City of Hamilton

Trinity Church Arterial Corridor Class Environmental Assessment Study Report Phase 3 and 4

City of Hamilton

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Project # 3349

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1. INTRODUCTION AND BACKGROUND

1.1 Introduction and Project Context

The Rymal Road Planning Area (ROPA 9) Master Plan Class Environmental Assessment documents Phases 1 and 2 (as per the Municipal Class EA process) of the recommended transportation improvements necessary to support the Rymal Road Secondary Plan area and the Special Policy Area 'C'. The Class Environmental Assessment process allows the Master Plan approach to be used for a group of related works or undertakings. Council has approved the Master Plan approach for the group of infrastructure improvements, in accordance with Section A.2.7 of the Municipal Engineers Class Environmental Assessment process.

Completion of the Master Plan Class Environmental Assessment is part of the process to enable the City to address both the short-term and long-term infrastructure and service needs for the Rymal Road Planning Area, and for Special Policy Area 'C'. The Master Plan was approved by the City Council in June 2006.

The City of Hamilton has also undertaken a Transportation Master Plan for the North Glanbrook Industrial Business Park. The North Glanbrook Industrial Business Park is defined by an area bounded by the north side of the Hydro Corridor on the north, Trinity Church Road on the east, Dickenson Road on the south, and beyond Nebo Road (in the vicinity of Upper Ottawa Street) on the west. The study has identified a transportation network within the North Glanbrook Industrial Business Park Secondary Plan area to support planned future development. This Transportation Master Plan has been endorsed by Council on July 12, 2006.

The ROPA 9 Master Plan addressed the Phase 1 and 2 requirements for the Trinity Church Arterial Corridor, north of Rymal Road. The North Glanbrook Industrial Business Park Master Plan addressed the Phase 1 and 2 requirements for the Trinity Church Arterial Corridor, south of Rymal Road. The Phase 3 and 4 EA study will address the entire corridor (north and south of Rymal Road).

The Trinity Church Arterial Corridor Environmental Assessment Study Area is bounded by Upper Mount Albion to the east, Stone Church Road-Paramount Drive to the north, Glover Road to the west, and Dickenson Road to the south. The study area is illustrated **Exhibit 1-1**.

A number of studies formed part of Phases 1 and 2 of the Master Plan Class EA. The flow chart below provides a summary and the relation of the Trinity Church Arterial Corridor study in relation to the ROPA 9 and NGIBP Master Plans.



The identification and evaluation of design alternatives and the selection of preferred design alternatives for transportation improvements for the Trinity Church Arterial Corridor are documented in this report summarizing Phases 3 and 4 of the Class EA process.

1.2 **Project Location and Study Area**

The project is located within the City of Hamilton, and spans three former municipalities - the former City of Stoney Creek, the former Township of Glanbrook and the former boundaries of the City of Hamilton. The project Study Area is shown in **Exhibit 1-1**.



Exhibit 1-1 Study Area

1.3 <u>Study Scope and Objectives</u>

1.3.1 Findings of the ROPA 9 Master Plan Class EA

The preferred planning alternative includes a combination of travel demand management and transit initiatives, new major infrastructure, road widenings and operational improvements.

The ROPA 9 Master Plan identified that a north-south link from the Red Hill Valley Parkway to south of Rymal Road is crucial to the broader road network within the City, and would also serve the local community. Providing adequate capacity in this corridor is critical to planning for the economic growth and well-being of the City. The former Region of Hamilton-Wentworth Official Plan recognizes this need, and has highlighted a future extension of Trinity Church Road to the Red Hill Valley Parkway.

The ROPA 9 Master Plan also identified the need for a north-south link from the Red Hill Valley Parkway to south of Rymal Road as a longer term solution to address the traffic operations issues within the Trinity Neighbourhood. It recommended that once the new road link was provided, Upper Mount Albion Road could be closed at Rymal Road.

1.3.2 Findings of the North Glanbrook Industrial Business Park Transportation Master Plan

In an effort to spur industrial development and make available "shovel ready lands", the City of Hamilton undertook the North Glanbrook Industrial Business Park (NGIBP) Transportation Master Plan to identify a road network that will support the development of the lands in accordance with the current approved land uses identified in the Secondary Plan for the area. The study was necessary in order to plan for the expected increase in traffic on roadways within and adjacent to the NGIBP when development occurs.

The NGIBP Transportation Master Plan identified the need for a two lane arterial road from Rymal Road to the future Dartnall Road Extension in the vicinity of Trinity Church Road with the protection for four lanes for the arterial road in the longer term.

The Study stated that Trinity Church Road including the east-west extension to the Dartnall Road Extension is a longer term project tied to development in the park as well as growth occurring at the airport. As development in the park should have been established by the time this upgrade is needed, it is feasible and maybe more appropriate to have it constructed as development proceeds as part of a Plan of Subdivision. If driven by airport growth, it may be more appropriate for the City of Hamilton to acquire lands and construct the road in one stage.

1.3.3 Study Objectives and Approach

With the approval of the Trinity Church Road improvements north of Rymal Road as part of the Rymal Road Planning Area Master Plan and improvements south of Rymal Road as part of the North Glanbrook Industrial Business Park Transportation Master Plan, it is appropriate that the Schedule 'C' requirements for both projects to be undertaken in one Class EA to be consistent with the direction of the MEA Class EA document.

1.3.4 Implementation

The timing for implementation of the Trinity Church Arterial Corridor segment between Stone Church Road and Rymal Road was discussed in the Rymal Road Planning Area Master Plan, which identified that additional north-south capacity (equivalent to 2 lanes per direction) is needed in the Trinity Church Arterial Corridor by the 2011 time horizon and should be implemented as soon as possible, given design and funding constraints.

The North Glanbrook Industrial Business Park Master Plan identified a need for a longerterm extension of the Trinity Church Arterial Corridor to continue south of Rymal Road to service the Business Park and to allow flexibility for a potential future connection to the airport.

1.4 <u>Project Team</u>

The Trinity Church Arterial Corridor Environmental Assessment Study is being carried out by a consulting team led by iTRANS Consulting Inc., on behalf of the City of Hamilton. The Study team is outlined below:

City of Hamilton:

- Christine Lee-Morrison (City Project Manager) Environmental Planning
- Mohan Philip Strategic Planning
- Leanne Ryan Traffic Engineering & Operations
- Harold Groen Functional Planning
- Tony Sergi Development Engineering

Consulting Team:

- Ray Bacquie (Consultant Project Manager) iTRANS Consulting
- Suzette Shiu (Transportation Planning) iTRANS Consulting
- Greg Perry (Road Design) iTRANS Consulting
- Nathalie Baudais (Project Coordination) iTRANS Consulting
- Christine Hill (Stormwater Management) XCG
- Grant Kauffman (Natural Environment) LGL
- Richard Unterman (Cultural Heritage) Unterman McPhail Associates
- Robert Pihl (Archaeology) Archaeological Services Inc.

1.5 Class Environmental Assessment Process

This Environmental Assessment (EA) is being undertaken in accordance with the guidelines of the Municipal Engineers Association *Municipal Class Environmental Assessment*, June 2000. The Environmental Assessment is being conducted in compliance with the guidelines for **Schedule "A", "B", and "C"** projects for the transportation infrastructure components. A brief description of each schedule follows:

- A Schedule "A" project is limited in scale, has minimal adverse environmental effects, and includes a number of municipal maintenance and operational activities. Schedule "A" projects are pre-approved and the proponent may proceed to implementation without following the full Class EA process.
- A schedule "B" project has the potential for some adverse environmental effects. Schedule "B" projects generally include improvements and minor expansions to existing facilities, and the proponent is required to undertake a screening process.
- A Schedule "C" project is one that generally involves the construction of new facilities and major expansions of existing facilities, for a total design and construction cost of greater than \$1.5 million for roads. Schedule "C" projects have the potential for significant environmental impact.

The Class EA Master Plan summarized the work completed including: 1) background to the Study; 2) the problem statement 3) alternative solutions; 4) a description of the preferred alternative solutions and the rationale for the identification of the preferred alternative solutions; and 5) the public consultation process.

This Study will complete the third and fourth phases of the five-phase Class Environmental Assessment Process. **Exhibit 1-2** illustrates the sequence of activities within the approved Class Environmental Assessment process leading to project implementation. The encompassing phases for this Study are described below:

- Phase 3 (Schedule "C" projects) Examine alternative methods of implementing the preferred solution, based on the existing environment, public and review agency input, anticipated environmental effects, and methods of minimizing negative effects and maximizing positive effects.
- Phase 4 (Schedule "C" projects) Document in an Environmental Study Report (ESR) a summary of the rationale, and the planning, design, and consultation process of the project.

Phase 5 (Schedule "A", "B" and "C" projects), which involves detail design, preparation of contract drawings and tender documents, construction, operation, and monitoring, is not part of this Study.

The Schedule "C" project resulting from the Master Plan Studies which will be documented in this Environmental Study Report is the Trinity Church Arterial Corridor. The Class EA Master Plan for the Rymal Road Planning Area was endorsed by City Council on June 14, 2006 and for the NGIBP on July 12, 2006. A Notice of Completion will advise the public and other stakeholders of their right to request a Part II Order, and how and when such a request must be submitted. Under the Environmental Assessment Act, if it is felt after consulting with the proponent (the City of Hamilton) that serious environmental concerns remain unresolved, members of the public, interest groups, agencies, and other stakeholders may submit a written request to the Minister of the Environment to require the proponent to comply with Part II of the Environmental Assessment Act before proceeding with the proposed undertaking. Part II of the EA Act addresses Individual Environmental Assessments.

The request for a Part II Order must be copied to the proponent at the same time it is submitted to the Minister. Written requests for a Part II Order must be submitted to the Minister within the 30-calendar day review period, after the proponent has filed the Master Plan ESR and has issued the Notice of Completion of the Study. The decision to issue a Part II Order rests with the Minister of the Environment. Requests after the minimum 30-calendar day review period will not be considered by the Minister of the Environment.

1.6 <u>Agency/Stakeholder Consultation</u>

A list of agency stakeholders, including federal and provincial ministries, City of Hamilton departments, local groups, conservation authorities, utilities, and developers and their consultants was prepared at the project initiation. The opportunity for these parties to participate in the project was provided through the distribution of a Study Commencement notice. Further opportunity was also provided through announcement of two formal Public Information Centres (PICs). The following is a summary of the agencies contact list.

Federal Agencies

- Canadian Wildlife Services
- Canadian Environmental
 Assessment Agency
- Department of Fisheries and Oceans
- Environment Canada
- Parks Canada

Provincial Agencies

- Ontario Realty Corporation
- Ontario Provincial Police Burlington
 Detachment
- Ministry of Agriculture, Food & Rural Affairs
- Ministry of Culture / Ministry of Tourism and Recreation
- Ministry of Community and Social Services
- Heritage and Libraries Branch, Ministry of Culture
- Ministry of Natural Resources
- Ministry of the Environment
- Ministry of Transportation
- Ministry of Health and Long Term Care

First Nations

Six Nations

City of Hamilton Departments

- Corporate Services
- Economic Development
- Hamilton Emergency Services
- Hamilton Police Services
- Mayor's Office / Council
- Planning and Development
- Public Health and Community Services
- Public Works

Local Groups / Stakeholders

- Citizens for a Sustainable Community
- Hamilton Chamber of Commerce
- Hamilton-Wentworth Catholic
 School Board
- Hamilton-Wentworth District
 School Board
- Local Architectural Conservation Advisory Committee
- Ontario Archaeological Society
- Canadian Center for Inland Waters
 Remedial Action Plan (RAP)
- Resident's Group: Upper Mount Albion Road

Conservation Authorities

- Hamilton Conservation Authority
- Niagara Peninsula Conservation Authority
- Niagara Escarpment Commission

Business Improvement Areas

- Barton Village BIA
- Concession Street BIA
- Downtown Hamilton BIA
- Dundas Downtown BIA
- International Village BIA
- King Street West BIA
- Main-West Esplanade BIA
- Ottawa Street BIA
- Stoney Creek BIA
- Waterdown BIA

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Westdale Village BIA



Exhibit 1-2 Class Environmental Assessment Process

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Utilities

- Bell Canada
- Cogeco Cable Inc.
- Enbridge Pipelines Inc.
- Hydro One
- Hamilton Hydro Incorporated
- Hamilton Community Energy
- Hamilton Utilities Corporation
- Fibrewired Network Hamilton
- Source Cable Limited
- Ontario Power Generation
- Union Gas Limited
- Trans Northern Pipeline
- TransCanada Pipelines Limited
- Mountain Cablevision
- Allstream (formerly ATT & Unitel)
- Canadian National Railway
- Canadian Pacific Railway
- Imperial Oil Products & Chemical Division
- Sun Canadian Pipeline

Developers and their Consultants

SmartCentres

- Counterpoint Engineering
 - Multi-Area Developments Inc.
- A.J. Clarke and Associates Ltd.
- LEA Consulting Ltd.
- Loblaw Properties Limited
- Delcan Corporation
- J. Beume Real Estate Ltd.
- Mr. Joseph Maziarz
- Mr. Jack Pelech
- Mr. Nimigan
- Mr. Lombardi
- Mr. Dicienzio
- Silvestri Investments
- BA Consulting Group Ltd.
- Arbra Developments Inc.
 - Demik Brothers Ltd.
- Paletta International Corporation
- McNally International Inc.
- Ontario Realty Corporation

Correspondences with agencies are provided in Appendix A.1.

1.7 <u>Summary of Public Consultation Process</u>

A comprehensive public consultation program was conducted for the Study, with the following components:

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- Mailing Lists A number of mailing lists were established for the Master Plan Study and were maintained for the Phase 3 and 4 Class Environmental Assessment Study. These included an agency mailing list as mentioned above and a mailing list which consisted of all members of the public within and adjacent to the Study Area, in addition to others who wrote, telephoned, emailed, or filled in comment sheets during the Study. People on the mailing list were sent letters prior to each of the public meetings. Opportunities for public input were provided throughout the process, including public meetings, telephone inquiries, letters, email and faxes.
- Stakeholder and Technical Committee Meetings A Stakeholder and Technical Committee was established as part of the Master Plan Study and was maintained for the Phase 3 and 4 Class Environmental Assessment Study. One meeting was held with this group during the Phase 3 and 4 Study. The meeting was held prior to the second Phase 3 and 4 Public Information Centre (PIC). The stakeholders consisted of representatives of

local groups and businesses, and developers. City of Hamilton staff and consultants comprised the technical representatives.

- Developers and their Consultants A list of developers and their consultants was
 prepared at the project initiation. The opportunity for these parties to participate in the
 project was provided through the distribution of a Study Commencement notice. One
 meeting was held prior to the first Phase 3 and 4 Public Information Centre (PIC) and a
 mail out update was sent prior to filing the Environmental Study Report.
- Public Information Centres (PICs) Two formal meetings were held during the Study. They consisted of a public open house with display panels. Attendees were asked to signin when they entered the public open house. A handout consisting of key display panels was made available. Comment forms were available to provide the public another opportunity for input to the Study. Members of the project team were on hand to respond to questions and concerns. Issues raised by the public during and after each meeting were recorded by the consultant team and subsequently addressed.
- Newspaper advertisements At least one and a half weeks prior to each public meeting, a newspaper advertisement was placed in two separate editions of the *Hamilton Spectator* and in one edition of the *At Your Service*, *Mountain News, Stoney Creek News*, and *Glanbrook Gazette* to announce the date, time, and location of the meetings. The newspaper advertisements invited the public to attend the meetings and to provide input. The advertisements provided information on contact names, telephone numbers, and addresses.
- Additional notification At least one and a half weeks prior to each public meeting, a
 notice of the public meeting was mailed out to area residents and businesses on the
 project mailing lists. Notification letters were also mailed to utility companies and
 external agencies.
- **Project email address** Through the newspaper advertisements and comments sheets, the public was invited to send comments by email to both the City and consultant team project managers.
- **Project website** As part of the Master Plan Study, a project website was launched to provide the public with an additional means to obtain information about the project. The project website was maintained during the Phase 3 and 4 Study and the website was advertised in the PIC display materials.

