Major components of the LRTP were to:

- Identify regional road improvements required by 2021 and 2031;
- Develop transportation vision, goals, objectives and policies and provide a framework for developing and co-ordinating future actions and programs to improve transportation in Peel; and
- Provide a list of provincial highways and GO Transit improvements required to meet future Regional needs.

For Dixie Road (from Queen Street to 2 km north of Mayfield Road) the master plan identified the need to widen Dixie Road from 4 to 6 lanes from Queen Street to Countryside Drive and from 2 to 4 lanes from Countryside Drive to 2 km north of Mayfield Road.

3.2 BRAMPTON TRANSPORTATION AND TRANSIT MASTER PLAN

A recent update to the City of Brampton's Transportation and Transit Master Plan (TTMP) dated: June 2009 has identified the widening of Dixie Road from its current 4-lane cross section to a 6-lane cross-section from the city's southern limit to Countryside Drive by the year 2016. This report also recommended widening of Dixie Road from the 2-lane to 4-lane cross-section from Countryside Drive to Mayfield Road by the same year. The updated TTMP report has indicated that the above recommendations would be valid beyond the year 2031. The updated TTMP has calculated a maximum load of 2854 transit riders in the PM period with the Brampton Rapid Transit (BRT) Corridor option on Dixie Road.

The master plan report has also identified Dixie Road as a Secondary Transit Corridor (10-15 minutes frequencies) by 2011 year, Primary Transit Corridor (5-10 minutes frequencies) by 2016 year and potential BRT Corridor (headway less than 5 minutes) by 2016 year between Steeles Avenue and Bovaird Drive East until 2031 year. As mentioned in the report, Primary Transit and BRT Corridors will incorporate transit priority measures including transit priority signal, bus bays, high occupancy lanes (HOV), and queue jump lanes, etc.

3.3 CALEDON TRANSPORTATION NEEDS STUDY

The Caledon Transportation Needs Study was undertaken as a joint project by the Town of Caledon and the Region of Peel to determine the existing and future travel demands within Caledon and the general nature of transportation improvements required to accommodate travel demands. The current transportation concerns in Caledon focus on several key issues, as follows:

- Peak period traffic congestion on the roadway network is a primary concern. This problem has been noted largely in the southern area of Caledon and includes east-west traffic along Mayfield Road; and
- Through traffic is a significant concern in Caledon. Growth to the west and north of the municipality has created increased traffic crossing Caledon to reach employment and other activities within larger centres of the Greater Toronto Area.

Accommodation of the future travel demands within Caledon is expected to require a range of options, including the following:

- Capacity improvements to arterial roadways where peak traffic demands exceed the existing capacity and congestion cannot be alleviated through other more acceptable measures; and
- Supporting Regional efforts to implement travel demand measures throughout Peel Region.

3.4 PURPOSE OF THE STUDY

The previously completed traffic analysis and planned growth forecasts provide the basis for the need and justification for improvements to Dixie Road between Queen Street and 2 km north of Mayfield Road. The opportunities for improvement have been defined by the following issues:

- The Region of Peel will continue to experience significant population growth;
- The Provincial Places to Grow Growth Outlook for the Greater Golden Horseshoe forecasts the Region of Peel to grow to 1.49 million by 2021 and 1.64 million by 2031;
- The Regional Municipality of Peel Long Range Transportation Plan (September 2005) and City of Brampton Transportation and Transit Master Plan identifies the need to widen and improve this section of Dixie Road;
- There is not sufficient capacity on Dixie Road to accommodate the increased volumes as a result of the population growth; and
- Many of the intersecting roads and adjacent North South arterial and collector roadways have been or are scheduled to be widened in the near future.

3.5 PROBLEM/OPPORTUNITY STATEMENT

Based on current and projected growth for the City of Brampton, improvements along Dixie Road, from Queen Street to Mayfield Road are required to address increased traffic congestion and deterioration of the road conditions over the next 25 years. In addition, a proposed industrial development will place capacity demands on Dixie Road in the Town of Caledon (north of Mayfield Road).

In order to serve the short and long term transportation needs related to planned future growth, this study will examine possible road widening and linkages, intersection improvements, pavement rehabilitation, and opportunities to facilitate public transit, bicycle traffic, pedestrian movement and active transportation.

3.6 STUDY OBJECTIVES AND GOALS

The objective of this study is to examine alternative road and operational improvements that are appropriate within the study area.

4. EXISTING AND FUTURE CONDITIONS

The following sections describe the project study area including its transportation network, socio-economic environment including existing and future land uses, natural environment, and social/cultural environment as well as planning considerations. This information was considered in the review of the potential effects the alternatives would have on these features.

4.1 TRANSPORTATION

The detailed needs analysis for Dixie Road that was undertaken pas part of this study can be found in **Appendix B**.

4.1.1 ROADWAY CHARACTERISTICS

Dixie Road (Regional Road 4) is under the jurisdiction of the Region of Peel. The Region of Peel Official Plan classifies Dixie Road as a Major Arterial Road from the Queen Elizabeth Way (QEW) in the City of Mississauga to Olde Base Line Road in the Town of Caledon. The basic number of through lanes on Dixie Road varies within the study area as follows:

- Six lanes to the north and south of Queen Street East;
- Four lanes between Hillside Drive and south of Countryside Drive; and
- Two lanes from south of Countryside Drive to 2 km north of Mayfield Road.

Access to adjacent land uses is generally restricted to both signalized and unsignalized intersections. Auxiliary lanes are provided at the intersections to accommodate turning movements. The posted speed limit on Dixie Road varies from 60 km/h (south) to 80 km/h (north) within the study area limits.

4.1.2 EXISTING TRAFFIC DATA

Existing turning movement counts (TMC) on Dixie Road for the weekday AM and PM peak hours at the 17 intersections in the study area were provided by the Region of Peel. The existing turning movement counts were factored to develop average day and month counts using Ministry of Transportation (MTO) guidelines and are presented in Figure 2 in the Needs Analysis (**Appendix B**).

4.1.3 TRAFFIC OPERATIONS

Traffic operations at all intersections in the study area were analyzed using the Synchro 7.0 software package. This analysis provides a detailed assessment of existing traffic operations in the study area, including levels of service (LOS), delays and volume to capacity ratios for each intersection approach and movement. LOS is a measure used to describe the operating characteristics of an intersection or road section. There are six levels ranging from “A” (excellent, low delay) to “F” (failure, or forced flow). Typically, LOS “C” or “D” is considered an acceptable overall LOS for urban conditions and for the design of future road improvements. Specific intersection movements, such as left-turns, may be acceptable at a lower LOS.

The LOS definitions for signalized and unsignalized intersections are provided in the Needs Analysis (**Appendix B**).

The existing traffic operations were conducted using existing traffic volumes, lane configurations and signal timings provided by the Region of Peel. The capacity analysis results for the signalized and unsignalized intersections are summarized below in **Table 3**. For completeness, the Queen Street East intersection has been included in the analysis; however, the Queen Street East intersection is situated south of the south study limits.

Table 3 Summary of Existing Intersections Operations

Intersections	Overall/ Movement	AM Peak Hour			PM Peak Hour		
Signalized		LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
Dixie Road at Mayfield Road	**Overall**	**B**	**19**	**0.48**	**C**	**22**	**0.54**
Dixie Road at Countryside Drive	**Overall**	**C**	**28**	**0.55**	**B**	**13**	**0.47**
Dixie Road at Father Tobin Road	**Overall**	**B**	**12**	**0.55**	**A**	**6**	**0.33**
Dixie Road at Octillo Boulevard	**Overall**	**A**	**10**	**0.44**	**A**	**9**	**0.38**
Dixie Road at Sandalwood Pkwy	**Overall**	**C**	**30**	**0.65**	**C**	**29**	**0.58**
Dixie Road at Springtown Trail	**Overall**	**A**	**4**	**0.34**	**A**	**4**	**0.29**
Dixie Road at Peter Robertson Boulevard	**Overall**	**B**	**20**	**0.54**	**B**	**18**	**0.46**
Dixie Road at Bovaird Drive East	**Overall**	**D**	**39**	**0.84**	**C**	**28**	**0.60**
	WBL	E	73	0.93	--	--	--
	SBT	E	55	0.92	--	--	--
Dixie Road at North Park Drive	**Overall**	**C**	**20**	**0.53**	**B**	**19**	**0.45**
Dixie Road at Northampton Street	**Overall**	**B**	**16**	**0.53**	**B**	**12**	**0.42**
Dixie Road at Williams Pkwy	**Overall**	**D**	**39**	**0.90**	**C**	**32**	**0.80**
	EBT	D	45	0.90	--	--	--
	WBL	E	56	0.84	--	--	--
	NBL	E	59	0.55	--	--	--
	SBT	D	44	0.91	--	--	--
Dixie Road at Howden Boulevard	**Overall**	**C**	**22**	**0.68**	**B**	**20**	**0.59**
Dixie Road at Queen Street East	**Overall**	**D**	**49**	**0.91**	**D**	**52**	**0.94**
	EBL	---	---	---	E	79	0.96
	EBT	E	58	0.98	---	---	---
	WBL	E	73	0.94	E	60	0.89
	NBL	E	58	0.46	E	61	0.79
	NBT	---	---	---	E	61	0.97
	SBL	---	---	---	E	65	0.66
	SBT	E	59	0.97	---	---	---
Unsignalized							
Dixie Road at Northcliffe Street	Average Delay	--	**2**	--	--	**2**	--
Dixie Road at Lascelles Street	Average Delay	--	**1**	--	--	**1**	--
Hazelwood Drive	Average Delay	--	**1**	--	--	**1**	--
Dixie Road at Hillside Drive	Average Delay	--	**1**	--	--	**1**	--

EBL= eastbound left, NBT= northbound through, WBL-T-R= westbound shared left-through-right, EBL-R, eastbound shared left-right

Table 3 indicates that all signalized intersections in the study area are operating at overall LOS of "D" or better with the volume to capacity ratio of 0.94 or lower. With respect to individual movements, some movements of the Dixie Road intersections with Bovaird Drive East, Williams Parkway and Queen Street East have shown level of service "E" and are approaching capacity. All study area unsignalized intersections are operating at an average delay of less than 2 seconds.

4.1.4 FUTURE TRAFFIC DATA

As part of the Needs Analysis, future traffic volumes were projected by the application of growth rates. The growth rates for the different sections of Dixie Road (north-south) and east-west Regional crossing roads are shown in **Table 4** and **Table 5**.

Table 4 Growth Rate Factors along Dixie Road

Future Years	Compounded Annual Growth rates on Dixie Road between Queen Street East and Bovaird Drive East	Compounded Annual Growth rates on Dixie Road between Bovaird Drive East and Mayfield Road
0 - 5 Years	3%	5%
6 - 10 Years	3%	4%
11 - 20 Years	1%	2%
21 or more Years	1%	1%

Table 5 Growth Rate Factors on Regional Crossing Roads near Dixie Road

Future Years	Compounded Annual Growth rates on Queen Street East	Compounded Annual Growth rates on Bovaird Drive East	Compounded Annual Growth rates on Mayfield Road
0 - 5 Years	4%	5%	4%
6 - 10 Years	3%	4%	3%
11 - 20 Years	1%	2%	2%
21 or more Years	1%	1%	2%

The growth rate factors for the minor crossing roads at Dixie Road were assumed to be one percent compounded annually except the Countryside Drive and Mayfield Road intersections where actual volumes from the Secondary Plan Area 48 (Countryside Villages), Transportation Study Background Report were utilized for the 2031 horizon year. For the 2021 horizon year, link volumes were interpolated between the existing and 2031 horizon year.

4.1.4.1 FUTURE MID-BLOCK LINK VOLUMES

The traffic growth rate factors presented in **Tables 4 and 5** were applied (compounded annually) to the existing mid-block link volumes to develop 2021 and 2031 mid-block link volumes as shown in Figure 5 and Figure 6 of the Needs Analysis. As explained in the previous section, the east-west and north-south link volumes immediate to the intersections of Dixie Road with Mayfield Road and Countryside Drive were taken from the *Mayfield West Industrial Lands* and *Countryside Villages Secondary Plan* transportation study reports.

4.1.4.2 FUTURE MID-BLOCK LINK VOLUMES TO CAPACITY ASSESSMENTS

A planning level capacity of 900 vehicles per hour per lane was used for Dixie Road mid-block link volume to capacity assessments. **Tables 6 and 7** present the southbound mid-block link traffic volumes (peak direction in the AM), northbound mid-block link traffic volumes (peak direction in the PM), capacities, and volume to capacity assessment for the horizon years of 2021 and 2031.

Table 6 2021 Mid-Block Link Volume to Capacity Assessment

Roadway Locations along Dixie Road	Dixie Road Without Improvements						Dixie Road With Improvements					
	Southbound, AM Peak Hour			Northbound, PM Peak Hour			Southbound, AM Peak Hour			Northbound, PM Peak Hour		
	Link Volume	Capacity	V/C	Link Volume	Capacity	V/C	Link Volume	Capacity	V/C	Link Volume	Capacity	V/C
North of Mayfield Road	1396	900	1.55	1143	1800	0.64	1396	1800	0.78	1143	1800	0.64
Between Mayfield Road and Countryside Drive	1526	900	1.70	1160	1800	0.64	1526	1800	0.85	1160	1800	0.64
Between Countryside Drive and Father Tobin Road	1789	1800	0.99	1131	1800	0.63	1789	2700	0.66	1131	2700	0.42
Between Father Tobin Road and Octillo Boulevard	1914	1800	1.06	1145	1800	0.64	1914	2700	0.71	1145	2700	0.42
Between Octillo Boulevard and Sandalwood Pkwy	1991	1800	1.11	1253	1800	0.70	1991	2700	0.74	1253	2700	0.46
Between Sandalwood Pkwy and Springtown Trail	2054	1800	1.14	1551	1800	0.86	2054	2700	0.76	1551	2700	0.57
Between Springtown Trail and Peter Robertson Boulevard	2045	1800	1.14	1697	1800	0.94	2045	2700	0.76	1697	2700	0.63
Between Peter Robertson Boulevard and Bovaird Drive East	2288	1800	1.27	1955	1800	1.09	2288	2700	0.85	1955	2700	0.72
Between Bovaird Drive East and Northcliff St.-Moregate Crescent	2141	1800	1.19	1551	1800	0.86	2141	2700	0.79	1551	2700	0.57
Between Northcliff St.-Moregate Crescent and North Park Drive	2202	1800	1.22	1646	1800	0.91	2202	2700	0.82	1646	2700	0.61
Between North Park Drive and Northampton Street	2146	1800	1.19	1784	1800	0.99	2146	2700	0.79	1784	2700	0.66
Between Northampton Street and Williams Pkwy	2268	1800	1.26	2016	1800	1.12	2268	2700	0.84	2016	2700	0.75
Between Williams Pkwy and Lascelles Boulevard	2240	1800	1.24	2027	1800	1.13	2240	2700	0.83	2027	2700	0.75
Between Lascelles Boulevard and Howden Boulevard	2379	1800	1.32	2149	1800	1.19	2379	2700	0.88	2149	2700	0.80
Between Howden Boulevard and Hazelwood Drive	2433	1800	1.35	2298	1800	1.28	2433	2700	0.90	2298	2700	0.85
Between Hazelwood Drive and Hillside Drive	2503	1800	1.39	2313	1800	1.29	2503	2700	0.93	2313	2700	0.86
Between Hillside Drive and Queen Street East	2551	2700	0.94	2371	2700	0.88	2551	2700	0.94	2371	2700	0.88
South of Queen Street East	2524	2700	0.93	2586	2700	0.96	2524	2700	0.93	2586	2700	0.96

