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Executive Summary

Background to the Environmental Study Report

The City of Hamilton undertook the Hamilton Transportation Master Plan study as part of the GRIDS process beginning in 2003 under the Municipal Class Environmental Assessment (EA) (June 2000), to develop policies and strategies for the transportation network over the next 30 years. The Transportation Master Plan consisting of Phases 1 and 2 of the EA process was completed in May 2007. Parkside Drive was identified in the Master Plan as requiring improvements. In order to move forward with these improvements, a Class EA study was required, which would satisfy Phases 3 and 4 of the EA process. Delcan Corporation was retained by the City of Hamilton to undertake this Class EA Study.

Parkside Drive is a two-lane minor arterial roadway under the jurisdiction of the City of Hamilton. The project limits for this study extend from Highway 6 in the west to 500m east of Churchill Avenue in the east, a length of approximately 4.0 kilometres. The Parkside Drive corridor within the project limits is a two-lane roadway with a mostly rural cross-section. The predominant land uses within the study area consist of residential and agricultural as well as institutional (school, church) and a few commercial uses.

Public and Agency Consultation

For the successful completion of this study an effective public/stakeholder consultation process throughout the duration of the project was essential. A consultation plan was used to engage and inform stakeholders and members of the public about the study and present them opportunities throughout the EA study to provide their input into the project. The goal of this plan was early issue identification and consensus building among
stakeholders and the general public, many of whom may have diverse and sometimes opposing interests.

The various members of the public and review agencies were grouped into the following categories:

- Public;
- Technical Agencies;
- Stakeholders; and
- First Nations.

Throughout the study process, members of the public were informed of the study through newspaper notices (Notice of Study Commencement, Notice of PIC and Notice of Study Completion), mailings, and a Public Information Centre (PIC). The purpose of the PIC was to obtain public input after reviewing the problem being addressed, background information, the alternative solutions being considered, and identifying a preliminary preferred alternative solution. Feedback received from this PIC was used in evaluating the alternatives and determining the preferred design concept. Prior to the PIC, a Technical Agency Committee (TAC) meeting and Stakeholder Advisory Group (SAG) meeting was held to obtain input on the work done to date, and the PIC displays, from the TAC and SAG members. Input received from the TAC and SAG members was used in evaluating the alternatives and determining the preferred design concept.

**Summary of Phases 1 and 2 of the EA process**

The following is the Problem Statement identified in the TMP:

"Between 2001 and 2031, Hamilton’s population will increase by 162,000 people (32%). During the same period, 105,000 new jobs are expected to be created. If current travel characteristics remain the same, there will be 180,000 additional auto driver trips per day that will need to be accommodated by the road network. This translates into 1.2 million additional kilometres driven by Hamilton residents each day and a consumption of 40 million litres of fuel per year. Left unchecked, significant congestion on most Escarpment crossings will result in increased delays to auto drivers, transit riders and commercial vehicles. Accordingly, key objectives of the TMP include reducing dependence on single-occupant vehicles and promoting improved options for walking, cycling and transit, while maintaining and improving the efficiency of trips related to the movement of goods and servicing of employment areas.”
The following is the recommended alternative solution identified in the TMP:

"Although no single approach is likely to solve all transportation problems, the preferred overall strategy is to rely on transit and travel demand management, in combination with road capacity optimization to solve transportation problems, before looking to road expansion. It is also recognized that adequate road infrastructure is essential for economic development and that strategies must reflect a balanced transportation network."

The Hamilton TMP (2007) proposes road widening and a two-way left turn lane for Parkside Drive between Highway 6 to Centre Road. These improvements are classified as a Schedule C Municipal Class EA project.

**Existing and Future Conditions**

In establishing the existing traffic conditions, Delcan reviewed the 2009 TIS report which analyzed transportation conditions along Parkside Drive for the Weekday AM and PM peak hours. The results documented indicate that the intersections along Parkside Drive during the weekday AM and PM peak hours were operating satisfactorily with an overall Level of Service (LOS) of B or better. Delcan also reviewed the Synchro analysis (Synchro files) provided by the City of Hamilton to confirm the results of the 2009 TIS.

**Alternative Road Design Concepts**

A number of alternative design concepts were developed based on the Phase 2 preferred alternative solution that attempted to address the problem statement. A preliminary screening of these alternatives was also done at this time to eliminate alternatives that would cause significant impacts. The various designs considered included:

1. Number of Through Lanes
2. Widening to the North
3. Widening to the South
4. Follow Existing Right-of-Way

A breakdown of the alternatives of the various components considered is included in Table E-1.
Table E-1: Design Concept Components

<table>
<thead>
<tr>
<th>Alternative Design Concepts</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do Nothing</td>
</tr>
<tr>
<td>2</td>
<td>Widening to the North</td>
</tr>
<tr>
<td>3</td>
<td>Widening to the South</td>
</tr>
<tr>
<td>4</td>
<td>Follow Existing Right-of-Way</td>
</tr>
</tbody>
</table>

**Evaluation of the Alternative Design Concepts**

The evaluation of the alternative design concepts was completed using the evaluation criteria previously developed in the study. The goal of the evaluation was to determine the best alternative to address the problem statement, while minimizing impacts to the environment. It should be noted that competing interests from various owners, agencies and the public means that the preferred alternative may not achieve all these goals. An evaluation matrix table was developed to provide a summary of the evaluation which was presented at the PIC.
Description of the Preferred Design

The following is a brief summary of some key aspects of the preliminary design:

- The horizontal centreline alignment of Parkside Drive generally follows the existing centerline alignment with widening of the existing ROW impacting the east and west properties equally.
- Key elements of the proposed cross-section of Parkside Drive include the following:
  - concrete curb and gutter;
  - two 3.50 m through lanes;
  - a 4.00m two way centre left turn lane (between Hollybush Dr. and Main St.);
  - 1.50m bike lanes;
  - 2.00m boulevards; and
  - 2.00m concrete sidewalks.

Typical cross sections for the Preferred Design are provided in Figures E-2 to E-4.

Figure E-2: Typical 2-lane Cross Section – Highway #6 to Hollybush Drive
Figure E-3: Typical 3-lane Cross Section – Hollybush Drive to Main Street

Figure E-4: Typical 2-lane Cross Section – Main Street to Eastern Project Limits
1.0 INTRODUCTION

The City of Hamilton has completed a Class Environmental Assessment Study to consider a range of options for transportation corridor improvements to satisfy future travel demands on Parkside Drive, from Highway 6 to 500m east of Churchill Avenue. Delcan Corporation was retained by the City of Hamilton to undertake this study on their behalf.

Following the Municipal Class Environmental Assessment (Class EA) process the City of Hamilton undertook a City-wide Transportation Master Plan (TMP) and developed policies and strategies for its transportation network for the next 30 years. The TMP was completed in 2007 and fulfilled Phases 1 and 2 of the EA process. The TMP also identified various road infrastructure improvements. One of the recommended projects for improvement was Parkside Drive (see Figure 1-1).

The Parkside Drive improvement was identified as a Schedule ‘C’ project. The sufficiency of Phases 1 and 2 of the EA study have been confirmed through this study and the problem statement defined. Going forward, this Class EA study shall fulfill the requirements of Phases 3 and 4 of a Municipal Class EA.

There are a number of other studies that incorporate the need for improvements on Parkside Drive, or are within a close vicinity to the study area. These studies are being reviewed and taken into consideration for the Parkside Drive Improvements Class EA Study. These studies include:

- Waterdown North Secondary Plan
- Waterdown North Master Drainage Plan Addendum
- Waterdown Aldershot Transportation Master Plan Phase 1 & 2
- New East-West Road Class EA Phases 3 & 4
- Hamilton Transportation Master Plan (May 2007)
- The Main St. North and Centre Road Class EA

Ultimately, the purpose of this study was to address the long term transportation requirements for Parkside Drive, protect for these future requirements and to provide the facilities in a phased manner consistent with the Hamilton Transportation Master Plan. The preliminary design also includes details on all potential above ground and/or underground infrastructure works required to bring this portion of Parkside Drive to urban standards.

1.1 Study Area

Parkside Drive is a two-lane minor arterial roadway under the jurisdiction of the City of Hamilton. The project limits for this study extend from Highway 6 in the west to 500m east of Churchill Avenue in the east, a length of approximately 4.0 kilometres. The Parkside Drive corridor within the project limits is a two-lane roadway with a mostly rural...
cross-section. The predominant land uses within the study area consist of residential and agricultural as well as institutional (school, church) and a few commercial uses.

**Figure 1-1: Study Area**
1.2 Project Team Organization

The City of Hamilton retained Delcan Corporation as their Prime Consultant to undertake this Class EA Study on their behalf. The “Project Team” consisted of members from The City of Hamilton, Delcan Corporation and specialized sub-consultants needed to address specific requirements of the project. The Project Team is comprised of the following members:

The City of Hamilton
- Diana Morreale, Senior Project Manager, Infrastructure Planning
- Monir Moniruzzman, Senior Project Manager, Infrastructure Planning
- Sally Yong-Lee, Manager, Infrastructure Planning
- Tanya McKenna, Project Manager, Corridor Management West

Delcan Corporation
- Manoj Dilwaria, Project Management/Transportation/Public Consultation
- Bob Bower, P.Eng., Preliminary Design
- Stanley Pijl, P.Eng., Preliminary Design/Public Consultation

Archaeological Services Inc.
- Robert H. Pihl, Team Leader (Archaeology and Cultural/Built Heritage)
- Rebecca Sciarra, Cultural and Built Heritage Assessment
- Lisa Merritt, Stage I Archaeological Assessment

MTE Consultants Inc.
- Kim Logan, Ecology

Aquafor Beech Limited
- Prem Tewari, Drainage and Stormwater Management

Terraprobe Inc.
- Garry Muckle, Geotechnical Investigation
2.0 CLASS EA APPROACH AND PUBLIC CONSULTATION

This Environmental Study Report (ESR) documents the planning process undertaken in completing the Class EA & Preliminary Design for the Parkside Drive Corridor, from Highway 6 to 500m east of Churchill Avenue, in the City of Hamilton. This project was classified as a Schedule ‘C’ Study and completed in accordance with the Municipal Class Environmental Assessment (EA) process (October 2000, as amended in 2007 and 2011).

2.1 The Municipal Class EA process

As noted above, this study has been undertaken and prepared in accordance with the Municipal Class EA process (October 2000, as amended in 2007 and 2011) and has been identified as a Schedule ‘C’ Class EA. Schedule ‘C’ projects generally include the construction of new facilities and major expansions to existing facilities.

Under the Class EA process, municipal road projects are categorized according to their environmental significance and the effects they may impose on the environment. These categories, described by specific Class EA “schedules”, prescribe planning methodologies for each category. At present, there are four schedule classification types including Schedule A, A+, B and C. The main difference between each of the schedule types is the degree to which each project may adversely affect the existing environment. The various Schedules are described below:

Schedule A
- limited in scale and have minimal adverse environmental impacts;
- includes a number of municipal maintenance and operational activities;
- are pre-approved and as such, no public notification or documentation is required.

Schedule A+
- limited in scale and have minimal adverse environmental impacts;
- are pre-approved and as such, no documentation is required;
- the public is to be advised of the project prior to implementation.

Schedule B
- have the potential for some adverse environmental impacts;
- the proponent is required to undertake a screening process, involving mandatory contact with the directly affected public and relevant review agencies;
- a project file is required to be prepared and made available for public review.

Schedule C
- have the potential for significant environmental impacts;
- must proceed under the full planning and documentation procedures of the Municipal Class EA process;
- an Environmental Study Report (ESR) is required to be prepared and filed on the public record for review by the public and review agencies.
Since the Parkside Drive Corridor Improvements Class EA study is being completed under the requirements of a Schedule C, the 5 Phases of the Class EA process must be undertaken. As permitted by the Environmental Assessment Act, phases 1 and 2 were deemed completed through the City of Hamilton’s Transportation Master Plan. Therefore only phases 3 and 4 were required to be completed as a part of this study. The 5th phase will be initiated following completion of the study. These 5 phases are summarized as follows:

Phase 1  
- identification and description of the problem or opportunity.

Phase 2  
- identification of alternative solutions to the problem;
- prepare a physical description of the study area as well as a general inventory of the natural, social and economic environments;
- evaluation of all reasonable alternatives, including the “do-nothing” scenario;
- consultation with the public and review agencies;
- selection of the preferred solution.

Phase 3  
- identification of alternative designs for the preferred solution;
- prepare a detailed inventory of the natural, social and economic environments;
- identification of the potential impacts of the alternative designs;
- evaluation of all alternative designs, including the “do-nothing” scenario;
- consultation with the public and review agencies;
- selection of the preferred design;
- preliminary finalization of preferred design.

Phase 4  
- completion of the Environmental Study Report (ESR);
- file the ESR and place on the public record for 30 days for review by the public and review agencies;
- respond to part II order requests during 30 day review period.

Phase 5  
- implementation of preferred design.

2.2 Consultation with Public, Agencies and Stakeholders

For the successful completion of this study an effective public/stakeholder consultation process throughout the duration of the project was essential. A consultation plan was used to engage and inform stakeholders and members of the public about the study and present them opportunities throughout the EA study to provide their input into the project. The goal of this plan was early issue identification and consensus building among stakeholders and the general public, many of whom may have diverse and sometimes opposing interests.
The various members of the public and review agencies were grouped into the following categories:

- Public;
- Technical Agencies;
- Stakeholders; and
- First Nations.

At the onset of the study, a list was compiled of all property owners, stakeholders, technical agencies and First Nations within the study area. This list was kept updated throughout the study and was utilized for all notices and meeting invitations.

### 2.2.1 Public

Since this study is classified as a Schedule ‘C’ Study, the Municipal Class EA (October 2000, as amended in 2007 and 2011) requires the proponent undertake two mandatory points of public contact (typically through a Public Information Centre (PIC)) and two mandatory notifications. The contact points as required by the Class EA process are as follows:

- Notice of Study Commencement - Phase 1;
- Contact during Phase 2 of the Class EA process – PIC #1 (completed during the Transportation Master Planning Process);
- Contact during Phase 3 of the Class EA process – PIC #2;
- Notice of Study Completion - Phase 4.

A PIC was held on September 19, 2012 at St. Thomas the Apostle Church in Hamilton. Invitations to attend the PIC were sent to all property owners within the study area, as well as advertised in the local newspapers prior to the PIC, to ensure all interested members of the public were provided reasonable notice of the upcoming PIC.

The PIC held for this study provided an opportunity for the public to:

- Meet the Project Team;
- Review the work done to date;
- Ask questions about the Study; and
- Provide feedback and comment on the work done to date.

Following the PIC, input from the public was collated and organized, and a PIC summary report prepared (see Appendix A). All feedback received from the PIC was utilized in the subsequent phases of the study including the evaluation of the various alternatives.
Within this framework, members of the public were provided a variety of opportunities for learning, sharing, and responding during the Class EA process. Public consultation is discussed further in Chapters 6.0.

### 2.2.2 Technical Agencies

A total of 2 Technical Agency Committee (TAC) meetings were held during the study.

At the onset of the study, a list of technical agencies including regional and local municipal departments, provincial ministries, federal departments, the local conservation authority, and various utility companies, that might have an interest in this study was compiled and all agencies on the list, were invited to join the TAC. TAC meetings are discussed further in Chapters 6.1.1 and 6.2.1. The list of Technical Agencies contacted is included in Appendix A.