Further details on the public consultation process are documented in other sections of the report. A summary of the Public Meetings is provided in **Appendix A.3**.

Major events in the Phase 3 and 4 public consultation process are summarized as follows:

June 2007

:	Meeting with Six Nations Council Notification letters to utility companies, external agencies, area businesses, residents and other stakeholders for Public Information Centre	June 6, 2006 June 14, 2006
•	Newspaper advertisement of Public Information Centre	June 16, 2006 & June 23, 2006
•	Meeting with Developers and their Consultants	June 19, 2006
•	Public Information Centre	June 26, 2006
•	Notification letters to utility companies, external agencies, area businesses, residents and other stakeholders for Public Information Centre	September 29, 2006
•	Newspaper advertisement of Public Information Centre	September 29 & October 6, 2006
•	Meeting with Stakeholder and Technical Committee	October 2, 2006
•	Public Information Centre	October 12, 2006 &
		October 18, 2006
	City of Hamilton Council pre-approval report	September 27, 2006
•	Notice of Study Completion (Phases 3 and 4)	June 15, 2007 & June 22, 2007

1.7.1 ROPA 9 Master Plan Public Consultation Process

During the Problem Statement and Planning Alternatives phases of the ROPA 9 Master Plan, the public consultation process for the Trinity Church Arterial Corridor involved the following activities:

•	First Stakeholder Committee Meeting	September 19, 2005
•	First Public Information Centre	October 3, 2005

First Stakeholder Committee Meeting (SC#1)

Representatives of the City and the consultant team met with the Stakeholder Committee once during this phase of the project. These meetings provided the SC members an opportunity to meet the project team, gain preliminary information on the project, and discuss any issues relating to the project. At the first meeting, 10 members of the SC were present. Many items were discussed, including:

- How the EA process works and the role of the SC, City of Hamilton, and the consultant team in this process;
- SC Terms of Reference;
- Other studies being carried out in the vicinity of the Study Area which may pertain to this Study;
- Problem Statement; and
- The preliminary list of evaluation criteria. The following criterion was added: Adjacent Local Roads (Potential for Traffic Infiltration)

First Public Information Centre (PIC#1)

The first Public Information Centre (PIC#1) was held on Tuesday, October 3rd, 2005 from 6 p.m. to 9 p.m., at the Salvation Army Church Gym, 300 Winterberry Drive (at Paramount Drive), in the City of Hamilton. The purpose of PIC#1 was to provide information about the Study to the public and at the same time obtain public input. Twenty-four panels were displayed. The information panels included the following:

- Welcome and Study Area
- Description of the Study background, Study goal and scope
- Chart of the EA process and class EA requirements
- Description of the public consultation plan
- Summary of the needs and opportunities for the Study for transportation, water, and wastewater
- Problem statement for transportation, water, and wastewater
- Existing official plan policies and other applicable policies
- Description of existing conditions
- Description of 7 transportation alternative solutions
- Description of 5 water alternative solutions
- Description of 3 wastewater alternative solutions
- Description of alternative solutions assessment criteria
- Evaluation tables of the transportation, water, and wastewater planning alternatives
- Identification and description of the preferred transportation, water, and wastewater planning alternatives
- Future actions
- Contact information

As with all of the public information centres, the public was advised about the meeting through advertisements in the local paper. Advertisements were placed in the Hamilton Spectator on Friday September 16, 2005 and Friday September 23, 2005, and in the Brabant papers (Mountain News, Glanbrook Gazette and Stoney Creek News) on Friday September 16, 2005. Notification letters were also mailed out to property owners within the Study Area, to other individuals who had responded with an interest in the Study since its commencement, to conservation authorities, Federal and Provincial agencies, and utility companies.

The format was an informal drop-in centre from 6:00 to 7:00 PM to meet the project team and to view the display panels and drawings. There was a presentation at 7:00 PM, followed by a question and answer period. The PIC continued until 9:00 PM, which provided participants the opportunity to further discuss the project with the Study team. Attendees were asked to sign-in and were invited to fill-in comment forms at their convenience within a 3-week time frame. Approximately 122 members of the public attended the PIC. Representatives from the City of Hamilton, iTRANS, and XCG attended the PIC to discuss the details of the project and answer questions of the public.

Key public comments provided on the Trinity Church Arterial Corridor needs assessment were related to the following topics:

- Need for a new north south link between Rymal Road and the Red Hill Valley Parkway/Stone Church Road ramps,
- Timing for improvement,
- Closure of Upper Mount Albion Road;
- Alignment alternatives; and
- Potential impacts of a new north-south roadway on adjacent properties, suggestions for consideration of other routes.

Further details and documentation regarding the Phase 1 and 2 consultation process can be found in the ROPA 9 Master Plan, June 2006.

1.7.2 North Glanbrook Industrial Business Park Master Plan Public Consultation Process

First Public Information Centre (PIC#1)

The first of two Public Information Centres (PIC) was held on Wednesday, June 29, 2005 from 4:00pm to 8:00pm at the Trinity United Church. This PIC was attended by the following members of the project team:

- Gavin Norman, City of Hamilton
- Mike Bricks, Ecoplans Limited
- Jack Thompson, McCormick Rankin Corporation

The PIC was attended by 76 people (count from sign-in sheet). The majority of the attendees reside within or nearby the study area.

The PIC was an open house with display boards presenting the network alternatives considered, the evaluation of alternatives and the recommended network. Attendees had the opportunity to address and discuss any question or concerns with the project team. Handout copies of the PIC display board and evaluation charts were available.

Comment sheets were provided for submission of comments During the PIC 15 comment sheets were submitted. After the PIC additional comments were received and included one fax, four e-mails and four letters. In addition to written comments, five telephone requests for PIC handouts were received by the City of Hamilton. The following table summarizes the written comments received. In addition to written comments, the following provides a general overview of attendee verbal comments during the Public Information Centre:

- Impact to residential homes along Trinity Church and concerns re: safety, increased traffic and previous Glanbrook bylaw providing a buffer strip between industrial development and Trinity Church Road should be implemented;
- Viability of the North Glanbrook Industrial Business Park;
- Displacement of agricultural land for more industrial land;
- Support for North Glanbrook Industrial Park since the Red Hill Valley Expressway will provide needed access;
- Interest in the extent of future sanitary services in study area;
- Alignment concerns specific to certain landowners; and
- Redirection of traffic away from roads servicing residential homes

Second Public Information Centre (PIC #2)

The second and final Public Information Centres (PIC) for the North Glanbrook Industrial Business Park was held on Tuesday, June 16, 2006 from 4:00pm to 8:00pm at the Trinity United Church. This PIC was attended by the following members of the project team:

- Gavin Norman, City of Hamilton
- Mike Bricks, Ecoplans Limited
- Katie Bright, Ecoplans Limited
- Scott Roberts, McCormick Rankin Corporation

The PIC was attended by 63 people (count from sign-in sheet). The majority of the attendees reside within or nearby the study area.

The PIC was an open house with display boards presenting the comments from the first PIC, the preferred network, details of the Schedule B projects, future study areas for Schedule C projects and three Dartnall Road Extension alignment alternatives. Attendees had the opportunity to address and discuss any question or concerns with the project team. Handout copies of the PIC display boards were available. Comment sheets were provided for submission of comments.

In addition to written comments, the following provides a general overview of attendee verbal comments during the Public Information Centre:

- Interest in future zoning changes and land use plans within the North Glanbrook Industrial Business Park;
- Concern regarding the displacement of agricultural land for more industrial land;
- Concern regarding direct link between the North Glanbrook Industrial Park and the Red Hill Valley Parkway, especially along Trinity Church Road; and
- Alignment concerns specific to certain landowners.

Further details and documentation regarding the Phase 1 and 2 consultation process can be found in the ROPA 9 Master Plan, June 2006.

1.7.3 Phase 3 and 4 Consultation

The public consultation process and public reaction during the Design Phase for the Trinity Church Arterial Corridor are summarized in **Section 4.2** of this report. Additional details on the public consultation process are contained in **Appendix A**.

2. EXISTING STUDY AREA CONDITIONS

This section describes the features of the existing transportation infrastructure in the study area. For information on the existing socio-economic environment, natural environment, surface runoff and utilities, please refer to the Master Plan document.

2.1 **Existing Transportation Facilities**

2.1.1 Road Classification

The existing road network and classifications based on the current City's Official Plan designations are illustrated in **Exhibit 2-1**. The official plan definitions of the road classes and designated right-of-way are noted in **Table 2-1**. For specifics on any road in the City's road network, refer to the appropriate Official Plan for right-of-way designations. The appropriate volume for the different classes is based on the 1999 *Geometric Design Guide for Canadian Roads* by the Transportation Association of Canada (TAC) and represents the 24-hour two-direction volume thresholds.

Current Designation	Definition	Designated Right-of-Way	Volume for Class
Arterial	Strategic links in the road network, the main functions of which are to carry relatively high volumes of long distance traffic within, between or through the City and surrounding Area Municipalities and/or to provide access past major geographic barriers and to inter-regional highways.	36 m	> 5,000 < 30,000
Collector	Function as connecting road links between Arterial and Local Roads. They generally carry lower traffic volumes than Arterial Roads and may provide direct access to abutting properties.	26 m	<8,000
Local	Provide direct access to abutting properties and carry traffic predominantly of local nature.	20 m	<1,500

 Table 2-1: Official Plan Definitions of the Road Classes

For roads in the City of Hamilton, road right-of-way designations can reach up to 60 m and volumes may exceed 30,000 per day.



Not to Scale

Exhibit 2-1 **Existing Road Network and Classifications** itrans

2.1.2 Road Network and Characteristics

The study area roads are described below.

Rymal Road – Rymal Road is an east-west arterial road, with a two-lane, paved rural crosssection and a posted speed limit of 70 km/h. Rymal Road had horizontal curves between Pritchard Road and Trinity Church Road. It intersects with a number of north-south collector and arterial roads. Rymal Road will also provide new collector road connections to the Rymal Road Planning area. Rymal Road has several residential and commercial accesses. No sidewalks are currently provided along the roadway.

Parallel east-west roadways north of Rymal Road include Mud Street West and Highland Road East. Golf Club Road parallels Rymal Road to the south of the Study Area.



Exhibit 2-2: Rymal Road Westbound (approaching Fletcher Road)



Exhibit 2-3: Rymal Road Westbound (approaching Swayze Road)

Trinity Church Road – Trinity Church Road is a two-lane north-south arterial south of Rymal Road with a rural cross-section, no shoulders and a posted speed limit of 50 km/h north of the Hydro Corridor and a posted speed limit of 60 km/h south of the Hydro Corridor. Trinity Church Road currently terminates at Rymal Road. The vertical geometry of Trinity Church Road is rolling. A future interchange for the Red Hill Valley Parkway is currently aligned with an extension of Trinity Church Road. Trinity Church Road provides north-south access for the lands in Glanbrook to the south of ROPA 9. There are residential driveways along Trinity Church Road. No sidewalks are provided on either side of the roadway.



Exhibit 2-4: Trinity Church Road Northbound (approaching Rymal Road)

Upper Mount Albion Road – Upper Mount Albion Road is a local road which extends from Mud Street to Rymal Road, and is discontinuous at the Lincoln Alexander Parkway. The road provides direct access to residential properties but provides an arterial road function in the study area road network. It is anticipated that Upper Mount Albion Road will serve more of a local road function (as designated) in the future. Upper Mount Albion Road has a posted speed limit of 60 km/h. The road has a rural cross-section with an average pavement width of approximately 7.5 m and no sidewalks. Upper Mount Albion Road has a rolling terrain. There are several residential accesses and frontages along Upper Mount Albion Road.



Exhibit 2-5: Upper Mount Albion Road Northbound (north of Rymal Road)

Highland Road – Highland Road is a collector road. It has an urban cross-section east of Winterberry Drive and a rural cross-section with an average pavement width of approximately 6.5 m west of Winterberry Drive. There are residential accesses and frontage along Highland Road, which becomes more dense east of Winterberry Drive. A high school (Saltfleet Secondary School) is located on the northwest corner of the intersection with Highbury Drive. A sidewalk is provided on the north side of Highland Road, east of Winterberry Drive. The posted speed limit on Highland Road is 50 km/h, reducing to 40 km/h near Highbury Drive.



Exhibit 2-6: Highland Road Eastbound (at Upper Mount Albion Road)

Stone Church Road – Stone Church Road is an east-west arterial which provides access to Mud Street via Paramount Drive. Stone Church Road has an urban cross-section with paved

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shoulders west of Pritchard Road, a rural cross-section with paved shoulders east of Upper Mount Albion Road, and a rural cross-section with gravel shoulders between Upper Mount Albion Road and Pritchard Road. A sidewalk is provided on the south side of Stone Church Road, near Winterberry Drive. Bike lanes are provided on Stone Church Road west of Pritchard Road, and near the intersection with Winterberry Drive. No bike lanes currently exist between Pritchard Road and east of Upper Mount Albion Road.



Exhibit 2-7: Stone Church Road Westbound (east of Pritchard Road)



Exhibit 2-8: Stone Church Road Eastbound (at Winterberry Drive)

3. PREFERRED PLANNING ALTERNATIVE

The Class Environmental Assessment process requires the examination of all reasonable alternatives, including alternatives to the undertaking, referred to as planning alternatives. Through the Master Plan Study, planning alternatives that addressed the problem statement were developed and evaluated and presented to the public. The following transportation improvements were part of the preferred alternatives for the Trinity Church Arterial Corridor, in conjunction with Travel Demand Management initiatives:

- Traffic controls (signals or roundabout) at: Stone Church Road, Highland Road, future midblock collector road, Rymal Road, and the future extension of Twenty Road;
- Closure of Upper Mount Albion Road.

The ROPA 9 Master Plan (Phase 1 and 2) Study also recommended that:

- Transit service be considered along the Trinity Church Arterial Corridor with potential new transit stops at intersections with Stone Church Road, Highland Road, proposed trail head for the Red Hill Valley Open Space Replacement Strategy, and Rymal Road;
- Carpool lot be considered along the Trinity Church Arterial Corridor
- Sidewalks be considered for the Trinity Church Arterial Corridor;
- Designated truck route be considered for the Trinity Church Arterial Corridor; and
- Bicycle routes be considered for the Trinity Church Arterial Corridor.

The NGIBP Master Plan recommended the extension of Trinity Church Road from Rymal Road to the Red Hill Valley Parkway (2 lane arterial roadway with protection for 4 lanes) and the provision of an eastwest connection between the south end of the NGIBP area, possibly via Dickenson Road or Airport Road, to the Trinity Church extension.

4. EVALUATION OF DESIGN ALTERNATIVES

The Class Environmental Assessment process requires the examination of alternative methods of implementing the preferred undertaking by considering design alternatives. This section of the report provides a discussion on the development and evaluation of the design alternatives for the Trinity Church Arterial Corridor.

4.1 <u>Development and Evaluation of Design</u> <u>Alternatives</u>

For the recommended planning alternative, there were a number of possible ways to implement the undertaking. Design alternatives are different ways of implementing the preferred planning alternative. The preferred planning alternatives were determined during the Master Plan Study and are summarized in **Section 3** of this report. The advantages and disadvantages of each design alternative were identified and evaluated to determine the best implementation of the undertaking. This is discussed below.

4.1.1 Development of Design Alternatives

The proposed Trinity Church Arterial Corridor design alternatives include the following:

- Alternative alignments for the Trinity Church Arterial Corridor,
- Warrants and appropriateness for traffic control devices (traffic control signals or roundabouts) for the intersections with Highland Road, Midblock Collector Road, Rymal Road and the extension of Twenty Road,
- Provision of urban or rural cross-section, and
- Storage requirements for auxiliary lanes.