Table 7 2031 Mid-Block Link Volume to Capacity Assessment

Roadway Locations along Dixie Road	Dixie Road Without Improvements						Dixie Road With Improvements					
	Southbound, AM Peak Hour			Northbound, PM Peak Hour			Southbound, AM Peak Hour			Northbound, PM Peak Hour		
	Link Volume	Capacity	V/C	Link Volume	Capacity	V/C	Link Volume	Capacity	V/C	Link Volume	Capacity	V/C
North of Mayfield Road	1488	900	1.65	1518	1800	0.84	1488	1800	0.83	1518	1800	0.84
Between Mayfield Road and Countryside Drive	1686	900	1.87	1773	1800	0.99	1686	1800	0.93	1773	1800	0.99
Between Countryside Drive and Father Tobin Road	1977	1800	1.10	1705	1800	0.95	1977	2700	0.73	1705	2700	0.63
Between Father Tobin Road and Octillo Boulevard	2108	1800	1.17	1623	1800	0.90	2108	2700	0.78	1623	2700	0.60
Between Octillo Boulevard and Sandalwood Pkwy	2251	1800	1.25	1716	1800	0.95	2251	2700	0.83	1716	2700	0.64
Between Sandalwood Pkwy and Springtown Trail	2339	1800	1.30	2076	1800	1.15	2339	2700	0.87	2076	2700	0.77
Between Springtown Trail and Peter Robertson Boulevard	2339	1800	1.30	2245	1800	1.25	2339	2700	0.87	2245	2700	0.83
Between Peter Robertson Boulevard and Bovaird Drive East	2638	1800	1.47	2443	1800	1.36	2638	2700	0.98	2443	2700	0.90
Between Bovaird Drive East and Northcliff St.-Moregate Crescent	2334	1800	1.30	1767	1800	0.98	2334	2700	0.86	1767	2700	0.65
Between Northcliff St.-Moregate Crescent and North Park Drive	2385	1800	1.33	1850	1800	1.03	2385	2700	0.88	1850	2700	0.69
Between North Park Drive and Northampton Street	2323	1800	1.29	1961	1800	1.09	2323	2700	0.86	1961	2700	0.73
Between Northampton Street and Williams Pkwy	2489	1800	1.38	2223	1800	1.24	2489	2700	0.92	2223	2700	0.82
Between Williams Pkwy and Lascelles Boulevard	2668	1800	1.48	2271	1800	1.26	2668	2700	0.99	2271	2700	0.84
Between Lascelles Boulevard and Howden Boulevard	2608	1800	1.45	2394	1800	1.33	2608	2700	0.97	2394	2700	0.89
Between Howden Boulevard and Hazelwood Drive	2685	1800	1.49	2539	1800	1.41	2685	2700	0.99	2539	2700	0.94
Between Hazelwood Drive and Hillside Drive	2768	1800	1.54	2555	1800	1.42	2768	2700	1.03	2555	2700	0.95
Between Hillside Drive and Queen Street East	2820	2700	1.04	2620	2700	0.97	2820	2700	1.04	2620	2700	0.97
South of Queen Street East	2759	2700	1.02	2854	2700	1.06	2759	2700	1.02	2854	2700	1.06

4.1.5 CONCLUSIONS

As currently constructed Dixie Road will fail to support projected traffic volumes due to planned growth within the study area. Dixie Road with improvements (six lanes up to Countryside Drive and four lanes up to 2 km north of Mayfield Road) will operate by 2031 as follows:

- Between north of Sandalwood Parkway and south of Queen Street East – approaching or above capacity in the AM peak hour;
- Between south of Lascelles Boulevard and south of Queen Street East – approaching capacity in the PM peak hour;
- A section between Peter Robertson Boulevard and Bovaird Drive East – approaching capacity in the PM peak hour; and
- A 4-lane section between Countryside Drive and 2 km north of Mayfield Road – approaching capacity in both the AM and PM peak hours.

As the 4-lane section of Dixie Road from Countryside Drive to 2 km north of Mayfield Road will start approaching capacity by the horizon year of 2031; monitoring beyond 2031 will be required.

4.1.6 GEOTECHNICAL FEATURES / PAVEMENT CONDITIONS

Terraprobe Inc. was retained by AECOM on behalf of the Region of Peel to carry out a geotechnical and hydrogeological investigation for the proposed improvements to Dixie Road from Queen Street to approximately 2.0 km north of Mayfield Road (see **Appendix C** for full report). The initial field investigation from Queen Street to Mayfield Road was conducted during the period of October 9 to 15, 2008. Additional field investigations were undertaken on July 28, 2010 for the section extending from Mayfield Road to the north project limit.

A total of 47 boreholes were drilled and sampled to depths ranging from 0.6 m to 9.6 m below ground level. The pavement was also cored at seven selected locations. Water level observations were made in the open boreholes during and immediately after completing the drilling operations. In addition, the borehole in the vicinity of the culvert at Station 7+900 was instrumented with a standpipe piezometer to permit longer term groundwater level monitoring.

The investigation results revealed that for the boreholes located along Dixie Road, the subsurface stratigraphy consisted of pavement or topsoil over fill material underlain by native clayey silt till deposits. Typically the pavement structure was found to be comprised of 140 mm to 155 mm of asphalt over 470 mm to 700 mm of granular base materials. Topsoil within the study limits was found to be typically 20 mm to 250 mm thick.

The borehole in the vicinity of the culvert at Station 7+900 was extended to a depth of 7.7 m below existing ground. A native deposit of sand and gravel was encountered at the borehole termination depth. At culvert site (Station 16+420), the borehole was extended to a depth of 9.6 m below existing ground. A native deposit of silty clay to clayey silt till was encountered at the borehole termination depth.

Water level observations were made in each borehole during and after completion of drilling. All of the shallow pavement boreholes were open and dry after drilling was complete. Groundwater levels were found to be approximately 2.6 to 3.5 m below the existing grades in the vicinity of the two culverts at Stations 7+900 and 16+420, respectively.

4.2 SOCIO-ECONOMIC ENVIRONMENT

4.2.1 LAND USE

4.2.1.1 EXISTING LAND USES

South of Mayfield Road, Dixie Road is within the urbanized portion of Brampton composed of a varied mix of residential, institutional and commercial development. For the portion of Dixie Road north of Mayfield Road land uses are primarily agricultural.

South of Mayfield Road, lands adjacent to Dixie Road contain a diverse mix of living, working and cultural properties including single family residences, town home complexes, neighbourhood commercial and community and neighbourhood recreational. Institutional uses within the study area consist of schools and places of worship.

Fronting Dixie Road the land use is predominantly residential with some neighbourhood commercial, primarily service type. An existing landscape buffer has been developed between the existing roadway and the adjacent properties for the most part between Howden Boulevard and the developed portions of Dixie Road north of Sandalwood Parkway. South of Howden Boulevard to Queen Street the landscape buffer is less pronounced, with residences placed in closer proximity to the roadway. For the most part the existing residential properties have rear yard frontages onto Dixie Road, although there are some properties with side yards adjacent to Dixie Road.

Institutional uses within the study area consist of predominantly schools and places of worship. St. Marguerite D'Youville Secondary School is located to the east of Dixie Road approximately 1km north of Sandalwood Parkway. Passive recreation is provided via the linear trail system adjacent to Etobicoke Creek, while active uses include the Brampton Soccer Facility and the Rosedale Village Golf Club located at the north east corner of Dixie Road and Sandalwood Parkway.

4.2.1.2 FUTURE LAND USES

4.2.1.2.1 COUNTRYSIDE VILLAGES SECONDARY PLAN

The Countryside Villages Secondary Plan occupies approximately 1,600 acres, and is bounded by Mayfield Road to the north, Countryside Drive to the south, Heart Lake Road to the west and the west branch of the West Humber River to the east. The Countryside Villages Secondary Plan is proposing a mixed use development that can accommodate 18,400 residents and 8,500 employees with accesses to Mayfield Road and Dixie Road. An east-west Main Street through the centre of the community is also being proposed to connect to Dixie Road at the west end. The goal for the secondary plan area is to create "new urbanism neighbourhoods" which are designed to contain a wide range of housing and employment opportunities and to be walkable.

4.2.1.2.2 MAYFIELD WEST SECONDARY PLAN

Within the Town of Caledon a proposed Industrial Park is to be located to the north of Mayfield Road between Heart Lake Road and Dixie Road which is part of the Mayfield West Secondary Plan Area. Development potential in the area is likely to consist of wholly or as a combination of:

- General Light Industrial Park;

- Distribution Centre or Trucking/Logistics Facilities; and/or
- Warehousing Facilities.

Located on the west side of Dixie Road is a proposed industrial park that provided the justification for extending the project study area limits 2 km north of Mayfield Road.

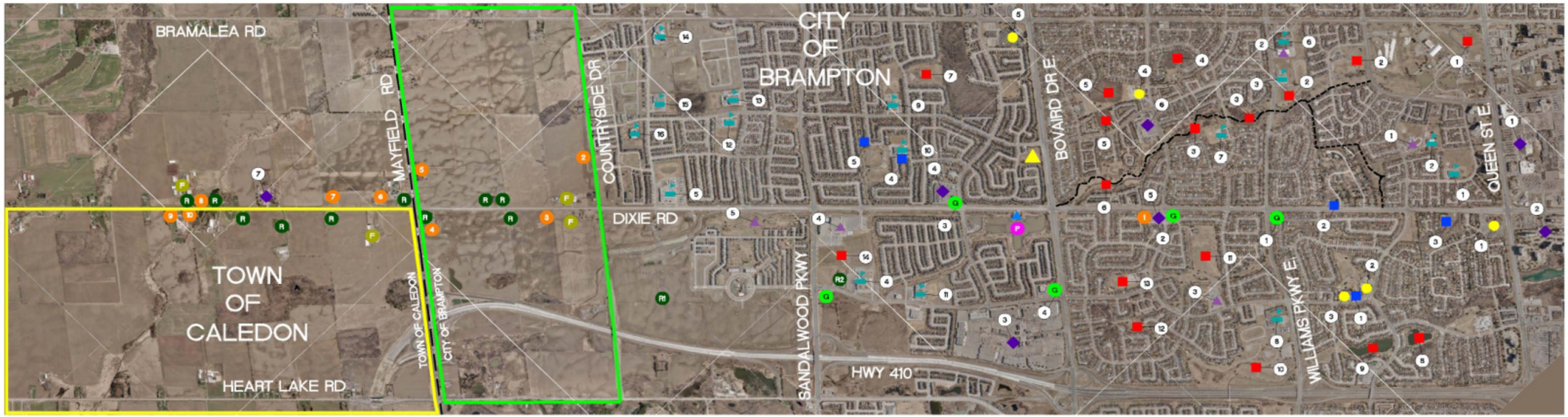
Figure 4 illustrates the existing and future land uses along Dixie Road.

4.2.1.3 SERVICING

The majority of the properties within the study area are or will be serviced by municipal infrastructure, including watermains and sanitary storm sewers. Few wells are expected to remain as the lands at the north end of the study area are developed.

The Region of Peel has a salt management plan in place to ensure responsible salt usage with respect to water quality considerations. Furthermore, the Region is continually evaluating and employing techniques to minimize salt usage to maintain a safe bare pavement policy.

Figure 4 Existing and Future Lands Uses



LEGEND:

- TRAIL - FOLLOWS ETOBICOKE CREEK
- MUNICIPAL BOUNDARY
- COUNTRYSIDE VILLAGES
- MAYFIELD WEST
- SCHOOL
- PARK
- DAY CARE
- SHOPPING CENTRE
- PLACE OF WORSHIP
- GAS STATION
- COMMUNITY/RECREATION FACILITY
- RESIDENTIAL
- GATED COMMUNITY "ROSEDALE VILLAGE"
- 425 SANDALWOOD PARKWAY RETIREMENT CARE CENTRE
- FARM
- BUILT HERITAGE RESOURCE
- PONDS
- EMERGENCY SERVICE
- PEEL VETERINARY CLINIC

Schools
1 Hanover Public School
2 Lester B. Pearson Catholic School
3 Williams Parkway Senior Public School
4 Harold M. Braithwaite Secondary School
5 St. Marguerite D'Youville Secondary School
6 North Peel Secondary
7 Mother Mary Ward Elementary
8 North Park Secondary
9 Fernforest Public School
10 Our Lady of Providence Catholic Elementary School
11 Great Lakes Elementary
12 Father Michael L. McGivney Catholic Elementary
13 Springdale Public
14 Peel District Secondary School (not completed)
15 Lougheed Middle School
16 Carberry Public School

Shopping Centres
1 Bramalea City Centre
2 Dixie Plaza
3 Trinity Common Shopping Centre
4 Woodsmere Shopping Centre
5 North Dixie Centre
6 Mackay Plaza
7 Sallsbug Garden Supplies

Parks
1 Chinguacousy Park
2 Hillside Park
3 Maitland Park
4 Manocrest Park
5 Massey Park
6 Manitou Park
7 Black Forest North Park
8 Laurelcrest Park
9 Parr Lake Park
10 Community Park
11 Northampton Park
12 Nuffield Park
13 Nesmith Park
14 Dixie Sandalwood Park

Ponds
1 Dixie Bovaird Pond

Recreation
1 Howden Recreation Centre
2 Terry Miller Recreation Centre
3 YMCA
4 Brampton Soccer Centre
5 Rosedale Village Golf and Country Club

Child Care Centres
1 Bailey's Children Centre
2 Carpe Diem Foster Home
3 Precious Jewels Daycare Centre
4 Our Lady of Providence Day Care Centre
5 Childspec Lincensed Home Daycare Services

Gas Stations
1 Shell Gas Station (at Dixie Road and Williams Parkway E.)
2 Petro Canada Gas Station (on Dixie Road and North Park Drive)
3 Esso Gas Station "Woodsmere" (at Dixie Road and Peter Robertson Blvd.)
4 Shell Gas Station (on Bovaird Drive)

Places of Worship
1 Bramalea Baptist Church
2 Bramalea Free Methodist Church
3 North Bramalea United Church
4 St. Anthony's Church
5 Church of Jesus Christ of Latter-Day Saints

Built Heritage Resource
1 Cemetary (Lundy Burial Grounds & Hunt Olivet Cemetary)
2 1524 Countryside Drive
3 11098 Dixie Drive
4 11960 Mayfield Road
5 4585 Mayfield Road
6 12035 Dixie Road
7 12094 Dixie Road
8 12434 Dixie Road (Mayfield Farms LTD.)
9 12496 Dixie Road (Mayfield United Church & Cemetary)
10 12489 Dixie Road

DIXIE ROAD IMPROVEMENTS - FROM QUEEN ST. TO 2 KILOMETERS NORTH OF MAYFIELD ROAD MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

FIGURE X

LAND USE FEATURES

BASE MAPPING PROVIDED BY:
REGION OF PEEL, 2009

DEC 2010

Region of Peel
Working for you

AECOM

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4.2.2 NOISE

As part of the development of background information for the Class EA, an environmental noise impact assessment of the proposed Dixie Road Widening (from Queen Street East to 2 km north of Mayfield Road) was undertaken by RWDI AIR Inc. (RWDI). The complete study report can be found in **Appendix C.**

4.2.2.1 APPLICABLE GUIDELINES

Ontario Provincial policies established by the MTO and MOE are directly applicable under the Municipal Class EA process for transportation projects, and are discussed in detail in the report found in Appendix C. The Region of Peel noise guidelines are also applicable for this project.

4.2.2.2 LOCATION OF NOISE SENSITIVE AREAS

Noise impacts from transportation projects are evaluated at noise sensitive receptors within the area of investigation. Noise receptors are called “Noise Sensitive Areas (NSAs)” in keeping with MTO practices for Provincial roadways. Under current MOE policies, NSAs include the following land uses, provided they have an Outdoor Living Area (OLA) associated with them:

- Private homes (single family units and townhouses)
- Multiple unit buildings such as apartments, provided they have a communal OLA associated with them
- Hospitals and nursing homes for the aged, provided they have an OLA for use by patients
- Schools, educational facilities and daycare centres where there are OLAs for students
- Campgrounds that provide overnight accommodation
- Hotels and motels with outdoor communal OLAs (e.g., swimming pools) for visitors
- Churches and places of worship.