### 2.2.3 Stakeholders

A total of 2 Stakeholder Advisory Group (SAG) meetings were held during the study.

At the onset of the study, a list of stakeholders that might have an interest in this study was compiled. This list included representatives of various landowners, business owners, schools, and representatives of local church congregations. A stakeholder package was mailed to these stakeholders, inviting them to participate in the study as a member of the SAG. A list of the SAG members is included in Appendix A. Stakeholder meetings are documented in Chapters 6.1.1 and 6.2.1.

### 2.2.4 First Nations

A study notification letter was mailed to the Ministry of Aboriginal Affairs (formerly Ontario Secretariat of Aboriginal Affairs) and Indian and Northern Affairs Canada (INAC) on February 16, 2012. The purpose of the letter was to inform each agency of the project and to solicit their respective input. Feedback received indicates that the Ministry is not aware of any First Nation land claims submitted to the Government of Ontario that will have an impact on this project. Feedback received from INAC indicated that there are no comprehensive First Nation land claims in the City of Hamilton. Notwithstanding, the following list of First Nations was compiled to receive notification of the study:

- Huron-Wendat Nation Council
- Metis Nation of Ontario
- Mississauga’s of the New Credit First Nation

The contact information and correspondence for the First Nations contacted is included in Appendix A.
2.3 Schedule

The Parkside Drive Corridor Improvements study was initiated in February, 2012. Key milestones throughout the study process were as follows:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notice of Study Commencement</td>
<td>February 16, 2012</td>
</tr>
<tr>
<td>Stakeholder Advisory Group Meeting #1</td>
<td>May 29, 2012</td>
</tr>
<tr>
<td>Technical Agency Committee Meeting #1</td>
<td>May 29, 2012</td>
</tr>
<tr>
<td>Public Information Centre</td>
<td>September 19, 2012</td>
</tr>
<tr>
<td>Stakeholder Advisory Group Meeting #2</td>
<td>November 12, 2012</td>
</tr>
<tr>
<td>Technical Agency Committee Meeting #2</td>
<td>November 16, 2012</td>
</tr>
<tr>
<td>Neighbourhood Meeting</td>
<td>November 19, 2012</td>
</tr>
<tr>
<td>Notice of Study Completion</td>
<td>TBD</td>
</tr>
</tbody>
</table>

2.4 Notice of Study Commencement

Since this study is classified as a Schedule ‘C’ Study, the Municipal Class EA (October 2000, as amended in 2007 and 2011) requires the proponent to provide a “Notice of Study Commencement” at the outset of the study. A Study contact list was developed at the outset of the study and a newspaper “Notice of Study Commencement” advertisement was placed in the February 16, 2012 edition of The Flamborough Review and in the February 17, 2012 edition of the Hamilton Spectator. The Notice of Study Commencement described the project, outlined the Municipal Class Environmental Assessment planning process, requested public involvement and identified contact persons. A letter “Notice of Study Commencement” was also delivered to local residents, members of the local business community, identified interest groups and agencies (Ministry of Transportation, Ministry of the Environment, Ministry of Natural Resources, First Nations, etc.). A fax-back form was attached to the letter to relevant agencies to facilitate responses. Copies of the newspaper notice of study commencement, agency letter, fax back form, and a list of the stakeholders, technical agencies and First Nations that were sent the notice are provided in Appendix A.
2.5 Environmental Study Report

2.5.1 Documentation

As per the requirements for a Schedule ‘C’ Class Environmental Assessment Study, an Environmental Study Report (ESR) is to be produced that documents the entire study, including technical analysis and consultation with stakeholders as well as the public. This ESR provides a clear, transparent and easily understood record of the decision making process followed throughout the Parkside Drive Transportation Corridor Improvements Class Environmental Assessment Study.

2.5.2 Notice of Study Completion

Property owners, stakeholders, agencies and First Nation communities have been notified by mail, email and also by advertisement in local newspapers.

2.5.3 30 Day Review Period

This ESR document will be available for public viewing for a period of no less than Thirty (30) days. During this time, stakeholders will be encouraged to review the documents and discuss any outstanding issues they may have with the study team for resolution.

2.5.4 Part II Order Requests

The Class EA process contains a provision that allows for changing the status of a project from a Class EA to an Individual Environmental Assessment. This is called a ‘Part II Order’. Members of the public, interest groups, government agencies and others may request that Individual Environmental Assessment be prepared for a specific project if they feel their concerns have not been addressed through the Class EA planning process. The Minister of the Environment would respond to a Part II Order by deciding whether to deny the request, refer the matter to mediation or require the proponent to comply with Part II of the EA Act. There is one additional option available to the Minister, namely to deny the request with conditions placed upon the EA. Compliance with Part II of the EA Act refers to the completion of an Individual Environmental Assessment. If the Part II Order’ is granted, the project cannot proceed unless an Individual Environmental Assessment is prepared. The Individual Environmental Assessment is subject to a formal government review and approval process. Anyone wishing to request a ‘Part II Order’ of this Environmental Assessment Study Report must submit a written request by the end of the thirty (30) calendar day review period to the Minister of the Environment at the following address with a copy sent to The City of Hamilton:
The Honourable Jim Bradley
Minister of the Environment
77 Wellesley Street West
11th Floor, Ferguson Block
Toronto, Ontario, M7A 2T5

The City of Hamilton
Mrs. Diana Morreale, MCIP, RPP
Senior Project Manager,
Growth Management Division
City of Hamilton
71 Main Street W, 6th Floor
Hamilton, Ontario, L8P 4Y5
Telephone: 905-546-2424 ext. 4101
Fax: 905-546-4435
Email: Diana.Morreale@hamilton.ca
3.0 SUMMARY OF PHASES 1 AND 2 (TRANSPORTATION MASTER PLAN)

The City of Hamilton undertook the Hamilton Transportation Master Plan study as part of the GRIDS process beginning in 2003 under the Municipal Class Environmental Assessment (EA) (June 2000), to develop policies and strategies for the transportation network over the next 30 years. The Transportation Master Plan consisting of Phases 1 and 2 of the EA process was completed in May 2007. Parkside Drive was identified in the Master Plan as requiring improvements.

As Phases 1 and 2 of the EA process is considered completed through the Master Planning process, Delcan reviewed and confirmed the sufficiency of the Transportation Master Plan with respect to Parkside Drive.

3.1 Problem Identification (Phase 1)

The following is the Problem Statement identified in the TMP:

"Between 2001 and 2031, Hamilton’s population will increase by 162,000 people (32%). During the same period, 105,000 new jobs are expected to be created. If current travel characteristics remain the same, there will be 180,000 additional auto driver trips per day that will need to be accommodated by the road network. This translates into 1.2 million additional kilometres driven by Hamilton residents each day and a consumption of 40 million litres of fuel per year. Left unchecked, significant congestion on most Escarpment crossings will result in increased delays to auto drivers, transit riders and commercial vehicles. Accordingly, key objectives of the TMP include reducing dependence on single-occupant vehicles and promoting improved options for walking, cycling and transit, while maintaining and improving the efficiency of trips related to the movement of goods and servicing of employment areas."

3.2 Planning Alternatives (Phase 2)

3.2.1 Alternative Solutions Considered

The following Strategic Transportation Alternatives were considered in the Hamilton TMP (2007) to address the Problem:

- **Status Quo** - No major changes to the road, transit or active transportation networks.
- **Committed Projects Only** - Projects already underway or identified in the 10 year capital plan.
- **Modest Transit Expansion** - Increases in existing bus services, expansion of bus routes to new areas, increased GO Transit Service.
- **Aggressive Transit Expansion** - Implementation of Bus Rapid Transit System in key corridors, policies to encourage more compact, mixed use
development in transit corridors, transit to major employment areas, new GO Rail lines.

- **Demand Management Options** - Aggressive programs to encourage walking, cycling, ride-sharing, telecommuting, etc.
- **Roadway Capacity Optimization** - Localized intersection improvements, access control along major corridors (i.e. improved signal coordination, turn restrictions).
- **Roadway Capacity Expansion** - Selected road widenings, where justified based on demand, new arterial or collector roads to serve new developments, potential freeway expansion.

### 3.2.2 Evaluation of Alternative Solutions

Each of the strategic transportation alternatives were evaluated based on four broad categories. The evaluation was largely based on a subjective evaluation, drawing on the technical studies and modelling, as well as the concurrent analysis undertaken to assess the options. Considerations under each of the four categories, or factors, are listed below.

- **Natural Environment Factors**
  - Reduces criteria air contaminants
  - Minimizes noise impacts
  - Improves water quality, green spaces, flora and fauna, etc.
- **Socio-cultural Factors**
  - Improves quality of life in neighbourhoods
  - Reduces collisions; improves personal safety and security
  - Improves mode choice
- **Economic Factors**
  - Attracts employment, capital, optimal use of transportation infrastructure capacity, and future land use
  - Increases land value, or does not decrease land values
  - Reduces or defers public and private costs of transportation capital construction or acquisition of fixed infrastructure and rolling stock) and operations (maintenance, enforcement, delay, fuel, etc.)
  - Maintains traffic flow at acceptable level
- **Technical Factors**
  - Ease of implementation
  - Minimizes operational impacts
3.2.3 Recommended Alternative Solution

The following is the recommended alternative solution identified in the TMP:

"Although no single approach is likely to solve all transportation problems, the preferred overall strategy is to rely on transit and travel demand management, in combination with road capacity optimization to solve transportation problems, before looking to road expansion. It is also recognized that adequate road infrastructure is essential for economic development and that strategies must reflect a balanced transportation network."

The Hamilton TMP (2007) proposes road widening and a two-way left turn lane for Parkside Drive between Highway 6 to Centre Road. These improvements are classified as a Schedule C Municipal Class EA project.
4.0 EXISTING CONDITIONS ASSESSMENT

4.1 Natural Environment

4.1.1 General

MTE Consultants Inc. (MTE) was retained by the City of Hamilton to prepare a Natural Environment Study (NES) as a component of the ESR that will fulfill the requirements of a Schedule C (Phases 3 and 4) Municipal Class EA. The NES was completed to identify and characterize natural heritage features located within the Study Area (approximately 120 meters north and south of the Site), assess the potential impacts to these features as a result of the proposed road improvements along Parkside Drive, and provide recommendations with regards to the mitigation of such impacts. The NES is provided in Appendix B, and should be referred to for further detailed information.

4.1.2 Field Methods

Table X provides a summary of the field inventory methods used in the completion of the NES. Refer to the NES report in Appendix B for more detailed descriptions of each of the survey methods included below. The boundaries of the NES Study Area, the locations of the vegetation communities observed and key Natural Heritage Features are illustrated in the MTE Natural Environment Study Summary Figure #1.

Table 4-1: Natural Environment Study Field Inventory Summary

<table>
<thead>
<tr>
<th>Field Inventory</th>
<th>Date(s) of Inventory</th>
<th>Utilized Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation of Vegetation Communities, including incidental wildlife observations (three seasons)</td>
<td>September 9, 2011, May 15, 2012, August 16, 2012</td>
<td>Ecological Land Classification for Southern Ontario (Lee et al. 1998)</td>
</tr>
<tr>
<td>Tree Inventory and Assessment</td>
<td>August 16, 2012, August 21, 2012</td>
<td>Parameters for assessment included species identification, diameter-at-breast height (DBH) and overall health condition (good, fair and poor).</td>
</tr>
</tbody>
</table>
### Field Inventory

<table>
<thead>
<tr>
<th>Field Inventory</th>
<th>Date(s) of Inventory</th>
<th>Utilized Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Habitat Assessment – Borer’s Creek &amp; Grindstone Creek</td>
<td>August 21, 2012</td>
<td>Ontario Stream Assessment Protocol (Stanfield, 2010)</td>
</tr>
<tr>
<td>Fish Community Sampling</td>
<td>August 17, 1999 August 5, 2005</td>
<td>Electrofishing methods</td>
</tr>
<tr>
<td></td>
<td>(Hamilton Conservation Authority)</td>
<td></td>
</tr>
</tbody>
</table>

#### 4.1.3 Analysis and Conclusions

The surrounding landscape of the Site was observed by MTE as comprised of a mixture of mainly residential, commercial and institutional lands, with lesser extents of culturally influenced meadows, thickets, agricultural fields, woodlands and forest communities. Two watercourses providing suitable aquatic wildlife habitat, Borer’s Creek and Grindstone Creek, intersect Parkside Drive at two locations within the Study Area. A number of features have also been identified within the Study Area as components of the City of Hamilton’s Natural Heritage System. These features include two Core Areas located along the reaches of Borer’s Creek and Grindstone Creek, upstream and downstream of Parkside Drive, respectively. Two Linkage features have also been identified on the south side of Parkside Drive within the southwestern portion of the Study Area. Sensitivity rankings have been assigned to the natural features within the Study Area, based on the results of field inventories and identification of the features as having ecological significance by regulatory agencies, such as the City of Hamilton.

Direct impacts to the natural features within the Study Area are anticipated through the removal of vegetation, and consequently potential wildlife habitat, required to accommodate the proposed road improvements. Although a direct loss of vegetation is expected, this removal is not anticipated to pose significant adverse impacts to the overall ecological integrity and function of the majority of the natural communities. Furthermore, an inventory and health assessment of City planted trees along the Site indicated a total of 73 posing constraints to the proposed development, thus requiring removal. An increase in dust and debris during construction phases, heightened noise volumes and wildlife sensory disturbance, as well as an increased risk of wildlife injury and mortality comprise the potential indirect and secondary impacts anticipated from the proposed road improvements.

In addition to the impacts anticipated to the terrestrial communities within the Study Area, effects on the adjacent aquatic systems have also been assessed. In order to accommodate the widening of Parkside Drive at the Borer’s Creek crossing location, the
replacement of the existing culverts is expected. The installation of stormwater outfalls downstream of the Study Area within the Grindstone Creek Valley has also been proposed. Such developments have the potential to directly impact the physical state of the watercourses (i.e. disruption to substrate, banks and riparian zone), and/or cause adverse effects to the water quality of downstream reaches. Although road improvements are proposed to terminate west of the Grindstone Creek crossing, indirect impacts to the watercourse may occur including the increase in sediment and non-soluble particles due to surface water runoff during construction.

4.2 Drainage

4.2.1 General

The study section of Parkside Drive in its current status has a rural cross section, with the drainage along the road facilitated by side ditches. The only surface water feature (i.e. major drainage system) within the study area is Borer’s Creek, which passes through the road between Duncan Avenue and Braeheid Avenue. The Borer’s Creek watershed area is approximately 1650 ha. In addition, a small segment of the study area (to the east of Main St.) drains to Grindstone Creek.

In order to develop a full understanding of the drainage area, previously completed reports that covered different aspects related to environmental and developmental issues were reviewed, including:

- The Waterdown North Master Drainage Plan (Philips, 2007);
- The Waterdown North Master Drainage Plan Addendum (AMEC, 2012);
- Parkside Hills Phase One Updated Stormwater Management Report (MCI, 2008);
- Borers Creek Rehabilitation – Channel Capacity Review (AECOM, 2009)
- New East-West Corridor Class Environmental Assessment ESR, Draft (Dillon, 2009)

The future road improvements for Parkside Drive (i.e. road widening and continuous left turning lane) have implications on the hydrogeology and hydraulics for the study section.