Additional roadway enhancements / improvements could include:

- Enhanced pedestrian environment
- Enhanced cyclist environment
- Streetscaping, where feasible

Each design alternative was developed and assessed in recognition of the following criteria:

Effect on Transportation Service

- Corridor Capacity and Level of Service
- Access for Emergency Vehicles
- Network Connectivity
- Compliance with the NGIBP Master Plan
- Flexibility for Future Network Connections (e.g. Airport)
- Accommodation for Pedestrians and Cyclists
- Traffic Safety
- Access to Adjacent Lands
- Geometric Standards
- Transit Operations
- Travel Demand Management
- Construction Staging (north of Rymal Road) - Implications on Transportation

Effect on Socio-Economic Environment

- Property Requirements for Right-of-Way
- Residents
 - Driveways and amenities
 - Privacy / use and enjoyment of property
- Businesses
 - Property requirements
 - Driveways and amenities
- Noise
- Archaeological / Cultural Heritage Resources
- Air Quality
- Agriculture
- Recreation
- Institutions
- Ability to Provide Servicing to Adjacent Lands
- Construction Staging (segment north of Rymal Road) - Implications on Residents / Institutions
- Traffic impacts on local roads adjacent to the study area

Each design alternative is described and assessed in further detail below.

Effect on Natural Environment

- Vegetation
- Wildlife
- Aquatic Habitat
- Eramosa Karst
- Stormwater

Cost Effectiveness

- Utility Relocation
- Capital Costs
- Maintenance and Operation Costs
- Potential for Contamination
- Property Acquisition
- User Costs

4.1.1.1 Trinity Church Arterial Corridor Alignment Alternatives

The six options identified and assessed include do nothing and alternative alignments for a new 4-lane arterial corridor between the Red Hill Valley Ramps and Stone Church Road intersection to south of Rymal Road. The six options are as follows:

1. Do Nothing

This alternative was included in the assessment to provide a benchmark against which the other design alternatives could be compared.

2. North-South Connection, East of Existing Trinity Church Road Includes an arterial connection from the Red Hill Valley Parkway and Stone Church Road intersection to south of Rymal Road to accommodate 4 travel lanes (2 per direction).

3. Extension of Existing Trinity Church Road Alignment

Includes an arterial connection from the Red Hill Valley Parkway and Stone Church Road intersection to the existing Trinity Church Road at Rymal Road and a widening of the existing Trinity Church Road south of Rymal Road to accommodate 4 travel lanes (2 per direction).

4. North-South Connection, between Existing Trinity Church Road and Pritchard Road

Includes an arterial connection from the Red Hill Valley Parkway and Stone Church Road intersection to south of Rymal Road to accommodate 4 travel lanes (2 per direction).

5. North-South Connection, West of Existing Trinity Church Road, Parallel to the Hydro Corridor

Includes an arterial connection from the Red Hill Valley Parkway and Stone Church Road intersection to south of Rymal Road to accommodate 4 travel lanes (2 per direction).

6. North-South Connection, West of Existing Trinity Church Road, connecting to Pritchard Road

Includes an arterial connection from the Red Hill Valley Parkway and Stone Church Road intersection to south of Rymal Road to accommodate 4 travel lanes (2 per direction).

The conceptual alternative alignment options are shown in Exhibit 4-1.



Not to Scale

Exhibit 4-1 Alternative Alignments iTRANS

4.1.1.2 Traffic Control Devices

The traffic control options identified and assessed for the intersections with Stone Church Road, Highland Road, Midblock Collector Road, Rymal Road and the extension of Twenty Road are listed below:

1. Traffic Signals

Includes the provision of traffic signals and exclusive turning lanes.

2. Roundabouts

Includes the provision of a roundabout with pedestrian splitter islands.

4.1.1.3 Urban or Rural Drainage Design

The cross-section options identified and assessed for the Trinity Church Arterial Corridor are as follows:

1. Rural Cross-section

Includes the provision of ditches

2. Urban Cross-section Includes the provision of curb and gutter

4.1.2 Evaluation of Design Alternatives

The evaluation of the design alternatives and recommendations were based on the criteria outlined in **Section 4.1.1**. Reasoned Argument Method was used to evaluate the design alternatives. The reasoned argument can be defined as the art of getting from one sentence to another sentence by valid moves only, using the rules of logic. The Reasoned Argument Method focuses on those criteria that generate a measurable difference between each alternative.

Due to the complexity of a new arterial road alignment, the evaluation was completed in two phases, a long list of alternatives and a short list of alternatives. The long list of alternatives was presented to the public in June 2006. The short list of alternatives was presented to the public in October 2006.

Table 4-1: Analysis and Evaluation of	Long List Design	Alternatives for the Tri	inity Church Arterial Corridor
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ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR EXTENSION - Lon	σ List of Alternatives
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CRITERIA	Option 1	Indicator	Option 2	Indicator	Option 3	Indicator	Option 4	Indicator	Option 5	Indicator	Option 6	Indicator
CRITERIA	Option 1 DO NOTHING Provides no connection of the Red Hill Valley Parkway ramps at Stone Church Road.	Indicator PT	Option 2 NORTH –SOUTH ROAD EAST OF EXISTING TRINITY CHURCH ROAD Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which runs parallel to existing Trinity Church Rd.	Indicator PT	Option 3 EXTENSION OF EXISTING TRINITY CHURCH ROAD Represents extension of Trinity Church Road from Rymal Road to Red Hill Valley Parkway Ramp at Stone Church Road and widening of existing Trinity Church Road South Of Rymal Road.	Indicator PT	Option 4NEW NORTH-SOUTHROAD WEST OFEXISTING TRINITYCHURCH ROADRepresents connection ofRed Hill Valley Parkwayramps at Stone ChurchRoad via a north-southroad which runs parallelto existing TrinityChurch Rd betweenPritchard Road andexisting Trinity ChurchRoad.	Indicator PT	Option 5 NEW NORTH-SOUTH ROAD WEST OF EXISTING TRINITY CHURCH ROAD Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which connects to Rymal Road in the vicinity of Pritchard Road and runs parallel to existing Trinity Church Rd south of Pritchard Road.	Indicator PT	Option 6NEW NORTH-SOUTHROAD WEST OFEXISTING TRINITYCHURCH ROAD (ATPRITCHARD)Represents connection ofRed Hill Valley Parkwayramps at Stone ChurchRoad via a north-southroad which connects toRymal Road at PritchardRoad and runs parallel toexisting Trinity ChurchRd south of PritchardRoad.	Indicator PT
TRANSPORTAT	FION SERVICE:	<u> </u>	4	1						1	1	
Corridor Capacity and Level of Service	No increase in the capacity of corridor and to overall study area roadway capacity. Additional north-south capacity will be needed. Would result in significant amounts of traffic on local roads in the area, such as Upper Mount Albion Road.		Significant increase in the capacity of corridor and to overall study area roadway capacity. Provides additional two lanes in each direction north of Rymal Road and additional two lanes in each direction south of Rymal Road.		Increase in the capacity of corridor and to overall study area roadway capacity. Provides additional two lanes in each direction north of Rymal Road and additional one lane in each direction south of Rymal Road.		Significant increase in the capacity of corridor and to overall study area roadway capacity. Provides additional two lanes in each direction north of Rymal Road and additional two lanes in each direction south of Rymal Road.		Increase in the capacity of corridor and to overall study area roadway capacity. Provides additional two lanes in each direction north of Rymal Road and additional two lanes in each direction south of Rymal Road, but requires the closure of Pritchard Road.		Increase in the capacity of corridor and to overall study area roadway capacity. Provides additional two lanes in each direction north of Rymal Road and additional two lanes in each direction south of Rymal Road, but requires the closure of Pritchard Road.	
Access for Emergency Vehicles	Same as existing access; however response times would increase with increasing congestion.		Access for emergency vehicles may improve as an additional route choice would be available.		Access for emergency vehicles may improve as an additional route choice would be available.		Access for emergency vehicles may improve as an additional route choice would be available.		Access for emergency vehicles may improve as an additional route choice would be available.		Access for emergency vehicles may improve as an additional route choice would be available.	
Network Connectivity	No improvement to network connectivity. Additional north-south connection would be required. Does not provide good access to the Rymal Road Planning Area (ROPA 9) and North Glanbrook Industrial Business Park.		Network connectivity will be significantly improved. Provides good network continuity with additional north-south connection. Allows for good access to the Rymal Road Planning Area (ROPA 9) and North Glanbrook Industrial Business Park.		Network connectivity will be significantly improved. Provides good network continuity with additional north-south connection. Allows for good access to ROPA 9 and North Glanbrook Industrial Business Park.		Network connectivity will be significantly improved. Provides good network continuity with additional north-south connection. Allows for good access ROPA 9 and North Glanbrook Industrial Business Park.		Network connectivity will be significantly improved. Provides good network continuity with additional north-south connection. Allows for good access ROPA 9 and North Glanbrook Industrial Business Park.		Network connectivity will be significantly improved. Provides good network continuity with additional north-south connection. Allows for good access ROPA 9 and North Glanbrook Industrial Business Park.	

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O least preferred



CRITERIA	Option 1	Indicator	Option 2	Indicator	Option 3	Indicator	Option 4	Indicator	Option 5	Indicator	Option 6	Indicator
Compliance with the NGIBP Master Plan	Does not comply with the NGIBP Master Plan, which identifies the need for protection for a 4-lane arterial connection to the Red Hill Valley Parkway to service the Business Park lands.		Partially complies with the NGIBP Master Plan since it does allow for some additional access to the North Glanbrook Industrial Business Park from the Red Hill Valley Parkway, but is not as direct since traffic would have to cross Trinity Church Road to enter the Business Park.		Complies with the NGIBP Master Plan. It provides good access to the NGIBP with a connection to the Red Hill Valley Parkway.		Complies with the NGIBP Master Plan. It provides good access to the NGIBP with a connection to the Red Hill Valley Parkway. However, it could result in some odd development parcels in some portions of the Business Park.		Complies with the NGIBP Master Plan. It provides good access to the NGIBP with a connection to the Red Hill Valley Parkway. However, it could result in some odd development parcels in some portions of the Business Park.		Complies with the NGIBP Master Plan. It provides good access to the NGIBP with a connection to the Red Hill Valley Parkway. However, it could result in some odd development parcels in some portions of the Business Park.	
Flexibility for Future Network Connections (e.g. Airport)	No change from existing.		Allows for potential for future network connections; however, is not as flexible as alignments west of the existing Trinity Church Road, due to the presence of the Greenbelt.		Allows for several potential future network connections.		Allows for several potential future network connections.		Allows for several potential future network connections.		Allows for several potential future network connections.	
Accommodation for Pedestrians and Cyclists	No bicycle routes or sidewalks currently exist within the study corridors. The impact of Do Nothing will be the worsening of conditions for pedestrians and cyclists because of the increase in traffic and the fact that no improvements to the ped/cyclist network will be done.		Potential for wide curb lanes and sidewalks on new road to accommodate pedestrians and cyclists. Provides the opportunity to build a portion of the Red Hill Valley Open Space Strategy; however, special consideration of the crossing will be needed.		Potential for wide curb lanes and sidewalks to accommodate pedestrians and cyclists. Provides the opportunity to build a portion of the Red Hill Valley Open Space Strategy; however, special consideration of the crossing will be needed.		Potential for wide curb lanes and sidewalks on new road to accommodate pedestrians and cyclists. Provides the opportunity to build a portion of the Red Hill Valley Open Space Strategy; however, special consideration of the crossing will be needed.		Potential for wide curb lanes and sidewalks on new road to accommodate pedestrians and cyclists. Provides the opportunity to build a portion of the Red Hill Valley Open Space Strategy; however, special consideration of the crossing will be needed.		Potential for wide curb lanes and sidewalks on new road to accommodate pedestrians and cyclists. Provides the opportunity to build a portion of the Red Hill Valley Open Space Strategy; however, special consideration of the crossing will be needed.	
Traffic Safety	Potential for increase in number of collisions on road network, due to increase in traffic volume on substandard road geometry.		Safety of all modes sharing the roadway will be considered and incorporated into the design of the new roadway.		Safety of all modes sharing the roadway will be considered and incorporated into the design of the new roadway.		Safety of all modes sharing the roadway will be considered and incorporated into the design of the new roadway.		Safety of all modes sharing the roadway will be considered and incorporated into the design of the new roadway.		Safety of all modes sharing the roadway will be considered and incorporated into the design of the new roadway.	

ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR EXTENSION – Long List of Alternatives





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CRITERIA	Option 1	Indicator	Option 2	Indicator	Option 3	Indicator	Option 4	Indicator	Option 5	Indicator	Option 6	Indicator
Access to Adjacent Lands	No change from existing.		Enhanced accessibility between ROPA 9 and North Glanbrook Industrial Business Park and areas to the north and west. Potential for new cross streets connections.		Enhanced accessibility between ROPA 9 and North Glanbrook Industrial Business Park and areas to the north and west. Potential for new cross streets connections. Additional lanes to cross when turning left from existing driveways on Trinity Church Road.		Enhanced accessibility between ROPA 9 and North Glanbrook Industrial Business Park and areas to the north and west. Potential for new cross streets connections.		Enhanced accessibility between ROPA 9 and North Glanbrook Industrial Business Park and areas to the north and west. Potential for new cross streets connections.		Enhanced accessibility between ROPA 9 and North Glanbrook Industrial Business Park and areas to the north and west. Potential for new cross streets connections.	
Geometric Standards	The vertical alignment on the existing Trinity Church Road south of Rymal Road does not conform to current design standards.		Design standards will be maintained as per City's requirements. An urban cross-section would be provided north of Rymal Road and a rural cross-section would be provided south of Rymal Road. Available sight lines do not meet requirements for the preferred design speed.		Design standards will be maintained as per City's requirements. The vertical alignment on the existing Trinity Church Road south of Rymal Road would be corrected to conform to design standards. An urban cross-section would be provided north of Rymal Road and a rural cross-section would be provided south of Rymal Road. Available sight lines do not meet requirements for the preferred design speed.		Design standards will be maintained as per City's requirements. The intersection at Rymal Road occurs on a horizontal curve and is not ideal. Close spacing of intersection with Rymal Road to intersection of Trinity Church Road / Rymal Road could present difficulties with signalization at both intersections. An urban cross-section would be provided north of Rymal Road and a rural cross-section would be provided south of Rymal Road. Available sight lines do not meet requirements for the preferred design speed.		Design standards will be maintained as per City's requirements. An urban cross-section would be provided north of Rymal Road and a rural cross- section would be provided south of Rymal Road. Available sight lines do not meet requirements for the preferred design speed.		Design standards will be maintained as per City's requirements. An urban cross-section would be provided north of Rymal Road and a rural cross-section would be provided south of Rymal Road. Available sight lines do not meet requirements for the preferred design speed.	
Transit Operations	No current transit operations within the study area; potential for transit service in the future could be hampered by traffic congestion.		Potential for transit and resulting improvement in transit service in the study corridor.		Potential for transit and resulting improvement in transit service in the study corridor.		Potential for transit and resulting improvement in transit service in the study corridor.		Potential for transit and resulting improvement in transit service in the study corridor.		Potential for transit and resulting improvement in transit service in the study corridor.	

ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR EXTENSION - Long List of Alternatives





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CRITERIA	Option 1	Indicator	Option 2	Indicator	Option 3	Indicator	Option 4	Indicator	Option 5	Indicator	Option 6	Indicator
Travel Demand Management Construction	Does not accommodate opportunities to incorporate travel demand management initiatives.		Accommodates for the provision of a carpool lot near the Red Hill Valley Expressway ramps to encourage shared-ride transportation. Require extension south		Accommodates for the provision of a carpool lot near the Red Hill Valley Expressway ramps to encourage shared-ride transportation. Highest potential use of		Accommodates for the provision of a carpool lot near the Red Hill Valley Expressway ramps to encourage shared-ride transportation. Temporary terminus at		Accommodates for the provision of a carpool lot near the Red Hill Valley Expressway ramps to encourage shared-ride transportation. Allows for temporary		Accommodates for the provision of a carpool lot near the Red Hill Valley Expressway ramps to encourage shared-ride transportation. Allows for temporary	
Staging (north of Rymal Road) - Implications on Transportation			of Rymal Road to avoid unacceptable intersection spacing on Rymal Road. High potential use of Trinity Church Road south of connection back to Trinity Church. Will likely require temporary closures of Trinity Church Road.		Trinity Church Road. Need to upgrade Trinity Church Road south of Rymal Road, which may require temporary closures of Trinity Church Road.		Rymal would result in unacceptable intersection spacing.		terminus at Rymal without unacceptable intersection spacing and without directly routing traffic to Trinity Church southbound. Requires a closure of Pritchard Road.		terminus at Rymal without unacceptable intersection spacing and without directly routing traffic to Trinity Church southbound. Requires a closure of Pritchard Road.	
SOCIO-ECONOM	MIC IMPACTS:						1		•	l .	•	
Property Requirements for Right-of-Way	No direct impacts to existing property.		Approximately 14 properties would be impacted.		Approximately 23 properties would be impacted.		Approximately 15 properties would be impacted.		Approximately 11 properties would be impacted.		Approximately 12 properties would be impacted.	
 Residents Driveways and amenities Privacy / use and enjoyment of property 	No direct impact to residents.		Approximately two houses have to be relocated and potential changes to five existing driveways. Would introduce an industrial road into an area designated for residential and related uses.		Approximately four houses have to be relocated and potential changes to eleven driveways. Would introduce an industrial road into an area designated for residential and related uses.		Approximately five houses have to be relocated and potential changes to one driveway.		Approximately two houses have to be relocated and potential changes to two driveways.		Approximately three houses have to be relocated and potential changes to two driveways.	
 Businesses Property requirements Driveways and amenities 	No direct impacts to existing businesses. Does not provide opportunities for future business.		No change in existing business or employment. Provides for additional opportunities for future business with potential for better access.		No change in existing business or employment. Provides for additional opportunities for future business with potential for better access.		No change in existing business or employment. Provides for additional opportunities for future business with potential for better access.		No change in existing business or employment. Provides for additional opportunities for future business with potential for better access.		No change in existing business or employment. Provides for additional opportunities for future business with potential for better access.	
Noise • Sensitive receptors experiencing change in sound level (5 dBA and more) over ambient conditions	Potential increase due to increased traffic volumes.		Increase in noise level with increased traffic. Provides opportunities for mitigation to be considered.		Increase in noise level with increased traffic. Provides opportunities for mitigation to be considered.		Increase in noise level with increased traffic. Provides opportunities for mitigation to be considered.		Increase in noise level with increased traffic. Provides opportunities for mitigation to be considered.		Increase in noise level with increased traffic. Provides opportunities for mitigation to be considered.	

ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR EXTENSION – Long List of Alternatives



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CRITERIA	Option 1	Indicator	Option 2	Indicator	Option 3	Indicator	Option 4	Indicator	Option 5	Indicator	Option 6	Indicator
Archaeological / Cultural Heritage Resources	No impacts to existing archaeological / cultural heritage resources.		No anticipated impact on, cultural heritage or built heritage resources. Potential impact on archaeological resources on undisturbed areas.		Potential for impact on archaeological pre- contact sites on undisturbed areas. No anticipated impact on the Trinity Cemetery. Potential for impact on two built heritage features: #4 Trinity Church Road and #31 Trinity Church Road. Impact on two cultural heritage landscapes: Trinity United Church and Trinity Church Road roadscape.		No anticipated impact on, cultural heritage or built heritage resources. Potential impact on archaeological resources on undisturbed areas.		No anticipated impact on, cultural heritage or built heritage resources. Potential impact on archaeological resources on undisturbed areas.		No anticipated impact on, cultural heritage or built heritage resources. Potential impact on archaeological resources on undisturbed areas.	
Air Quality	No improvement to air quality. Congestion will continue to degrade air quality with increased vehicle emission due to increased congestion in the study area road network as development proceeds.		Moderate air quality improvement with less traffic congestion in the study area road network.		Moderate air quality improvement with less traffic congestion in the study area road network.		Moderate air quality improvement with less traffic congestion in the study area road network.		Moderate air quality improvement with less traffic congestion in the study area road network.		Moderate air quality improvement with less traffic congestion in the study area road network.	
Agriculture	No change from existing.		Potential impact to agricultural land uses; however, could allow for easier access to/from the fields due to wider lanes which would better accommodate agricultural equipment.	•	Potential impact to agricultural land uses; however, could allow for easier access to/from the fields due to wider lanes which would better accommodate agricultural equipment.	•	Potential impact to agricultural land uses; however, could allow for easier access to/from the fields due to wider lanes which would better accommodate agricultural equipment. Potential impact to agricultural operation south of Twenty Road and east of Glover Road.		Potential impact to agricultural land uses; however, could allow for easier access to/from the fields due to wider lanes which would better accommodate agricultural equipment. Potential impact to agricultural operation south of Twenty Road and east of Glover Road.		Potential impact to agricultural land uses; however, could allow for easier access to/from the fields due to wider lanes which would better accommodate agricultural equipment. Potential impact to agricultural operation south of Twenty Road and east of Glover Road.	

ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR EXTENSION – Long List of Alternatives





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CRITERIA	Option 1	Indicator	Option 2	Indicator	Option 3	Indicator	Option 4	Indicator	Option 5	Indicator	Option 6	Indicator
Recreation	No change from existing. Potential for implementation of proposed Trail for the Red Hill Valley Open Space Replacement Strategy may take longer to construct.		Potential for accommodation of proposed Trail for the Red Hill Valley Open Space Replacement Strategy during construction of the new corridor. However, special consideration will be necessary to ensure the proper integration of multi modes of travel at the crossing.	C	Potential for accommodation of proposed Trail for the Red Hill Valley Open Space Replacement Strategy during construction of the new corridor. However, special consideration will be necessary to ensure the proper integration of multi modes of travel at the crossing.	C	Potential for accommodation of proposed Trail for the Red Hill Valley Open Space Replacement Strategy during construction of the new corridor. However, special consideration will be necessary to ensure the proper integration of multi modes of travel at the crossing.	C	Potential for accommodation of proposed Trail for the Red Hill Valley Open Space Replacement Strategy during construction of the new corridor. However, special consideration will be necessary to ensure the proper integration of multi modes of travel at the crossing.	C	Potential for accommodation of proposed Trail for the Red Hill Valley Open Space Replacement Strategy during construction of the new corridor. However, special consideration will be necessary to ensure the proper integration of multi modes of travel at the crossing.	C
Institutions	No anticipated impacts to the Trinity United Church or parking lot.		No institutions along corridor.		Potential for higher traffic exposure to the Trinity United Church south of Rymal Road on the west side of Trinity Church Road. The church parking lot is located on the east side of Trinity Church Road. Consideration of pedestrians crossing Trinity Church Road to access the church from the parking lot will be needed.		No institutions along corridor.		No institutions along corridor.		No institutions along corridor.	
Ability to Provide Servicing to Adjacent Lands	Does not provide the ability to service the lands north of Rymal Road.		Allows servicing to be provided to the lands north of Rymal Road.		Allows servicing to be provided to the lands north of Rymal Road.		Allows servicing to be provided to the lands north of Rymal Road. However, since the alignment is not centred in the lands, longer service connections will be required.	e	Allows servicing to be provided to the lands north of Rymal Road. However, since the alignment is not centred in the lands, longer service connections will be required.	e	Allows servicing to be provided to the lands north of Rymal Road. However, since the alignment is not centred in the lands, longer service connections will be required.	e
Construction Staging (north of Rymal Road) - Implications on Residents / Institutions	No implications		Will likely require temporary closures of Trinity Church Road, resulting in detour for residents and potentially to the church.		Will likely require temporary closures of Trinity Church Road, resulting in detour for residents and potentially to the church.		No implications.		No implications.		No implications.	

ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR EXTENSION – Long List of Alternatives





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	L'INLEATION OF DES									
CRITERIA Traffic impacts on local roads	Option I Large increases in traffic volumes on local	Option 2 New corridor would accommodate diverted	Indicator	Option 3 New corridor would accommodate diverted	Indicator	Option 4 New corridor would accommodate diverted	Indicator	Option 5 New corridor would accommodate diverted traffic	Option 6 New corridor would accommodate diverted	Indicator
adjacent to the	roads in the	traffic from area local		traffic from area local		traffic from area local		from area local roads such as	traffic from area local	
study area	surrounding area (such	roads such as Upper		roads such as Upper		roads such as Upper		Upper Mount Albion	roads such as Upper	
stady alow	as Upper Mount Albion	Mount Albion, resulting		Mount Albion, resulting		Mount Albion, resulting		resulting in a benefit to	Mount Albion, resulting	
	Road), which would	in a benefit to residents		in a benefit to residents		in a benefit to residents		residents along the local	in a benefit to residents	
	lead to related impacts	along the local roads.		along the local roads.		along the local roads.		roads.	along the local roads.	
	associated with noise									
	and air quality.									
NATURAL ENV	IRONMENT IMPACTS:									
Vegetation	No anticipated impact	No significant impact on		No significant impact on		Potential for large		Potential for small impact to	Potential for small	
	on vegetation.	vegetation. Some shrubs		vegetation. Some shrubs		impact to woodlot south		woodlot south of Rymal	impact to woodlot south	
		found in the study area.		found in the study area.		of Rymal Road; however		Road; however would impact	of Rymal Road; however	
		Potential for planting to		Potential for planting to		no impacts to Black		Black Walnut species.	would impact Black	
		be incorporated into the		be incorporated into the		Walnut species. Potential		Potential for planting to be	Walnut species. Potential	
		design.		design.		for planting to be		incorporated into the design.	for planting to be	
						incorporated into the			incorporated into the	
XX7'1 11'C						design.			design.	
Wildlife	No anticipated impact	A few species were found		A few species were		A few species were		A few species were found in	A few species were	
	on wildlife.	in the study area, but no		found in the study area,		found in the study area,		the study area, but no	found in the study area,	
		identified		but no endangered		but no endangered		identified	but no endangered	
A quatia Habitat	No opticipated impost	Ne significant impact on		Species were identified.		No significant impact on		No significant impost on	No significant impact on	
Aqualle Habilat	on aquatic habitat	aquatic life is identified		aquatic life is identified		aquatic life is identified		aquatic life is identified	aquatic life is identified	
	on aquatic nabitat.	Potential impact to a		Potential impact to a		Potential impact to two		Potential impact to a tributary	Potential impact to a	
		tributary of Hannon		tributary of Hannon		tributaries of Hannon		of Hannon Creek A crossing	tributary of Hannon	
		Creek Additional runoff		Creek Additional runoff		Creek Crossings would		of the tributary would be	Creek A crossing of the	
		expected due to increased		expected due to		be required at both		required Additional runoff	tributary would be	
		road surface area.		increased road surface		locations. Additional		expected due to increased	required. Additional	
		Mitigation measures will		area. Mitigation		runoff expected due to		road surface area. Mitigation	runoff expected due to	
		be provided during		measures will be		increased road surface		measures will be provided	increased road surface	
		detailed design.		provided during detailed		area. Mitigation		during detailed design.	area. Mitigation	
				design.		measures will be			measures will be	
						provided during detailed			provided during detailed	
						design.			design.	
Eramosa Karst	No anticipated impact	Eramosa Karst will not be	\square	Eramosa Karst will not		Eramosa Karst will not		Eramosa Karst will not be	Eramosa Karst will not	
 Sink Holes 	on the Eramosa Karst.	directly impacted.		be directly impacted.		be directly impacted. No		directly impacted. No impacts	be directly impacted. No	
 Springs 		Potential impacts to two		Potential impact to one		impacts on sinkholes or		on sinkholes or springs.	impacts on sinkholes or	
		springs (One along the		sinkhole.		springs.			springs.	
		alignment, the second east								
		 of the alignment).								
Stormwater	No anticipated impact	Additional runoff		Additional runoff		Additional runoff		Additional runoff expected	Additional runoff	
 Water quantity 	on stormwater.	expected due to increased		expected due to		expected due to		due to increased road surface	expected due to	
and quality		road surface area.		increased road surface		increased road surface		area. Mitigation measures	increased road surface	
		Nitigation measures will		area. Mitigation		area. Mitigation		will be provided during	area. Mitigation	
		detailed design		measures will be		measures will be		detailed design	measures will be	
		uetaneu uesign.		design		design			design	
				ucsign.		ucsign.			ucsign	
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ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR EXTENSION - Long List of Alternatives

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CRITERIA	Option 1	Indicator	Option 2	Indicator	Option 3	Indicator	Option 4	Indicator	Option 5	Indicator	Option 6	Indicator
COSTS:												
Utility Relocation	No anticipated impact on utilities.		Utility relocation is involved. Crosses a gas pipeline between Highland Road and Rymal Road. Crosses a hydro corridor south of Rymal Road.		Utility relocation is involved. Crosses a gas pipeline between Highland Road and Rymal Road. Crosses a hydro corridor south of Rymal Road.		Utility relocation is involved. Crosses a gas pipeline between Highland Road and Rymal Road. Crosses a hydro corridor south of Rymal Road.		Utility relocation may be involved. Crosses a gas pipeline between Highland Road and Rymal Road. Crosses a hydro corridor south of Rymal Road. Runs parallel to the hydro corridor at Rymal Road.		Utility relocation may be involved. Crosses a gas pipeline between Highland Road and Rymal Road. Crosses hydro corridors north of Rymal Road, at Rymal Road and south of Rymal Road.	
Capital Cost	No anticipated capital costs.		Costs of constructing approximately 2,940 m of arterial road.		Costs of constructing approximately 2,295 m of arterial road.		Costs of constructing approximately 3,305 m of arterial road.		Costs of constructing approximately 3,255 m of arterial road.		Costs of constructing approximately 3,275 m of arterial road.	
Maintenance and Operation Costs	Potential for increase in operating cost with higher roadway maintenance costs, due to road surface and road base deterioration.		Maintenance costs related to roadway, sidewalks and cycling lanes to better respond to the needs of the residents along the new corridor		Maintenance costs related to roadway, sidewalks and cycling lanes to better respond to the needs of the residents along the new corridor		Maintenance costs related to roadway, sidewalks and cycling lanes to better respond to the needs of the residents along the new corridor		Maintenance costs related to roadway, sidewalks and cycling lanes to better respond to the needs of the residents along the new corridor		Maintenance costs related to roadway, sidewalks and cycling lanes to better respond to the needs of the residents along the new corridor	
Potential for Contamination	No change from existing.		Potential for contamination, due to agricultural uses. Further investigations may be required		Potential for contamination, due to agricultural uses. Further investigations may be required		Potential for contamination, due to agricultural uses. Further investigations may be required		Potential for contamination, due to agricultural uses. Further investigations may be required		Potential for contamination, due to agricultural uses. Further investigations may be required	
Property Acquisition	No anticipated property acquisition, therefore no property cost.		A portion of approximately 14 properties would need to be acquired.		A portion of approximately 23 properties would need to be acquired.		A portion of approximately 15 properties would need to be acquired.		A portion of approximately 11 properties would need to be acquired.		A portion of approximately 12 properties would need to be acquired.	
User Costs	Congestion would create delays to users.		The reduced congestion would reduce delays to users, in turn reducing vehicle operating costs.		The reduced congestion would reduce delays to users, in turn reducing vehicle operating costs.		The reduced congestion would reduce delays to users, in turn reducing vehicle operating costs.		The reduced congestion would reduce delays to users, in turn reducing vehicle operating costs.		The reduced congestion would reduce delays to users, in turn reducing vehicle operating costs.	

ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR EXTENSION – Long List	st of Alternatives





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SUMMARY OF ANALYSIS AND EVALUATION FOR TRINITY CHURCH ARTERIAL CORRIDOR FORLONG LIST OF ALTERNATIVES

Criteria	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
	DO NOTHING Provides no connection of the Red Hill Valley Parkway ramps at Stone Church Road.	NORTH –SOUTH ROAD EAST OF EXISTING TRINITY CHURCH ROAD Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which runs parallel to existing Trinity Church Rd.	EXTENSION OF EXISTING TRINITY CHURCH ROAD Represents extension of Trinity Church Road from Red Hill Valley Parkway ramps at Stone Church Road to Rymal Road and widening of existing Trinity Church Road south of Rymal Road.	NEW NORTH- SOUTH ROAD WEST OF EXISTING TRINITY CHURCH ROAD Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which runs parallel to existing Trinity Church Rd between Pritchard Road and existing Trinity Church Road.	NEW NORTH- SOUTH ROAD WEST OF EXISTING TRINITY CHURCH ROAD Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which connects to Rymal Road in the vicinity of Pritchard Road and runs parallel to existing Trinity Church Rd south of Pritchard Road.	NEW NORTH- SOUTH ROAD WEST OF EXISTING TTRINITY CHURCH ROAD (AT PRITCHARD) Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which connects to Rymal Road at Pritchard Road and runs parallel to existing Trinity Church Rd south of Pritchard Road.
Transportation Service	\bigcirc					
Social Environment						
Natural Environment					C	C
Costs						
Recommendation	Screened Out	Screened Out	Screened Out	Carry Forward for Further Investigation	Carry Forward for Further Investigation	Carry Forward for Further Investigation

Based on the long-list evaluation table, **Options 1, 2 and 3** were screened out from further evaluation. Option 1 did not provide sufficient transportation service and would have significant impacts to the social environment. Option 2 would have significant impacts to the Karst and to the residents along existing Trinity Church Road. Option 3 would have significant impacts to cultural heritage resources, archaeological resources and residents along existing Trinity Church Road.

After the long-list of alternatives was reduced to a short-list, **Options 4, 5 and 6** were assessed and evaluated in further detail. The evaluation of the short listed alignments is summarized below in **Table 4-2**.

Table 4-2: Analysis and Evaluation	of Short List Design Alternative	s for the Trinity Church	Arterial Corridor
Tuble 1 2. That sis and Evaluation	of Short Eist Design Theer had to	s for the frincy church	

ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR – SHORT LIST OF ALTERNATIVES

CRITERIA	Option 4	Indicator	Option 5	Indicator	Option 6	Indicator
	NEW NORTH-SOUTH ROAD WEST OF EXISTING TRINITY CHURCH ROAD (BETWEEN PRITCHARD AND TRINITY CHURCH ROAD) Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which runs parallel to existing Trinity Church Rd between Pritchard Road and existing Trinity Church Road.	PT	NEW NORTH-SOUTH ROAD WEST OF EXISTING TRINITY CHURCH ROAD (EAST OF PRITCHARD) Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which connects to Rymal Road in the vicinity of Pritchard Road and runs parallel to existing Trinity Church Rd south of Pritchard Road.	PT	NEW NORTH-SOUTH ROAD WEST OF EXISTING TTRINITY CHURCH ROAD (AT PRITCHARD) Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which connects to Rymal Road at Pritchard Road and runs parallel to existing Trinity Church Rd south of Pritchard Road.	PT
TRANSPORTATION SERVI	ICE:	-	-	÷	<u>-</u>	-
Corridor Capacity and Level of Service	Significant increase in the capacity of corridor and to overall study area roadway capacity. Provides additional two lanes in each direction north of Rymal Road and additional two lanes in each direction south of Rymal Road.	C	Significant increase in the capacity of corridor and to overall study area roadway capacity. Provides additional two lanes in each direction north of Rymal Road and additional two lanes in each direction south of Rymal Road.		Significant increase in the capacity of corridor and to overall study area roadway capacity. Provides additional two lanes in each direction north of Rymal Road and additional two lanes in each direction south of Rymal Road.	
Access for Emergency Vehicles	Access for emergency vehicles will improve as an additional route choice will be available.		Access for emergency vehicles will improve as an additional route choice will be available.		Access for emergency vehicles will improve as an additional route choice will be available.	
Network Connectivity	Network connectivity will be significantly improved. Provides good network continuity with an additional north- south connection. Allows for good access to ROPA 9 and the North Glanbrook Industrial Business Park.		Network connectivity will be significantly improved. Provides good network continuity with additional north-south connection. Allows for good access to ROPA 9 and the North Glanbrook Industrial Business Park.		Network connectivity will be significantly improved. Provides good network continuity with additional north- south connection. Allows for good access to ROPA 9 and the North Glanbrook Industrial Business Park.	
Flexibility for Future Network Connections (e.g. Airport)	Allows for several potential future network connections.		Allows for several potential future network connections.		Allows for several potential future network connections.	
Compliance with the NGIBP Master Plan and East Mountain Industrial Business Park / Land Use Coordination	Complies with the Master Plans. It provides good access to the Business Parks with a connection to the Red Hill Valley Parkway.		Complies with the Master Plans. It provides good access to the Business Parks with a connection to the Red Hill Valley Parkway. However, odd shaped parcels will be created along Pritchard Road. Potential to create a carpool lot in the odd-shaped parcels.		Complies with the Master Plans. It provides good access to the Business Parks with a connection to the Red Hill Valley Parkway. However, odd shaped parcels will be created along Pritchard Road. Potential to create a carpool lot in the odd-shaped parcels. Less odd-shaped parcels will be created than Option 5.	e
Accommodation for Pedestrians and Cyclists	Potential for wide curb lanes and sidewalks on new road to accommodate pedestrians and cyclists. Provides the opportunity to build a portion of the Red Hill Valley Open Space Strategy; however, special consideration of the crossing will be needed.		Potential for wide curb lanes and sidewalks on new road to accommodate pedestrians and cyclists. Provides the opportunity to build a portion of the Red Hill Valley Open Space Strategy; however, special consideration of the crossing will be needed.		Potential for wide curb lanes and sidewalks on new road to accommodate pedestrians and cyclists. Provides the opportunity to build a portion of the Red Hill Valley Open Space Strategy; however, special consideration of the crossing will be needed.	
Access to Adjacent Lands	Enhanced accessibility between ROPA 9 and North Glanbrook Industrial Business Park and areas to the north and west. Potential for new midblock connections.		Enhanced accessibility between ROPA 9 and North Glanbrook Industrial Business Park and areas to the north and west. Potential for new midblock connections.		Enhanced accessibility between ROPA 9 and North Glanbrook Industrial Business Park and areas to the north and west. Potential for new midblock connections.	
Geometric Standards	The intersection at Rymal Road occurs on a tangent between two horizontal curves and is not ideal. Available sight lines for some of the turning movements do not meet requirements for the preferred design speed and additional property will be required to maintain the sightlines or an alternate traffic control will be required to reduce the approach speeds at the intersection.		Available sight lines for some of the turning movements do not meet requirements for the preferred design speed and additional property will be required to maintain the sightlines or an alternate traffic control will be required to reduce the approach speeds at the intersection.		Available sight lines for some of the turning movements do not meet requirements for the preferred design speed and additional property will be required to maintain the sightlines or an alternate traffic control will be required to reduce the approach speeds at the intersection. Desirable tangent lengths are not available for the appropriate design speed.	

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CRITERIA	Option 4	Indicator	Option 5	Indicator	Option 6	Indicator
Midblock Collector	The geometry of the new midblock collector road satisfies the desirable tangent lengths and sight lines.		The geometry of the new midblock collector does not allow for desirable tangent lengths. Back to back curves on both Option 6 and the midblock collector are not desirable.		The geometry of the new midblock collector does not allow for desirable tangent lengths. Back to back curves on both Option 6 and the midblock collector are not desirable.	
Transit Operations	Potential for transit and resulting improvement in transit service in the study corridor.		Potential for transit and resulting improvement in transit service in the study corridor.		Potential for transit and resulting improvement in transit service in the study corridor.	
Travel Demand Management	Accommodates for the provision of a carpool lot near the Red Hill Valley Expressway ramps to encourage shared-ride transportation. Access to the carpool lot can be provided by the midblock collector.		Accommodates for the provision of a carpool lot near the Red Hill Valley Expressway ramps to encourage shared-ride transportation. The carpool lot could be provided in one of the odd-shaped parcels; however, access to/from the carpool lot could be difficult to accommodate since the Trinity Church Corridor will have restricted access.		Accommodates for the provision of a carpool lot near the Red Hill Valley Expressway ramps to encourage shared-ride transportation. The carpool lot could be provided in one of the odd-shaped parcels; however, access to/from the carpool lot could be difficult to accommodate since the Trinity Church Corridor will have restricted access.	
Construction Staging (north of Rymal Road) - Implications on Transportation	Close spacing of intersection with Rymal Road to intersection of Trinity Church Road / Rymal Road could present difficulties with signalization at both intersections. Temporary terminus at Rymal would result in less desirable intersection spacing.		Allows for temporary terminus at Rymal without unacceptable intersection spacing and without directly routing traffic to Trinity Church southbound. Requires a closure of Pritchard Road. A connection from Pritchard Road to the new corridor will be provided.		Allows for temporary terminus at Rymal without unacceptable intersection spacing and without directly routing traffic to Trinity Church southbound. Requires a closure of Pritchard Road. A connection from Pritchard Road to the new corridor will be provided.	
SOCIO-ECONOMIC IMPAC	<u>CTS:</u>					
Property Requirements for Right-of-Way	<i>Approximately 13 (7 north of Rymal Road, 6 south of Rymal Road) properties would be impacted.</i>		<i>Approximately 10 (6 north of Rymal Road, 4 south of Rymal Road)</i> <i>properties would be impacted.</i>		Approximately 11 (8 north of Rymal Road, 3 south of Rymal Road) properties would be impacted.	
Residents	Impacts to approximately four houses (2 north of Rymal Road, 2 south of Rymal Road).		Impacts to approximately one house (north of Rymal Road).		<i>Impacts to approximately three houses (north of Rymal Road).</i>	
Businesses	Impacts to approximately one business (south of Rymal Road). Provides for additional opportunities for future business with potential for better access.	C	Impacts to approximately one business (south of Rymal Road). Provides for additional opportunities for future business with potential for better access.		No anticipated impacts to existing businesses or employment opportunities. Provides for additional opportunities for future business with potential for better access.	
Noise • Sensitive receptors experiencing change in sound level (5 dBA and more) over ambient conditions	Increase in noise level with increased traffic. There are 3 properties within 50 m and 9 properties within the 50 to 100 m boundary of the new corridor.	•	Increase in noise level with increased traffic. There are 3 properties within 50 m and 6 properties within the 50 to 100 m boundary of the new corridor.	•	Increase in noise level with increased traffic. There are 4 properties within 50 m and 4 properties within the 50 to 100 m boundary of the new corridor.	e
Archaeological/Cultural Heritage Resources	No anticipated impact on cultural heritage or built heritage resources. Potential impact on archaeological resources on undisturbed areas.		No anticipated impact on cultural heritage or built heritage resources. Potential impact on archaeological resources on undisturbed areas.		No anticipated impact on cultural heritage or built heritage resources. Potential impact on archaeological resources on undisturbed areas. Existing Pritchard Road and hydro corridor right-of-ways likely to be previously disturbed.	
Air Quality	Moderate air quality improvement with less traffic congestion in the study area road network.		Moderate air quality improvement with less traffic congestion in the study area road network.		Moderate air quality improvement with less traffic congestion in the study area road network.	
Agriculture	Potential impact to agricultural land uses; however, could allow for easier access to/from the fields due to wider lanes which would better accommodate agricultural equipment. Potential impact to agricultural operation south of Twenty Road and east of Glover Road.		Potential impact to agricultural land uses; however, could allow for easier access to/from the fields due to wider lanes which would better accommodate agricultural equipment. Potential impact to agricultural operation access road south of Twenty Road and east of Glover Road.		Potential impact to agricultural land uses; however, could allow for easier access to/from the fields due to wider lanes which would better accommodate agricultural equipment. Potential impact to agricultural operation access road south of Twenty Road and east of Glover Road.	e

ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR – SHORT LIST OF ALTERNATIVES

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CRITERIA	Option 4	Indicator	Option 5	Indicator	Option 6	Indicator
Recreation	Potential for accommodation of proposed Trail for the Red Hill Valley Open Space Replacement Strategy during construction of the new corridor. However, special consideration will be necessary to ensure the proper integration of multi modes of travel at the crossing.		Potential for accommodation of proposed Trail for the Red Hill Valley Open Space Replacement Strategy during construction of the new corridor. However, special consideration will be necessary to ensure the proper integration of multi modes of travel at the crossing.		Potential for accommodation of proposed Trail for the Red Hill Valley Open Space Replacement Strategy during construction of the new corridor. However, special consideration will be necessary to ensure the proper integration of multi modes of travel at the crossing.	
Development Implications	More in keeping with the original intent of the Secondary Plan, which designates light industrial west of the Trinity Church Corridor and service commercial and residential to the east. Results in more developable land. The further west the road is, the more residential/commercial land is created and less light industrial.		Less in keeping with the original intent of the Secondary Plan, which designates light industrial west of the Trinity Church Corridor and service commercial and residential to the east. Results in less developable land. The further west the road is, the more residential/commercial land is created and less light industrial.		Less in keeping with the original intent of the Secondary Plan, which designates light industrial west of the Trinity Church Corridor and service commercial and residential to the east. Results in less developable land. The further west the road is, the more residential/commercial land is created and less light industrial.	
Traffic Impacts on Local Roads Adjacent to the Study Area	New corridor would accommodate diverted traffic from area local roads such as Upper Mount Albion, resulting in a benefit to residents along the local roads.		New corridor would accommodate diverted traffic from area local roads such as Upper Mount Albion, resulting in a benefit to residents along the local roads.		New corridor would accommodate diverted traffic from area local roads such as Upper Mount Albion, resulting in a benefit to residents along the local roads.	
Ability to Provide Servicing to Adjacent Lands	Allows servicing to be provided to the lands north of Rymal Road. Servicing may be provided south of Rymal during development of lands as part of NGIBP.		Allows servicing to be provided to the lands north of Rymal Road. Servicing may be provided south of Rymal during development of lands as part of NGIBP.		Allows servicing to be provided to the lands north of Rymal Road. Servicing may be provided south of Rymal during development of lands as part of NGIBP.	
NATURAL ENVIRONMENT	<u>IMPACTS:</u>	-		-		
Vegetation	Potential impact to Dogwood cultural thickets south of Rymal Road. Potential for planting to be incorporated into the design.		Potential impact to black walnut cultural woodland south of Rymal Road. Potential for planting to be incorporated into the design.	\bigcirc	Potential impact to black walnut cultural woodland south of Rymal Road. Potential for planting to be incorporated into the design.	\bigcirc
Wildlife	A few species were found in the study area, but no endangered species were identified. Several bird species are protected by the Migratory birds Convention Act.		A few species were found in the study area, but no endangered species were identified. Several bird species are protected by the Migratory birds Convention Act.		A few species were found in the study area, but no endangered species were identified. Several bird species are protected by the Migratory birds Convention Act.	
Aquatic Habitat	No anticipated impact on aquatic life. Potential impact to two tributaries of Hannon Creek; however, the crossings are not well defined channels and no aquatic habit has been identified in the crossings. Crossings would be required at both locations.		No anticipated impact on aquatic life. Potential impact to one tributary of Hannon Creek; however, the crossings are not well defined channels and no aquatic habit has been identified in the crossings. A crossing of the tributary would be required.		No anticipated impact on aquatic life. Potential impact to one tributary of Hannon Creek; however, the crossings are not well defined channels and no aquatic habit has been identified in the crossings. A crossing of the tributary would be required.	
Stormwater • Water quantity and quality	Additional runoff expected due to increased road surface area.		Additional runoff expected due to increased road surface area.		Additional runoff expected due to increased road surface area.	
COSTS:						
Utilities	Crosses a gas pipeline between Highland Road and Rymal Road. Crosses a hydro corridor south of Rymal Road. Crosses a bell eastment north of Rymal Road.		Crosses a gas pipeline between Highland Road and Rymal Road. Crosses a hydro corridor south of Rymal Road. Runs parallel to the hydro corridor at Rymal Road. Crosses a bell eastment north of Rymal Road.		Crosses a gas pipeline between Highland Road and Rymal Road. Crosses hydro corridors north of Rymal Road, at Rymal Road and south of Rymal Road. Crosses a bell eastment north of Rymal Road.	
Capital Cost	Costs of constructing approximately 1,075 m of arterial road north of Rymal Road and 2,230 m of arterial road south of Rymal Road.		Costs of constructing approximately 1,050 m of arterial road north of Rymal Road and 2,205 m of arterial road south of Rymal Road.		Costs of constructing approximately 1,055 m of arterial road north of Rymal Road and 2,220 m of arterial road south of Rymal Road.	
Maintenance and Operation Costs	Costs of maintaining approximately 1,075 m of arterial road north of Rymal Road and 2,230 m of arterial road south of Rymal Road.		Costs of maintaining approximately 1,050 m of arterial road north of Rymal Road and 2,205 m of arterial road south of Rymal Road.		Costs of maintaining approximately 1,055 m of arterial road north of Rymal Road and 2,220 m of arterial road south of Rymal Road.	
Property Acquisition	Will require property acquisition for approximately 64,500 square metres north of Rymal Road and approximately 100,350 square metres south of Rymal Road.		Will require property acquisition for approximately 63,000 square metres north of Rymal Road and approximately 99,225 square metres south of Rymal Road.		Will require property acquisition for approximately 63,300 square metres north of Rymal Road and approximately 99,900 square metres south of Rymal Road.	
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ANALYSIS AND EVALUATION OF DESIGN ALTERNATIVES FOR TRINITY CHURCH ARTERIAL CORRIDOR – SHORT LIST OF ALTERNATIVES