The following land uses are generally not considered by the MOE to qualify as NSAs:

- Apartment balconies
- Cemeteries
- Parks and picnic areas not part of a defined OLA
- All commercial
- All industrial

There are 14 representative NSAs within the study area for this project, meeting the requirements discussed above. They are fourteen existing single family homes, town homes, and one new town house subdivision being built. The NSAs are shown in Figures 1a to 1c for the Environmental Noise Impact Assessment Report included in **Appendix C** of this document.

4.2.2.3 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations were identified in the noise assessment:

- There will be unmitigated changes in sound levels at some locations (where there are no existing noise barriers) resulting from the Dixie Road widening that are greater than 5dBA and equal to or exceed 55dBA; and/or
- Some existing noise walls are in poor condition and do not provide adequate noise mitigation.

Therefore it is recommended that:

- New noise walls be installed where there presently are none;

- Replace existing privately owned noise walls that are deteriorated and do not provide effective noise mitigation; and
- Retain existing noise walls that are in good condition and provide adequate noise mitigation.

4.2.3 AIR QUALITY

As part of the Dixie Road Class EA process an Air Quality Study was undertaken of the study area and can be found in **Appendix C.** In order to develop a better understanding of the existing conditions, an analysis of the current background air quality was undertaken. The objective of the assessment was to quantify air contaminant emissions from vehicular traffic along, entering, exiting, and crossing Dixie Road and to determine how these emissions will affect air quality in the vicinity of the proposed project.

4.2.3.1 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions were identified in the air quality assessment:

- Incremental pollutant concentrations attributed to the roadway improvements are much lower than background pollutant concentrations, and are below the applicable thresholds; and
- The collective results indicate that overall, air quality is acceptable and the potential for unacceptable health impacts due to the widening of Dixie Road is low.

Based on the findings, it was concluded that any health impacts associated with emissions from the project would be essentially indistinguishable from those attributable to normal background levels.

4.3 NATURAL ENVIRONMENT

A Natural Environment site review was completed along the Dixie Road corridor in the fall of 2008 and 2010 by Warmé Engineering and Biological Services. The results of the review are summarized below, with additional details provided in the Natural Environment Reports in **Appendix C**.

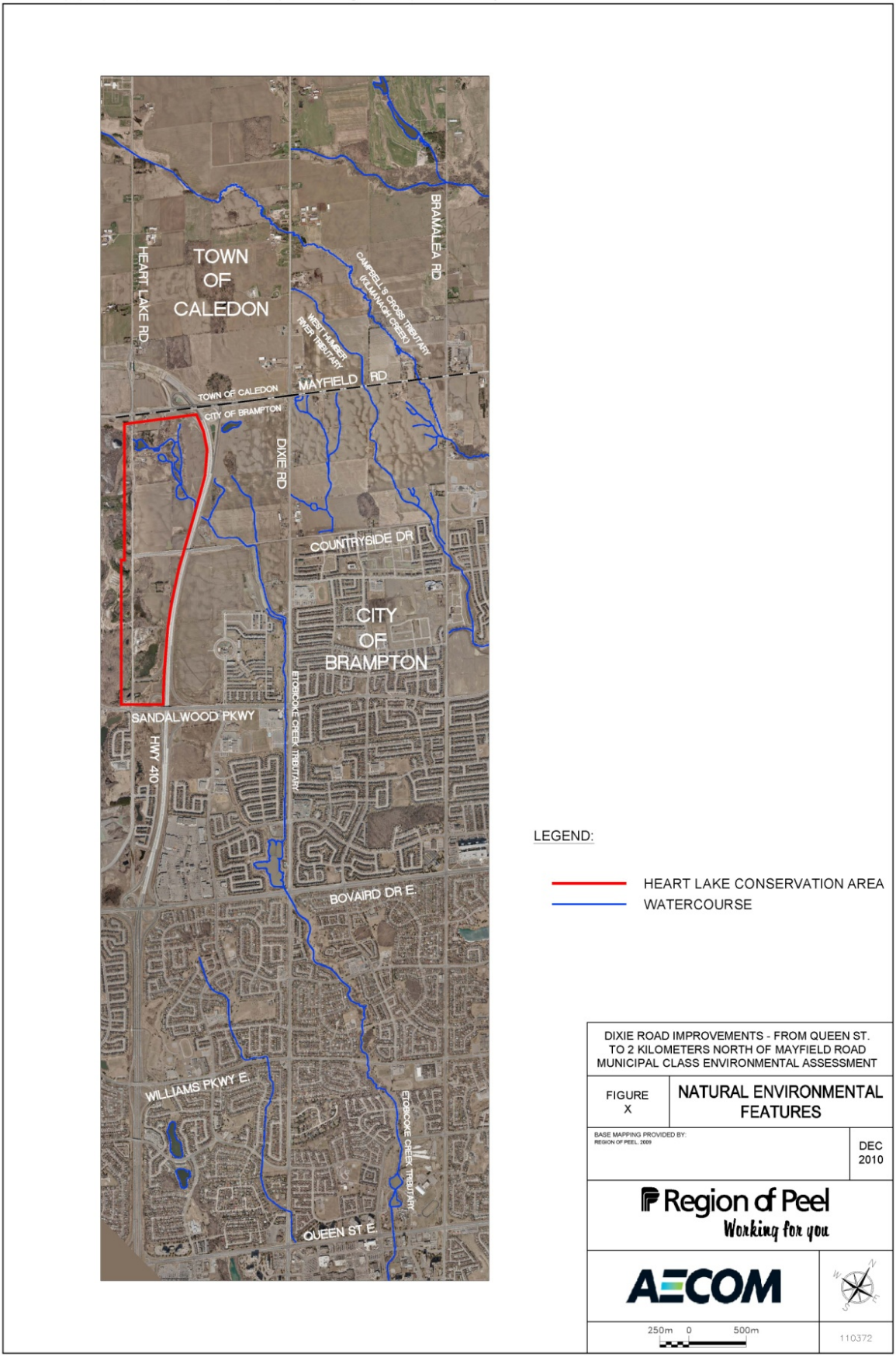
The study area is within the jurisdiction of the Toronto and Region Conservation Authority (TRCA) and is primarily urban residential. However, the remaining developable lands in Brampton and the northerly 2 km of adjacent lands in Caledon remain rural agricultural with the exception of some planned industrial development.

The Dixie Road corridor is situated at the boundary of the South Slope and Peel Plain Physiographic Regions. Several headwater tributaries of Etobicoke Creek and West Humber River cross the area from northwest to southeast. Natural environment features along the Dixie Road corridor from Queen Street north to Mayfield Road were identified and reviewed on an August 8, 2008 reconnaissance visit and again on September 10, 2008 at which time detailed fish surveys were undertaken at selected Etobicoke Creek tributary locations.

The natural environment features along the study limit extension of the Dixie Road corridor to 2 km north of Mayfield Road were identified and reviewed on a June 29 and August 8, 2010 reconnaissance visit and again on October 18, 2010 at which time detailed fish surveys were undertaken along the two headwater tributaries of the West Humber River (north of Mayfield Road).

Figure 5 illustrates the natural environmental features located within the study area corridor which consist of watercourses and associated riparian zones.

Figure 5 Natural Environmental Features



4.3.1 FISHERIES AND AQUATIC ECOSYSTEMS

South of Mayfield Road

Several headwater tributaries of Etobicoke Creek cross the area from northwest to southwest. Under normal conditions, many of these upper tributaries would be dry through the summer months; however, in 2008 the summer was very wet and water was present at several roadway crossings at the time of the file investigations.

Two small tributaries of Etobicoke Creek separated by approximately 200m, neither of which flowed within formal channels, cross Dixie Road from northwest to southwest above Countryside Drive. On the west side, ditches drain into 0.6 m diameter (north crossing) and 1.2 m diameter (south crossing) CSPs under Dixie Road. Both were flowing on the day of the August site visit; however, neither are considered fish habitat since they proceed southeast across the cultivated fields and are dry for most of the summer. On September 10, they were dry. There was no riparian vegetation zone associated with either of the tributary channels within the study corridor. Water simply runs over the vegetation when flowing. Although surrounding vegetation is old field herbaceous growth along the roadsides, there were occasional mature tree specimens including white elm, silver maple and crack willow frequently associated with farm and rural residential buildings along the roadway.

At Octillo Boulevard, additional tributaries of Etobicoke Creek approach the roadway from the northeast. There has been extensive recent realignment and restoration of tributary channels approaching to within 25 m east of the roadway, related to adjacent residential development. The water was extremely turbid but forage fish were observed in the channel in the August site visit. Subsequent electrofishing in September, however, yielded no fish after extensive sampling efforts. Water had cleared significantly of turbidity by this time but the channel bottom was muck covered and quickly clouded the surrounding waters. Downstream of this disturbance area is a 4 m by 1 m concrete box culvert under Dixie Road that conveys drainage from an easterly tributary to a broad, cattail lined channel, often completely filled with emergent, 25 m west of Dixie Road. Widenings of Dixie Road in this vicinity could impact fish habitats locally if extensions to this culvert are required, although the existing culvert length may accommodate a roadway widening. The main channel continues south through a golf course to Sandalwood Parkway. Fish sampling below the bridge in September did yield a dozen brook stickleback after considerable effort in the turbid waters. Several westerly tributaries, including flows from Heart Lake located 1 km upstream, join the cattail dominated channel that continues south and parallel to Dixie Road to where it enters a large reservoir at the northwest quadrant of Bovaird Drive and Dixie Road with a formal water level control structure located just northeast of the intersection. Water in the upstream channel remained turbid until it reached the reservoir. Another tributary enters the reservoir from the east just above Bovaird Drive; however, the culvert location could not be determined in the field.

A large twin 4 m by 2 m concrete box culvert conveys flows from the reservoir southeast under the intersection to Manitou Park in the southwest quadrant, where parkland containing the channel extends south some distance adjacent to Dixie Road. This section of waterway is considered fish habitat, but of low sensitivity.

Another Etobicoke Creek tributary at the south end of the study area approaches Dixie Road several hundred metres north of Queen Street, also very cloudy, but with what appears to be a continuous flow. This tributary crosses Dixie Road in an easterly direction through a 4 m by 2 m concrete box culvert under the roadway before turning south and adjacent to Dixie Road. Immediately upstream of the west sidewalk and culvert inlet is a 0.4 m channel drop/waterfall from a concrete pad that presumably covers a sewer that crosses under the channel. Fish passage is therefore completely blocked upstream. This tributary was extensively sampled both upstream and downstream of the roadway crossing in the September visit but no fish were observed or captured. Despite the poor sampling success, it must still be considered fish habitat, although of low quality/sensitivity. Any changes in roadway width at this crossing will require culvert extension(s). This downstream tributary channel continues flowing south parallel and east of Dixie Road, first between the roadway and row homes and further south into the more

naturalized parkland, sometimes over/through/around an old concrete lined section, before veering to the east and under Queen Street.

Mayfield Road Northerly

Two headwater tributaries of the West Humber River cross the area from northwest to southeast. The more northerly branch, with its headwaters northeast of Campbell's Cross, appears to be permanently flowing with a large off-stream pond immediately adjacent to the roadway on the west side (survey station 16+420). Known locally as Kilmanagh Creek, it is conveyed across Dixie Road via a 5.5 m wide by 3 m high non rigid frame concrete culvert. Although a Fish Collection Licence was obtained from the Ministry of Natural Resources, no electroshocking was undertaken to identify the resident fish community due to the possible presence of redside dace, a fish species at risk listed in MNR's Endangered Species Act legislation.

On June 29 the north tributary at the culvert was approximately 2.5 m wide and 0.3 m in depth at the culvert inlet, flowing as a run over a rocky substrate with occasional boulders and silt areas. The bankfull height was approximately 0.6 m indicating significant flow variations in times of extended precipitation. Immediately upstream in the northeast quadrant was a large 20 m by 30 m off-line pond immediately adjacent to the roadway. Adjacent vegetation included Manitoba maple, elm, white cedar, hawthorn, riverbank grape touch-me-not, goldenrod, iris, deadly nightshade, Joe pie weed and canary grass. Downstream, the channel meandered as a series of pools and riffle areas through abandoned pasture with occasional trees and overhanging shrubs and long grasses providing overhead cover.

The TRCA was able to provide background information through its website for the West Humber area and in particular this Campbell's Cross tributary. The Humber River system lists 74 species of fish as resident in its various reaches. Forty-three species were recorded in the most recent 2001 comprehensive survey. This information is contained in the Humber River Fisheries Management Plan (2004), which documents fisheries information for the entire watershed as well as defining specific management objectives for various reaches. The Campbell's Cross tributary (Kilmanagh Creek) has been identified as a "small riverine cold water channel" to be specifically managed for brook trout and redside dace. Applicable management objectives that could impact this Environmental Assessment include protection of existing wetlands (none within our study area), rehabilitation of degraded sections of channel, any stormwater ponds to have bottom draw outlets or subsurface drainage, maintenance or enhancement of existing base flow and reduction of sediment runoff from construction activities. The Endangered Species Act has specific penalties for harmful impacts to a listed species or its habitat. Additional discussion on species at risk follows in Section 4.3.2 of this Report.

From Appendix V of the Humber Report the following fish species were recorded at an upstream fish sampling station (HU017WM) in 2001 by MNR/TRCA: white sucker (*Catostomus commersoni*), northern hogsucker (*Hypentelium nigricans*), fathead minnow (*Pimephales promelas*), blacknose dace (*Rhinichthys atratulus*), creek chub (*Semotilus atromaculatus*), brook stickleback (*Culaea inconstans*) and Johnny darter (*Etheostoma nigrum*).

A secondary, unmapped tributary of Kilmanagh Creek was conveyed across the roadway from the west by a 750 mm diameter CSP at chainage 16+280. The upstream drainage area is the grassed front yard of a farm residence. Downstream and to the east, a narrow channel with occasional cattails crossed the yard of another residence. The culvert itself has been placed on grade and is slightly perched at its downstream end. Although this channel contributes flow to the system in the spring and during significant precipitation events it does not appear to provide direct fish habitat. No water was in the channel or within the culvert during the August fish survey.

Several hundred metres further south and approximately 0.9 km north of Mayfield Road at 15+910 another West Humber River tributary crosses diagonally under Dixie Road via twin 1.2 m diameter CSPs. There was some stagnant water in each of the culvert barrels but no fish were observed on the June site visit. Adjacent vegetation filled channels were dry with no observable streambed. Upstream, a 2 m wide area of uncut grass paralleled a farm entrance driveway with adjacent mowed lawn. Downstream, the channel extended southeast through a hay field.

Adjacent vegetation included purple loosestrife, long grasses, goldenrod and a cattail patch at the culvert outlet. It was not considered fish habitat.

Two Etobicoke Creek tributaries cross Mayfield Road from north to south within close proximity to the study area. Within several metres east of Dixie Road on Mayfield and partially obscured in the deep roadside ditch a 0.6 mm diameter CSP directs ditch flows and adjacent barnyard drainage to the southeast quadrant. The intermittent drainage is directed across cultivated lands to join another branch. To the west of the Dixie Road intersection another tributary is conveyed under Mayfield Road via a 750 mm CSP, which is located just beyond the present zone of roadway improvement disturbance. It provides roadside drainage in the northwest quadrant as well as some drainage from the adjacent farmland. These two upper tributaries are in open field settings and distinguishable only as shallow depressions across surrounding agricultural fields. They are typically dry through the summer months and do not provide any fish habitat.