4.2.2 Existing Drainage System

The Parkside Drive study area drains via four pathways:

- The central area along Borer’s Creek drains directly to the Creek
- The eastern side north of Parkside Dr. extending from Main St. to Borer’s Creek drains via ditch inlets and eventually into the Creek.
- The western side north of Parkside Dr. extending from west of Borer’s Creek to Hollybush Dr. drains into Parkside Dr. and moves through a swale along the west side of the development south of Parkside Dr.
- The area west of Main Street drains via the road crossing to Grindstone Creek
4.2.3 Existing Culverts

Hydraulic analysis of the existing conditions for the Borer’s crossing was performed using HEC RAS. The design flows for the culvert assessment were extracted from Waterdown North Master Drainage Plan Addendum (AMEC, 2012).

The MTO design criteria for hydraulic structures on freeway systems were used for the culvert capacity assessment, and are summarized below:

- For bridges/culverts with a span up to 6.0 metres, a minimum of 1.0 metre freeboard should be provided for the 50-year event;
- For bridges/culverts with a span of greater than 6.0 metres, a minimum of 1.0 metre freeboard should be provided for the 100-year event; and
- Overtopping analysis should be undertaken using the Regulatory Storm event for watercourses with a drainage area greater than 125 ha; and using the 100-year event for areas smaller than 125 ha.
- Since the existing culvert is well below the 6 m span, the criterion of providing a minimum of 1.0 metre freeboard for the 50-year event was evaluated. In addition, since the drainage area is above 125 ha, overtopping analysis was carried out.

Based on these criteria, for existing conditions, the Borer’s culvert has less than one (1.0) meter of freeboard for the 50-year flood event and therefore, it does not meet the MTO design guidelines.

4.2.4 Existing Storm Sewer

The Waterdown North Master Drainage Plan (Philips, 2007) indicated that ditches and swales along Parkside Drive had been the main drainage system within the limits of the Waterdown North lands. Recently, two storm sewer systems have been constructed within the study reach, including:

A storm sewer system ranging in size from 900 mm upstream of Parkside Hills to 1350 mm at the outlet to Borer’s Creek. The storm sewer was sized to provide sufficient capacity to convey the 100-year storm event and uncontrolled flow from ROW, and it drains the following areas (MCI, 2008):

- The MC-2 development directly to the east of Borer’s Creek with controlled flow of 0.70 m³/s;
- The YMCA and high school ponds, with controlled flows of 0.32 and 0.47 m³/s, respectively;
- Parkside Hills development with controlled flow of 0.24 m³/s;
- Silverwood development;
- Landmart development;
- Uncontrolled post development from Parkside Dr. ROW
4.2.5 Existing Stormwater Management Facilities

Philips (2007) and AMEC (2012) recommended the implementation of four (4) ponds along Parkside Drive, namely Pond 4, Pond 5, Pond 6, and Pond 7. Two of the ponds were proposed for water quality and erosion (Ponds 4 and 5 along Borer’s Creek), and Ponds 6 and 7 were proposed for full stormwater management including water quality, erosion and flood control (Philips, 2007, AMEC, 2012). Currently, these ponds are already constructed (please refer to Appendix C, page 19).

Other stormwater management measures such as Low Impact Development measures and Best Management Practices are lacking within the study area. Reasons behind that include the following:

- Physical constraints such as high traffic, underground utilities, and lack of boulevard space;
- LID maintenance issues; and,
- The City does not have LID standards and guidelines in place

Recommendations of a preferred stormwater management strategy for the study area will take into consideration available infrastructure, opportunities, and constraints as explained earlier.

The Functional Drainage and Stormwater Management Report prepared for the Parkside Drive Corridor Improvements Class EA is provided in Appendix C.

4.3 Geotechnical

4.3.1 Pavement Condition Survey

A detailed visual inspection of the pavement was carried out on June 12, 2012. The survey was conducted in general accordance with MFO SP-022 Flexible Pavement Condition Rating Guidelines for Municipalities. During the site visit, the riding quality and key pavement distresses were observed (noting the type, severity and general density of distresses). The general site and pavement drainage conditions were also noted. The condition of these pavement sections are summarized below:

**Section 1 - HWY 6 to Keewaydin Street (approx. 2.2 km)**

This section of Parkside Drive generally consists of two driving lanes with a right turn lane at Hollybush Drive and Duncan Avenue and with left turn lanes at HWY 6, Braeheid Avenue and Keewaydin Street. The existing roadway consisted of a rural cross-section (gravel shoulders and side ditches). It was observed that the westbound lane from west of Braeheid Avenue to east of Keewaydin Street appeared to have been recently reconstructed to an urban cross section. The overall surface drainage was generally considered to be poor. The side ditches were observed to be shallow or non-existent at some locations and overgrown with vegetation.
The overall condition of this section of pavement was considered poor with a Pavement Condition Rating (PCR) of 54 and a Ride Condition Rating (RCR) of 6.1. The most significant distresses in the pavement surface observed included: moderate wheel track rutting and frequent moderate single and multiple alligator cracking, extensive very severe pavement edge cracking and frequent to extensive slight flushing and ravelling and aggregate loss.

Section 2- Keewaydin Street to Hamilton Street North (approx. 0.6 km)

This section of roadway consisted of two driving lanes and a continuous left turn lane which becomes a directional left turn lane at the traffic signals. The north side of the road (west bound lane) had an urban cross section while the south side (east bound) had a rural cross section however about half of the south side did not have a ditch.

This section of pavement was generally in fair to poor condition with a PCR of 60 and an RCR of 6.5. The predominant distresses were: frequent severe distortions; frequent slight longitudinal wheel track cracks which had progressed to alligator cracking in many locations; and moderate alligator transverse cracks, typically at a spacing of less than 10m.

Section 3 - Hamilton Street North to the East Study Limit (approx. 1.4 km)

This section of the roadway consisted of two driving lanes with a rural cross section, except for the intersection at Hamilton Street which had been widened and upgraded to an urban standard. A substantial portion of the west bound lane had been repaired. The new pavement was due to a new watermain installation. The pavement was generally in fair condition with a PCR of 72 and an RCR of 6.8. The predominant distresses were: intermittent slight wheel track rutting; intermittent slight distortions (usually in areas of poor drainage); intermittent slight longitudinal wheel track cracks; and severe alligator transverse cracks at a spacing of less than about 20m.

The pavement structure encountered in the section of Parkside Drive under consideration ranged in total thickness from about 300 to 990 mm. The asphaltic concrete ranged in thickness from about 50 to 300 mm. The thickness of the underlying granular base/sub-base ranged from about 250 to 870 mm.

4.3.2 Subsurface Conditions

A subsurface investigation was completed in two stages. Initially 11 boreholes (boreholes #1 to #11) were drilled on January 9 and 10, 2012 in the section of Parkside Drive between Hwy 6 and Braeheid Avenue. 10 additional boreholes (boreholes #12 to #21) were drilled in the section between Braeheid Avenue and the east limit of the study area on November 21 and 22, 2012. The boreholes were drilled in the existing roadway platform at approximate intervals of 200m. The boreholes were explored to depths of about 1.1 to 5.0 m below the existing road surface.
The boreholes were drilled using a truck mounted power auger drill rig supplied and operated by a specialist drilling contractor. The boreholes were advanced using nominal 150 mm outside diameter continuous flight augers. Standard Penetration testing and sampling were carried out at regular intervals of depth in each borehole using 50 mm outside diameter split spoon sampling equipment. Ground water observations were made in the boreholes during drilling.

Eight soil samples from the first stage of the investigation were submitted for bulk chemistry analyses to identify potential constraints on the management of excess soil that could result from the proposed construction. In addition, three soil samples were analysed for a suite of parameters to assess the aggressiveness of the subsurface environment to underground plant. Similarly six soil samples from the second stage of the drilling program were submitted for bulk chemistry and one sample for corrosivity analyses.

The subsurface conditions encountered in the boreholes are shown on the Log of Borehole sheets. The stratigraphic boundaries indicated are inferred from non-continuous samples and observations of drilling resistance and typically represent a transition from one soil type to another. These boundaries should not be interpreted to represent exact planes of geological change. The subsurface conditions have been confirmed at the borehole locations only, and will vary between and beyond the borehole locations. The following discussion has been simplified in terms of the major soil strata for the purposes of geotechnical design.
Fill

Brown clayey silt fill with topsoil, sand, and gravel was encountered beneath the pavement and to depths of 0.9 to 2.7m below the existing ground surface in boreholes 1 to 4, and 8 to 13. N values ranging from 5 to 26 blows per 0.3 m were determined in the Standard Penetration Testing carried out within the clayey silt fill, inferring a relatively stiff consistency. The in-situ water content of the samples of clayey silt fill recovered from the boreholes ranged from 10 to 36 percent. Sandy fill, including sand, silty sand and sand and gravel was penetrated in boreholes 15 to 19 and 21. The N values in the sandy fill were in the range of 3 to 17 blows per 0.3m inferring a very loose to compact state of packing. The in-situ water content of the sandy fill ranged from about 8 to 16 per cent.

Glacial Till

Strata of brown clayey silt till were encountered beneath the fill in most of the boreholes west of Hamilton Street and boreholes 12, 13, and 14 were terminated in clayey silt till. N values of 14 to greater than 100 blows per 0.3 m were determined for the clayey silt till, with an average N value of about 32 blows per 0.3 m, indicating a very stiff to hard consistency. The natural water contents of the samples of clayey silt till recovered from the penetration testing ranged from about 8 to 23 percent. Liquid limits of about 25 and 28 percent and plastic limits of about 13 and 16 percent. On the basis the clayey silt till can be categorized as an inorganic clay of low plasticity.

A layer of sandy silt till was encountered beneath the clayey silt till in boreholes 11, 21 and 21. N values of 10 to greater than 100 blows per 0.3m and corresponding natural water contents of about 10 percent were determined in the sandy silt till.

It must be assumed that cobbles and boulders will be present within the till strata encountered at the site although not necessarily observed in all or any of the boreholes. The presence of cobbles and boulders is an inherent characteristic of till deposits.

Sand, Silty Sand

Boreholes 15 to 17 penetrated strata of fine to medium sand and silty sand below the fill. The N values in the sand ranged from 3 to 17 blows per 0.3m. The natural water content of the sand was in the range of about 7 to 17 percent with the higher water contents indicated for samples recovered near to or below the ground water level.

Sand and Gravel

Sand and gravel was encountered beneath the fill in boreholes 18, 19 and 20. The N values in the sand and gravel ranged from 12 to 42 blows per 0.3m with corresponding natural water contents of about 5 to 6 per cent.
**Sandy Silt, Silt**

Boreholes 1 to 3, and 5 to 11 were terminated in strata of silt and sandy silt with pieces of gravel and rock fragments. The N values determined in these strata ranged from 7 to greater than 100 blows per 0.3m however in some instances the high penetration resistance coincided with the presence of rock fragments and coarser particles. The natural water content of the silt and sandy silt strata were in the range of about 6 to 19 percent.

**Silty Clay**

Borehole 16 was terminated in a stratum of silty clay. A single N value of 6 blows per 0.3m and a natural water content of 16 percent was indicated for the silty clay.

**Auger Refusal**

The auguring and interval sampling method used to explore the overburden at the site is conventionally accepted investigative practice. However, this method does not define the bedrock surface with precision, particularly in this instance where the overlying soil may contain gravel, rock fragments, cobbles and boulders. Several of the boreholes were terminated in strata with very high penetration resistance and auger refusal was encountered in boreholes 1 to 11 at depths of about 1.1 to 5.0 m below the existing ground surface. Verification of the bedrock (i.e. by core drilling) was not carried out as part of this investigation; however a review of regional bedrock mapping indicated that the bedrock exists at depths of about 3 to 5m beneath the site and consists of limestone and dolostone of the Lockport Formation. In this area the bedrock probably belongs to the Gasport member that has been described as fine to medium crystalline, medium to massive bedded, porous and fossiliferous.

### 4.3.3 Ground Water Observations

Ground water was encountered in Boreholes 3, 5, 9, 11, 15, 16 and 20 at depths of about 1.8 to 4.7 m below the existing ground surface. All of the other boreholes remained dry during and upon completion of drilling. It should be noted that these conditions may not necessarily represent stabilized conditions or the ground water conditions that will be encountered during construction. The ground water levels will vary due to seasonal effects and precipitation conditions.

The Geotechnical Investigation conducted for the Parkside Drive Corridor Improvements Class EA is provided in Appendix D.
4.4 Stage 1 Archaeological Assessment

4.4.1 General

As part of the Class EA, a Stage 1 Archaeological Assessment (Background Study and Property Inspection) was conducted. All work has been undertaken as required by the Environmental Assessment Act, RSO (1990) and regulations made under the Act, and are therefore subject to the requirements of the Municipal Class Environmental Assessment process. All activities carried out during this assessment were completed in accordance with the terms of the Ontario Heritage Act (2005) and the Standards and Guidelines for Consultant Archaeologists (S&G, MTCS 2011).

4.4.2 Field Methods

A property inspection was conducted in order to gain first-hand knowledge of the geography, topography, and current conditions of the Parkside Drive study area as per Section 1.2 of the S&G. A property inspection is a visual inspection only and does not include excavation or collection of archaeological resources. The property inspection found that the parts of the study area have been disturbed by road construction activities and recent residential development, while other parts of the study area retain archaeological potential.

4.4.3 Analysis and Conclusions

The Stage 1 property inspection determined that while the majority of the Parkside Drive from these study area has not retained archaeological potential due to previous construction activity and low and wet conditions, several parcels of relatively undisturbed land retain archaeological potential.

Areas of potential exist in the Parkside Drive study area beyond the disturbed ROW. These areas include relatively undisturbed lands bordering residential properties and lands in agricultural fields (See figure 8 through 14, Appendix E). These lands retain archaeological potential and will require further archaeological assessment should they be impacted by the proposed work.

In light of these results, the following recommendations are made:

1. Archaeological potential exists in the study area in the form of several parcels of land adjacent to residential areas and in agricultural fields. These lands require a Stage 2 Archaeological Assessment, which will be conducted by a combination of pedestrian and test pit survey. A test pit survey includes the systematic excavation of small test pits by hand at 5 m intervals and can only be conducted when ploughing for pedestrian survey is not feasible;
2. Part of the study area has been previously assessed by ASI in 2008 and 2010. These lands do not retain archaeological potential and do not require further archaeological assessment;

3. Due to extensive and deep land alterations that have severely damaged the integrity of any potential archaeological resources, low and wet conditions, and steep slope, the remainder of the study area does not require further archaeological assessment; and,

4. Should the proposed work extend beyond the current Parkside Drive study area then further Stage 1 assessment must be conducted to determine the archaeological potential of the surrounding lands.

The Stage 1 Archaeological Assessment conducted for the Parkside Drive Corridor Improvements Class EA is provided in Appendix E.

4.5 Cultural/Built Heritage

4.5.1 Approach and Methodology

In order to make a preliminary identification of existing built heritage resources and cultural heritage landscapes within the study corridor, a number of municipal resources were consulted. The City of Hamilton Register of Property of Cultural and Historical Interest and the City of Hamilton Heritage Inventories, which includes both designated and non-designated properties, were consulted.

A review of the inventories of designated properties revealed that there are no properties which are designated under Part IV or Part V of the Ontario Heritage Act within the vicinity of and in the study corridor. A review of the City of Hamilton Heritage Inventories revealed that are five non-designated properties of heritage interest in the vicinity of the study corridor within the City limits. Two of these properties appear to have been demolished since their entry in the Hamilton Heritage Inventories. There were no properties listed in the ‘Register’.