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SUMMARY OF ANALYSIS AND EVALUATION FOR TRINITY CHURCH ARTERIAL CORRIDOR FOR SHORT LIST OF ALTERNATIVES

Criteria	Option 4	Option 5	Option 6
	NEW NORTH-SOUTH ROAD WEST OF EXISTING TRINITY CHURCH ROAD (BETWEEN PRITCHARD AND TRINITY CHURCH ROAD) Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which runs parallel to existing Trinity Church Rd between Pritchard Road and existing	NEW NORTH-SOUTH ROAD WEST OF EXISTING TRINITY CHURCH ROAD (EAST OF PRITCHARD) Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which connects to Rymal Road in the vicinity of Pritchard Road and runs parallel to existing Trinity Church Rd south of	NEW NORTH-SOUTH ROAD WEST OF EXISTING TTRINITY CHURCH ROAD (AT PRITCHARD) Represents connection of Red Hill Valley Parkway ramps at Stone Church Road via a north-south road which connects to Rymal Road at Pritchard Road and runs parallel to existing Trinity Church Rd south of Pritchard Road.
	Trinity Church Road.	Pritchard Road.	
Transportation Service			
Social Environment			
Natural Environment			
Costs			
Recommendation	Recommended	Not Recommended	Not Recommended





Based on the short-list evaluation table, **Option 4 – New North-South Road west of existing Trinity Church Road (between Pritchard Road and Trinity Church Road)** is the preferred alignment. Alignment 4 is the most preferred from a land use perspective. It is more in keeping with the original intent of the Secondary Plan, which designates light industrial west of the Trinity Church Corridor and service commercial and residential to the east. It also results in more developable land. The further west the road is, the more residential/commercial land is created and less light industrial. It avoids any impacts to the sensitive Black Walnut cultural woodlot. No significant environmental impacts are anticipated. Alignment Option 4 also provides adequate tangent lengths for the appropriate design speed. It also allows for better geometry for the midblock collector.

4.1.2.1 Traffic Control Devices

An evaluation of the potential traffic controls for the Trinity Church Arterial Corridor was completed for the 2021 time horizon (Trinity Church Corridor extends south of Rymal Road). A number of evaluation criteria were considered. A summary of the evaluation of alternatives is provided in the table below.

FACTOR	Option 1	Option 2
	TRAFFIC SIGNALS	ROUNDABOUTS
Capacity (LOS for AM and PM peak hour shown)	 Level of service (LOS) results for the AM / PM peak hours is shown below. Stone Church Road – LOS D / LOS C Highland Road – LOS B / LOS B Midblock Collector – LOS B / LOS B Rymal Road – LOS C / LOS D 	 Level of service (LOS) results for the AM / PM peak hours is shown below. Stone Church Road – LOS A / LOS B Highland Road – LOS A / LOS A Midblock Collector – LOS A / LOS A Rymal Road – LOS A / LOS F Lowers operational speeds
numan Factors / Driver Expectations / Safety	 Low potential for sideswipe collisions Potential for red light crossing at high vehicle speed with potential severe right angle collisions 	 Lowers operational speeds. Provides fewer vehicle-vehicle conflict points Severity of any collisions would be reduced and it is anticipated that fewer fatal collisions will occur based on the anticipated lower approach speeds Eliminates potential right angle collisions
Impacts to Residents, Businesses, Institutions	 Less property needed Vehicular access to adjacent properties will likely be more restricted with signals. 	 Stone Church Road –development lands on northeast quadrant / vacant lands on other quadrants Highland Road – dwellings on north and south side of Highland Road Midblock Collector – vacant /

 Table 4-3: Evaluation of Traffic Control Alternatives

FACTOR	Option 1	Option 2	
	TRAFFIC SIGNALS	ROUNDABOUTS	
		 agricultural lands Rymal Road – dwellings / businesses on north and south side of Rymal Road Added benefit of traffic calming Added benefit of potential landscaping / streetscaping 	
Accommodation of Pedestrians and Cyclists	 Pedestrians will be provided with appropriate cross walks and crossing time with protected right of way at the signalized intersections Cyclists will be provided with bike lanes along Pritchard Road/Trinity Church Arterial Corridor 	 Splitter islands are provided in the design to create a midpoint refuge area so that pedestrians are only dealing with crossing one direction (2 lanes) of traffic flow at a time with fewer conflict points. Crossing distance is shorter and vehicle speeds are slower. Additional technologies would be required to accommodate for visually impaired persons crossing roundabouts. Specific training and education would be necessary. Cyclists will be provided with a bike path along Pritchard Road/Trinity Church Arterial Corridor and they may have difficulties manoeuvring through a roundabout. Experienced cyclists may negotiate the roundabout as they are considered vehicles. Roundabout can be designed with a cycle ramp in advance of and beyond the roundabout that will give riders an opportunity to leave the roadway, dismount and walk across the roundabout as a pedestrian. This could create some user confusion and may require education and guidance. Midblock Collector - opportunity exists to create a safe and attractive pedestrian crossing for the multi-use trail by use of a roundabout. The preferred alternative is a round about. 	
Vehicle Emissions	Higher emission due to more vehicle idling time/delay.	Generally reduced vehicle emissions due to less stopping activity, hence more	
	Average delay in seconds for the AM / PM peak hours is shown below.	environmentally friendly. Average delay in seconds for the AM / PM peak hours is shown below	
	• Stone Church Road – 42 / 26	Shown below.	
	Highland Road – 11 / 17	- Stone Unurch Koad $-8/13$ - Highland Pood $-4/4$	
	 Midblock Collector – 12 / 18 	 Highland Koad – 4 / 4 	

FACTOR	Option 1	Option 2
	TRAFFIC SIGNALS	ROUNDABOUTS
	 Rymal Road – 34 / 52 Less environmental friendly 	 Midblock Collector – 4 / 5 Rymal Road – 7 / 70
Costs	 An annual maintenance program for signals and electrical costs that will continue every year Higher operating and maintenance cost for signal heads, poles, cable ducts, electronic controller etc. 	 Marginally higher capital costs due to the additional property acquisition required Low maintenance cost, no operating cost, no signal hardware, no energy consumption
SUMMARY	Not Selected	Selected

In consideration of the overall net benefit, the City of Hamilton prefers the roundabout option at the intersection with Rymal Road, Midblock Collector, Highland Road and Twenty Road.

The roundabout intersections are currently under further detailed assessment/review by Ourston Roundabouts Canada. The feasibility of a 3 lane roundabout will also be investigated for the improvement of LOS at the proposed Rymal Road Roundabout. Should the roundabouts be determined unfeasible (or expensive at site specific locations) prior to detailed design, signalization will be implemented, where warranted.

4.1.2.2 Urban or Rural Drainage Design

An urban cross-section (curb and gutter) with sidewalks was deemed appropriate for the Trinity Church Corridor north of Rymal Road given the planned development for the area and a rural cross-section (ditches) was deemed appropriate for the Trinity Church Corridor south of Rymal Road since it is more fitting for the North Glanbrook Industrial Business Park.

4.1.3 Summary of the Preferred Design

The preliminary preferred design for transportation improvements for the Trinity Church Arterial Corridor includes:

- Alignment between existing Trinity Church Road and Pritchard Road (Option 4) to accommodate 4 travel lanes (2 per direction).
- Provision of traffic signal and exclusive turn lanes at the intersection with Stone Church Road.
- Provision of a roundabout at the intersections with Highland Road, Midblock Collector, Rymal Road and Twenty Road, subject to confirmation through detailed assessment. Should the roundabouts be determined unfeasible during detailed design, signalization will be implemented, where warranted.
- Provision of an urban cross-section north of Rymal Road and rural cross-section south of Rymal Road.

4.2 Phase 3 and 4 Public Consultation

Complete summaries of the public meetings, along with project team responses to questions / issues are provided in **Appendix A.3**.

During the Phase 3 and 4 process of the Trinity Church Arterial Corridor EA, the public consultation process involved the following activities:

- Meeting with Six Nations Council
- Consultants and their Developers Meeting
- Public Information Centre #2
- Stakeholder Committee Meeting
- Public Information Centre #3

June 6, 2006 June 19, 2006 June 26, 2006 October 2, 2006 October 12 & October 18, 2006

Meeting with Six Nations Council

Representatives of the City and the consultant team met with the Six Nations Council during the Trinity Church Arterial Corridor design alternatives phase of the project. This meeting provided the Six Nations Council with an opportunity to discuss the status of the Master Plan project, the Master Plan recommendations and issues of concern for the Six Nations. Two representatives of the Six Nation Council (not including the project team members) were present at the meeting. Many items were discussed, including:

- Project update;
- ROPA 9 Master Plan recommended solutions; and
- Concerns / Issues.

A copy of correspondence with the Six Nations Council, including meeting minutes is included in **Appendix A.5**.

Developers and Their Consultants Meeting #1

Representatives of the City and the consultant team met with the Developers and their Consultants during the Trinity Church Arterial Corridor design alternatives phase of the project. This meeting provided the developers and their consultants an opportunity to discuss the status of the Master Plan project, and the results of the transportation assessment for the Trinity Church Arterial Corridor design alternatives. Seven developers and their consultants (not including the project team members) were present at the meeting. Many items were discussed, including:

- Project update;
- Trinity Church Arterial Corridor design alternatives and short-listed alternatives; and
- Trinity Church Arterial Corridor public consultation.

A copy of the meeting minutes is included in **Appendix A.4**.

Second Public Information Centre (PIC #2)

The Second Public Information Centre (PIC#2) for the Trinity Church Arterial Corridor Environmental Assessment Study, was held on Monday, June 26th, 2006 from 6:30 to 8:30 PM at the Salvation Army Church Gym, 300 Winterberry Drive (at Paramount Drive), in the City of Hamilton. The purpose of PIC#2 was to provide information about the Study to the public and at the same time obtain public input. Twenty-nine panels were displayed. The information panels included the following information for the Trinity Church Arterial Corridor:

- 1 Welcome and study area
- 2 Description of the study background
- 3 Chart of the Class EA process
- 4 Description of the public consultation plan
- 5 Summary of the needs and opportunities for the area
- 6 Problem and opportunity statement for the study area
- 7 Existing official plan policies and other applicable policies
- 8 Description of existing conditions
- 9 ROPA 9 alternative solutions
- 10 North Glanbrook Industrial Business Park alternative solutions
- 11 Summary of public information comments from the related EA and Transportation Master Plans
- 12 Alternative design concepts
- 13 Design alternatives assessment criteria
- 14 Chart of the evaluations of design alternatives
- 15 Alternatives carried forward
- 16 Future actions
- 17 Contact information

The public was advised about the meeting through advertisements in the local paper. Advertisements were placed in the Hamilton Spectator on Friday, June 16, 2006 and Friday, June 23, 2006, and in the Brabant paper on Friday, June, 16, 2006 informing the public of the PIC. Notification letters were also mailed out to property owners within the study area, to other individuals who had responded with an interest in the study since its commencement, to conservation authorities, Federal and Provincial agencies, and utility companies. A copy of the advertisement is provided in **Appendix A.2**.

The format was an informal drop-in centre from 6:30 to 8:30 PM to meet the project team and to view the display panels and drawings. Attendees were asked to sign-in and were invited to fill-in comment forms at their convenience within a 2-week time frame.

Approximately 60 members of the public attended the PIC. Representatives from the project team attended the PIC to discuss the details of the project and answer questions of the public. A full summary of the PIC is provided in **Appendix A.3**.

The consultant team compiled comments and questions received from the public via returned comment sheets and e-mail. Key public comments provided on the Trinity Church Arterial Corridor design phase included the following:

- Use existing roads instead of building new ones;
- It is difficult to turn left onto Rymal from Trinity Church Road;
- Option 3 should be the preferred alignment; and
- Option 6 should be the preferred alignment.

Stakeholder Committee Meeting #3 (SC #3)

Representatives of the City and the consultant team met with the Stakeholder Committee during the Trinity Church Arterial Corridor design alternatives phase of the project. This meeting provided the SC members an opportunity to discuss the status of the Master Plan project, and the results of the transportation assessment for the Trinity Church Arterial Corridor design alternatives. Six members of the SC (not including the project team members) were present at the meeting. Many items were discussed, including:

- Project update;
- Trinity Church Arterial Corridor design alternatives;
- Trinity Church Arterial Corridor timing; and
- Trinity Church Arterial Corridor public consultation.

A copy of the SC#3 meeting minutes is included in **Appendix A.4**.

Third Public Information Centre (PIC#3)

The Third Public Information Centre (PIC#3) for the Trinity Church Arterial Corridor Environmental Assessment Study, was held on Thursday, October 12th, 2006 from 6:00 to 8:00 PM and on Wednesday, October 18th, 2006 from 6:00 to 8:00PM at the Salvation Army Church Gym, 300 Winterberry Drive (at Paramount Drive), in the City of Hamilton. The purpose of PIC#3 was to provide information about the Study to the public and at the same time obtain public input. Twenty-two panels were displayed. The information panels included the following information for the Trinity Church Arterial Corridor:

- 1 Welcome
- 2 Study Area
- 3 Study Background
- 4 Class Environmental Assessment Process
- 5 Study Public Consultation Plan
- 6 Problem and Opportunity Statement
- 7 Description of Trinity Church Arterial Corridor Design Alternatives
- 8 Description of Design Alternatives Assessment Criteria
- 9 Trinity Church Arterial Corridor Short-List Design Alternatives Evaluation
- 10 Description of the Design Criteria for Trinity Church Arterial Corridor
- 11 Identification and Description of Preferred Trinity Church Arterial Corridor Design Alternative

- 12 Functional Design Plans and Cross Sections
- 13 Summary of Impacts and Mitigative Measures
- 14 Future Actions and Contact Information

The public was advised about the October 12 meeting through advertisements in the local paper. Advertisements were placed in the Hamilton Spectator on Friday, September 29, 2006 and Friday, October 6, 2006, and in the Brabant papers (Mountain News, Glanbrook Gazette and Stoney Creek News) on Friday, September 29, 2006.