4.3.2 SPECIES AT RISK (SAR)

In order to comment on the possible presence of endangered and/or threatened species or those of special concern in the vicinity of the project corridor a search of Environment Canada's Species at Risk Web Mapping Application was undertaken. This database identified the possible presence of sixteen species of animals and plants. None of these species were observed during any site visit. Although there is some likelihood that one or more of the species may be present in the type of habitat offered within the green spaces at the northern limits of the study area, these green spaces are typically situated outside the Dixie Road corridor.

4.3.3 WILDLIFE AND WILDLIFE HABITAT

With the exception of the road corridor north of Mayfield Road, the location of the proposed Dixie Road improvements is within the urbanised area of the City of Brampton in an area previously disturbed by a lengthy period of agricultural development and usage. As such, much of the original habitat for many species of plants and wildlife has been lost or altered. In regards to the 2 km extension north of Mayfield Road, proposed road improvements are within the rural agricultural area of the Town of Caledon, however these areas are significantly degraded but do represent the primary natural areas and urban wildlife corridors.

4.3.4 ENVIRONMENTALLY SENSITIVE AREAS

There are no Environmentally Sensitive Areas, wetlands or Areas of Natural or Scientific Interest (ANSIs) within or adjacent to the study area. However there are a number of tributary branches of Etobicoke Creek which cross or run parallel to the road alignment including a reservoir/stormwater management area located in the northwest quadrant of the Dixie Road/Bovaird Drive intersection. In addition, two headwaters tributaries of the West Humber River are located north of the intersection of Dixie Road and Mayfield Road. These tributaries form green space and possible wildlife corridors within the study area.

4.4 CULTURAL ENVIRONMENT

A Stage 1 and partial Stage 2 archaeological assessment was originally conducted for the approximately 7.4 kilometre section of Dixie Road from Queen Street north to Mayfield Road in the north end of the City of Brampton, Ontario. The background information review was carried out during the months of July and August of 2008. Subsequently, an addendum was completed to evaluate archaeological potential for the 2.0 km study limit extension north of Mayfield Road and to conclude whether a Stage 2 assessment was warranted. The background information review for the extension limit was carried out during the months of March, April and May of 2010.

A summary of the findings is provided below. The complete Archaeological and Built Heritage Assessment is provided in **Appendix C**.

4.4.1 ARCHAEOLOGY

4.4.1.1 STAGE 1 ARCHAEOLOGICAL ASSESSMENT

South of Mayfield Road

The Stage 1 background review indicated that much of the area demonstrated that, with the exception of lands in the northern portion of the corridor, all areas within the proposed ultimate right-of-way had been significantly disturbed by prior road construction, servicing and adjacent development.

North of Mayfield Road

The Stage 1 Addendum indicated that much of the area demonstrated potential for either First Peoples or historic era archaeological resources. However, a follow-up field reconnaissance on March 12, 2010 established that the existing Dixie Road right-of-way and some adjoining commercial properties have witnessed major land alterations.

4.4.1.2 STAGE 2 ARCHAEOLOGICAL ASSESSMENT

The Stage 2 Archaeological Assessment conducted for the section of Dixie Road from Queen Street to Mayfield Road documented the presence of the Mount Olivet and Lundy Family burial ground on the west side of Dixie Road, within an otherwise urban portion of the study area. The current road reconstruction plans are to completely avoid impacts to the cemetery; however, if works should take place adjacent to the cemetery, monitoring during construction must occur. A potential significant archaeological site was identified along the west side of Dixie Road between Mayfield Road and Countryside Drive. This site will require a Stage 3 Investigation prior to construction. It was concluded that lands away from this site can be considered free of archaeological concern.

Any lands where permission to enter was not granted or where changes are made to the footprint of the Preferred Design which are situated outside of the lands cleared through the 2009 Stage 2 Archaeological Assessment will be assessed and any applicable follow-up work completed prior to construction.

A Stage 2 Archaeological Assessment is being undertaken for the segment of the study area situated north of Mayfield Road. This assessment and any applicable follow-up work will also be completed prior to construction.

Refer to **Appendix C** for the complete details of the Stage 1 and Stage 2 Archaeological Assessments.

4.4.2 CULTURAL AND BUILT HERITAGE

A number of historic properties are located within the study limit including two pioneer cemeteries: Mount Olivet Cemetery and Lundy family burial ground. Several cultural heritage buildings are within the Study Area and are included on the City of Brampton Heritage Properties List. Furthermore, a number of historic properties within the study limit extension (2 km of Dixie Road north of Mayfield Road) were identified and several cultural heritage buildings are within the Study Area and are included on the Town of Caledon Heritage Properties List. Although not designated as heritage properties, these properties are considered to be significant heritage resources and are subject to the Provincial Policy Statement (2005) which states they be conserved.

Refer to **Appendix C** for the complete details of the Built Heritage and Cultural Landscape Update.

4.5 RELATED PLANNING STUDIES

4.5.1 REGION OF PEEL – REGIONAL OFFICIAL PLAN

The purpose of the Regional Official Plan[1] (ROP) is to set the Regional context for detailed planning by protecting the environment, managing resources, directing growth and setting the basis for providing Regional services in an efficient and effective manner. The Regional Official Plan applies to the combined areas of the City of Brampton, City of Mississauga and the Town of Caledon. The ROP outlines strategies to guide growth and development in Peel Region for the period 2005 to 2031.

The population and employment forecasts contained in the Regional Official Plan provides the framework for future growth in Peel and serves as a basis for determining Regional services and establishing land requirements to accommodate growth to the year 2031.

The Region of Peel ROP Schedule D (Regional Structure) designates the study area lands as predominately "Urban Systems". The Region of Peel Official Plan Amendment (ROPA) 15 (June 2005) updated the planning horizon of the Cities of Brampton and Mississauga to the year 2031. Based on the revisions contained in ROPA 15, the Region of Peel population is project to be 1.51 million in the year 2031. However, after accounting for the census under count, the Regional population projection was confirmed to be 1.64 million by the year 2031.

The Long Range Transportation Plan (LRTP) forms the basis for ROPA 16 which amends the Regional Official Plan objectives, policies and Schedule E (Major Street Network), Schedule F (Right-of-way Requirements) and Schedule G (High Order Transit Network).

In June 2009, the Region released draft ROPA 24. The purpose of the amendment is to review and add policies to the Region's Official Plan for the purposes of conformity to provincial initiatives (i.e., Provincial Policy Statement and Growth Plan) in areas such as growth management, regional forecasts, employment lands and Greenbelt conformity.

4.5.2 CITY OF BRAMPTON OFFICIAL PLAN

The 2006 City of Brampton Official Plan[2] sets out the course for land use decision-making within the municipality for the next 25 years. The City's Official Plan identifies significant growth in population and employment over the next 25 years. The Growth Management Forecasts adopted by the City Council in spring 2009 revealed that the City's population is expected to increase to 510,000 by 2011; 646,000 by 2012; and 738,000 by 2031. The forecast for employment is expected to increase to 180,000 by 2011; 274,000 by 2021; and 319,000 by 2031.

The Official Plan designates Dixie Road from Queen Street northerly to Mayfield Road as a "Major Arterial" road. Major arterial roadways are planned, designed, constructed and designated to carry medium to high volumes of medium distance intra-regional traffic at medium speeds together with transit services through High Occupancy Vehicle (HOV) lanes, dedicated transit lanes, or other transit priority measures, and to serve traffic flows between the principal areas of traffic generation, as well as traffic to or from highways. The arterials are also designed with a high degree of access control to the abutting properties. Arterial roads should be continuous and able to accommodate direct transit routes and transit priority measures with the appropriate street furniture including sidewalks where appropriate.

[1] *Region of Peel Regional Official Plan, November 2008*
[2] *City of Brampton's Official Plan, 2006*

4.5.3 TOWN OF CALEDON OFFICIAL PLAN

The 2008 Town of Caledon OP[3] designates Dixie Road 2 km north of Mayfield Road as a "Medium Capacity Arterial" road. Medium capacity arterial roadways can serve moderate volumes of medium distance traffic at moderate speeds with limited property access and no on-street parking.

The OP Schedule B indicates that the 2 km stretch of Dixie Road north of Mayfield Road is located between rural undeveloped land to the north east and the Mayfield West Secondary Plan area to the south west. The Mayfield West area encompasses the lands to the west of Dixie Road and has been designated as Prestige Industrial and Institutional.

4.5.4 PLACES TO GROW

The provincial *Places to Grow Act,* approved in June 2005, enables the Province of Ontario to put in place regional growth plans. As part of its membership in the Greater Toronto Area (GTA), the Region of Peel is part of the Greater Golden Horseshoe (GGH) Growth Plan Area, the fastest growing urban area in Canada. In 2006, the Province (former Ministry of Public Infrastructure Renewal) approved its "Growth Plan for the Greater Golden Horseshoe" which set specific population and employment forecasts (25 year planning horizon to year 2031) for upper tier municipalities, as well as prescribed density targets for intensification and greenfield development (i.e., lands currently not urbanized but designated for future urban development).

Provincial Places to Grow Growth Outlook for the Greater Golden Horseshoe forecasted the Region of Peel to grow to 1.49 million by 2021 and 1.64 million by 2031. This represents a 59% growth from the 2001 population of 1.03 million.

According to the *Growth Outlook for the Greater Golden Horseshoe* document released by the Province of Ontario in January 2005, the forecast for the Region of Peel is expected to grow to 1.49 million by 2021 and 1.64 million by 2031. This represents a 59% growth from the 2001 population of 1.03 million and is higher than the Region's currently adopted forecasts used for official plan development charge purposes[4].

The relevant polices identified in the Plan will be incorporated, where possible, into the generation of planning alternatives and design concepts.

4.5.5 PROVINCIAL POLICY STATEMENT

The Provincial Policy Statement (PPS) is issued under the authority of Section 3 of the Planning Act. It provides direction on matters of provincial interest related to land use planning and development, and promotes the provincial "policy-led" planning system. The PPS recognizes the complex inter-relationships among economic, environmental and social factors in planning and embodies good planning principles. It includes enhanced policies on key issues that affect communities such as the efficient use and management of land and infrastructure; protection of the environment and resources; and ensuring appropriate opportunities for employment and residential development, including support for a mix of uses[5].

Where applicable, the policies related to Transportation Systems and Transportation and Infrastructure Corridors will be incorporated into the generation of planning alternatives and design concepts, particularly designing to accommodate for transit services and facilities in the corridor.

[3] *Town of Caledon Official Plan Consolidation 2008*
[4] *Source: Hemson Consulting Ltd. – The Growth Outlook for the Greater Golden Horseshoe, January 2005.*
[5] *Source: Provincial Policy Statement, 2005*

4.5.6 GREENBELT PLAN

The study area is located outside of the Greenbelt Planning Area, therefore, policies contained in the Greenbelt Plan (Ministry of Municipal Affairs and Housing, 2005) do not apply to this study.

4.5.7 NIAGARA ESCARPMENT PLAN

The study area is located outside of the Niagara Escarpment Plan area; therefore, policies contained in the Niagara Escarpment Plan (Niagara Escarpment Commission, 2006) do not apply to this study.

4.6 SURFACE WATER AND STORMWATER MANAGEMENT

Several headwater tributaries of Etobicoke Creek as well as two headwater tributaries of the West Humber River cross the study area from northwest to southeast. The study area falls entirely within the jurisdiction of Toronto Region Conservation Authority.

There are a total of ten watercourse crossings within the study limits, consisting of four (4) concrete culverts and six (6) corrugated steel pipes (CSPs). The crossing culvert at Bovaird Drive will not likely be impacted by the expansion. The crossing culvert just north of Queen Street East, however, will likely have to be extended due to the widened roadway. Hydraulic modelling will be undertaken to ensure that water levels do not exceed existing conditions. North of Mayfield Road, the northern-most culvert crossing will not likely require alterations to accommodate road expansion while the southern-most culvert will likely need to be replaced to prevent upstream flood impacts as it is undersized relative to the Regional storm peak flow at the crossing.

Throughout the study area Dixie Road is currently a four-lane roadway with an urban cross section, except for the very north portion which is a two-lane roadway with ditches. Storm drainage is provided by a combination of storm sewers, ditch flow and overland flow along the roadway.

The potential storm drainage impacts resulting from a roadway widening would mainly be due to the increase in pavement (impervious) area. More impervious area generally results in less infiltration, higher peak flow, and decreased water quality relative to existing conditions. Higher peak flows can result in an increase in stream bank erosion and flooding, and a decline in water quality can affect the natural habitat of the creek.

There is the potential for a slight decrease in water quality due to the increase in pavement area, and therefore some sort of water quality measure will be required. Improvements to the existing storm sewers through the study area will also be required to convey the local increase in peak flow rates.

The stormwater management criteria as per the TRCA guidelines includes Level 1 (Enhanced) water quality, no increase in downstream erosion, and the proposed peak flow must not be greater than the existing peak flow.

The City of Brampton and Region of Peel storm sewer criteria were also referenced in the proposed conditions analysis. The storm sewer system must be designed for the 10 year return period storm event. The storm sewers can be sized based on the 5 year return period storm event if the 10 year standard cannot be achieved and there are no foundation drains connected to the storm sewer system.

The City of Brampton criterion for watercourse crossings is that they contain all storm events, including the Regional event. The Ministry of Transportation guidelines state that for an arterial road with a culvert less than 6m wide, during a 50-year event there must be at least 1.0m of freeboard and 0.3m clearance.

A stormwater management report was prepared for the original study area south of Mayfield Road. A subsequent stormwater management report was prepared to address stormwater management for the extended study area north of Mayfield Road. Further details on potential impacts and alternative mitigation measures can be found in the stormwater management reports provided in **Appendix C** which were prepared in support of the proposed road improvements.

5. ALTERNATIVE SOLUTIONS (EA PHASE 2)

5.1 DESCRIPTION OF THE PLANNING ALTERNATIVES

The Class EA process recognizes that there are many ways of solving a particular problem and requires various alternative solutions to be considered. The six alternative solutions for consideration in this study are described in **Table 8**.

Table 8 Planning Alternative Solutions

Planning Alternative Solutions		Description
Alternative 1	Do Nothing	Maintain existing conditions; involves no changes or improvements. The transportation system would not change. This alternative has been used as a benchmark to compare other alternatives against.
The following Planning Alternatives have been characterized as Road Network Improvements:		
Alternative 2	Intersection Improvements	Provide possible lane configuration improvements to accommodate left and right turn lanes and improve traffic signal timing.
Alternative 3	Road Widening	Widen Dixie Road to six lanes from Queen Street to Countryside Road and to four lanes from Countryside Road to 2 km north of Mayfield Road.
Alternative 4	Widen Alternative Routes	This includes widening parallel roads to allow for a greater movement of vehicles within the study area. This will enhance the ability for vehicles to move more efficiently throughout the study area, but does not address future growth adjacent to Dixie Road.
The following Planning Alternatives have been characterized as Transportation Demand Management Improvements:		
Alternative 5	Increase Transit Use	Encourage and promote transit and other modes of transportation by providing infrastructure to reduce travel demand.
Alternative 6	Provide High Occupancy Vehicle (HOV) Lanes	Introduce the use of HOV lanes to promote two or more passenger travel per vehicle and reduce the number of vehicles.

5.2 EVALUATION CRITERIA

An evaluation framework was developed as presented in **Table 9**, including technical considerations and environmental components that address the broad definition of the environment as described in the *Environmental Assessment Act* (EAA) and those based on comments received from relevant agencies.

Table 9 Evaluation Framework Components

Component	Description
Transportation / Technical	Component that evaluates the technical suitability and other engineering aspects of the road network system.
Socio-Economic Environment	Component that evaluates the potential effects on residents, neighbourhoods, businesses, community character, social cohesion and community features, in addition to municipal development objectives.
Natural Environment	Component that evaluates the potential effects on the natural and physical aspects of the environment (e.g., air, land, water and biota) including natural heritage/environmentally sensitive areas.
Cultural Environment	Component that evaluates the potential effects on historical/archaeological and built heritage resources.
Cost	Component that evaluates the proposed financial costs to construct the road improvements.