A field review was also undertaken in April 2012 to document the existing conditions of the study corridor.

4.5.2 Analysis and Conclusions

The results of historical research confirmed that the study corridor features historically surveyed thoroughfares, residences and farm complexes that date back as early as the late nineteenth century and into the first half of the twentieth century. The field review confirmed that the study corridor retains elements associated with early residential development, dating predominantly to the first half of the twentieth century but with (remnant) and other cultural heritage landscapes features dating to the last decades of the nineteenth century. In the western section, the remaining farm complexes provide a sense of the rural landscapes that predominated in this area in the late nineteenth and
early twentieth century. Whilst the middle section (east of Hollybush Drive) has been heavily developed, the western and eastern sections retain much of their rural character. West of Hamilton Street /Centre Street the study corridor is a mix of early and late twentieth-century residences with an evolved landscape that provides a picture of ongoing settlement of this area over more than a century.

A total of nine cultural heritage landscapes and three built heritage resources were identified during the field review (See figure 5 through 11, Appendix F).

The Cultural Heritage Assessment Report for the Parkside Drive Corridor Improvements Class EA is provided in Appendix F.

4.6 Noise

For the purpose of assessing noise as part of a road expansion project, a noise sensitive area (NSA) is defined as a noise sensitive land use with an outdoor living area, which includes: single family houses (typically back yard), townhouses (typically back yard), multiple unit buildings such as apartments with outdoor living areas for use by all occupants, as well as hospital and nursing homes, where there are outdoor living areas for the patients.

As described in the MTO (2006) guide to transportation noise assessments, the acoustic impact of a major transportation project is determined by predicting the future noise levels after the project is completed and comparing with the future noise levels without the project. The level of noise experienced is a combination of factors, including, traffic volume, distance to the source of noise and objects that serve to block or reflect the noise.

If a proposed road widening creates an increase in noise levels above a certain threshold, noise mitigation would be required, if possible. Following the identification of a preferred design, it will be determined if any mitigation measures will be required or feasible.

4.7 Transportation Analysis

4.7.1 Road Network

Parkside Drive is a two-lane minor arterial roadway under the jurisdiction of the City of Hamilton, within the community of Waterdown. In addition to Parkside Drive, Waterdown is also served by another east-west arterial road to the south of Parkside Drive, Dundas Street. The City of Hamilton is planning on introducing a third east-west arterial road north of Parkside Drive that would serve as a key east-west roadway within the Village.

Within the study area, a number of new developments are planned for the lands located to the north of Parkside Drive and west of Hamilton Street/Centre Road. In order to
determine the ultimate design of Parkside Drive as a multi-modal corridor, the study team needed to evaluate the following:

- The 2009 Waterdown North Coordinated Traffic Impact Study completed by Paradigm Transportation Solutions;
- The introduction of the New East-West Road Corridor on the Waterdown Road Transportation Network, including all of the recommendations made in the 2008 Waterdown-Aldershot Transportation Master Plan;
- The City of Hamilton’ EMME/2 model; and,
- Current traffic volumes and turning movements for Parkside Drive

In order to assess the impacts of the planned developments and the new East-West road on the transportation network, as well as determine the appropriate improvements to develop Parkside Drive as a multi-modal corridor (which will consider the needs of not only vehicles, but pedestrians and cyclists as well), a comprehensive review of the analysis completed in the TIS as well as a review of the City of Hamilton’s EMME/2 model was undertaken. Additionally, the analysis undertaken and the subsequent recommendations made in the 2008 Waterdown-Aldershot Transportation Master Plan have been thoroughly reviewed, and a review of the recommendations made in the 2007 Hamilton Transportation Master Plan was completed.

For the purpose of this review, Delcan has also analyzed traffic operations within the corridor using current 2012 traffic volume data provided by the City of Hamilton in May and June 2012.

The intersection of Highway 6 and Parkside Drive is under the jurisdiction of The Ministry of Transportation (MTO). The Ministry has recently completed a design for the intersection which will be implemented by the Ministry as part of their capital improvements along Highway 6. As such, the Ministry’s recommended intersection design should be incorporated with the existing roadway design.

4.7.2 Existing Conditions (2012)

In establishing the existing traffic conditions, Delcan reviewed the 2009 TIS report which analyzed transportation conditions along Parkside Drive for the Weekday AM and PM peak hours. The results documented indicate that the intersections along Parkside Drive during the weekday AM and PM peak hours were operating satisfactorily with an overall Level of Service (LOS) of B or better. Delcan also reviewed the Synchro analysis (Synchro files) provided by the City of Hamilton to confirm the results of the 2009 TIS. As this report is an approved document, and based on a review of the analysis, Delcan agrees with the findings.
In addition to the 2009 TIS review, Delcan have undertaken a comprehensive corridor traffic operations analysis utilizing 2012 traffic count data and current signal timing plans provided by the City. The 2012 Weekday AM and PM traffic volumes are included in Figure 4-1.
Figure 4-1: Existing 2012 Traffic Volumes
4.7.3 Existing Traffic Analysis (2012)

Using current traffic volumes and signal timings, Delcan completed capacity analyses for the signalized and unsignalized intersections within the corridor using Synchro/SimTraffic (Version 8). The Synchro modelling assumptions and analysis parameters used were consistent with those from the approved 2009 TIS report.

The intersection capacity analysis completed for the signalized and unsignalized intersections during the weekday AM and PM peak hours under existing traffic conditions is summarized in Table 4-1, 4-2 and 4-3. Synchro output sheets can be found in Appendix G.

Table 4-2: Existing 2012 Weekday AM and PM Peak Hour Signalized Operational Performance (Existing Timings)

<table>
<thead>
<tr>
<th>Signalized Intersections</th>
<th>Overall LOS</th>
<th>Delay/Veh (sec.)</th>
<th>Overall V/C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AM PEAK HOUR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkside Dr. &amp; YMCA/Keewaydin St.</td>
<td>B</td>
<td>13.3</td>
<td>0.44</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Hamilton Street</td>
<td>B</td>
<td>17.3</td>
<td>0.57</td>
</tr>
<tr>
<td><strong>PM PEAK HOUR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkside Dr. &amp; YMCA/High School</td>
<td>B</td>
<td>12.9</td>
<td>0.50</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Hamilton Street</td>
<td>C</td>
<td>24.7</td>
<td>0.68</td>
</tr>
</tbody>
</table>

As illustrated in Table 4-1, all signalized intersections within the study area operate satisfactorily with a level of service ‘C’ or better with no critical movements or delay under the Weekday AM and PM peak hours. Upon further review of the analysis, several intersections could benefit from introducing advanced left turn phases. Those intersections are as follows:

- Southbound advanced left during the Weekday AM and PM peak hour at Parkside Drive and YMCA/Keewaydin Street;
- Westbound and northbound advanced left during the Weekday AM and PM peak hours and eastbound advanced left during the PM peak hour at Parkside Drive and Hamilton Street.

To illustrate the resulting intersection performance, additional capacity analysis with the introduction of the advanced left turn phases was performed at the intersections for both the Weekday AM and PM peak hours. The results of that analysis are provided in Table 4-2.
Table 4-3: Existing 2012 Weekday AM and PM Peak Hour Signalized Operational Performance (Optimized)

<table>
<thead>
<tr>
<th>Signalized Intersections</th>
<th>Overall LOS</th>
<th>Delay/Veh (sec.)</th>
<th>Overall V/C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AM PEAK HOUR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkside Dr. &amp; YMCA/Keewaydin St.</td>
<td>B</td>
<td>13.2</td>
<td>0.51</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Hamilton Street</td>
<td>C</td>
<td>25.3</td>
<td>0.60</td>
</tr>
<tr>
<td><strong>PM PEAK HOUR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkside Dr. &amp; YMCA/High School</td>
<td>B</td>
<td>13.3</td>
<td>0.57</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Hamilton Street</td>
<td>C</td>
<td>33.0</td>
<td>0.77</td>
</tr>
</tbody>
</table>

As presented above, with the introduction of the left turn phases, all intersections continue to operate satisfactorily with no critical movements or delay with improved levels of service for left turning vehicles.

The existing unsignalized intersection analysis is presented in Table 4-3.

Table 4-4: Existing 2012 Weekday AM and PM Peak Hour Unsignalized Operational Performance

<table>
<thead>
<tr>
<th>Unsignalized Intersections</th>
<th>Highest Movement Lane LOS</th>
<th>Delay (s)</th>
<th>V/C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AM PEAK HOUR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkside Dr. &amp; Hollybush Dr.</td>
<td>EBLTR=A</td>
<td>0.3</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>WBLTR=A</td>
<td>3.1</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>NBL=C</td>
<td>19.6</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>NBTR=B</td>
<td>11.6</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>SBLTR=C</td>
<td>22.9</td>
<td>0.11</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Duncan Ave.</td>
<td>EBTR=A</td>
<td>0.0</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>WBTL=A</td>
<td>0.5</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>NBLR=B</td>
<td>12.0</td>
<td>0.10</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Braheid Ave.</td>
<td>EBLTR=A</td>
<td>0.3</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>WBLTR=A</td>
<td>1.8</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>NBLTR=C</td>
<td>16.8</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>SBLTR=C</td>
<td>17.2</td>
<td>0.19</td>
</tr>
<tr>
<td><strong>PM PEAK HOUR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkside Dr. &amp; Hollybush Dr.</td>
<td>EBLTR=A</td>
<td>0.1</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>WBLTR=A</td>
<td>4.2</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>NBL=C</td>
<td>22.5</td>
<td>0.09</td>
</tr>
</tbody>
</table>
### Unsignalized Intersections

<table>
<thead>
<tr>
<th>Unsignalized Intersections</th>
<th>Highest Movement Lane LOS</th>
<th>Delay (s)</th>
<th>V/C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NBTR=B</td>
<td>10.6</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>SBLTR=C</td>
<td>18.5</td>
<td>0.10</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Duncan Ave.</td>
<td>EBTR=A</td>
<td>0.0</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>WBTL=A</td>
<td>1.2</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>NBLR=B</td>
<td>13.2</td>
<td>0.04</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Braheid Ave.</td>
<td>EBLTR=A</td>
<td>0.9</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>WBLTR=A</td>
<td>2.1</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>NBLTR=C</td>
<td>19.0</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>SBLTR=C</td>
<td>22.4</td>
<td>0.17</td>
</tr>
</tbody>
</table>

As is presented above, all unsignalized intersections operate satisfactorily under existing traffic conditions with no critical movements, delay or v/c ratios. However, roadway users will experience some delay as they wait for suitable gaps in traffic to complete their traffic manoeuvres. This is not uncommon for two-way stop controlled intersections. The issue of delay at these unsignalized intersections was raised by residents at public meetings with a request to consider signalization. A traffic signal warrant analysis to determine if any of these intersections may require a traffic signal. The analysis shows that traffic signals are not warranted at any of these unsignalized intersections. The signal warrant sheets are included in Appendix G.

#### 4.7.4 Future Conditions (2016)

The 2009 TIS report analysed the impacts that the planned developments (including infill) within Waterdown would have on Parkside Drive, utilizing a horizon year of 2016 (when all developments are assumed to be completed). These developments include the following 5 residential developments as well as 2 commercial developments:

- Silverwood
- Waterdown Bay
- Upcountry Estates
- MC2 Homes
- Parkside Hills
- Flamborough Power Centre
- Trinity/Krpan Development

The projected travel demands were calculated based on these future developments and utilized a 1.5% growth rate from the 2009 traffic volumes as well as a 2.0% reduction for public transit use. Since 2009 some of the planned development has occurred and the associated traffic is part of the 2012 traffic volumes. Also, since not all planned roadways and accesses are implemented (to 2016 levels); traffic distribution is not at its final state. As such, we would expect some moderate anomalies between 2012 counts and the 2016...
forecasts. In reviewing this data the majority of the 2012 volumes were found to be representative. However, we did identify some anomalies (existing 2012 volumes higher than 2016 volumes) within the volumes. In order to be conservative and ensure that the intersections would operate as an acceptable level of service, Delcan has increased the 2012 volume anomalies by 1.5% per annum to account for confirmed growth.

Should transit service enhancements (outlined in the City of Hamilton’s Rapid Ready Report (2013) be introduced, a reduction in vehicle volumes may be possible. These enhancements would require Council’s approval of an increased transit operating budget. An increase in public transit use is in keeping with the TMP targets to reduce auto use & increase the use of other transportation models.

The resulting future 2016 total traffic volumes for the Weekday AM and PM peak hours are illustrated in Figure 4-2.
Figure 4-2: Future 2016 Total AM Traffic Volumes
4.7.5 Geometric Modifications

Between Main Street and Hollybush Drive there are a number of existing and proposed municipal roadway intersections and a considerable number of private residential accesses. Currently there are left turn lanes at all major intersections within this section. Given the number of accesses and close spacing, the introduction of a continuous centre two-way left turn lane would provide enhanced roadway operations, improved safety for turning traffic and reduce delay for residential driveways through the introduction of two-way left turning. This recommendation is consistent with and supported by the approved 2009 TIS report. This modification is included in future traffic analysis presented below.

4.7.6 Future Traffic Analysis (2016)

The 2016 traffic capacity analysis completed for the signalized and unsignalized intersections during the Weekday AM and PM peak hours, under 2016 traffic conditions is summarized in Table 4-4 and Table 4-5. The following analysis was completed utilizing the previously mentioned geometric and planned improvements (left turn phases and two-way left turn lanes). Synchro output sheets are provided in Appendix G.

Table 4-5: Future 2016 Weekday AM and PM Peak Hour Signalized Operational Performance (with improvements)

<table>
<thead>
<tr>
<th>Signalized Intersections</th>
<th>Overall LOS</th>
<th>Delay/Veh (sec.)</th>
<th>Overall V/C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AM PEAK HOUR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkside Dr. &amp; YMCA/Keewaydin St.</td>
<td>C</td>
<td>19.3</td>
<td>0.81</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Hamilton Street</td>
<td>C</td>
<td>34.8</td>
<td>0.81</td>
</tr>
<tr>
<td><strong>PM PEAK HOUR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkside Dr. &amp; YMCA/High School</td>
<td>B</td>
<td>15.9</td>
<td>0.73</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Hamilton Street</td>
<td>D</td>
<td>41.6</td>
<td>0.86</td>
</tr>
</tbody>
</table>

As presented above, with the optimization of the traffic signal timings, all signalized intersections are forecast to operate satisfactorily with a level of service of ‘D’ or better under the future 2016 traffic conditions.