The public was advised about the October 18 meeting through advertisements in the local paper. Advertisements were placed in the Hamilton Spectator on Friday, October 6, 2006 and Friday, October 13, 2006, and in the Brabant papers (Mountain News, Glanbrook Gazette and Stoney Creek News) on Friday, October 6, 2006.

Notification letters were also mailed out to property owners within the Study Area, to other individuals who had responded with an interest in the Study since its commencement, to conservation authorities, Federal and Provincial agencies, and utility companies. A copy of the advertisement is provided in **Appendix A.2**.

The format was an informal drop-in centre from 6:00 to 8:00 PM to meet the project team and to view the display panels and drawings. Attendees were asked to sign-in and were invited to fill-in comment forms at their convenience within a 2-week time frame.

Approximately 60 members of the public attended the October 12, 2006 PIC and approximately 80 members of the public attended the October 18, 2006 PIC. Representatives from the project team attended the PIC to discuss the details of the project and answer questions of the public. A full summary of the PIC is provided in **Appendix A.3**.

The consultant team compiled comments and questions received from the public via returned comment sheets and e-mail. Key public comments provided on the Trinity Church Arterial Corridor design phase included the following:

- Option 6 is my preferred route; and
- Keep the North Glanbrook Industrial Business Park traffic contained. Do not provide a connection to Trinity Church Road from the Trinity Church Arterial Corridor.

5.

SELECTED DESIGN, ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

Inherent in the consideration of potential changes to existing conditions associated with transportation projects, is the significance of any impacts and the extent to which these impacts may be mitigated. Significance is related to importance in a local, regional, provincial or national context, and importance, relative to other identified sensitive areas and issues. This section describes the engineering features, and examines the anticipated environmental effects and mitigation measures for the relevant components of the natural, socio-economic and cultural environments for the preferred design alternative.

5.1 <u>Recommended Alternative</u>

This section describes the engineering features of the recommended design alternative for the Trinity Church Arterial Corridor. The preliminary design plan and typical cross-sections are included in **Appendix B**.

The technically preferred Design Alternative for the Trinity Church Arterial Corridor includes:

- A new 4 lane (2 through lanes in each direction) arterial corridor from the Red Hill Valley Parkway-Stone Church Road intersection to south of Rymal Road.
- Provision of traffic signals at the intersection with Stone Church Road.
- Provision of a roundabout at the intersections with Highland Road, Midblock Collector, Rymal Road and Twenty Road. The roundabout intersections are subject to further assessment during detailed design. Should the roundabouts be determined unfeasible during detailed design, signalization will be implemented, where warranted.
- Provision of an urban cross-section for the Trinity Church Arterial Corridor north of Rymal Road and a rural cross-section south of Rymal Road.

Details regarding the design of the recommended alternative are contained in the following sections.

5.1.1 Geometric Design

<u>Horizontal Alignment</u>

The preferred alignment is alignment Option 4, which is located between Pritchard Road and the existing Trinity Church Road. The horizontal alignment of the Trinity Church Arterial Corridor will comply with the Transportation Association of Canada *Geometric Design Guidelines* for a design speed of 90km/h. The alignment of the existing RHVP Ramp will be verified and necessary adjustments, if needed, may be made for the south leg to align with the north leg during detailed design. The alignment is shown on the design plates provided in **Appendix B.1**.

Vertical Alignment

The vertical alignment of the Trinity Church Arterial Corridor will comply with the Transportation Association of Canada *Geometric Design Guidelines* for a design speed of 90km/h.

Typical Cross-Sections

Typical cross-sections were developed to anticipate right-of-way needs for the Trinity Church Arterial Corridor, and include the following:

- 4-lanes
- Shoulders (south of Rymal Road)
- Curb and Gutter (north of Rymal Road)
- Exclusive turning lanes
- Sidewalks
- Bike lanes (north of Rymal), bike path (south of Rymal)
- Streetscaping, where feasible
- Utilities
- Median

Accommodation for Transit

The City of Hamilton's *Promoting Public Transit Policy Paper* states that a goal of providing at least 90% of residents and employees within the City with transit service within 400 metres (5 minute walk) should be established. Transit improvements will be required to service the NGIBP and East Mountain Business Park lands. As development proceeds, transit service should be re-examined along the Trinity Church Arterial Corridor. Stops could be provided at Highland Road, Midblock Collector Road, Rymal Road, and the extension of Twenty Road. The Trinity Church Arterial Corridor provides a strategic location for transit service due to its vicinity to the Lincoln Alexander Parkway, Red Hill Valley Parkway, ROPA 9 lands, and North Glanbrook Industrial Business Park. The opportunity for transit service will need to balance the operational cost-effectiveness, strategic objectives, and providing a service to the community.

In discussions with the City of Hamilton, it was noted that consideration should be given to bus bays at all potential transfer points along the Trinity Church Arterial. Guidelines from the City of Hamilton for bus stops indicate a 25m taper, and 40m parallel length prior to the bus stop, with an additional 25m parallel length to the intersection from the bus stop. The possibility of providing bus bays on the near side of the intersections was reviewed for corridor and potential stops have been identified. The provision of bus bays will be reviewed during detail design.

Accommodations for Pedestrians and Cyclists

The City of Hamilton's *Walking and Cycling Policy Paper* has recommended that the existing network of pedestrian and bicycle infrastructure be improved and expanded. It also

recognizes that these uses should be considered in the establishment of the right-of way and the design of new roads, and the reconstruction of existing roads. As such, the preferred design for the Trinity Church Arterial Corridor allows for a 2.0 m sidewalk, above the 1.5 m minimum, on both sides of the roadway, a 1.8 m on-road bike lane north of Rymal Road and a 3.0 m paved shoulder south of Rymal Road. The preferred location for the bike facilities will be identified through the future functional design / feasibility study for the installation of bike lanes along Pritchard Road.

Pavement Design

The recommended pavement design should be consistent with City of Hamilton standards.

Streetscaping

Locations where streetscaping can be feasibly accommodated will be determined during detail design, as per the typical cross sections (**Appendix B.2**).

5.1.2 Design Criteria

The preliminary design criteria for the recommended design concepts for the Trinity Church Arterial Corridor are summarized below.

An urban cross-section (curb and gutter) with sidewalks was deemed appropriate for Trinity Church Arterial Corridor, north of Rymal Road, given the planned development for the area, and also since urban cross-sections are typically implemented on all roadways within the urban area. A rural cross-section (ditches) without sidewalks was deemed appropriate for Trinity Church Arterial Corridor, south of Rymal Road, given the planned development for the area.

Trinity Church Corridor: New Classification – Urban Arterial		
Right of Way	60 m (north of Rymal Road)	
	45 m minimum (south of Rymal Road)	
Basic Number of Lanes	4	
Posted Speed Limit	N/A	
Design Speed Limit	90 km/hr	
Minimum Radius	600 m min (at 2% superelevation)	
Maximum Grade	4.5%	
Minimum Grade	0.75%	
Vertical Curves ^{1,2}	k = 32-53 crest	
	k = 30-40 sag; (headlight control)	

Lane Widths ³	
• through	3.75 m
• left turn	3.3 m (adjacent to median)
	3.5 m (not adjacent to median)
• right turn	3.5 m
Tangent Length for Intersection	Storage length required + 15 m, or 30 m min
Approaches	
Tangent Length between Curves	150 m minimum
Intersection Angle	90 +/- 5 degrees
Median at Intersections	2.0 m
Minimum Stopping Sight Distance ¹	170 m
Intersection radius	15 m at arterials; 12 m at collectors, 9 m at locals
Sight Triangles	
• arterial to collector	15 m x 15 m
• arterial to arterial	15 m x 15 m
• arterial to local	15 m x 15 m
Max. grade through intersections	2% max.
Bike Lane	1.8 m on-road bike lane (north of Rymal)
	3.0 m paved shoulder / bike lane (south of Rymal)
	1.8 m bike lane at intersections (south of Rymal)
Sidewalk width	2.0 m (above 1.5 m minimum, north of Rymal)

Note: ¹ The combination of all design elements, including required motorists turning and stopping sightlines at intersections and access points, must be met.

² Length of vertical curve in m, not to be less than the design speed in km/h

³ Lane widening through horizontal curves should be applied for tractor trailer units

5.1.3 Drainage and Stormwater Management

New stormwater management facilities will be required for this new road. Stormwater management requirements were estimated for water quantity, water quality and erosion control based on the 2003 *Stormwater Management Planning and Design Manual* (MOE, 2003). In general, the following sizing requirements were used to develop specific requirements:

- Quantity control requirements were estimated based on controlling post development flows to pre development levels for all storms up to and including the 100 year storm.
- Level 2 quality requirements were developed. This is consistent with requirements identified in earlier facilities.
- Erosion control requirements were estimated based on providing erosion control storage for a 25mm rainfall.
- The total volume required was equal to the quantity control storage volume plus the larger of the quality control or erosion control volumes. This is based on the Stormwater Management Planning and Design Manual.
- Area requirements for facilities were calculated based on a preferred extended detention storage depth of 1.0m and a 3:1 length to width ratio.

The following sections present the specific requirements. Where applicable, water quantity, water quality and erosion control requirements were identified.

Proposed stormwater management facilities for the proposed Trinity Church Arterial Corridor will need to consider controlling post development flows to pre-development levels, quality control and erosion control. Stormwater from this area will discharge into Outlet 1 and eventually into Hannon Creek.

Proposed stormwater management facilities for the Trinity Church Arterial Collector were estimated considering controlling post development flows to pre-development levels, quality control and erosion considerations. Stormwater from the roadway will be conveyed to Hannon Creek. To maintain post development flows at pre-development levels for the 100 year storm will require a total storage volume of 2,400m³. An additional storage volume of 1,807 m³ will be required to provide Level 2 quality control. Finally, a storage volume of 1,210 m³ will be required to provide erosion control. The sizing of the stormwater management pond has not considered any external drainage areas but has considered matching pre-development conditions over a range of storm events for the road allowance.

To meet stormwater management requirements, a wet pond with extended detention with a total storage volume of 4,207 m³ will be required. To accommodate this volume, a total area of 4,207 m² or 4.02 ha is required and can be accommodated within the Trinity Church Arterial Corridor right-of-way.

XCG also notes that: "The City's recently completed Stormwater Master Plan identified a preferred strategy for this area as "business as usual with urban retrofits". This strategy is a continuation of convention stormwater management activities in new development areas augmented by the implementation of source, conveyance and end of pipe controls within existing areas. As such, the preferred alternative of a wet pond sized for Level 2 is consistent with Stormwater Master Plan."

These requirements should be considered as conceptual in nature and should be confirmed following consultation with affected agencies and through the detailed design of facilities.

5.1.4 Utilities

Several utilities are located within the study area. These include Union Gas, Hamilton Hydro, Bell Canada, Hydro One and Cable. A summary of the potential impact on each utility is provided below.

<u>Hamilton Hydro</u>

Approximately four streetlighting poles on the south side of Highland Road will need to be relocated to accommodate the roundabout at the intersection with the Trinity Church Arterial Corridor. Approximately three hydro poles on the south side of Rymal Road will need to be

relocated to accommodate the roundabout at the intersection with the Trinity Church Arterial Corridor.

<u>Union Gas</u>

An existing buried gas line is located on the south and north sides of Rymal Road in the study area. No impacts are anticipated to the existing buried gas line within the study area, since no changes are proposed to the Rymal Road vertical alignment. Sufficient cover should be maintained.

Water

Existing buried water lines are located near the centreline of Rymal Road and on the south side of Highland Road. No impacts are anticipated to the existing buried water lines within the study area, since no changes are proposed to the Rymal Road and Highland Road vertical alignment. Sufficient cover should be maintained.

<u>Sewer</u>

An existing buried sewer line is located on the south side of Rymal Road. An existing buried sewer line is located near the centreline of Highland Road, west of the proposed intersection with Trinity Church Arterial Corridor. No impacts are anticipated to the existing buried sewer lines within the study area, since no changes are proposed to the Rymal Road and Highland Road vertical alignment. Sufficient cover should be maintained.

<u>Bell Canada</u>

Impacts are anticipated for the overhead Bell facility on the south side of Rymal Road at the intersection with Trinity Church Arterial Corridor. The Bell facility is located on the Hydro poles, three of which will need to be relocated. Impacts are anticipated for the overhead Bell facility on the south side of Highland Road at the intersection with Trinity Church Arterial Corridor. The Bell facility is located on the Hydro poles, four of which will need to be relocated. Impacts on overhead facilities are subject to relocation of Hamilton hydro poles. There is an existing bell easement which crosses the Trinity Church Arterial Corridor in an east-west direction, north of Rymal Road. The easement appears to be inactive at this time and not conduits are currently present.

<u>Cable</u>

An existing overhead cable line is located on the south side of Rymal Road. The Bell facility is located on the Hydro poles, three of which will need to be relocated.

Formal definition of impacts on utilities will be determined during detailed design. All utility information should be updated prior to construction to ensure that the data is accurate and to finalize relocation requirements as necessary.

Pipelines

An existing 406.4mm high pressure petroleum products pipeline (Trans-Northern Pipelines) exists within the north-south hydro corridor easement in the study area, east of Pritchard Road. Another pipeline (TransCanada) exists within the east-west hydro corridor easement in the study area, south of Rymal Road.

Formal definition of impacts on utilities will be determined during detailed design. All utility information should be updated prior to construction to ensure that the data is accurate and to finalize relocation requirements as necessary.

5.1.5 Illumination and Traffic Signals

The need for and type of illumination within the Trinity Church Arterial Corridor is to be confirmed at the detailed design stage. Given that the Trinity Church Arterial Corridor will be a 4-lane cross-section with a median, illumination will be required on both sides of the roadway throughout the corridor.

New traffic signals are recommended at the intersection of Trinity Church Arterial Corridor with Stone Church Road.

5.1.6 Closure of Upper Mount Albion Road

The need for closure of Upper Mount Albion Road was identified in the ROPA 9 Master Plan. The ultimate closure of Upper Mount Albion Road is proposed to be an L- shaped road pattern (to the west) which will be integrated with the Trinity Neighbourhood Plan Review. Final plans will be determined in coordination with the Trinity Neighbourhood land use review. However, since the closure of Upper Mount Albion Road should be coordinated with the implementation of the Trinity Church Arterial Corridor, it may be necessary to provide a temporary cul-de-sac prior to the Trinity Neighbourhood road network construction. The preliminary design for the potential temporary closure involves a 13m radius cul-de-sac, as illustrated on **Design Plate 4** in **Appendix B.1**.

5.1.7 Closure of Pritchard Road

The closure of Pritchard Road was identified in the approved plan for the East Mountain Industrial Business Park. The timing and details of the closure of Pritchard Road will be coordinated with the extension of Anchor Road to Rymal Road, the further review of traffic control on Rymal Road and the Trinity Church Arterial Corridor and the future feasibility study for the installation of bike lanes long Pritchard Road. The preliminary design for the closure involves a 13m radius cul-de-sac, as illustrated on **Design Plate 4** in **Appendix B.1**.

5.1.8 Carpool Lot

As part of the Rymal Road Planning Area Transportation Master Plan, a carpool lot was recommended in the vicinity of the Red Hill Valley Parkway and Lincoln Alexander Expressway interchange as part of the overall transportation strategy. The lot locations would logically be in close proximity to the Trinity Church Arterial Road to provide the greatest access to the expressway system. Planning for a carpool facility will require identification of anticipated demand to allow for determining the size of lot and then suitable parcels. The following is a summary of anticipated demand. The exact location of the lot is beyond the scope of this study as it requires property negotiation and valuation.