Table 10 presents the evaluation criteria based on the above components used to evaluate the alternative solutions.

Table 10 Criteria for Evaluating Alternative Solutions

Category	Criteria	Criteria Indicators
Transportation/Technical	Road Geometry	• Ability to improve road alignment, lane width/configuration.
	Utilities Relocation	• Ability to minimize adverse effects on utilities located within the City/Town's right-of-way.
Socio-Economic Environment	Residential / Business Areas	• Ability to maintain and/or maximize opportunities for improved access into adjacent residential and commercial properties.
	Property Acquisitions	• Amount (m^2/hectares (ha)) of property required.
	Aesthetics/Streetscape	• Ability to provide opportunities to improve landscaping, streetscape, tree planting, and enhance public spaces.
Natural Environment	Terrestrial Species/Habitat	• Adverse effects on terrestrial species/habitats. • Potential to enhance local terrestrial communities.
	Aquatic/Watercourse	• Adverse effects on Etobicoke Creek and West Humber tributaries in the project area. • Potential to enhance fisheries and aquatic habitat.
Cultural Environment	Archaeological Resources	• Potential for disruption of archaeological resources.
	Cultural and Built Heritage Features	• Potential for disruption of built heritage and cultural landscape features.
Cost	Capital Costs	• Cost of construction and maintenance.

A detailed assessment of each alternative was completed based on the evaluation components. A descriptive or qualitative evaluation was used to consider the suitability and feasibility of alternative solutions and design concepts.

5.3 EVALUATION OF PLANNING ALTERNATIVES

The evaluation of the alternatives is presented in **Table 11**.

Table 11 Evaluation of Planning Level Alternatives

Evaluation of Planning Alternatives for Dixie Road Improvements From Queen Street to 2 km north of Mayfield Road							
Criteria	**Sub-Criteria**	**ALTERNATIVES**					
		1) Do Nothing	**2) Intersection Improvements**	**3) Widen Dixie Road**	**4) Improve Other North-South Roads**	**5) Transportation Demand Management / Transit**	**6) Transportation Demand Management / Provide HOV Lanes**
Transportation / Technical	Corridor Capacity and Level of Service	***Least Preferred*** Does not address traffic congestion and delays along Dixie Road.	***Partially Preferred*** Potential for marginal improvements in level of service at intersections only. However, does not address traffic congestion and delays along Dixie Road.	***Preferred*** Widening will increase corridor capacity as well as improve Level of Service at intersections.	***Partially Preferred*** Potential to divert traffic to the adjacent network and improve corridor capacity and Level of Service. Bramalea Road planned for widening to 6 lanes. Airport Road already widened to 6 lanes.	***Partially Preferred*** Potential for marginal reduction in demand for capacity in corridor.	***Partially Preferred*** Potential for marginal reduction in demand for capacity in corridor. Provision of HOV lanes requires widening to accommodate additional lane.
	Access for Emergency Vehicles	***Least Preferred*** Adverse impacts due to increase in traffic volumes.	***Partially Preferred*** Potential for minor improvements.	***Preferred*** Potential to improve access for emergency vehicles.	***Partially Preferred*** Potential for minor improvements.	***Partially Preferred*** Potential for minor improvements.	***Partially Preferred*** Potential for minor improvements.
	Compliance with Planning Objectives and Sustainable Growth	***Least Preferred*** Does not meet Region's OP, Long Range Transportation Plan (LRTP), and City's AcceleRide Plans.	***Least Preferred*** In compliance with Brampton's AcceleRide Plans but does not meet Region's OP and LRTP.	***Preferred*** In compliance with Region's OP, LRTP, and City's AcceleRide Plan.	***Partially Preferred*** In compliance with Region's OP and City's AcceleRide Plans, but does not meet LRTP.	***Preferred*** In compliance with Region's OP and City's AcceleRide Plans. Meets Region's LRTP, by supporting alternative modes.	***Preferred*** In compliance with Region's OP and City's AcceleRide Plans. Meets Region's LRTP, by supporting alternative modes.
	Ability to Accommodate Pedestrians and Cyclists	***Partially Preferred*** No impacts over existing.	***Partially Preferred*** Potential for minor improvements at intersection.	***Preferred*** Potential to improve access for pedestrians and cyclists.	***Partially Preferred*** No impacts over existing.	***Preferred*** No impacts over existing.	***Preferred*** No impacts over existing.
	Stormwater Management	***Preferred*** No impacts.	***Partially Preferred*** Increased impervious area at intersections.	***Least Preferred*** Increase impervious area along Dixie Road.	***Preferred*** No impacts.	***Preferred*** No impacts.	***Preferred*** No impacts.
	Transit Services	***Least Preferred*** No improvements in accessibility to transit systems.	***Partially Preferred*** Minor improvements.	***Preferred*** Potential for improvements to transit service.	***Partially Preferred*** Minor reduction in traffic delays due to diversion of traffic to other roads.	***Partially Preferred*** Potential for minor reduction in traffic growth and related transit delays due to diversion of traffic to other modes or change in travel times.	***Partially Preferred*** Potential for minor reduction in traffic growth and related transit delays due to diversion of traffic to other modes and provision of HOV lanes for transit.
	Utilities	***Preferred*** No utility relocations.	***Partially Preferred*** Minor utility relocations.	***Partially Preferred*** Significant utility relocation along Dixie Road with opportunity to upgrade.	***Partially Preferred*** Significant utility relocation on other corridors with opportunity to upgrade.	***Preferred*** No utility relocations.	***Least Preferred*** Requires utility relocations to accommodate additional lane.
Socio- Economic Environment	Noise Impacts	***Partially Preferred*** Potential impact with increase of traffic, growth and congestion.	***Partially Preferred*** Potential minor impact with reduction in traffic congestion.	***Partially Preferred*** May increase noise due to traffic growth. Provide opportunity for noise mitigation.	***Partially Preferred*** Potential reduction in noise with diversion of traffic to adjacent network.	***Preferred*** Potential minor impacts with marginal reduction in traffic.	***Partially Preferred*** Potential minor impacts with marginal reduction in traffic. May increase due to transit vehicles.
	Potential Impacts on Air Quality	***Least Preferred*** Minor impact from pollution with increase of traffic, growth and congestion.	***Partially Preferred*** Minor improvement with marginal reduction in traffic and congestion.	***Preferred*** Potential improvement in air quality with more corridor capacity and better level of service.	***Partially Preferred*** Improvement in air quality with the potential traffic diversion offset by increased congestion and traffic on other roads.	***Partially Preferred*** Minor improvement with marginal reduction in traffic and congestion.	***Partially Preferred*** Minor improvement with marginal reduction in traffic and congestion.
	Residential / Business Areas	***Least Preferred*** Potential for difficulty accessing Dixie Road from unsignalized sideroads due to traffic congestion / infrequent gaps and absence of centre turning lane.	***Partially Preferred*** Potential for difficulty accessing Dixie Road from unsignalized sideroads due to traffic congestion / infrequent gaps and absence of centre turning lane.	***Partially Preferred*** Potential for difficulty accessing Dixie Road from unsignalized intersections due to traffic growth and additional through lanes.	***Partially Preferred*** Minor impact but traffic growth along corridor would require additional capacity.	***Partially Preferred*** Potential for minor impact with reduction in traffic.	***Partially Preferred*** Potential for minor impact with reduction in traffic.

Evaluation of Planning Alternatives for Dixie Road Improvements
From Queen Street to 2 km north of Mayfield Road

Criteria	Sub-Criteria	ALTERNATIVES					
		1) Do Nothing	**2) Intersection Improvements**	**3) Widen Dixie Road**	**4) Improve Other North-South Roads**	**5) Transportation Demand Management / Transit**	**6) Transportation Demand Management / Provide HOV Lanes**
	Impacts on local roads adjacent to study area	***Least Preferred*** Significant impacts due to traffic spill as a result of increased volume and delays	***Partially Preferred*** Potential for minor traffic congestion improvements on local roads adjacent to study area.	***Preferred*** Potential for reduction in traffic congestion on local roads adjacent to the study area.	***Partially Preferred*** Potential for minor traffic congestion improvements on local roads adjacent to study area.	***Partially Preferred*** Significant impacts due to traffic spill as a result of increased volume and delays, however diversion to other modes may minimize impacts.	***Partially Preferred*** Significant impacts due to traffic spill as a result of increased volume and delays, however diversion to other modes may minimize impacts.
	Ability to service adjacent lands	***Preferred*** No impact.	***Preferred*** No impact.	***Preferred*** No impact.	***Preferred*** No impact.	***Preferred*** No impact.	***Preferred*** No impact.
	Property Acquisitions	***Preferred*** No impact.	***Partially Preferred*** Property impacts depend upon proposed improvements at intersections.	***Least Preferred*** Will impact property, acquisition is dependent on amount of widening required.	***Preferred*** No impact.	***Preferred*** No impact.	***Preferred*** No impact.
	Safety	***Least Preferred*** Decrease in accident severity as a result of lower speeds is off-set by increase in number of collisions resulting from increased volume / congestion.	***Partially Preferred*** Some improvement as a result of intersection improvements.	***Preferred*** Improvements to safety as a result of improved geometrics and sightlines.	***Partially Preferred*** Dependent upon extent of traffic diversion to other routes some improvement to the Dixie Road corridor may occur.	***Partially Preferred*** Decrease in accident severity as a result of lower speeds is off-set by increase in number of collisions resulting from increased volume; however effects may be delayed due to diversion to other modes.	***Partially Preferred*** Decrease in accident severity as a result of lower speeds is off-set by increase in number of collisions resulting from increased volume; however effects may be delayed due to diversion to other modes.
	Aesthetics/Streetscape	***Least Preferred*** No impacts.	***Partially Preferred*** Minor impact to existing landscaping and aesthetics but, has the potential to improve aesthetics at intersections.	***Partially Preferred*** Temporary impacts to existing landscaping and aesthetics but, has the potential to improve the aesthetics along Dixie Road.	***Partially Preferred*** No impacts along Dixie Road. Potential to impact other roads.	***Least Preferred*** No impact.	***Least Preferred*** No impact.
Natural Environment	Impact on terrestrial resources (e.g., wildlife, vegetation)	***Preferred*** No impacts.	***Partially Preferred*** Potential for minor impacts.	***Least Preferred*** Potential for impact on terrestrial environment, especially if widening occurs near Etobicoke Creek.	***Least Preferred*** Potential for impacts along other roads.	***Preferred*** No impacts.	***Preferred*** No impacts.
	Impact to aquatic/watercourses (i.e., stream crossings)	***Preferred*** No impacts.	***Partially Preferred*** Potential for minor impacts.	***Least Preferred*** Potential for impacts, if widening occurs near Etobicoke Creek.	***Least Preferred*** Potential for impacts along other widened roads.	***Preferred*** No impacts	***Preferred*** No impacts
Cultural Environment	Potential impact on cultural heritage and archaeological resources.	***Preferred*** No impacts.	***Partially Preferred*** Potential for impacts near undisturbed areas.	***Least Preferred*** Potential for impacts, if widening occurs near Etobicoke Creek / undisturbed areas.	***Least Preferred*** Potential for impacts along other roads.	***Preferred*** No impacts.	***Preferred*** No impacts.
Cost	Maintenance and operation	***Partially Preferred*** Potential for difficulty accessing Dixie Road from unsignalized sideroads due to traffic congestion / infrequent gaps and absence of centre turning lane.	***Partially Preferred*** Potential increase in cost due to maintenance requirements.	***Preferred*** Potential reduction in operations and maintenance cost due to improvements.	***Least Preferred*** Potential increase in cost.	***Partially Preferred*** Potential for difficulty accessing Dixie Road from unsignalized intersections due to traffic congestion / infrequent gaps and absence of centre turning lane.	***Partially Preferred*** Potential for difficulty accessing Dixie Road from unsignalized intersections due to traffic congestion / infrequent gaps and absence of centre turning lane.
	Capital Costs	***Preferred*** No Impacts.	***Partially Preferred*** Moderate capital costs.	***Least Preferred*** High capital costs.	***Least Preferred*** High capital costs.	***Partially Preferred*** Moderate capital costs due to program start-ups and infrastructure procurements.	***Least Preferred*** High capital costs.

Evaluation of Planning Alternatives for Dixie Road Improvements From Queen Street to 2 km north of Mayfield Road							
Criteria	**Sub-Criteria**	**ALTERNATIVES**					
		1) Do Nothing	**2) Intersection Improvements**	**3) Widen Dixie Road**	**4) Improve Other North-South Roads**	**5) Transportation Demand Management / Transit**	**6) Transportation Demand Management / Provide HOV Lanes**
OVERALL		***Not Carried Forward*** Does not address problem statement – deteriorating traffic congestion and impacts on economic development potential. Is not consistent with the planning objective (LRTP).	***Not Carried Forward*** This option only addresses the problem statement by providing relief at intersections and does not improve road capacity along Dixie Road.	***Carried Forward*** Directly addresses problem statement by improving road capacity for Dixie Road and assists in the development of the area. Will also allow for the future development of HOV lanes.	***Not Carried Forward*** The City's and Region's TTMPs have identified the need to widen all north-south roads in this area, as well as significant transit improvements in order to address the growth in commuter demands in this part of the Region. In addition, this option would not address local congestion issues.	***Not Carried Forward*** Dixie Road has been identified as a support corridor for the AcceleRide Program. The City of Brampton has an ambitious transit improvement program called AcceleRide which will see a network of higher order transit supported by an improved frequency of buses (including Dixie Road). The Region is supportive of the goals of the AcceleRide Program. This will assist in addressing the problem statement without totally solving the problem on its own.	***Not Carried Forward*** The provision of HOV lanes may be implemented at a future date but will require the widening of Dixie Road to accommodate the additional road width required by an HOV lane.

5.4 PREFERRED ALTERNATIVE SOLUTION

From the evaluation presented in **Table 11**, the preferred alternative solution to address the anticipated traffic volumes is to **widen Dixie Road from 4 to 6 lanes from Queen Street to Countryside Drive and from 2 to 4 lanes between Countryside Drive and 2 km north of Mayfield Road** with a provision for a future widening of this road section to 6 lanes. In addition, it was determined that intersection improvements and continued Transportation Demand Management (TDM) measures would be carried forward as part of the preferred alternative solution.

6. ALTERNATIVE DESIGN CONCEPTS (EA PHASE 3)

6.1 DESCRIPTION OF ALIGNMENT ALTERNATIVES

A series of initial alignment alternatives were developed for the preferred solution at a preliminary level of detail to properly assess the potential impacts and benefits associated with each alternative. The functional designs were generated to a suitable level of detail to illustrate location, general design issues (alignment, intersection, lane arrangements, utility conflicts, property impacts) along the entire corridor such that the public and property owners could provide meaningful input on the alternatives.

The alternative design concepts that were developed and evaluated are shown in **Table 12**.

Table 12 Alternative Design Concepts

Alternative Design Concepts		Description
Alternative 1	Widen from the centreline	Shift the existing road alignment equally on both sides.
Alternative 2	Widen to the west	Shift the road alignment and curbline all to the west side of Dixie Road.
Alternative 3	Widen to the east	Shift the road alignment and curbline all to the east side of Dixie Road.
Alternative 4	Widen based on combined design	Fluctuate the shift of the road alignment in strategic locations (either to the west or to the east side of Dixie Road) to minimize the impacts on the environment and existing properties.

The recommended design speed for the widening of Dixie Road, which dictates vertical grade and horizontal curvature along with suggested lane widths, varies as follows:

- 70 km/h from Queen Street to Bovaird Drive;
- 80 km/h from Bovaird Drive to Mayfield Road; and
- 90 km/h north of Mayfield Road.