Table 4-5 below presents the results of the future 2016 unsignalized capacity analysis.
### Table 4-6: Future 2016 Weekday AM and PM Peak Hour Unsignalized Operational Performance (with improvements)

<table>
<thead>
<tr>
<th>Unsignalized Intersections</th>
<th>Highest Movement Lane LOS</th>
<th>Delay (s)</th>
<th>V/C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AM PEAK HOUR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkside Dr. &amp; Hollybush Dr.</td>
<td>EBLTR=A</td>
<td>0.4</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>WBL=A</td>
<td>8.5</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>WBTR=A</td>
<td>0.0</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>NBL=D</td>
<td>34.1</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>NBTR=B</td>
<td>12.7</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>SBL=F</td>
<td>81.9</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>SBTR=B</td>
<td>14.0</td>
<td>0.10</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Duncan Ave.</td>
<td>EBL=A</td>
<td>8.2</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>EBTR=A</td>
<td>0.0</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>WBL=A</td>
<td>8.9</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>WBTR=A</td>
<td>0.0</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>NBL=E</td>
<td>38.8</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>NBTR=B</td>
<td>13.8</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>SBLTR=D</td>
<td>27.7</td>
<td>0.38</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Braheid Ave.</td>
<td>EBL=A</td>
<td>8.1</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>EBTR=A</td>
<td>0.0</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>WBL=A</td>
<td>9.0</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>WBTR=A</td>
<td>0.0</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>NBL=E</td>
<td>40.6</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>NBTR=B</td>
<td>15.0</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>SBL=F</td>
<td>93.6</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>SBTR=B</td>
<td>12.1</td>
<td>0.17</td>
</tr>
<tr>
<td><strong>PM PEAK HOUR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkside Dr. &amp; Hollybush Dr.</td>
<td>EBLTR=A</td>
<td>1.1</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>WBL=A</td>
<td>9.5</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>WBTR=A</td>
<td>0.0</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>NBL=F</td>
<td>79.7</td>
<td>0.42</td>
</tr>
<tr>
<td></td>
<td>NBTR=C</td>
<td>18.5</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>SBL=F</td>
<td>166.6</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>SBTR=C</td>
<td>18.6</td>
<td>0.10</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Duncan Ave.</td>
<td>EBL=A</td>
<td>9.0</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>EBTR=A</td>
<td>0.0</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>WBL=A</td>
<td>8.6</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>WBTR=A</td>
<td>0.0</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>NBL=F</td>
<td>50.9</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>NBTR=B</td>
<td>12.0</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>SBLTR=D</td>
<td>25.1</td>
<td>0.24</td>
</tr>
<tr>
<td>Parkside Dr. &amp; Braheid Ave.</td>
<td>EBL=B</td>
<td>10.0</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>EBTR=A</td>
<td>0.0</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>WBL=A</td>
<td>8.4</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>WBTR=A</td>
<td>0.0</td>
<td>0.41</td>
</tr>
</tbody>
</table>
Table 4-7 presents the highest movement lane LOS, delay (s), and V/C for unsignalized intersections. As illustrated, all unsignalized intersections are forecast to operate satisfactorily under future total 2016 traffic conditions. Several left-turn movements experience delay, which is not uncommon. However, traffic signal warrant analysis was conducted at these intersections using 2016 traffic volumes to determine if traffic signals are required. The results indicate that traffic signals are not warranted at any of the intersections. The signal warrant results are included in Appendix G.

### 4.7.7 Future Conditions (2031)

By 2031, it is assumed that the new East-West road will be constructed. In order to assess the impacts, the model for existing (2008), 2021, and 2031 scenarios were reviewed within and adjacent to the study area. The City's model, however, is not properly calibrated and does not reflect the anticipated traffic likely to use this new east-west roadway facility. This can be confirmed from the model plot indicating that only 1 (one) trip is attracted to the new road in 2021 in the eastbound direction. Additionally, by 2031, only 408 trips have been assigned to this new roadway in the eastbound direction and none in the westbound direction. Despite the fact that the City's travel demand forecasting model was unable to realistically assign traffic on to this new facility, it is our understanding for the City’s Transportation Plan that this new east-west roadway is proposed to be a key east-west link in the City’s transportation network. The current time, the use of the new East-West Road by public transit is not anticipated. Parkside Drive will continue to be used to provide transit service to the northern portions of the Waterdown Urban Area.

The East-West Road Corridor will provide the required additional capacity and connectivity for Highway 6 to support the build out of the greater Waterdown area. As such, this roadway will mostly take on new trips but is anticipated to attract trips currently utilizing Parkside Drive to access Highway 6.

Therefore, in the future Parkside Drive will predominantly be utilized by the traffic from the surrounding developments. The 2016 forecast traffic assumed that a significant amount of the planned development in the immediate area will be in place. Based on these travel demands, the analysis presented above indicated that this demand can be accommodated and the intersections will still contain some reserve capacity.
In summary, by 2031 with the east-west roadway in place and the associated traffic redistribution, it is reasonable to consider traffic levels on Parkside Drive will be at a level below 2016. Therefore, 2016 traffic forecast can be considered a 2031 worst case scenario for Parkside Drive. Based on this assumption, no further geometric improvements are required however, the city should continue to monitor intersection traffic levels and adjust signal timings and traffic control as necessary.

### 4.7.8 Supporting Policies

In 2007, the City of Hamilton completed their Road Network Strategy as a part of their Transportation Master Plan (TMP). As a part of this TMP, Parkside Drive was recommended for a number of improvements. These included:

- Road widening from Hwy 6 to Braeheid Avenue
- A two-way left-turn from Braeheid Avenue to the east part of industrial section

As a part of the TMP’s Cycling Network Strategy and the Cycling Master Plan (2009), Parkside Drive was recommended for the following improvement:

- Bike Lane/Paved shoulder/Shared Lane from Hollybush Drive to east of Churchill Avenue

As a part of the TMP’s Pedestrian Network Strategy, Parkside Drive was recommended for the following improvement:

- Off Road Multi-Use Paths from Borer’s Creek to Hamilton Street/Centre Avenue.

### 4.7.9 Recommendations

Based on the results of the analysis and the recommendations made in the previously approved 2009 TIS and 2007 TMP, and the completed existing and future traffic analysis, the recommended improvements to be made to Parkside Drive, from Highway 6 to 500m east of Churchill Avenue are as follows:

- Provide 1.5m wide dedicated bike lanes along both sides of Parkside Drive throughout the study area.
- Provide a continuous sidewalk on both the north and south side of Parkside Drive within the study area. Between Hollybush Drive and Centre Street which experiences greater pedestrian demand. It is recommended that a wider (2.0 meter) sidewalk be provided on both the north and south sides.
Incorporate the MTO preliminary design of the Highway 6 intersection into the design of Parkside Drive.

Provide a continuous 4.0m two-way left-turn lane from Hollybush Drive to Main Street. The intersections at Braeheid Avenue, Keewaydin Street and Hamilton Street/Centre Road currently include left turn lanes. As a number of properties in this area front on Parkside Drive, the inclusion of a two-way-left-turn lane would aid in facilitating the smooth operation of Parkside Drive. Also, providing a consistent cross section over a longer distance is preferable to having a number of shorter, differing cross sections.

Upgrade Parkside Drive to an urban cross section from Highway 6 to Hollybush Drive. As the Urban Area Boundary runs along Parkside Drive on this section, the north side will require a curb and gutter, with an open ditch for drainage, while the south side will require curb and gutter with a storm sewer system for storm drainage.

Upgrade Parkside Drive to an urban cross section from Main Street to 500m East of Churchill Drive. This section of Parkside Drive is entirely within the Urban Area Boundary and as such, curb and gutter with a storm sewer system are required.

15 meter left turn storage lanes are required (as per the left turn warrant analysis) at the following intersections:
  - Parkside Drive and Mill Street North (eastbound and westbound directions)
  - Parkside Drive and Victoria Street (eastbound and westbound directions)

Advanced left turn phases should be implemented at the intersections of Parkside and Keewaydin Street and Parkside and Hamilton Street to mitigate the delay to left turning vehicles.

Traffic signal warrants not met for the intersection of Parkside Drive and Hollybush Drive and Parkside Drive and Braeheid Avenue. However, the City should consider monitoring these intersections in the future once the Parkside Drive Improvements are in place.

The Transportation Assessment Report for the Parkside Drive Corridor Improvements Class EA is provided in Appendix G.
5.0 ALTERNATIVE DESIGN CONCEPTS FOR PREFERRED SOLUTION

5.1 Development of Alternative Design Concepts

5.1.1 Design Criteria

Prior to developing alternative design concepts for Parkside Drive, a set of design criteria was developed to act as a set of guidelines to ensure consistent design standards were used throughout. The design criteria were developed based on Transportation Association of Canada (TAC) standards as well as the City of Hamilton’s design standards in consultation with the project team. The design criteria sheet is provided in Appendix H.

5.1.2 Design Concept Requirements

In developing the design concept for Parkside Drive as a multi-modal corridor, the following components were required:

- Two 3.5m wide general purpose lanes for vehicular traffic
- Accommodation for Active Transportation via dedicated 1.5m wide on-road bike lanes and 2.0m sidewalks
- Provision of 3.5m wide left turn lanes at intersections and/or 4.0m two-way left-turn lanes between intersections, where appropriate

In addition, the following aspects were considered:

- Minimizing impacts to residential Properties
- Minimizing impacts to Natural Environment (i.e. woodlots, trees, etc.)
- Minimizing construction costs
- Maximizing traffic operations and safety

5.1.3 Design Concept Components

Based on the considerations listed previously, a number of alternative design concepts were developed based on the Phase 2 preferred alternative solution that attempted to address the problem statement. A preliminary screening of these alternatives was also done at this time to eliminate alternatives that would cause significant impacts. The various designs considered included:

5. Number of Through Lanes
6. Widening to the North
7. Widening to the South
8. Follow Existing Right-of-Way

A breakdown of the alternatives of the various components considered is included in Table 5-1.
Table 5-1: Design Concept Components

<table>
<thead>
<tr>
<th>Alternative Design Concepts</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Do Nothing</td>
<td>The existing transportation system is not changed. (required to be considered for comparison purposes, as per the EA Act)</td>
</tr>
<tr>
<td>2 Widening to the North</td>
<td>Property line along south side would form the limit of the new Right-of-Way, with the widening occurring entirely on the north side of Parkside Drive.</td>
</tr>
<tr>
<td>3 Widening to the South</td>
<td>Property line along north side would form the limit of the new Right-of-Way, with the widening occurring entirely on the south side of Parkside Drive.</td>
</tr>
<tr>
<td>4 Follow Existing Right-of-Way</td>
<td>The new road alignment would deviate from the centreline of the existing road but generally follow the existing Right-of-Way.</td>
</tr>
</tbody>
</table>

5.2 Evaluation Criteria

In order to properly assess and compare each alternative against each other and the “do-nothing” scenario, a broad range of criteria was developed. The evaluation of the alternatives based on these criteria would form the basis and justification of the selection of the preferred planning solution alternative. The various criteria were separated into the following categories (with each category further expanded as seen in Table 5-2):

- Transportation/Technical
- Cultural Environment
- Natural Environment
- Socio-Economic
- Cost
5.3 Evaluation of Alternative Design Concepts

The evaluation of the alternative design concepts was completed using the evaluation criteria previously developed. The goal of the evaluation was to determine the best alternative to address the problem statement, while minimizing impacts to the environment. It should be noted that competing interests from various owners, agencies and the public means that the preferred alternative may not achieve all these goals. An evaluation matrix table was developed to provide a summary of the evaluation and is presented in Table 5-2.
<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>CRITERIA</th>
<th>INDICATORS</th>
<th>ALTERNATIVE 1 (DO NOTHING FOR COMPARISON PURPOSES ONLY)</th>
<th>ALTERNATIVE 2 (WIDEN TO THE NORTH)</th>
<th>ALTERNATIVE 3 (WIDEN TO THE SOUTH)</th>
<th>ALTERNATIVE 4 (FOLLOW EXISTING RIGHT OF WAY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation/Technical</td>
<td>Planning Objectives</td>
<td>Ability to meet the City of Hamilton’s Transportation Master Plan Objectives</td>
<td>No improvement to transit infrastructure</td>
<td>Meets City of Hamilton’s Transportation Master Plan Objectives</td>
<td>Meets City of Hamilton’s Transportation Master Plan Objectives</td>
<td>Meets City of Hamilton’s Transportation Master Plan Objectives</td>
</tr>
<tr>
<td></td>
<td>Transit Services</td>
<td>Ability to improve from existing and/or integrate transit infrastructure into the overall transportation system</td>
<td>No improvement to transit infrastructure</td>
<td>Able to implement improvements to transit infrastructure</td>
<td>Able to implement improvements to transit infrastructure</td>
<td>Able to implement improvements to transit infrastructure</td>
</tr>
<tr>
<td></td>
<td>Overall Safety</td>
<td>Ability to improve safety from existing conditions</td>
<td>No safety improvements</td>
<td>Able to implement safety enhancements through corridor improvements</td>
<td>Able to implement safety enhancements through corridor improvements</td>
<td>Able to implement safety enhancements through corridor improvements</td>
</tr>
<tr>
<td></td>
<td>Network Capacity and Level of Service</td>
<td>Ability to improve traffic congestion and level-of-service</td>
<td>No does not address existing congestion during peak periods</td>
<td>Able to provide required capacity and greater level of service</td>
<td>Able to provide required capacity and greater level of service</td>
<td>Able to provide required capacity and greater level of service</td>
</tr>
<tr>
<td></td>
<td>Stormwater Management</td>
<td>Ability to improve existing drainage facilities</td>
<td>No does not address overall drainage/SWM requirements</td>
<td>Able to address overall drainage/SWM requirements</td>
<td>Able to address overall drainage/SWM requirements</td>
<td>Able to address overall drainage/SWM requirements</td>
</tr>
<tr>
<td>Cultural Environment</td>
<td>Archeological Resources</td>
<td>Potential for disruption of archeological resources</td>
<td>No impacts</td>
<td>Unknown potential impacts because improvements would occur within previously undisturbed areas. Stage II archeological assessment to confirm</td>
<td>Unknown potential impacts because improvements would occur within previously undisturbed areas. Stage II archeological assessment to confirm</td>
<td>Live potential impacts due to majority of construction occurring within the existing, previously disturbed right-of-way</td>
</tr>
<tr>
<td></td>
<td>Cultural and Built Heritage Features</td>
<td>Potential for disruption of built heritage and cultural landscape features</td>
<td>No impacts to known Cultural or Built Heritage resources</td>
<td>Possible Impacts to known Built Heritage resources (273 Parkside Drive and 249 Parkside Drive) and Cultural Heritage Landscapes</td>
<td>Possible Impacts to known Built Heritage resources (40 Parkside Drive) and Cultural Heritage Landscapes</td>
<td>Minimal impacts to known Built Heritage resources. Some impacts to Cultural Heritage Landscapes</td>
</tr>
<tr>
<td>Natural Environment</td>
<td>Terrestrial Resources (Wildlife and Vegetation)</td>
<td>Impacts on Terrestrial Species and Habitats</td>
<td>No Impacts on terrestrial resources</td>
<td>Significant overall impacts to terrestrial resources on north side of Parkside Drive.</td>
<td>Significant overall impacts to terrestrial resources on south side of Parkside Drive.</td>
<td>Minor impacts to terrestrial resources on both sides of Parkside Drive.</td>
</tr>
<tr>
<td></td>
<td>Aquatic Species/ Watercourses</td>
<td>Impacts on watercourses within the project area</td>
<td>No Impacts</td>
<td>Minor impacts to watercourses which can be mitigated</td>
<td>Minor impacts to watercourses which can be mitigated</td>
<td>Minor impacts to watercourses which can be mitigated</td>
</tr>
<tr>
<td>Socio-Economic Environment</td>
<td>Residential Business Access</td>
<td>Ability to maintain and/or maximize opportunities for improved access into adjacent residential and commercial properties</td>
<td>No opportunity for access improvements</td>
<td>Able to provide adequate access</td>
<td>Able to provide adequate access</td>
<td>Able to provide adequate access</td>
</tr>
<tr>
<td></td>
<td>Property Requirements</td>
<td>Amount of property required</td>
<td>No property required</td>
<td>Significant property required on the north side of Parkside Drive</td>
<td>Significant property required on the south side of Parkside Drive</td>
<td>Some property required on both sides of Parkside Drive</td>
</tr>
<tr>
<td></td>
<td>Emergency Response</td>
<td>Access for emergency vehicles</td>
<td>Increased response time during peak periods</td>
<td>Improves emergency response time</td>
<td>Improves emergency response time</td>
<td>Improves emergency response time</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>Ability to minimize impacts on ambient noise levels after construction</td>
<td>Increase in noise levels during peak periods</td>
<td>Minimal increase in noise levels on the north side of the roadway. Some increase in noise levels on the north side.</td>
<td>Minimal increase in noise levels on the south side. Some increase in noise levels on the south side.</td>
<td>Minimal increase in noise levels on the north side of the roadway. Some increase in noise levels on the north side.</td>
</tr>
<tr>
<td></td>
<td>Aesthetics/ Streetscape</td>
<td>No enhancements to aesthetics</td>
<td>Able to provide suitable streetscaping</td>
<td>Able to provide suitable streetscaping</td>
<td>Able to provide suitable streetscaping</td>
<td>Able to provide suitable streetscaping</td>
</tr>
<tr>
<td></td>
<td>Cost</td>
<td>Cost of Construction (including property acquisition)</td>
<td>Lowest cost impacts</td>
<td>Higher capital costs, due to need to acquire significant amount of property on north side of Parkside Drive</td>
<td>Higher capital costs, due to need to acquire significant amount of property on south side of Parkside Drive</td>
<td>Cost of construction similar to Alternatives 2 and 3, however reduced property acquisition costs</td>
</tr>
<tr>
<td></td>
<td>Summary</td>
<td>Was carried forward for comparison purposes. Does not address the problem statement.</td>
<td>Fully addresses the problem Statement. Property acquisition and environmental impacts mainly occur on the north side of Parkside Drive.</td>
<td>Fully addresses the problem Statement. Property acquisition and environmental impacts mainly occur on the north side of Parkside Drive.</td>
<td>Fully addresses the problem Statement. Property acquisition and environmental impacts mainly occur on the south side of Parkside Drive.</td>
<td>Fully addresses the problem Statement. Property acquisition and environmental impacts are essentially equal on both sides of Parkside Drive.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>CRITERIA</th>
<th>INDICATORS</th>
<th>ALTERNATIVE 1 (DO NOTHING FOR COMPARISON PURPOSES ONLY)</th>
<th>ALTERNATIVE 2 (WIDEN TO THE NORTH)</th>
<th>ALTERNATIVE 3 (WIDEN TO THE SOUTH)</th>
<th>ALTERNATIVE 4 (FOLLOW EXISTING RIGHT OF WAY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALTERNATIVE 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALTERNATIVE 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALTERNATIVE 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALTERNATIVE 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.4 Refinement of Evaluation for East of Main Street