6.2 EVALUATION OF ALIGNMENT ALTERNATIVES

To facilitate the comparative evaluation of alternative alignments, a set of evaluation criteria were developed. As presented previously in **Table 11**, the evaluation criteria were divided into four categories to measure the degree of impact associated with each alternative alignment. Feedback from stakeholders and adjacent landowners confirmed the evaluation criteria presented in **Table 13**.

Table 13 Evaluation Criteria

Category	Criteria	Criteria Indicators
Transportation/ Technical	Road Geometry	• Ability to improve road alignment, lane width/configuration.
	Utilities Relocation	• Ability to minimize adverse effects on utilities located within the City/Town's right-of-way.
Socio-Economic Environment	Residential / Business Areas	• Ability to maintain and/or maximize opportunities for improved access into adjacent residential and commercial properties.
	Property Acquisitions	• Amount (m^2/hectares (ha) of property required.
	Aesthetics/Streetscape	• Ability to provide opportunities to improve landscaping, streetscape, tree planting, and enhance public spaces.
Natural Environment	Terrestrial Species/ Habitat	• Adverse effects on terrestrial species/habitats. • Potential to enhance local terrestrial communities.

Category	Criteria	Criteria Indicators
	Aquatic/Watercourse	• Adverse effects on Etobicoke Creek and West Humber tributaries in the project area. • Potential to enhance fisheries and aquatic habitat.
Cultural Environment	Archaeological Resources	• Potential for disruption of archaeological resources.
	Cultural and Built Heritage Features	• Potential for disruption of built heritage and cultural landscape features.
Cost	Capital Costs	• Cost of construction and maintenance.

The result of the evaluation of the alternative alignments is provided in the form of an evaluation matrix in **Table 14** and **Table 15**. The goal of the comparative evaluation of alternative design concepts was not to rank the alternatives, but to assess their relative impacts using the evaluation criteria above. The four proposed alternative design concepts offer varying advantages, and have varying disadvantages as described in the evaluation matrix.

Table 14 Evaluation of Alternative Alignments – South of Mayfield Road

LEGEND				
○	◔	◐	◔	●
Least Preferred ⟷ Most Preferred				

SOUTH OF MAYFIELD ROAD

CATEGORY	CRITERIA	ALIGNMENT 1 WIDEN FROM THE CENTRELINE		ALIGNMENT 2 WIDEN TO THE WEST		ALIGNMENT 3 WIDEN TO THE EAST		ALIGNMENT 4 WIDEN BASED ON COMBINED DESIGN	
Transportation / Technical	Road Geometry	• Ability to improve vertical geometry. Horizontal geometry is maintained. Additional pavement width is split equally.	◔	• Ability to improve vertical geometry. Additional pavement width is provided on west side only.	◐	• Ability to improve vertical geometry. Additional pavement width is provided on east side only.	◐	• Ability to improve vertical geometry. Additional pavement width is provided on both east and west sides as required to mitigate impacts or constraints.	◐
	Utilities Relocation	• Requires relocation of utilities on both sides of Dixie Road.	◔	• Requires relocation of utilities on west side of Dixie Road.	◐	• Requires relocation of utilities on east side of Dixie Road.	◐	• Relocation of utilities required on both sides of Dixie Road with extent per side dependent upon extent of widening and direction from centerline.	◔
Social-Economic Environment	Residential/Business Access	• Moderate Impacts to both residential and business properties as a result of widening on both sides.	◔	• Significant Impacts to residential properties as a result of widening on west side.	○	• Significant Impacts to businesses as a result of widening on east side.	○	• Moderate Impacts to residential and business properties. • Ability to mitigate impacts by varying extent of widening per side.	◔
	Property Acquisitions	• Property would be required on both sides of Dixie Road at isolated locations. • Much of the widening can be accommodated within the existing ROW.	◐	• Extensive property requirements on west side of Dixie Road adjacent to Residential properties.	○	• Extensive property requirements on east side of Dixie Road adjacent to Industrial/Commercial properties. Negative impacts on adjacent properties.	○	• Property would be required on both sides of Dixie Road dependent upon extent of required widening per side; however, impacts are less than other alternatives. Widening can be accommodated within the existing ROW.	◔
	Aesthetics/Streetscape	• Widening will require removal of some vegetation and impacts into existing landscape buffer zone. • Minor to moderate reduction in property setbacks.	◔	• Widening will require extensive removal of vegetation and mature trees in existing landscape buffer zone. • Significant reduction in property setbacks for residential properties on west side of Dixie Road.	○	• Widening will require removal of vegetation from business properties. No impacts into existing landscape buffer zone. • Moderate to significant reduction in property setbacks for residential properties on east side of Dixie Road.	◐	• Widening will require removal of some vegetation into existing landscape buffer zone. • Minor to moderate reduction in property setbacks for business properties. The project provides an opportunity for upgraded streetscaping, and landscaping within the road right of way.	●
Natural Environment	Terrestrial Species/ Habitat and Vegetation/Trees	• Minor to moderate impacts to existing trees along the corridor and landscape buffer.	◔	• Significant impacts to existing trees along the corridor and landscape buffer.	○	• Minor impacts to existing trees along the corridor and landscape buffer.	●	• Minor to moderate impacts to existing trees along the corridor.	●
	Aquatic/Watercourse	• No increase in storm runoff into Etobicoke Creek, but widening road will require minimum 5 m extension of the existing culvert to the West and a 2m extension to the east. • Significant impact to natural vegetation on the east side of Etobicoke Creek and existing aquatic habitat function.	◔	• No increase in storm runoff into Etobicoke Creek, but widening road will require minimum 5m culvert extension to the west. • No impact to natural vegetation on the west side of Etobicoke Creek.	●	• No increase in storm runoff into Etobicoke Creek, but widening road will require minimum 5m culvert extension to the east. • Significant encroachment and impact on habitat to the east of Etobicoke Creek.	◔	• No increase in storm runoff into Etobicoke Creek, but widening road will require minimum 5 m extension of the existing culvert to the West and a 2m extension to the east.	●
Cultural Environment	Archaeological Resources	• There are no known archaeological sites located within the proposed right-of-way however there is the possibility to disturb potential archaeological resources outside of the proposed right-of-way (e.g., lands North of Countryside Drive, Mount Olivet Cemetery and Lundy Family burial ground). • Stage 2/3 archaeological investigation maybe required for previously undisturbed lands (i.e., work outside of ROW).	◔	• A Stage 2 archaeological investigation confirmed one archaeological site located near a large tree in front of a residential property north of Countryside Drive produced 17 historic artifacts. • A Stage 3 assessment is recommended if the site is to be impacted by construction.	◔	• Same as Alignment 1.	◔	• Same as Alignment 1.	◔
Cost	Capital Costs	• Significant capital costs for road improvements, including utility relocation, culvert extension on both sides and creek realignment.	○	• Reduced capital Costs for road improvements including utility relocation and culvert extension.	◐	• Significant capital costs for road widening, including utility relocation, culvert extension, creek realignment and cemetery relocation.	○	• Lowest capital Costs for road improvements including utility relocation and culvert extension. .	●
Criteria Summary		***Partially Preferred***		***Least Preferred***		***Least Preferred***		***Most Preferred***	
RECOMMENDATION		***Not Recommended***		***Not Recommended***		***Not Recommended***		***Recommended***	
TOTAL SCORE		**19**		**11**		**14**		**28**	

Table 15 Evaluation of Alternative Alignments – North of Mayfield Road

LEGEND				
○	◔	◐	◕	●
Least Preferred ⟷ Most Preferred				

NORTH OF MAYFIELD ROAD

CATEGORY	CRITERIA	ALIGNMENT 1 WIDEN FROM THE CENTRELINE		ALIGNMENT 2 WIDEN TO THE WEST		ALIGNMENT 3 WIDEN TO THE EAST		ALIGNMENT 4 WIDEN BASED ON COMBINED DESIGN	
Transportation/ Technical	Road Geometry	• Ability to improve vertical geometry. • Horizontal geometry is maintained. Additional pavement width is split equally. • Improved access throughout the corridor.	–	• Ability to improve vertical geometry. • Additional pavement width is provided on west side with only minor widening on the east side. • Improved access throughout the corridor.	◐	• Ability to improve vertical geometry. • Additional pavement width is provided on east side with only minor widening on the west side. • Improved access throughout the corridor.	◐	• Ability to improve vertical geometry. • Additional pavement width is provided on west side up to south of the cemetery location and from there additional pavement width required on the east. • Improved access throughout the corridor.	◐
	Utilities Relocation	• Minor relocations to Gas and Hydro required, however Bell and Water potentially remain unaffected.	◐	• Only Gas impacted.	◕	• Relocations required to all utilities.	◔	• Relocations to Gas along with minor Hydro relocations at the project limits.	◐
Socio-Economic Environment	Residential/Business Access	• Minor to Moderate Impacts to both residential and business properties as a result of widening on both sides. • Moderate impact to driveways on both sides of Dixie Road.	◕	• Moderate Impacts to residential/business properties as a result of widening on west side. • Significant impact on driveways on west side.	◐	• Moderate Impacts to residential/businesses as a result of widening on east side. • Significant impact on driveways on east side.	◐	• Minor to Moderate Impacts to both residential and business properties as a result of widening on both sides. • Minor to Moderate impact to driveways on both sides of Dixie Road.	◕
	Property Acquisitions	• Property would be required on both sides of Dixie Road. • Minor/moderate impact on both east and west side including 15 residential, 8 agricultural and 3 commercial properties.	◔	• Extensive property requirements on west side of Dixie Road adjacent to Residential/Development properties. • Significant impact to 10 residential 5 agricultural and 2 commercial properties, very minor impacts to 5 residential, 3 agricultural and 1 commercial properties.	○	• Extensive property requirements on east side of Dixie Road adjacent to Residential/Commercial properties. • Significant impact to 5 residential, 3 agricultural and 1 commercial properties, very minor impacts to 10 residential, 5 agricultural and 2 commercial properties	◔	• Property would be required on both sides of Dixie Road at various locations. This impact however is mitigated by altering the road alignment from the west to east side. This avoids the major hydro line along with having no major impact to the properties around the heritage/culturally significant area at the cemetery location.	◕
	Aesthetics/Streetscape	• Minor impact to existing landscaping and aesthetics but, has the potential to improve aesthetics at intersections. • Widening will require removal of some vegetation and impacts into existing landscape buffer zone. • Minor to moderate reduction in property setbacks.	◑	• Moderate impact to existing landscaping and aesthetics on the west side but, has the potential to improve aesthetics at intersections. • Widening will require significant removal of vegetation on the west side of Dixie Road. • Significant reduction in property setbacks on the west.	◔	• Moderate impact to existing landscaping and aesthetics on the east side but, has the potential to improve aesthetics at intersections. • Widening will require significant removal of vegetation on the east side of Dixie Road. • Significant reduction in property setbacks on the east.	◔	• Minor impact to existing landscaping and aesthetics but, has the potential to improve aesthetics at intersections. • Widening will require removal of some vegetation and impacts into existing landscape buffer zone. • Minor to moderate reduction in property setbacks.	●
Natural Environment	Terrestrial Species/ Habitat and Vegetation/Trees	Not Applicable – No Differentiation Between Alternatives (Minor impacts to existing trees along the corridor)							
	Aquatic/Watercourse	Not Applicable – No Differentiation Between Alternatives (No impact to Kilmanagh Creek but road widening will require extension of remaining three culverts)							
Cultural Environment	Archaeological Resources	• There are no known archaeological sites located within the proposed right-of-way however there is the possibility to disturb potential archaeological resources outside of the proposed right-of-way. • Stage 2/3 archaeological investigation maybe required for previously undisturbed lands (i.e., work outside of ROW).	–	• All lands adjacent to the west of the Dixie Road right-of-way, with the exception of the B.P. Landscaping and Snow Removal property, are more or less pristine and retain archaeological potential; a Stage 2 archaeological assessment will be required.	◐	• All lands adjacent to the disturbed existing Dixie Road right-of-way, with the exception of the Salisbury Garden Supplies property, are more or less pristine and retain archaeological potential. If the proposed construction will impact these areas, a Stage 2 archaeological assessment will be required.	◐	• Same as Alignment 1.	◕
Cost	Capital Costs	• Significant Capital Costs for road improvements, including utility relocation, culvert extension on both sides.	○	• Reduced Capital Costs for road improvements, including utility relocation and culvert extension.	◑	• Reduced Capital Costs for road widening including utility relocation and culvert extension.	◑	• Lowest Capital Costs for road widening including minor utility relocation and culvert extensions on both sides.	◕
Criteria Summary		***Partially Preferred***		***Partially Preferred***		***Least Preferred***		***Most Preferred***	
RECOMMENDATION		***Not Recommended***		***Not Recommended***		***Not Recommended***		***Recommended***	
TOTAL SCORE		**14**		**12**		**11**		**22**	

6.3 PREFERRED DESIGN CONCEPT

Based on the evaluation of alternative design concepts, Alternative 4 (widen based on combined design) was selected as the preliminary preferred design. Input received during Phase 3 was taken into consideration and used to refine the preliminary preferred design where appropriate. Key issues in the assessment of the alternative design concepts included safety for all road users, including pedestrian and cyclists, and the need to achieve efficient traffic operations.

The Recommended Design includes:

- Widening of Dixie Road to six (6) through lanes plus turning lanes from north of Queen Street to Countryside Drive;
- Widening of Dixie Road to four (4) through lanes plus turning lanes north of Countryside Drive to the northerly project limit (i.e., approximately 2 km north of Mayfield Road);
- A number of new intersections, dedicated turn lanes at intersections, and a center median;
- A 1.5 m sidewalk on both sides of Dixie Road from Queen Street to Countryside Drive, a 1.5 m sidewalk on the east side of Dixie Road north of Countryside Drive, and a 3.0 m multi-use trail on the west side of Dixie Road north of Countryside Drive.

The Recommended Design is described in more detail in Section 7 of this report.

7. PROJECT DESCRIPTION

The Preferred Design for Dixie Road, presented on the design drawings in **Section 10**, is to widen Dixie Road to six (6) through lanes plus turning lanes from north of Queen Street to Countryside Drive and four (4) through lanes plus turning lanes north of Countryside Drive to the northerly project limit (i.e., approximately 2 km north of Mayfield Road). Key features include; a number of new intersections, dedicated turn lanes at intersections, a center median, a 1.5 m sidewalk on both sides of Dixie Road from Queen Street to Countryside Drive, a 1.5 m sidewalk on the east side of Dixie Road north of Countryside Drive, and a 3.0 m multi-use trail on the west side of Dixie Road north of Countryside Drive.

7.1 PLAN AND PROFILE

The proposed horizontal alignment follows the existing alignment in some locations. Elsewhere it shifts approximately 3.0 m to 4.0 m west of the existing alignment. The final tie-in to the existing alignment occurs approximately 200 m north of the southern project limits. The minimum curve radii and superelevation criteria are described in the design criteria section, which follows.

Storage lengths and taper lengths for turning lanes at intersections are described in the design criteria section. Storage lengths and taper lengths are to be reviewed and revised as necessary during detailed design.

To minimize grading impacts, the proposed profile follows the existing profile as closely as possible. The profile was designed based on the proposed design speed for each segment. Where the existing profile elements did not meet this design criteria, the profile was revised. The vertical alignments section in Section 7.2 describes the vertical alignment design criteria in detail.

7.2 DESIGN CRITERIA

The following proposed design criteria were developed based on TAC and Region of Peel Standards. The design criteria, presented on the following three pages, are based on the design speed which varies throughout the study corridor as follows:

- 70 km/h from Queen Street to Bovaird Drive;
- 80 km/h from Bovaird Drive to Mayfield Road; and
- 90 km/h north of Mayfield Road.