From Hwy. 6 to Main Street, the impacts of the preferred design to private properties as well as the natural environment are relatively minor. However, from Main Street to the east limit of the study area it was recognized that the preferred design concept would result in significant impacts to both the natural environment and private properties. As a result, the project team decided to analyze a number of different alternatives for this section in order to identify a solution that would have a reduced impact. These alternatives are detailed in Table 5-3:

Table 5-3: Alternative Design Concepts for East of Main Street

<table>
<thead>
<tr>
<th>ALTERNATIVE DESIGN CONCEPTS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4A 3-lane cross section</td>
<td>3-lane cross section with sidewalk on both sides of roadway</td>
</tr>
<tr>
<td>4B No Sidewalk on North Side</td>
<td>Same as Alternative 4A however no sidewalk on north side of Parkside Drive, from Main Street to the east limit of study area.</td>
</tr>
<tr>
<td>4C 2-lane cross section</td>
<td>2-lane cross section instead of a 3-lane cross section, with left turn lanes at Mill Street N and Victoria Street.</td>
</tr>
</tbody>
</table>

5.5 Evaluation of Alternative Design Concepts for East of Main Street

The evaluation of the alternative design concepts for Parkside Drive, east of Main Street was completed using the evaluation criteria previously developed. The goal of the evaluation was to determine the best alternative to address the problem statement, while minimizing impacts to the environment. It should be noted that competing interests from various owners, agencies and the public means that the preferred alternative may not achieve all these goals. An evaluation matrix table was developed to provide a summary of the evaluation and is presented in Table 5-4.
Table 5-4: Evaluation of Alternative Design Concepts East of Main Street

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>CRITERIA</th>
<th>INDICATORS</th>
<th>ALTERNATIVE 4A</th>
<th>ALTERNATIVE 4B</th>
<th>ALTERNATIVE 4C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(3-LANE CROSS SECTION)</td>
<td>(NO SIDEWALK ON NORTH SIDE)</td>
<td>(2-LANE CROSS SECTION)</td>
<td></td>
</tr>
<tr>
<td>Transportation/Technical</td>
<td>Overall Safety</td>
<td>Ability to improve safety from existing conditions</td>
<td>Same as Alternative 4</td>
<td>Same as Alternative 4</td>
<td>Reduced safety due to increased congestion from vehicles turning left into driveways.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Same as Alternative 4</td>
<td>Same as Alternative 4</td>
<td></td>
</tr>
<tr>
<td>Network Capacity and Level of Service</td>
<td>Ability to improve traffic congestion and level-of-service</td>
<td></td>
<td>Same as Alternative 4</td>
<td>Same as Alternative 4</td>
<td>Increased congestion from vehicles turning left into driveways.</td>
</tr>
<tr>
<td>Cultural Environment</td>
<td>Archaeological Resources</td>
<td>Potential for disruption of archaeological resources</td>
<td>Unknown potential impacts because improvements would occur within previously undisturbed areas. Stage II archaeological assessment to confirm</td>
<td>No impacts</td>
<td>Unknown potential impacts because improvements would occur within previously undisturbed areas. Stage II archaeological assessment to confirm</td>
</tr>
<tr>
<td>Cultural and Built Heritage Features</td>
<td>Potential for disruption of built heritage and cultural landscape features</td>
<td>Possible impacts to known Built Heritage resources (273 Parkside Drive and 349 Parkside Drive) and Cultural Heritage Landscapes</td>
<td>No impacts</td>
<td>Possible impacts to known Cultural or Built Heritage resources (273 Parkside Drive and 349 Parkside Drive) and Cultural Heritage Landscapes</td>
<td></td>
</tr>
<tr>
<td>Natural Environment</td>
<td>Terrestrial Resources (Wildlife and Vegetation)</td>
<td>Impacts on Terrestrial Species and Habitats</td>
<td>46 trees to be removed and replaced</td>
<td>18 trees to be removed and replaced</td>
<td>46 trees to be removed and replaced</td>
</tr>
<tr>
<td>Socio-Economic Environment</td>
<td>Property Requirements</td>
<td>Amount of property required</td>
<td>1493 m² of property required</td>
<td>No property required</td>
<td>1493 m² of property required</td>
</tr>
<tr>
<td></td>
<td>Emergency Response</td>
<td>Access for emergency vehicles</td>
<td>Same as Alternative 4</td>
<td>Same as Alternative 4</td>
<td>Increased response time during peak periods</td>
</tr>
<tr>
<td>Cost</td>
<td>Capital Costs</td>
<td>Cost of Construction (including property acquisition)</td>
<td>Highest cost</td>
<td>Lower cost than Alternative 4A</td>
<td>Lowest cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUMMARY</td>
<td></td>
<td></td>
<td>Fully addresses the problem Statement. Property acquisition and some environmental impacts still occur on the north side of Parkside Drive</td>
<td>Fully addresses the problem Statement. Property acquisition and environmental impacts greatly reduced on the north side of Parkside Drive</td>
<td>Fully addresses the problem Statement. Property acquisition and some environmental impacts still occur on the north side of Parkside Drive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not Recommended</td>
<td>Recommended</td>
<td>Not Recommended</td>
</tr>
</tbody>
</table>


5.6 Selection of Preferred Design

Based on the results of the evaluation matrix including the consultation with stakeholders and technical agencies, the study team selected Alternative 4 (from Highway #6 to Main Street) as the Preliminary Preferred Design concept. Figure 5-1, 5-2 and 5-3 illustrates the preferred design concept.

![Figure 5-1: Typical 2-lane Cross Section – Highway #6 to Hollybush Drive](image-url)
Figure 5-2: Typical 3-lane Cross Section – Hollybush Drive to Main Street

Figure 5-3: Typical 3-lane Cross Section – Main Street to Eastern Project Limits
5.7 Review of Preferred Design following Public Information Centre #1

Reaction to the preferred design at the Public Information Centre (PIC) held on September 19, 2012, was unfavorable to the preferred design as shown in Figure 5-3 (for the portion of the study area east of Main Street). As a result, the project team decided to reassess the evaluation of the design alternatives. The main concerns raised at the PIC from the public were:

- No need for any improvements
- No need for a two-way left-turn lane
- Need to include sidewalk on north side
- Do not impact the trees along our road
- Do not impact my property
- Speeding is an issue now and the new design will increase speeding in the future

To fully address these concerns (for the portion of the study area east of Main Street), the project team developed a hybrid solution that would still address the problem statement, but have reduced impacts along the corridor. It should be noted that the hybrid design is not the technically best solution; however, considering the local residents’ concerns, the hybrid design was selected as the preferred design for this section of Parkside Drive. Figure 5-4 illustrates the hybrid design concept.

Figure 5-4: Typical 2-lane Cross Section – Main Street to Eastern Project Limits
It is further recommended that the reconstruction of Parkside Drive occur in two stages, the first, from Highway 6 to Main Street, and following that from Main Street to the east. This would allow time for the new East-West Arterial Road to be constructed and the impacts on Parkside Drive on the eastern section to be confirmed.

5.8 Review Environmental Significance and Choice of Schedule

As required by the Class EA Act, following the selection of the Preferred Alternative Design, the status of the project was confirmed to be a Schedule ‘C’.
6.0 CONSULTATION

6.1 Consultation Round #1

6.1.1 Technical Agency Committee Meeting #1

The first Technical Agency Committee (TAC) Meeting was held on Tuesday, May 29, 2012 at the City of Hamilton meeting room 830 at 2:00 pm. Invitations were sent by email on May 11, 2012 to all the technical agencies.

The TAC meeting #1 was well attended by City of Hamilton staff as well as local utility and conservation authority representatives. Attendees were provided with the background of the project as well as the work done to date, including the preferred design concept. Attendees generally did not present any opposition to the design presented, however, some comments were provided and subsequently incorporated into the preliminary design.

TAC meeting minutes #1 are provided in Appendix A (Public and Agency Consultation).

6.1.2 Stakeholder Advisory Group Meeting #1

The first Stakeholder Advisory Group (SAG) Meeting was held on Tuesday, May 29, 2012 at St. Thomas the Apostle Church at 6:00 pm. Invitations were sent by email on May 11, 2012 to all the members.

The SAG meeting #1 was well attended by local residents and representatives. Attendees were provided with the background of the project as well as the work done to date, including the preferred design concept. Attendees generally did not present any opposition to the design presented, however, some comments were provided and subsequently incorporated into the preliminary design.

SAG meeting #1 minutes are provided in Appendix A.

6.1.3 Public Information Centre #1

Notification

Local area residents, property and business owners, and agencies were invited to attend the first PIC via regular mail (mailed out on September 4th, 2012) and advertisements published in local newspapers (Hamilton Spectator, September 7th and September 14th 2012 and The Flamborough Review on September 6th and September 13th 2012). All Public Information Centre notification materials are provided in Appendix A.
Date and Time

Public Information Centre (PIC) #1 for the Parkside Drive Transportation Corridor Improvements Class Environmental Assessment (EA) Study was held on Wednesday, September 19, 2012 from 6:00 p.m. to 8:00 p.m. at St. Thomas the Apostle Parish.

Purpose

The purpose of this meeting was to provide stakeholders, agencies and interested members of the public an opportunity to meet the Project Team, review the study scope and discuss issues related to the study including alternative solutions, environmental considerations and evaluation of design alternatives and the preliminary preferred design.

The PIC was set up as a “drop-in” style information centre in which participants were encouraged to view the boards on display and to address their questions and concerns to members of the project team.

Display Materials

Information displays presented at the PIC included the following:

- Welcome;
- Purpose of the Public Information Centre
- Study Area;
- The EA Process;
- Parkside Drive Study Process
- Study Organization
- Previous Consultation
- Need and Justification
- Summary of Technical Analysis Undertaken
- Natural Environment – Existing Conditions
- Design Concept Requirements
- Two-Way Left-Turn Lanes
- Overall Design Concepts
- Preliminary Evaluation of Alternative Design Concepts
- Alternative Design Concepts East of Main Street
- Preliminary Evaluation of Alternative Design Concepts for East of Main Street
- Typical Sections – Preferred Alternative
- Next Steps
- Thank you for Attending

The display materials presented are provided in Appendix A.
Attendance and Comments Submitted

Those attending the PIC were requested to sign an attendance booklet and were encouraged to provide their written comments to the material presented. Attendance at the PIC included 71 individuals signing the attendance booklet. Nineteen (19) comments were submitted at the PIC and twenty-two (22) comments were received by mail following the PIC. The submitted comment sheets are provided in Appendix A.

Generally, the concern from the attendees was in regards to the proposed works on Parkside Drive, east of Main Street. There was significant opposition to the identified preferred design concept. Concerns included the need for improvements, safety concerns, impacts to trees and properties, as well as speeding. These issues were also brought up by attendees during discussions held between the project team and attendees at the PIC.

6.2 Consultation Round #2

6.2.1 Technical Agency Committee Meeting #2

The second Technical Agency Committee (TAC) Meeting was held on Friday, November 16, 2012 at the City of Hamilton at 10:00 am. Invitations were sent by email on October 31, 2012 to all the technical agencies.

The TAC meeting #2 was well attended by City of Hamilton staff as well as local utility and conservation authority representatives. Attendees were provided with the background of the project as well as the work done to date, including the preferred design concept. Attendees generally did not present any opposition to the design presented, however, some comments were provided and subsequently incorporated into the preliminary design.

TAC meeting minutes #2 are provided in Appendix A.

6.2.2 Stakeholder Advisory Group Meeting #2

The second Stakeholder Advisory Group (SAG) Meeting was held on Monday, November 12, 2012 at Alexander Place at 6:00 pm. Invitations were sent by email on October 31, 2012 and November 9, 2012 to all the technical agencies.

The SAG meeting #2 was well attended by local residents and representatives. Attendees were provided with the background of the project as well as the work done to date. The focus of the meeting was to present the hybrid design for Parkside Drive, from Main Street to the east study limits. Attendees generally did not present any opposition to the design presented, however, some comments were provided and subsequently incorporated into the preliminary design.

SAG meeting #2 minutes are provided in Appendix A.
6.2.3 Individual Stakeholder Meeting

In response to the comments received at the Public Information Centre held on September 19, 2012, the project team reviewed and revised the design for Parkside Drive from Main Street to the east study limits (see Chapter 5.7). The impacts from this hybrid design were eliminated for this section of the study, with the exception of 328 Parkside Drive. The project team invited the property owner to attend a separate meeting on Monday, November 19, 2012 at 5:30pm in order to present the hybrid design.