DIXIE ROAD DESIGN CRITERIA: QUEEN STREET TO BOVAIRD DRIVE		
DESCRIPTION	**DESIGN STANDARD TAC**	**PROPOSED STANDARD**
CLASSIFICATION		
ROAD CLASSIFICATIONS	UAU 70	UAU 70
DESIGN SPEED (km/h)	70	70
POSTED SPEED (km/h)	60	60
HORIZONTAL ALIGNMENTS		
NC NORMAL CROWN (-0.02m/m) **R**min. (m)	1680	1680
CURVE RADIUS WITH SUPERELEV. RATE e=0.06 **R**min (m)	190	190
RC REMOVE CROWN (+0.02m/m) **R**min (m), for e=0.06	330	330
CURVE RADIUS WITH SUPERELEV. RATE e=0.04 **R**min (m)	200	200
RC REMOVE CROWN (+0.02m/m) **R**min (m), for e=0.04	290	290
TRANSITION BETWEEN 4-LANE AND 2-LANE or 6 lane and 4 lane:		
PARALLEL LANE (m)	120-195	120-195
MERGING TAPER (m)	115	115
DIVERGING TAPER (m)	60	60
RIGHT TURN TAPER	60-70	60
LEFT TURN TAPER	53-168	53
LEFT & RIGHT TURN PARALLEL	40	40
CROSS SECTIONS		
THROUGH LANE WIDTH (m)	3.7	3.5
LT LANE WIDTH (m)	3.5-3.3	3.5
RT LANE WIDTH (m)	3.5-3.3	3.5
CURB LANE WIDTH (m)	3.5-3.3	3.75
TANGENT SECTION CROSS FALL	2%	2%
Sidewalk Width (m)	1.50	1.50
Kill strip width	1.00	0.75-1
Bike path (MUT)	3.00	3.00
Driveway grades (max %) behind sidewalk	8%	8.00%
Driveway grades (max %) b/w curb and sidewalk	1-5%	6.00%
Sidewalk cross fall (%)	1-5%	2-4%
Clear Zone	4	4
VERTICAL ALIGNMENTS		
MAXIMUM GRADE (%)	5	5
MINIMUM GRADE (%)	0.5	0.5
SAG VERTICAL CURVE **K**min.	10-12	10-12
CREST VERTICAL CURVE **K**min.	16-23	16-23
LAYOUT		
RADIUS OF CURBS AT INTERSECTION		
ARTERIAL TO LOCAL	15	15
ARTERIAL TO ARTERIAL	18	18
ROW WIDTH (m)	Varies	Varies

DIXIE ROAD DESIGN CRITERIA: BOVAIRD DRIVE TO MAYFIELD ROAD		
DESCRIPTION	**DESIGN STANDARD TAC**	**PROPOSED STANDARD**
CLASSIFICATION		
ROAD CLASSIFICATIONS	UAU 80	UAU 80
DESIGN SPEED (km/h)	80	80
POSTED SPEED (km/h)	70	70
HORIZONTAL ALIGNMENTS		
NC NORMAL CROWN (-0.02m/m) **R**min. (m)	2130	2130
CURVE RADIUS WITH SUPERELEV. RATE e=0.06 **R**min (m)	250	250
RC REMOVE CROWN (+0.02m/m) **R**min (m), for e=0.06	450	450
CURVE RADIUS WITH SUPERELEV. RATE e=0.04 **R**min (m)	280	280
RC REMOVE CROWN (+0.02m/m) **R**min (m), for e=0.04	400	400
TRANSITION BETWEEN 4-LANE AND 2-LANE or 6 lane and 4 lane:		
PARALLEL LANE (m)	140-215	140
MERGING TAPER (m)	130	130
DIVERGING TAPER (m)	70	70
RIGHT TURN TAPER	60-84	60
LEFT TURN TAPER	53-168	53
LEFT & RIGHT TURN PARALLEL	60-130	60
CROSS SECTIONS		
THROUGH LANE WIDTH (m)	3.7	3.75
LT LANE WIDTH (m)	3.5-3.3	3.5
RT LANE WIDTH (m)	3.5-3.3	3.5
CURB LANE WIDTH (m)	3.5-3.3	3.75
TANGENT SECTION CROSS FALL	2%	2%
Sidewalk Width (m)	1.50	1.50
Kill strip width	1.00	0.75-1
Bike path (MUT)	3.00	3.00
Driveway grades (max %) behind sidewalk	8%	8.00%
Driveway grades (max %) b/w curb and sidewalk	1-5%	6.00%
Sidewalk cross fall (%)	1-5%	2-4%
Clear Zone	5	5
VERTICAL ALIGNMENTS		
MAXIMUM GRADE (%)	5	5
MINIMUM GRADE (%)	0.5	0.5
SAG VERTICAL CURVE **K**min.	12-16	12
CREST VERTICAL CURVE **K**min.	24-36	24
LAYOUT		
RADIUS OF CURBS AT INTERSECTION		
ARTERIAL TO LOCAL	15	15
ARTERIAL TO ARTERIAL	18	18
ROW WIDTH (m)	Varies	Varies

DIXIE ROAD DESIGN CRITERIA: MAYFIELD ROAD NORTHERLY 2.0 KM		
DESCRIPTION	**DESIGN STANDARD TAC**	**PROPOSED STANDARD**
CLASSIFICATION		
ROAD CLASSIFICATIONS	UAU 90	UAU 90
DESIGN SPEED (km/h)	90	90
POSTED SPEED (km/h)	80	80
HORIZONTAL ALIGNMENTS		
NC NORMAL CROWN (-0.02m/m) **R**min. (m)	2620	2620
CURVE RADIUS WITH SUPERELEV. RATE e=0.06 **R**min (m)	340	340
RC REMOVE CROWN (+0.02m/m) **R**min (m), for e=0.06	600	600
CURVE RADIUS WITH SUPERELEV. RATE e=0.04 **R**min (m)	380	380
RC REMOVE CROWN (+0.02m/m) **R**min (m), for e=0.04	530	530
TRANSITION BETWEEN 4-LANE AND 2-LANE or 6 lane and 4 lane:		
PARALLEL LANE (m)	160-240	160
MERGING TAPER (m)	145	145
DIVERGING TAPER (m)	75	75
RIGHT TURN TAPER (MTO)	75	75
LEFT TURN TAPER	95-190	95
LEFT & RIGHT TURN PARALLEL	70	70
CROSS SECTIONS		
THROUGH LANE WIDTH (m)	3.7	3.75
LT LANE WIDTH (m)	3.5-3.3	3.5
RT LANE WIDTH (m)	3.5-3.3	3.5
CURB LANE WIDTH (m)	3.5-3.3	3.75
TANGENT SECTION CROSS FALL	2%	2%
Sidewalk Width (m)	1.50	1.50
Kill strip width	1.00	0.75-1
bike path (MUT)	3.00	3.00
Driveway grades (max %) behind sidewalk	8%	8.00%
Driveway grades (max %) b/w curb and sidewalk	1-5%	6.00%
sidwalk cross fall (%)	1-5%	2-4%
Clear Zone	6	6
VERTICAL ALIGNMENTS		
MAXIMUM GRADE (%)	5	5
MINIMUM GRADE (%)	0.5	0.5
SAG VERTICAL CURVE **K**min.	15-20	15
CREST VERTICAL CURVE **K**min.	32-53	32
LAYOUT		
RADIUS OF CURBS AT INTERSECTION		
ARTERIAL TO LOCAL	15	15
ARTERIAL TO ARTERIAL	18	18
ROW WIDTH (m)	Varies	Varies

7.3 TYPICAL CROSS-SECTIONS

Typical cross sections are described in general below.

The proposed typical cross-section north of Countryside Drive is as follows:

- Four lanes, 3.75 m wide
- Painted centre median, 5.50 m wide
- Multi-use trail, 3.0 m wide on the west side
- Sidewalk, 1.5 m wide on the east side

The proposed typical cross-section south of Countryside Drive is as follows:

- Six lanes, 3.75 m wide
- Concrete centre median, 6.0 m wide
- Multi-use trail, 3.0 m wide on the west side (Mayfield Road to Countryside Drive)
- Sidewalk, 1.5 m wide on the east side (Mayfield Road to Countryside Drive)
- 1.5 m sidewalk both sides (south of Countryside Drive)

Elements common to all typical cross sections are as follows:

- Splash pad, 1.0 m wide both sides
- Boulevard, 1.5 m wide both sides
- At intersections, 3.5 m wide left turn lane where applicable
- At intersections, 3.5 m wide right turn lane where applicable
- At bus bays, 3.0 m wide bus bay with dropped curb adjacent to curb lane
- At signalized intersections, 2.0 m wide centre concrete median

7.4 WATER CROSSINGS

The proposed improvements at each watercourse location as well as the anticipated environmental impacts and proposed mitigation at each site are summarized in the following table:

Watercourse Crossing Location	Existing Structure		Proposed Work	Anticipated Environmental Impacts	Proposed Mitigation
	Type	Size			
West Humber Tributary / Kilmanagh Creek Crossing 1* (Station 16+420)	Concrete culvert	5.5 m x 3 m	• No changes	• None	• Although no in-water works are required, fish habitat disturbances *must* be avoided due to the presence of endangered species (redside dace) • Standard erosion and sediment controls for adjacent road improvement work
Kilmanagh Creek Tributary Crossing 2* (Station 16+280)	CSP	800 mm diameter	• Culvert replacement / extension to west (800 mm diameter)	• No net impacts to fish and fish habitat	• Implement environmental protection plan to ensure maintenance and enhancement of water quality and associated riparian habitats
West Humber Tributary Crossing 3* (Station 15+910)	Twin CSPs	1.2 m diameter	• Culvert replacement / extension to east and west (3.6 m x 1.2 m)	• No net impacts to fish and fish habitat	• Implement environmental protection plan with emphasis on erosion and sediment control

Watercourse Crossing Location	Existing Structure		Proposed Work	Anticipated Environmental Impacts	Proposed Mitigation
	Type	Size			
Etobicoke Creek Tributary Crossing 4* (East of Dixie Road on Mayfield Road)	Culvert	600 mm diameter	• Culvert extension (600 mm diameter)	• No net impacts to fish and fish habitat	• Implement environmental protection plan with emphasis on erosion and sediment control
Etobicoke Creek Tributary Crossing 5* (West of Dixie Road on Mayfield Road)	Culvert	750 mm diameter	• No changes	• None	• Standard erosion and sediment controls for adjacent road improvement work
Etobicoke Creek Tributary (Station 14+625, South of Mayfield Road)	CSP	600 mm diameter	• Culvert removal; storm sewer system to be implemented	• None (not fish habitat)	• Standard erosion and sediment controls for adjacent road improvement work
Etobicoke Creek Tributary (Station 14+150, North of Countryside Drive)	CSP	1.2 m diameter	• Culvert removal; storm sewer system to be implemented	• None (not fish habitat)	• Standard erosion and sediment controls for adjacent road improvement work
Etobicoke Creek Tributary (Station 12+950, North of Octillo Blvd)	Concrete Culvert	4 m x 1 m	• No changes	• None	• Standard erosion and sediment controls for adjacent road improvement work
Etobicoke Creek Tributary (Station 12+300, Sandalwood Parkway)	Concrete Culvert	4 m x 2 m	• No changes	• None	• Standard erosion and sediment controls for adjacent road improvement work
Etobicoke Creek Tributary (Station 7+910, North of Queen Street)	Concrete Culvert	4 m x 2 m	• Culvert extension to east and west	• No net impacts to fish and fish habitat	• Implement environmental protection plan with emphasis on erosion and sediment control

Further details regarding the proposed mitigation measures are provided in the Natural Environment Report in Appendix C1. These measures will form major components of a future environmental protection plan associated with roadway reconstruction, particularly at culvert crossing locations.

7.5 PROPERTY REQUIREMENTS AND GRADING EASEMENTS

Land dedications were obtained from adjacent properties during the development process to allow for widening Dixie Road with minimal property requirements.

A number of relatively minor property acquisitions will be required throughout the corridor along Dixie Road as described in **Table 16** below. Where possible, horizontal alignment shifts and changes to grading slopes were utilized to minimize impacts to property. In addition, temporary grading easements will likely be required for a number of properties throughout the study corridor.

Table 16 Property Acquisition Requirements

Property (PIN / Address)	Total Area (m2)	Required Area (m2)	Purpose / Type
14152-0082	Unknown*	88	Widening
14152-0082	5,336	95	Grading
14152-0085, 49 Newbury Crescent	558	1	Grading
14152-0086, 47 Newbury Crescent	608	1	Grading
14152-0087, 45 Newbury Crescent	558	2	Grading
14152-0088, 43 Newbury Crescent	558	2	Grading
14152-0139	93	84	Grading
14152-0140	487	252	Grading
14153-0105	1,820	7	Grading
14154-0290, 9878 Dixie Road	3,810	1	Grading
14154-0293	7	2	Grading
14154-0293	8	6	Grading
14154-0295	3	2	Grading
14154-0299	9	1	Grading
14156-0098	2,150	265	Grading
14156-0098	2,150	112	Widening
14156-0099	4,464	6	Grading
14156-0099	4,464	14	Widening
14156-0167	9	7	Grading
14156-0167	9	1	Widening
14156-0168	3	1	Grading
14156-0176	3	1	Grading
14156-0177	3	2	Grading
14158-0176	2,076	966	Grading
14158-0179	323	30	Grading
14159-0035, 3 Hazelwood Court	2,605	1	Grading
14159-0036, 1 Hazelwood Court	1,529	2	Grading
14159-0059	3,086	6	Grading
14159-0062	3,502	23	Grading
14159-0075	14	8	Grading
14159-0075	31	12	Grading
14159-0081	Unknown*	150	Grading
14159-0081	Unknown*	470	Widening
14159-0094	Unknown*	41,489	Grading
14159-0096	45	14	Grading
14171-0496	32	22	Grading
14173-0200	4,978	762	Grading
14173-0200	4,978	465	Widening
14173-1099	Unknown*	20	Grading
14173-1235, 2 Crescent Hill Drive S	4,102	6	Grading

Property (PIN / Address)	Total Area (m2)	Required Area (m2)	Purpose / Type
14173-1265	19	17	Grading
14173-1266	46	3	Grading
14174-0315	1,994	404	Grading
14174-0315	1,994	648	Widening
14174-0328	52	44	Grading
14174-0330	299	120	Grading
14179-0124	3,533	487	Grading
14179-0124	3,533	1,135	Widening
14179-0126	737	19	Grading
14179-0126	737	11	Widening
14180-0002	Unknown*	795	Grading
14180-0124	Unknown*	297	Grading
14180-0277	22	6	Grading
14180-0278	22	14	Grading
14180-0279	32	22	Grading
14180-0288	51	28	Grading
14180-0299	59	50	Grading
14180-0299	19	5	Grading
14180-0300	115	73	Grading
14224-0275	Unknown*	241	Grading
14224-0276	73	66	Grading
14224-0282	764	231	Grading
14224-0725	1,327	177	Grading
14224-1071	1,201	308	Grading
14224-1260	608	153	Grading
14224-1262	560	120	Grading
14224-1264	Unknown*	55	Grading
14224-1345	70	68	Grading
14224-1346	Unknown*	127	Grading
14224-1719	Unknown*	530	Widening
14224-2475	Unknown*	530	Widening
14224-2724	Unknown*	34	Widening
14224-2724	Unknown*	5	Grading
14224-2734	24	22	Widening
14224-2737	116	19	Grading
14224-2738	7	7	Widening
14225-0011, 11300 Dixie Road	2,845	311	Widening
14225-0038	3,738	536	Widening
14225-0039	3,798	430	Widening
14225-0049, 1524 Countryside Drive	3,360	448	Widening
14225-0073	Unknown*	5,748	Widening

Property (PIN / Address)	Total Area (m2)	Required Area (m2)	Purpose / Type
14225-0073	Unknown*	107	Grading
14225-0074	Unknown*	4,926	Widening
14225-0075	Unknown*	1,828	Widening
14225-0084	Unknown*	1,520	Widening
14225-0089	Unknown*	636	Widening
14225-0090	633	83	Widening
14225-0097	2,563	674	Widening
14226-0088	9,250	56	Grading
14226-0104	158	28	Grading
14226-1348	61	31	Widening
14226-1348	61	14	Grading
14226-1351	57	19	Grading
14226-2487	Unknown*	736	Widening
14226-2487	4,926	70	Grading
14226-2497	Unknown*	297	Widening
14226-2497	Unknown*	784	Widening
14226-2497	Unknown*	114	Grading
14235-1539, 12192 Dixie Road	3,235	284	Widening
14235-1539, 12192 Dixie Road	3,235	15	Grading
14235-1540	3,317	292	Widening
14235-1540	3,317	32	Grading
14235-1730	Unknown*	3,179	Widening
14235-1730	Unknown*	269	Grading
14235-1730	Unknown*	56	Grading
14235-1744	84,787	1,722	Widening
14235-1744	84,787	50	Grading
14235-2131, 12380 Dixie Road	254,125	2,901	Widening
14235-2131, 12380 Dixie Road	254,125	248	Grading
14303-0505	Unknown*	30	Grading
14303-0507	Unknown*	1	Grading
14303-0509	1,726	508	Grading
14303-0511	909	97	Grading
14303-0513	480	26	Grading
14303-0518	5	4	Grading
14303-0671	174	113	Grading
14303-0673	1,150	352	Grading
14303-0674	503	34	Grading
14303-0678	Unknown*	67	Grading
14304-0155	1,911	2	Grading
14304-0158	Unknown*	20	Grading
14304-0159	36	29	Grading

Property (PIN / Address)	Total Area (m2)	Required Area (m2)	Purpose / Type
14304-0160	2	2	Grading
14304-0161	280	52	Grading
14304-0162	25	25	Grading
14304-0163	Unknown*	20	Grading
14304-0165	Unknown*	115	Grading
14304-0184	10	8	Grading
14304-0185	3	3	Grading
14306-0318	Unknown*	2,218	Grading
14347-0014, 12321 Dixie Road	21,153	396	Widening
14347-0016	200,317	305	Widening
14347-0319	577	65	Widening
41471-0495	1,855	178	Grading
N/A	Unknown*	3,097	Widening
N/A	20,569	120	Grading
N/A	21,953	32	Grading

* Portion of property situated beyond available legal plans.

7.6 STORMWATER MANAGEMENT

Throughout the study area Dixie Road is currently a four-lane roadway with an urban cross section, except for the very north portion which is a two-lane roadway with ditches. Storm drainage is provided by a combination of storm sewers, ditch flow and overland flow along the roadway.

The recommended upgrades to the current stormwater system consists of storm sewer upgrades, enhanced swales, oil grit separators and other end of pipe treatment methods. The upgrades are required to obtain the required water quality parameters in accordance with requirements outlined by the regulatory agencies including TRCA and MOE. A brief overview of the recommended design is provided below. Further details can be found in the stormwater management reports provided in **Appendix C** which were prepared in support of the proposed road improvements.

For the study corridor segment from Queen Street to Mayfield Road, the pavement area is increased from 15.2 ha to 22.9 ha. Of the 7.7 ha of increased pavement, 5.3 ha will drain to the existing stormwater management pond at Dixie Road and Bovaird Drive. This will treat the increased runoff quality and quantity in accordance with the Ministry of the Environment's Enhanced Water Quality Protection Level 1 standards. The 2.4 ha downstream of the pond will have oil-grit separators installed to treat water quality upstream of outfalls or connections. The increased quantity produced by the expanded pavement will be negligible and therefore does not warrant the cost or inconvenience of treatment since the lack of space renders a treatment solution to be drastic, expensive and disruptive to the public.

The section of storm sewer between Williams Parkway and the outfall west of Dixie Road will be undersized during proposed conditions, and should be analyzed during the detailed design phase to determine the proposed upgrade diameter.

The crossing culvert just north of Queen Street will have to be extended by up to 8m to allow it to span the width of the widened roadway. The hydraulic analysis found that the impact to upstream water levels would be negligible.

7.7 LANDSCAPING

Preliminary information regarding existing trees within the study corridor can be found in the Appendices under the Natural Environmental Report. Information on individual trees should be confirmed and surveyed during the detailed design phase. A tree protection and replacement plan for individual trees will be developed during the detailed design stage. The tree replacement plan will be prepared in co-ordination / consultation with the Region of Peel, City of Brampton and the TRCA.

7.8 GEOTECHNICAL RECOMMENDATIONS / PAVEMENT STRUCTURE DESIGN

The Geotechnical Report in **Appendix C** documents the geotechnical and hydrogeological recommendations for the project with respect to the foundations for the two culverts within the project limits, the pavement structure and other design features. A brief summary of the key recommendations are provided below with further details provided in the Geotechnical Report in **Appendix C**.

Spread footings are recommended for supporting a culvert extension or replacement. Recommended founding depths and geotechnical resistances for spread footings founded on undisturbed competent natural soils are provided in the Geotechnical Report for the two culvert sites. Excavations at the culvert sites will be made through silty clay fill, sand and gravel fill, sand and silt till and silty clay to clayey silt till.

While no significant dewatering issues were identified, the dewatering effort can be expected to increase with depth, especially at Culvert Site 7+900 where sand and silt till soils were encountered. Therefore, the depth of excavation should be minimized to the extent possible. A suitable system that might be employed can include gravity drainage and pumping from strategically placed filter sumps.

The recommended pavement structure for new construction is:

Hot Mix Asphalt	
o DFC – 50mm	150mm
o HDBC – 2 x 50mm	
Granular A Base Course	150mm
Granular B Type 1 Sub-base	500mm
Granular Base Equivalency (GBE)	783mm

Further details regarding the pavement structure recommendations for pavement widening and full depth reconstruction can be found in Section 5.5 of the Geotechnical Report.

7.8 COST ESTIMATE

The estimated construction cost for the entire proposed preliminary design is $55.8 million. A breakdown of the cost by segment is as follows:

- Northerly Project Limit to Countryside Drive – $15,790,000
- Countryside Drive to Bovaird Drive – $18,630,000
- Bovaird Drive to Queen Street – $21,345,000

7.9 UTILITIES

7.9.1 HYDRO

Along the entire study corridor, there is an existing line of hydro poles along the east side of Dixie Road. North of Mayfield Road, where the widening is only to four lanes, relocation is likely unnecessary. Where the road is widened to six lanes, from Countryside to Queen Street, the majority of the poles will need to be relocated. Utility relocation requirements will be confirmed during detailed design.

7.9.2 STREET LIGHTING AND TRAFFIC SIGNALS

Upgraded street lighting along Dixie Road will be installed to ensure adequate lighting levels. Existing signalized intersections will be maintained as signalized and additional signalized intersections have been identified as part of this EA process and are further outlined in the Traffic Report located in Appendix B-1. During construction temporary traffic control signals will be installed and maintained as required.

7.10 FUTURE WORK TO SUPPORT DETAILED DESIGN

Activities / studies to be undertaken prior to or in conjunction with detailed design include the following:

- Obtain the latest hydraulic and floodplain data for the watercourse running along the west side of Dixie from TRCA,
- Confirm / refine proposed stormwater management plan.
- Prepare erosion and sediment control plan.
- Conduct a tree inventory study and prepare a detailed restoration plan.
- Prepare Permit to Take Water applications and associated documentation.
- Confirm site conditions at watercourse crossing for permitting purposes.
- Finalize environmental protection plans.
- Complete Stage 2 archaeological assessment and any applicable follow-up work prior to construction.
- Finalize utility relocations requirements.

8. ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

It is recognized that the proposed improvements to Dixie Road will result in some impact on the existing environment. **Table 17** provides a detailed assessment of the potential environmental impacts associated with the project and the recommended mitigative measures required to reduce these effects.

A preliminary Environmental Protection Plan has been developed to identify measures to mitigate the impacts from roadway improvements. These measures are recommended for implementation to address the anticipated components of related construction activities which have the potential to negatively affect the aquatic and terrestrial environment and will require management. Based on the proposed mitigation measures, the proposed roadway improvements are not expected to result in significant residual adverse environmental effects.

Table 17 Anticipated Impacts and Proposed Mitigation

FACTOR	ANTICIPATED IMPACT	PROPOSED MITIGATION
Socio-Economic Environment		
Noise	Increase in existing noise levels from traffic Increase in noise level during construction	• Install and/or replace existing noise walls as per recommendations in the Noise Impact Assessment report. • Adhere to local municipal bylaws for hours of construction operation. Require contractor to maintain construction vehicles and equipment in good working order.
Residential / Business Areas	Impacts on residences / impacts on businesses	• Prior to construction specific notices and contact information must be delivered to area residences and property and business owners informing them of construction details and schedule. • Maintain access to individual driveways/business accesses during construction.
Property Acquisitions	Requirements for additional property	• Property will be required for Dixie Road improvements. Preliminary property requirements are available for review as part of the preliminary recommended design plans. The recommended preliminary design was developed to minimize property required. • The formal property acquisition process will be initiated after the completion of the Dixie Road Class EA Study and as part of detailed design.
Safety	Safety for other corridor users	• To encourage pedestrian movements, sidewalks will be maintained throughout the corridor. Where required, temporary sidewalk detours will be implemented by signage. • With the additional roadway width, pedestrians will have wider intersections to cross. Traffic signals will be timed to provide adequate crossing time for pedestrians.
Aesthetics / Streetscape	Potential for reduced aesthetics	• To improve pedestrian realm and to begin to establish a more comfortable pedestrian environment, streetscaping improvements are necessary. • Streetscaping details will be developed during detailed design.
Air Quality	Reduced air quality due to dust	• Apply water and calcium during construction. The use of non-chloride based compounds will be used to protect water quality. • Require contractor to maintain construction vehicles and equipment in good working order.
Natural Environment		
Vegetation / Trees	Minimal impact on existing vegetation/trees.	• There are no significant natural vegetation communities within the project. • Prior to construction, protective fencing will be placed around existing mature trees, as appropriate, to reduce the potential for damage. Should any mature tree be damaged as a result of construction, replacement with a tree of similar features will be provided, if possible. • Landscape plans will be developed during the detailed design phase of the project. • Vegetation requiring removal should be replaced at a minimum 3:1 ratio within suitable areas with an appropriate planting plan in consultation with the TRCA.

FACTOR	ANTICIPATED IMPACT	PROPOSED MITIGATION
Fisheries and Aquatic Habitat	Impact on fisheries and aquatic habitat Potential contamination to Etobicoke Creek/West Humber River during construction	• Obtain TRCA permits and Permit(s) To Take Water for applicable construction operations. • Detailed plans and sequencing for in-water work (e.g., culvert extensions) on the upstream side will be developed that include working in dry conditions using accepted methods to bypass flows such as damming and pumping the water around the in-water construction area or using a diversion channel. Construction schedule will follow the applicable fisheries timing windows identified by the TRCA. • All activities, including maintenance procedures, should be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into Etobicoke Creek and the West Humber River tributary. Vehicular refueling and maintenance will be conducted away (minimum of 30 m) from the identified watercourse.
	Soil disturbances/sedimentation to Etobicoke Creek/West Humber River	• Where construction occurs in proximity to watercourses, proper sedimentation/erosion controls will be employed to the satisfaction of all relevant agencies including the MNR and TRCA. • An erosion and sediment control plan will be prepared during detailed design and will include construction sequencing, measures to prevent erosion, and devices to contain any sediment that moves towards the creek. (e.g., sediment fencing and heavy duty fencing in the vicinity of Etobicoke Creek and the West Humber Tributary, straw bales installed within all water conveyance systems and road side ditches). • Ensure proper onsite monitoring of erosion and sediment control, especially during in-water works and before and after precipitation events. • Any areas disturbed by construction will be restored and stabilized as soon as practically possible.
	Increase in the existing pavement area will result in increase in quantity of runoff	• Implement stormwater management strategy as per recommendations in Stormwater Management Report.
Wildlife Habitat	Minimal impact on wildlife habitat	• Majority of identified species in the study area are considered urban or tolerant of human presence, therefore associated impacts to wildlife with this project are negligible.
Cultural Environment		
Cultural Heritage	Impact on built heritage and cultural landscapes	• No anticipated impacts on cultural heritage features.
Archaeology	Discovery of archaeological / human remains	• Due to the established high potential for the recovery of archaeological remains within the identified undisturbed sections of the study corridor that are to be affected by proposed construction, the Stage 2 Archaeological Field Investigation must be completed prior to any construction activities. • A Stage 3 Archaeological Investigation will be carried out prior to detailed design for lands north of Countryside Drive. • Immediately contact appropriate ministries if any deeply buried deposits are found, or in the event that human remains are encountered.

9. SUMMARY AND CONCLUSIONS

This ESR was prepared pursuant to the MEA Municipal Class EA (October 2000, amended in 2007) to facilitate the Dixie Road Improvements from Queen Street to 2 km North of Mayfield Road to address the identified transportation deficiencies. The ESR provides a full and complete account of Phases 1 through 4 of the planning process followed for the project.

This study involved undertaking an inventory of the natural, physical, socio-economic, cultural and technical setting within the Dixie Road corridor study area. This information was used to produce maps identifying features/areas, which could be sensitive to roadway construction, and to facilitate the identification of alternative solutions and designs. The alternative solutions and designs were then compared and a preliminary preferred solution/design concept was selected, which minimizes environmental and socio-economic impacts in a cost-effective manner.

Regulatory agencies, affected property owners and stakeholders have participated in the planning process by providing input through the Study. Two PICs were held to inform the public and regulatory agencies about the Project and to solicit feedback on the environmental features inventoried within the Study Area, the planning process followed, proposed evaluation criteria, the Alternative Solutions/Design Concepts identified, and the Preliminary Preferred Solution/Design Concept. Based on the EA process and the public/regulatory agency consultation carried out throughout the Study, and as described throughout the ESR, a Preferred Design Concept for the Preferred Solution was chosen.

The Preferred Design for Dixie Road is to widen Dixie Road to six (6) through lanes plus turning lanes from north of Queen Street to Countryside Drive and four (4) through lanes plus turning lanes north of Countryside Drive to the northerly project limit (i.e., approximately 2 km north of Mayfield Road). Additional improvements to Dixie Road will include:

- Dedicated turn lanes at the intersections;
- Maintain the urban cross-section (curb and gutter) on both sides of the road;
- Provide for streetscape and landscape enhancements to improve the pedestrian realm and to establish a more comfortable environment.

The overall conclusion drawn from this ESR is that construction of the proposed improvements can be achieved with minimal disruption to and impact upon the natural, physical, socio-economic and cultural environment. The principal negative impacts will include:

- Increase in traffic noise;
- Impacts to residents and business owners during construction;
- Impacts to vegetation along the corridor;
- Permanent and temporary easements required from several property owners along both sides of the corridor; and
- Potential impacts to fisheries and aquatic habitat.

The significance of these effects can be mitigated through the measures prescribed in this Report, along with the use of standard design measures and Best Construction Management Practices. It is noted that construction of the proposed roadway improvements are not expected to have any discernable adverse impact on the environment.

10. PREFERRED DESIGN DRAWINGS

The Preferred Design for Dixie Road is presented on the following design drawings:

Plan Drawing	Title
1	2 km North of Mayfield Road to Mayfield Road
2	Mayfield Road to South of Countryside Drive
3	South of Countryside Drive to South of Sandlewood Parkway
4	South of Sandlewood Parkway to Bovaird Drive
5	Bovaird Drive to Williams Parkway
6	Williams Parkway to Hillside Drive
7	Mayfield Road / Dixie Road Intersection

Profile Drawing	Title
1	2 km North of Mayfield Road to Mayfield Road
2	Mayfield Road to South of Countryside Drive
3	South of Countryside Drive to South of Sandlewood Parkway
4	South of Sandlewood Parkway to Bovaird Drive
5	Bovaird Drive to Williams Parkway
6	Williams Parkway to Hillside Drive