At this meeting, the property owners expressed their concern with the design and communicated to the project team that they did not agree with the need to implement any improvements in this area.

6.2.4 Neighbourhood Meeting

Notification

Notice of the Neighbourhood Meeting was provided to local property owners by way of letters.

All Neighbourhood Meeting notification materials are provided in Appendix A.

Date and Time

The Neighbourhood Meeting for the Parkside Drive Transportation Corridor Improvements Class Environmental Assessment (EA) Study was held at Alexander Place, 329 Parkside Drive on Monday, November 19, 2012 from 6:00pm to 7:00pm.

Purpose

The purpose of this meeting was to provide property owners within the east section of Parkside Drive an opportunity to review the hybrid design concept developed as a result of the comments received at the first PIC for this eastern section.

The meeting was set up as a “drop-in” style information centre. There was a formal presentation made by Diana Morreale and Manoj Dilwaria at the beginning of the meeting, as well as a brief question and answer period following the presentation. Following the presentation, participants were encouraged to address any further questions and concerns to members of the project team that were present.
Display Materials

The hybrid design of Parkside Drive, from Centre Street to east of Churchill Avenue was presented on a roll plan. The roll plan presented is provided in Appendix A.

Attendance and Comments Submitted

Those attending the Neighbourhood Meeting were requested to sign an attendance booklet and were encouraged to provide their written comments to the material presented. Attendance at the Neighbourhood Meeting included 44 individuals signing the attendance booklet. Eight (8) comments were submitted at the Neighbourhood Meeting and four (4) comments were received by mail following the Neighbourhood Meeting. The sign-in sheet and submitted comment sheets are provided in Appendix A.

Generally, the comments received were not in favor of the improvements. There was significant opposition to the hybrid design concept. Concerns included the need for improvements, safety concerns, impacts to trees and properties, as well as speeding. These issues were also brought up by attendees during discussions held between the project team and attendees at the Neighbourhood Meeting.
7.0 DESCRIPTION OF THE PREFERRED DESIGN

This section of the report identifies the key features of the preferred design that was developed for Parkside Drive. Additional details, including preliminary plan and profile drawings are provided in Appendix I.

7.1 Preferred Design Components

7.1.1 Typical Cross Sections

The typical cross section selected for Parkside Drive is shown in Figure 5-1, 5-2 and 5-4.

7.1.2 Horizontal Alignment

The horizontal alignment was designed to achieve a number of design goals:

- Follow the existing ROW as closely as possible,
- Minimize impacts to properties that would be significantly impacted by widening the ROW,
- Align with the existing or proposed road alignments at the study limits, and
- Meet the design criteria and minimum design standards.

Based on these design goals, the horizontal alignment generally follows the existing ROW alignment. Deflections in the proposed alignment are generally small (less than 0.5 degrees) and as such do not require horizontal curves. During detailed design, refinements can be made to the horizontal alignment as required.

The preferred alignment design is shown in Appendix I.

7.1.3 Vertical Alignment

The vertical alignment was designed to achieve the following goals:

- Minimize the amount of grading on either side of the ROW,
- Minimize the amount of cut and fill required to construct the new road,
- Follow the existing vertical alignment as closely as possible,
- Align with the existing or proposed vertical alignments at the study limits, and
- Meet the design criteria and minimum design standards.

Based on these design goals, the vertical alignment generally follows the existing road profile. Grades varied between 0.5% and 6.5%, with parabolic curves utilized at all grade changes. During detailed design, refinements can be made to the vertical alignment as required.

The preferred vertical design is shown in Appendix I.
7.1.4 SWM/Drainage

Storm Sewer System

The methodology used for estimating drainage for the identified preferred design is composed of the following:

- The Rational Method was used to calculate flows from the roadway and areas smaller than 5 ha;
- The EPA SWMM model was used to calculate the flows draining from areas north of Parkside Dr. whenever it is applicable;
- Capacity check was conducted based on 85% of full design capacity;
- Velocity check was conducted based on minimum of 0.9 m/s and maximum of 3.65 m/s.
- Runoff coefficient of 0.95 was used for road drainage calculations;
- IDF curves were extracted from the City of Hamilton Criteria and Guidelines for Stormwater Infrastructure Design, and they represent Mount Hope data as recommended by the document;
- The storm sewer system was designed to convey the 5-year storm event if there was an overland flow, or the 100-year flow if there was no overland flow;
- Pipes were assumed as made of concrete with Manning’s n equals to 0.012;
- Manholes are located 120m-150m apart according to the Guideline document;

According to the City of Hamilton Criteria and Guidelines for Stormwater Infrastructure Design, there are five (5) main outlets where the proposed storm sewers outlet to existing hydraulic structures or surface water features. These outlets are:

1. Outlet 1: a proposed 1350 mm storm sewer located to the east of Highway 6;
2. Outlet 2: an existing 1350 mm storm sewer located downstream of Pond 7;
3. Outlet 3: an existing 600 mm storm sewer pipe at Duncan Ave.;
4. Outlet 4: Borer’s Creek crossing;
5. Outlet 5: Grindstone Creek

The storm sewers proposed to drain the stormwater draining from the road section from Main St. to Cole St. is connecting to the existing 900 mm pipe (proposed by AMEC, 2012), which eventually drains to Borer’s Creek. As overland flow routes were not available, all storm sewers were designed to convey the 100-year design flow as recommended by the City of Hamilton except the section draining to Grindstone Creek, which was designed to convey the 5-year flow since an overland flow route is available.

Plan and profile sheets included in Appendix I shows the storm sewer design for the proposed 1350 mm sewer outletting to Borer’s Creek. The sewer drains 39.1 hectares including external drainage from Subcatchments 307, 3070 and Parkside Drive drainage from Highway 6 to 140 m west of Hollybush Drive.
Based on the proposed road design, all proposed storm sewers have a cover above 1.2 m, except for storm sewer S10, where the minimum cover could not be achieved because of limitations related to Borer’s Creek invert elevation. It is recommended that future studies discuss this issue at the detailed level warranted.

**Borer’s Creek Culvert**

Capacity Assessment

Four (4) scenarios were developed and analyzed for the preferred design:

1. Existing conditions with existing culvert size (1.53 x 1.25 m);
2. Proposed conditions according to AMEC (2012). Culvert size upgraded to 2.25 x 1.4 m;
3. Proposed conditions according to AMEC (2012) with road widening and culvert size: 2.25 x 1.4 m;
4. Proposed conditions according to AMEC (2012) with road widening. Culvert size upgraded to 2.25 x 2.1 m

The MTO design criteria for hydraulic structures on freeway systems were used for the culvert capacity assessment, and are summarized below:

- For bridges / culverts with a span up to 6.0 metres, a minimum of 1.0 metre freeboard should be provided for the 50-year event;
- Overtopping analysis should be undertaken using the Regulatory Storm event for watercourses with a drainage area greater than 125 ha;

A summary of the analysis is provided in **Table 7-1**.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>50-Year Storm Freeboard (1.0m required)</th>
<th>Regional Storm Overtopping</th>
<th>Water depth x velocity &lt; 0.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Does not meet minimum (-0.1m)</td>
<td>Overtops (-0.42m)</td>
<td>No (0.42)</td>
</tr>
<tr>
<td>2.</td>
<td>Meets minimum (1.14m)</td>
<td>Overtops (-0.18m)</td>
<td>Yes (0.11)</td>
</tr>
<tr>
<td>3.</td>
<td>Does not meet minimum (0.75m)</td>
<td>Overtops (-0.13m)</td>
<td>Yes (0.11)</td>
</tr>
<tr>
<td>4.</td>
<td>Meets minimum (1.02m)</td>
<td>Overtops (-0.10m)</td>
<td>Yes (0.09)</td>
</tr>
</tbody>
</table>
As shown in Table 7-1, for existing conditions (Scenario 1), the Borer’s culvert has less than one (1.0) meter of freeboard for the 50-year flood event and therefore, it does not meet the MTO design guidelines. Under proposed conditions without road widening (Scenario 2), the proposed culvert (2.25 x 1.4 m) provides more than 1.0 meter of freeboard under the 50-year flow conditions. With the proposed conditions and planned road widening (Scenario 3), the predicted freeboard is less than 1.0 m for the 50-year flow. The results of Scenario 4 which assessed culvert capacity under the size of 2.25 x 2.1 show that the freeboard is above 1 meter.

Table 7-1 summarizes the potential for overtopping for each scenario. As shown in Table 7-1, the road will be overtopped by the Regional flood under all conditions. However, the criterion of having the water depth multiplied with the velocity less than 0.4 was met under Scenario 2 through 4.

Flood Assessment

Historically, Borer’s creek watershed has been under increasing urban development that warranted channel improvement to accommodate post-development flows. In assessing hydraulic structures within the Waterdown North area, Philips (2007) used a HEC RAS hydraulic model that was based on the Borer’s Creek Capacity Assessment report (Philips, 1998). The results of the hydraulic analysis carried out by Philips (2007) indicate that the floodwaters would be entirely contained within the valley system for all events up to and including the 100-year storm. The Regional storm would be anticipated to breach the valley at various locations downstream of Parkside; however this would also be anticipated under existing land use conditions (Philips, 2007).

Updated hydraulic analysis carried out by AMEC (2012) revealed that fourteen (14) residential properties are susceptible to Regional Storm event flooding under existing land use conditions. The change under proposed conditions is minor and does not impact more properties (AMEC, 2012).

In order to evaluate the impact of road widening on flooding in the area, water surface profiles upstream and downstream of the Borer’s Creek culvert were analyzed for the four scenarios mentioned earlier. With a culvert size of 2.25 x 2.1 m box (Scenario 4), there is no increase in flood elevations resulting from flows ranging between 2-year to the Regional Flood upstream and downstream of the culvert. However, there is an increase in the 20-year flow elevation, which is expected to be contained within the valley. Appendix C shows water surface elevations downstream and upstream of the proposed culvert of 2.25 x 2.1 m.

Based on the hydraulic analysis conducted, a box culvert of the dimensions 2.25 x 2.1 m could be used for conveying flows from upstream catchments and drainage from Parkside.
Dr. with sufficient freeboard and without increasing flood elevations upstream or downstream Borer’s Creek culvert.

**Stormwater Management**

Since the study reach is located within two subwatersheds, namely Borer’s Creek subwatershed and Grindstone subwatershed, stormwater management recommendations are proposed accordingly. Each creek has certain water quality and quantity characteristics that affect the recommendations for best management practices to address stormwater management.

Historically, stormwater runoff from Parkside Dr. has not received treatment before discharging either to Borer’s Creek or to Grindstone Creek except for some water quality benefits from the ditch/swale system along the existing road. The preferred design is a typical urban drainage system where road drainage is conveyed using curbs, catch basins and underground storm sewers.

Stormwater management requirements for the proposed Parkside Dr. widening were reviewed based on Conservation Halton letters dated (March 2nd, 2012 and September 19th, 2012), previous studies covering the study area, and the MOE guidelines.

The lands to be developed are within the urban boundary and will be developed as industrial lands. This will reduce infiltration and base flow within these lands. However, this area of the creek is not a regulated area. Any new area that is not within the scope of Waterdown North Master Drainage Plan (WNMDP) must be controlled to the predevelopment flow rates.

**Borer’s Creek**

*a) Water quantity management*

The hydraulic analysis carried out showed that additional drainage resulting from the proposed widening of Parkside Dr. to the east of west of Borer’s Creek will not increase flood elevations.

*b) Water quality management*

Oil-grit separators are recommended at the outlets from the storm sewer system for segments of the road where no physical constraints (e.g. grades, space) exist within this section of Parkside Drive. Previous experience with Oil/grit separators in Ontario has shown that they provide high removal efficiencies for TSS, oil and grease and some heavy metals. Although, these facilities require maintenance to ensure functionality, it is the only viable option within the study area since Ponds 4,5, and 7 cannot be utilized, in addition to the fact that the City does not have LID standards and guidelines in place at this time.

**Grindstone Creek**
a) Water quantity management

Existing drainage area for the road segment draining to Grindstone Creek is around 0.7 ha, and it consists of road drainage only where areas to the north of Parkside Dr. drain eastward to Grindstone Creek while areas to the south of Parkside Dr. drain into the south-east direction to Grindstone Creek. Proposed drainage area is around 1.4 ha, which comprises the widened road from the existing width of approximately 8 m to a road width of around 17 m. The storm sewers draining to Grindstone Creek were designed to convey the 5-year storm event. The 100-year storm event will be drained overland since an overland flow route exists for this segment.

Grindstone Creek Watershed Study recommended measures to maintain, restore, or improve the water quality and quantity of Grindstone Creek. In order to address the quantity control of the stormwater draining from the study area to the Grindstone Creek, the strategies recommended in the Grindstone Creek Watershed study should be followed. Recommendations of the watershed study related to stormwater quantity management include the following:

- **Preventing the increase in flooding: Infiltrate when soils are permeable, and maintain Regional Storm floodplain**

  It was concluded that flood control for the proposed drainage area is not needed because of the following reasons:

  - The drainage area is less than 2 ha which is less than what is required for the recommendation of a stormwater management pond according to MOE (2003);
  - The difference between the existing and proposed drainage area is not significant.

- **Prevent the increase in erosion:**

  Erosion control will not be needed due to minimal impact of additional drainage area resulting from the proposed widening of Parkside Dr.

- **Construct stormwater management facilities**

  The proposed drainage area is less than 2 hectares, which is an area that does not warrant the construction of a stormwater management pond according to MOE guidelines.

b) Water quality management

In order to address the quality control of the stormwater draining from the study area to the Grindstone Creek, the strategies recommended in the Grindstone Creek Watershed study should be followed. Recommendations of the watershed study related to stormwater quality management include the following:
• **Prevent the contamination of surface runoff: include water quality in best management practices**

  Contaminant removal will be facilitated by the use of Oil/Grit separators since the City does not have LID standards and guidelines in place at this time.

• **Construct stormwater management facilities**

  The proposed drainage area is less than 2 hectares, which is an area that does not warrant the construction of a stormwater management pond according to MOE guidelines.

### 7.1.5 Intersections

All intersections within the study area were reviewed for possible improvements. Where warranted, left turn lanes are provided on Parkside Drive with the storage lengths provided as recommended in the transportation analysis. Tapers are provided as per the TAC design standards based on the design speed of the roadway at the intersection approaches. The approaches for intersecting roadways are designed to match their existing cross section.

### 7.1.6 Illumination

Illumination design will need to be considered as part of the detailed design phase of this project. As per the typical cross section shown previously, the illumination design would include light standards within the boulevard wherever sidewalks are recommended. Typical pole and luminaires would be as per The City of Hamilton standards. Light standard spacing and opportunities for sharing poles with the local hydro company would need to be further explored during detailed design.

### 7.1.7 Utilities

All utility companies that may be within the study area were requested to join the Technical Agency Committee at the outset of the study. They were also asked to provide details on locations of existing plant, as well as future plans for the study area. Following the selection of the preferred design, base plans and preliminary design drawings were sent to the utility companies again. The location of these utilities were added to the base plans and assessed for impacts. It was determined that nearly all above ground utilities along Parkside Drive would require relocation. The details of these relocations will need to be considered during detailed design. Also, during reconstruction, the utility companies with underground services should be given an opportunity to replace or relocate their services.

### 7.1.8 Pavement Design

Full depth reconstruction of the existing pavement will generally involve the following:
• Removal of all of the existing asphaltic concrete and underlying base/subbase granular materials. The excavated granular base and subbase materials may be stockpiled for reuse as subgrade fill where needed and the asphaltic concrete will be taken to an asphalt plant for recycling;

• Sub-excavation of subgrade to design elevation to accommodate the new pavement structure; the prepared subgrade should be carefully proof-rolled in the presence of the geotechnical engineer, and soft or wet areas or other obviously deleterious materials excavated and the grade restored with suitable, approved material;

• Restoration of sub-excavated areas and fine grading of the subgrade may be carried out using the stockpiled recycled granular materials from existing pavements, or OPSS 1010 Granular B Type I material. All backfill material should be placed in uniform lifts not exceeding 200 mm loose thickness and compacted to at least 98 per cent Standard Proctor Maximum Dry Density (SPMDD). The finished subgrade should be provided with a continuous centre-to-edge cross fall of 3 per cent;

• Construction of continuous perforated subdrains in accordance with OPSD 216.021Subdrain Pipe Connection and Outlet Urban (or alternatively Hamilton STD No. RD-101). Subdrains should consist of perforated 100 mm diameter subdrain pipe surrounded in 19mm clear crushed stone wrapped in a suitable geotextile. The invert of the pipes should be at least 300mm below the subgrade elevation.

• Placement of a minimum of 500 mm OPSS 1010 Granular B Type II subbase course (or alternatively a minimum of 600 mm OPSS 1010 Granular B Type I subbase course); place in loose lifts not exceeding 200 mm thickness, uniformly compacted to 100 per cent of SPMDD. In areas where the subgrade consists primarily of sand or silty sand, the Granular B Type II subbase thickness may be reduced to 300 mm;

• Placement of 150 mm of OPSS 1010 Granular A base course, uniformly compacted to 100 per cent of SPMDD; and

• Placement of 50 mm of OPSS 1150 HDBC hot mix asphalt binder course and 50 mm of OPSS 1150 HL 1 hot mix asphalt surface course. The surface of the completed pavement should also be provided with a minimum centre-to-edge cross fall of 2 per cent.

The pavement Structural Number is 138, which exceeds the Design Structural Number (115) and is therefore considered to be structurally adequate for the expected traffic loads in 20-year design period.

The pavement design is included in Appendix D.
7.1.9 Property Requirements

In order to accommodate the proposed road improvements, the purchase of property is required. Table 7-2 summarizes the property requirements for the preferred design.

Table 7-2: Property Requirements Summary

<table>
<thead>
<tr>
<th>Street Address</th>
<th>Area of Property Required (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South East Corner of Hwy 6 Intersection</td>
<td>576.9</td>
</tr>
<tr>
<td>133 Parkside Drive</td>
<td>149.0</td>
</tr>
<tr>
<td>135 Parkside Drive</td>
<td>147.0</td>
</tr>
<tr>
<td>184 Parkside Drive</td>
<td>92.8</td>
</tr>
<tr>
<td>200 Parkside Drive</td>
<td>92.8</td>
</tr>
<tr>
<td>229 Parkside Drive</td>
<td>77.0</td>
</tr>
<tr>
<td>237 Parkside Drive</td>
<td>96.9</td>
</tr>
<tr>
<td>239 Parkside Drive</td>
<td>100.1</td>
</tr>
<tr>
<td>240 Parkside Drive</td>
<td>124.3</td>
</tr>
<tr>
<td>245 Parkside Drive</td>
<td>69.3</td>
</tr>
<tr>
<td>261/263 Parkside Drive</td>
<td>183.9</td>
</tr>
<tr>
<td>267 Parkside Drive</td>
<td>115.3</td>
</tr>
<tr>
<td>Park</td>
<td>1045.3</td>
</tr>
<tr>
<td>285 Parkside Drive</td>
<td>32.9</td>
</tr>
<tr>
<td>316 Parkside Drive</td>
<td>4.5</td>
</tr>
<tr>
<td>322 Parkside Drive</td>
<td>4.5</td>
</tr>
<tr>
<td>328 Parkside Drive</td>
<td>4.5</td>
</tr>
<tr>
<td>198 Victoria Street</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2925.1</strong></td>
</tr>
</tbody>
</table>
7.1.10 Preliminary Cost Estimates

The estimated project cost for implementing the Parkside Drive improvements as detailed in the preferred design, from Highway #6 to Main Street, is estimated to be approximately $10.6 million (including property acquisition). Cost to acquire property is estimated to be $460,000.00. The estimated project cost for implementing the Parkside Drive improvements from Main Street to east of Churchill Ave, is estimated to be approximately $2.9 million (including property acquisition). Cost to acquire property is estimated to be $1,800.00.

City of Hamilton will determine the portion of the construction to be covered through Development Charges, General Tax Levy, etc.

Details of the Preliminary Cost Estimate are provided in Appendix J.
8.0 ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

8.1 Natural Environment

In order to mitigate the impacts noted in Section 4.1 and minimize them to the greatest extent possible, MTE provides the following recommendations:

- Tree preservation measures such as signage, fencing and root protection should be applied to all trees to be retained adjacent to the Site and should be maintained until construction activities are complete;
- Trees that pose developmental constraints should be removed in accordance with the City’s active Tree By-law and replaced as per the recommended criteria provided in Table 5 of the Natural Environment Study;
- Restoration efforts within and along the edges of the forest Linkage and Core Area associated with Borer’s Creek should be implemented in order to maintain the ecological function of these features;
- All new plantings should consist of non-invasive species that are indigenous to the Halton and Hamilton area watersheds, and should comply with the City’s and Conservation Authority’s landscaping and planting guidelines;
- All construction activities should occur outside of the general Breeding Bird Season timeframe of May to August;
- All construction-related activities should be controlled to prevent the entry of petroleum products, debris or other deleterious substances and sediment into the watercourses or significant natural features. For instance, silt fencing should be installed along the eastern extent of the construction area during road works to prevent the movement of debris into Grindstone Creek;
- In-stream works must be completed outside of the fish spawning timeframe of September 15th to July 15th in accordance with applicable permits and regulations, with all potential HADD addressed;
- Water quality and tree protection measures should be installed at the location of the proposed stormwater outfall into Grindstone Creek Valley;
- The removal of contaminants from surface runoff prior to entering the watercourses should be facilitated by the use of oil/grit separators (location and size details to be determined during detail design stages); and
- Monitoring is required for implementation of tree protection and silt fencing during construction activities.

8.2 Archaeological

A Stage 1 Archaeological Assessment was conducted to assist with the Parkside Drive EA. A review of the geography and history of the study area suggested that it has potential for the identification of Aboriginal and Euro-Canadian archaeological resources. The property inspection determined that while the majority of the Parkside Drive study area has not
retained archaeological potential due to previous construction activity and low and wet conditions, several parcels of relatively undisturbed land retain archaeological potential.

**Recommendations**

Archaeological potential exists in the study area in the form of several parcels of land adjacent to residential areas and in agricultural fields (see figures 8 through 14, Appendix E). These lands require a Stage 2 Archaeological Assessment, which should be conducted by a combination of pedestrian and test pit survey. A test pit survey includes the systematic excavation of small test pits by hand at 5 m intervals and can only be conducted when ploughing for pedestrian survey is not feasible;

**Advice on Compliance with Legislation**

Compliance with the following legislation is advised:

- The Stage 1 Archaeological Assessment report is to be submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development;

- It is an offence under Sections 48 and 69 of the Ontario Heritage Act for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest , and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the Ontario Heritage Act.

- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act; and

person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

8.3 Built Heritage

Parkside Drive road widening may have a variety of impacts upon built heritage resources and cultural heritage landscapes. Impacts may include: direct impacts that result in the loss of resources through demolition or alteration, or the displacement of resources through relocation; and indirect impacts that result in the disruption of resources by introducing physical, visual, audible or atmospheric elements that are not in keeping with the resources and/or their setting.

Recommendations

Where any identified, above ground, cultural heritage resources are to be affected by direct or indirect impacts, further research should be undertaken to identify the specific heritage significance of the affected cultural heritage resource and/or appropriate mitigation measures should be adopted. This may include completing a heritage impact assessment or documentation report, or employing suitable measures such as landscaping, buffering or other forms of mitigation, where appropriate. In this regard, provincial guidelines should be consulted for advice and further heritage assessment work should be undertaken as necessary.

8.4 Socio-Economic

8.4.1 Property Requirements

Due to the amount of property that will be required to implement the preferred design, The City of Hamilton should initiate the negotiation of property as soon as possible. The City should be committed to provide fair market value for land and/or compensation for damages due to acquisition.

8.4.2 Property Access

The following are the requirements with respect to property access:

- Access to all public and private land will be maintained at all times.
- The contractor(s) shall not enter or occupy with crews, equipment or materials, any lands other than property owned by the City of Hamilton and easements shown on the Detailed Design Drawings, unless formal consent has been received from all affected parties.
- Property/business owners will be contacted during detailed design, to discuss their respective entrance impacts. Applicable mitigation strategies will be developed in consultation with property/business owners.
If property/business access impacts are unavoidable, compensation will be determined in consultation with property owners during the property negotiation process during detailed design.

8.4.3 Noise

Construction Noise

Construction noise is temporary noise and depends on the type of work required. The impact of construction noise depends on the type of equipment used, number of pieces of equipment, time and duration of operation and the proximity to noise sensitive receivers in question.

The following recommendations are made:

- General noise control measures will be referred to, or placed into construction contract documents. The following constraints addressing construction equipment operation and maintenance should be included in the construction contract documents:

  Equipment Maintenance: Equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffling systems, properly secured components and the lubrication of moving parts.

  Equipment Operation: Idling of equipment shall be restricted to the minimum necessary to perform the specified work.

  Additional noise constraints may be included at the discretion of the Environmental Planner. They could include, for example, the siting of the contractor’s yard.

- Any initial complaint from the public will require verification that the general noise control measures agreed to are in effect, any noise concerns will be investigated, and the contractor warned of any problems.

- Notwithstanding compliance with the “general noise control measures”, a persistent complaint will require a contractor to comply with the MOE sound level criteria for construction equipment contained in the MOE Model Municipal Noise Control By-law. Subject to the results of field investigation, alternative noise control measures will be required, where these are reasonably available.

Post-Construction Noise
For the purpose of assessing noise as part of a road expansion project, a noise sensitive area (NSA) is defined as a noise sensitive land use with an outdoor living area, which includes: single family houses (typically back yard), townhouses (typically back yard), multiple unit buildings such as apartments with outdoor living areas for use by all occupants, as well as hospital and nursing homes, where there are outdoor living areas for the patients.

As described in the MTO (2006) guide to transportation noise assessments, the acoustic impact of a major transportation project is determined by predicting the future noise levels after the project is completed and comparing with the future noise levels without the project. The level of noise experienced is a combination of factors, including, traffic volume, distance to the source of noise and objects that serve to block or reflect the noise.

In light of these factors, no noise mitigation efforts are required for the following reasons:

- An overall reduction in traffic volumes following construction of the new East-West corridor will result in an overall reduction in noise levels.
- The road widening will reduce the distance between the travel lanes and any noise sensitive areas (NSA’s) however, the change in distance and the corresponding increase in noise levels will be minimal.
- A significant portion of the properties fronting on Parkside Drive consist of either agricultural land, commercial properties or front facing lots, which provide no opportunity for noise mitigation efforts.
- Residential properties that back onto Parkside Drive currently have fences in place. These fences are currently serving the function of noise mitigation.

### 8.5 Air Quality

During construction air quality can be degraded locally due to construction equipment and dust. The following measures are recommended to mitigate the effects of construction on air quality:

- Parkside Drive and adjacent streets shall be swept and/or washed at the end of each work day and as required;
- Water and/or commercial dust suppressants approved by the Ministry of Environment (MOE) are to be used during construction to reduce dust emissions.
- All haul equipment shall use tarpaulins to cover loads of materials being delivered or removed from the construction site;
- Stockpiles of fine grained materials shall be covered with tarpaulins during dry and/or windy periods;
- All equipment shall have properly installed and functioning exhaust systems; and
- Burning of waste materials is prohibited onsite.
8.6 Commitment to Future Work

The permits and approvals that may be required for this project are identified in Table 8-1.

Table 8-1: Commitment to Future Work

<table>
<thead>
<tr>
<th>Future Work</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Review the need for improvements to the east section of Parkside Drive</td>
<td>Following completion of the first Phase of Parkside Drive and the construction of the new East-West corridor, determine if the need to reconstruct the east section of Parkside Drive is still valid</td>
</tr>
<tr>
<td>2. Stage 2 Archaeological Assessment</td>
<td>Prior to Construction, complete a Stage 2 Archaeological Assessment where identified in the Stage 1 Archaeological Assessment Report.</td>
</tr>
<tr>
<td>3. Tree Protection</td>
<td>Tree protection measures should be installed within, and adjacent to, the Core Feature and Borer’s Creek during construction phases. Trees that do not pose a development constraint are to be retained and appropriate signage, fencing and root protection measures are to be applied during the construction phase. Monitoring should be done of trees during construction activities.</td>
</tr>
<tr>
<td>4. Tree Replacement</td>
<td>Trees that pose development constraints are to be removed and replaced according to the recommended replacement criteria and must be removed in accordance with the City’s Tree By-Law No. 06-151. Monitoring should be done of trees during construction activities.</td>
</tr>
<tr>
<td>5. Silt Control</td>
<td>Silt fencing should be installed along the eastern extent of the construction area in order to prevent the movement of debris into Grindstone Creek.</td>
</tr>
</tbody>
</table>
8.7 Summary of Permitting Requirements

The permits and approvals that may be required for this project are identified in Table 8-1.

Table 8-2: Permits and Approvals

<table>
<thead>
<tr>
<th>Regulatory Agency</th>
<th>Legislation</th>
<th>Permit/Approval</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Federal Government</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canadian Environmental Assessment Agency (CEAA)</td>
<td>Canadian Environmental Assessment act</td>
<td>Federal Environmental Screening</td>
<td>May be required. Triggered by requirement for Fisheries Act approval</td>
</tr>
<tr>
<td>Fisheries and Oceans Canada (DFO)</td>
<td>Fisheries Act</td>
<td>Authorization for the Harmful Alteration, Disruption or Destruction of Fish Habitat</td>
<td>Will require preparation of a Fish Habitat Compensation and Mitigation Plan.</td>
</tr>
<tr>
<td><strong>Provincial Government</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ministry of the Environment</td>
<td>Ontario Environmental Assessment Act</td>
<td>Schedule ‘C’ Class EA (Municipal Engineer’s Association Class EA)</td>
<td>Satisfactory completion of EA requirements is a prerequisite for obtaining most other approvals</td>
</tr>
<tr>
<td></td>
<td>Ontario Water Resources Act</td>
<td>Permit to Take Water</td>
<td>Required if &gt;50,000 L/d of surface or groundwater taken, includes temporary dewatering during construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Certificate of Approval (CofA) for Industrial Sewage Works</td>
<td>Required if settling pond or other water treatment used during construction</td>
</tr>
<tr>
<td>Ministry of Labour</td>
<td>Construction Projects Regulation (O.Reg. 213/91)</td>
<td>Notice of Project</td>
<td>Required before construction commences</td>
</tr>
</tbody>
</table>