Based on a review of the *Carpool Lot Strategy Study* (March 1998) prepared for the Ministry of Transportation which summarizes the parking demands at carpool lots throughout the GTA and beyond, we have selected the carpool lots on the Highway 400 corridor (King Road to Highway 9) to estimate the future demand at the proposed carpool lot along the Trinity Church Corridor. The MTO *Carpool Parking Lot Inventory* - February / March 2000 provided surveyed carpool lot parking demand from 2000 for the proxy sites.

The total parking demand at the proxy lots was 217 spaces in 2000. The approximate AM peak hour volume on Highway 400 was 6,700 vph in 2000. Using this ratio of parking demand versus adjacent corridor traffic, the estimated parking demand for the Trinity Church Corridor carpool lot would be 115 spaces in 2021.

The majority of the carpool traffic along the Trinity Church Corridor will be northbound in the AM and southbound in the PM, consistent with the prevailing peak commuter direction. While the carpool lot will attract new trips to the Trinity Church Corridor / Stone Church Road intersection, it will also divert traffic away from the critical southbound left to the non-critical movement in the PM peak.

At this stage of the carpool lot planning, it is anticipated that approximately 115 parking spaces should be accommodated. 115 parking spaces could typically be accommodated in a space of approximately 1,100 m². The carpool lot along the Trinity Church Corridor could be accommodated at any of the following locations:

- Southeast, southwest and northwest corners of the intersection with Stone Church Road
- Southeast, southwest, northeast and northwest corners of the intersection with Highland Road

The carpool lot location could also be combined with a trail head parking lot for the potential Red Hill Valley Open Space Trail.

Access to the carpool lot should be provided from the proposed mid-block collector or Stone Church Road and not from the Trinity Church Arterial Corridor.

5.1.9 Property Requirements

The new arterial road link is recommended to:

- Provide a connection to the ROPA 9 and Heritage Green community traffic from the Parkway system.
- Serve as an extension and transition of the Red Hill Valley Parkway to an arterial road.
- Provide a connection further south as a component of the road network to serve the North Glanbrook Industrial Business Park and to service lands to the south.

Each of these needs reflects a major arterial road role.

A 60 m ROW is recommended for the Trinity Church Arterial Corridor, north of Rymal Road and a minimum 45 m ROW is recommended for the Trinity Church Arterial Corridor, south of Rymal Road. These right-of-way widths were recommended for several reasons:

- To provide for future transportation capacities along the corridor beyond the 2021 time horizon, including potential for additional vehicle lanes, transitway, bus bays, etc.;
- To accommodate the necessary flare for the roundabout;
- To provide for utility services; and
- To provide for stormwater facilities.

These right-of-way requirements are typical for similar high-level arterial corridors in the City, such as Mud Street.

Property requirements identified for this project involve approximately 1 commercial property, 4 residential properties, and Ontario Realty Corporation lands, north of Rymal Road, and approximately 7 residential properties, south of Rymal Road. Formal definition of property requirements will be determined during detailed design.

The approximate property requirements are illustrated in **Appendix B.1**. The exact property requirements will be determined at detailed design. Overall, more detailed review of property requirements is required in all areas throughout the corridor as part of the detailed design.

5.1.10 Cost Estimate

The preliminary estimated construction cost for the recommended improvements is \$6,394,000 (north of Rymal Road) and \$2,203,000 (south of Rymal Road), including design fees and administrative costs. The fees do not include property acquisition costs which will be confirmed during detail design. The cost breakdown is included in **Appendix D**.

5.2 **Environmental Effects and Mitigation Measures**

This section examines the anticipated environmental effects and mitigating measures for the relevant components of natural, social, economic and cultural environments.

5.2.1 Natural Environment

5.2.1.1 Fisheries and Aquatic Habitat

Watercourses located within the project limits are intermittent and do not directly support fish habitat throughout the year. As a result, potential effects on fish habitat can be fully mitigated through standard road construction practices, erosion and sedimentation control and in-water construction timing restrictions. Increases in quantity of runoff associated with the increased surface imperviousness from the proposed road improvements will not impact existing conditions.

Further details can be found in the Natural Environment report, provided in **Appendix D.3** of the ROPA9 Master Plan and **Appendix C.1** of this report.

5.2.1.2 Vegetation and Wildlife

Trinity Church Arterial Corridor will require vegetation removals within the new right-ofway. This vegetation has been disturbed previously through human activity and comprises cultural thicket and cultural meadow communities. The higher quality vegetation, including the black walnut woodlot, was avoided through route selection.

The development of Trinity Church Arterial Corridor will result in disturbance to vegetation located adjacent to the right-of-way. Since this vegetation is cultural in origin (i.e. previously disturbed), the effects of disturbance are considered minor.

No plant species of conservation concern or significant vegetation communities will be lost or disturbed by road development.

Within the project limits, the Trinity Church corridor supports wildlife species that are tolerant of urban conditions and human disturbance. Impacts to wildlife associated with this undertaking are therefore considered relatively minor.

Trinity Church Arterial Corridor will be constructed primarily through agricultural lands and cultural vegetation communities. These areas primarily consist of previously modified/disturbed terrestrial wildlife habitat with low habitat structure and diversity. Consequently, road development will result in the loss of approximately 2,340 m² of habitat with limited capability for wildlife.

Numerous bird species located within the project limits are listed under the Migratory Birds Convention Act (MBCA). The MBCA prohibits the killing, capturing, injuring, taking or disturbing of migratory birds (including eggs) or damaging, destroying, removing or disturbing of nests. Migratory insectivorous and non-game birds are protected year-round and migratory game birds are protected from March 10 to September 1. No permits are issued for the destruction of migratory birds or their nests incidental to some other undertaking or activity and project works or activities are not specifically prohibited under the Act. To meet the requirements of the MBCA, no vegetation removals should occur during the nesting season. With several exceptions, this includes the period from April 1 to July 31. If vegetation clearing is required during this period, a nesting survey should be carried out by a qualified avian biologist prior to construction. If active nests are found, a site-specific mitigation plan should be prepared in consultation with the Canadian Wildlife Service.

Further details can be found in the Natural Environment report, provided in **Appendix D.3** of the Master Plan and **Appendix C.1** of this report.

5.2.1.3 Contaminated Property Screening

No evidence of actual contamination was identified within the study area. However, there is the potential for environmental contamination to be associated with some of the land uses (agricultural) identified. As a result, consideration should be given to conducting a further investigation during the detailed design stage and in advance of property acquisition.

5.2.1.4 Recommended Mitigation

The following are recommended mitigation measures for the protection of terrestrial and aquatic within the study corridor, during construction.

Natural Sciences

The effects of habitat removal on wildlife can be mitigated through the following measures:

- Avoid vegetation clearing during wildlife breeding seasons, primarily March 15 to July 31;
- Disperse, capture and relocate wildlife prior to vegetation clearing; and
- Install a temporary tree protection barrier around trees to be protected during construction in accordance with OPSS 565.

Trees on private property that may be affected as a result of the road widening or during construction will be identified prior to or during detailed design and may require the development of further strategies for mitigating these impacts.

In addition, in an effort to compensate for trees and other vegetation removed, and to enhance the aesthetics of the works and reduce any potential visually intrusive effects, streetscaping will be provided throughout the corridors, as appropriate, in accordance with the City of Hamilton Street Tree Planting Policy – Planning and Design and as shown on cross sections in **Appendix B.2**.

Provide erosion and sediment control during construction.

Any soils that are removed during construction should be tested for contaminants that may have been used or dumped along the corridor limits. If the soils are contaminated, the City of Hamilton Contaminated Sites Management Program for Municipal Works measures will be implemented and will follow appropriate soil management practices including testing and disposing of contaminated soils using licensed haulers and disposal facilities.

To minimize reduced air quality due to dust, apply water and calcium chloride during construction.

5.2.2 Social, Economic and Cultural Environment

5.2.2.1 Land Use and Socio-Economic Impacts

The design directly affects 6 existing accesses (3 at Highland Road and 3 at Rymal Road). The City will negotiate with the affected properties during the detailed design phase. The design will be an access-controlled arterial corridor, with a flush or raised median throughout the entire corridor. During detailed design, a traffic management plan will be developed to determine how traffic will be accommodated during construction.

The corridor construction may temporarily impact access points to existing institutions and residences while construction is taking place. Timing of construction activities can be coordinated to mitigate many of these impacts. Construction activities should not have significant impacts on regular institution and residents operations throughout the corridor.

5.2.2.2 Road Construction and Noise

The Ministry of the Environment (MOE) does not have noise guidelines specifically relating to construction or roadway widening. However, the MOE does have a protocol with the Ministry of Transportation (MTO) relating to Provincial Highway Expansions. The protocol states that the primary objective is to achieve 55 dBA or the preconstruction ambient sound exposure, whichever is higher, at outdoor amenity areas. The MOE/MTO protocol indicates that for sound exposure increases greater than 5 dBA, an investigation into the administrative, economic, and technical feasibility of noise mitigation is required.

Future conditions expected with this project result in a predicted noise level of 68 dBA for existing noise receptors (residential backyards) at Rymal Road and at Highland Road adjacent to the Trinity Church Arterial Corridor. The biggest change over the existing noise levels results in an increase of >5 dBA. According to the MOE/MTO protocol, mitigation is required for increases of 5 dBA or more. Noise mitigation measures (soundwalls, purchasing the land, etc.) will be investigated for these existing occupied properties during detailed design, where appropriate, for existing receptors. Any future development will be responsible for any required mitigation for future receptors.

5.2.2.3 Archaeology, Heritage and Cultural Resources

Archaeology

There is a potential for the identification of precontact and historic archaeological sites in areas depending on the degree of previous land disturbance.

Several new routes options for Trinity Church Arterial Corridor have been proposed east and west of, and coinciding with the current Trinity Church Road right-of-way. The various options connect via a variety of collectors, many of which link to other proposed road extensions. In general, the area is comprised of agricultural lands with scattered historic farmsteads, isolated residential properties, and strips of residential properties. Most of the area is undisturbed by development.

Field review identified potential for archaeological sites over almost all of the study area. In view of the historic potential along the existing road, the option following existing Trinity Church Road is the least preferred alternative due to potential impact to heritage resources. In the area between Highland Road and Rymal Road, most of the area covered by the various route options has been previously subjected to archaeological assessment, and, pending clearance by the MCL, those lands would not require further assessment. Two of the five registered sites in the vicinity of the route options might require further archaeological assessment.

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

 With the exception of lands that have been previously assessed and cleared of further heritage concerns by the MCL, a Stage 2 archaeological assessment should be conducted of the preferred route option within the Trinity Church Corridor Extension project area, in accordance with the Ministry of Culture's Stage 1-3 Archaeological Assessment Technical Guidelines (1993, 2006). This work would be conducted to identify any archaeological remains that may be present;

The above recommendations are subject to Ministry of Culture approval, and it is an offence to alter any archaeological site without Ministry of Culture concurrence. No grading or other activities that may result in the destruction or disturbance of an archaeological site are permitted until notice of Ministry of Culture approval has been received.

• Should deeply buried archaeological remains be found during construction activities, the Heritage Operations Unit of the Ontario Ministry of Culture should be notified immediately.

Further details can be found in the Stage 1 Archaeological Assessment report, provided in **Appendix C.2**.

Cultural Heritage

No heritage or cultural features are expected to be impacted as a result of the proposed road alignment. Further details on the study area build heritage and cultural landscape can be found in the cultural heritage assessment report, provided in **Appendix D.2** of the Master Plan.

5.2.3 Comments from Provincial Agencies

Ontario Realty Corporation

Ontario Realty Corporation (ORC) provided comments through the public process on July 17, 2006. Their comments related to the Trinity Church Arterial Corridor are as follows: "

- 1. It is crucial that the road design incorporate the following principles:
 - Will not create parcel configurations that limit the marketability, desirability, and value of these lands (rectangular configurations are preferred and attention to width of land between the future road and hydro/pipeline corridor needs to be considered);
 - Consider appropriate design speeds that would permit lots to front and have direct access to the ROW;
 - Provide for a mid-block intersection (between Highland Rd. W. and Rymal Rd., e.g. 300m south of Highland Rd.W.), to permit connection to an east-west road between Pritchard Road and Upper Mount Albion Road.
- 2. ORC should be fully compensated for the land taking required for this road as it will serve as a City-wide benefit. This compensation may not necessarily be restricted to the land required for the right-of-way, but may also include compensation for the loss of land value due to the creation of irregular/unusable land parcel shapes between the road and hydro/pipeline corridor."

In response to the ORC comments, the proposed design for the Trinity Church Arterial Corridor was chosen on a variety of criteria, which included "Compliance with the NGIBP Master Plan and East Mountain Industrial Business Park / Land Use Coordination" to consider the creation of odd-shaped parcels. The preferred alternative (Option 4) was the most desirable alignment for this criterion. Although the recommended design will have access management, the recommended design accommodates an intersection with a midblock collector road approximately 250 m south of Highland Road, which will provide access to the East Mountain Industrial Business Park lands. A copy of the ORC letter is provided in **Appendix A.1**.

Ministry of Natural Resources:

The Ministry of Natural Resources provided comments through the public process on October 27, 2006. Their comments related to the Eramosa Karst ANSI. The following comments were provided:

"Thank you for providing notice regarding initiation of Phases 3 and 4 of the Municipal Class Environmental Assessment process for the schedule 'C' projects identified through the Rymal Road Planning Area Master Plan. The Ministry has reviewed information available from the City's website and mapping provided by iTRANS Consulting Inc. and offers the following comments.

Sections of the provincially significant Eramosa Karst ANSI are located within the Rymal Road Planning Area. Some of the projects proposed have the potential to impact the ANSI. The preferred alternative for a new collector road for the Trinity neighbourhood is proposed to pass through the ANSI Feeder Area and Developed Area. The widening of Rymal Road will occur within the ANSI Feeder Area. The Ministry notes that the mapping provided to show the Trinity neighbourhood collector alternatives does not show the full extent of creeks within the ANSI Feeder Area that would potentially be affected. The mapping should be carefully reviewed.

The *Earth Science Inventory and Evaluation of the Eramosa Karst ANSI* (April 2003) provides detailed information about the significance of the ANSI and includes recommendations for protecting its values. As the report notes, the Feeder Area contains all of the watersheds for streams that sink along the south edge of the Core Area. These streams are believed to contribute flow to the karst system in the Core and Developed Areas, and thus play a critical role in maintaining the provincially significant karst features. The report recommends, *that the Feeder Area be afforded a level of protection to ensure that:*

- 1) the flows of the creeks into the Core Area are substantially maintained (i.e. stream discharge including low flow and high flow characteristics, and discharge response to runoff events),
- 2) water quality is improved (i.e. primarily a reduction in sediment load, since the sediment load is currently quite high as a result of agriculture), and
- *3)* protective measures are employed to reduce the risk of contamination of surface streams by substances that would significantly impact the karst.

It is also recommended that prior to any development in the Feeder Area, development plans be reviewed to ensure that these objectives will be met. As well as expertise in civil engineering, reviewers should have expertise in environmental hydrology and geomorphology. A sound knowledge of karst hydrology and geomorphology would be an asset. There are significant features within the Developed Area, and the report provides recommendations for this area that should also be reviewed.

It is the Ministry's expectation that the recommendations of this report will be respected, and that the City will consult with reviewers with suitable expertise in the evaluation and selection of design alternatives. This information and assessment should be included in the Environmental Study Report.

Please continue to circulate new information as it becomes available. You may contact the undersigned if you have questions or clarification is required."

In response to the MNR comments, the proposed design for the Trinity Church Arterial Corridor will not be directly impacting the Eramosa Karst ANSI. Potential impacts to sinkholes or other Karst features in the Karst feeder area will need to be reviewed during detail design. A copy of the MNR letter is provided in **Appendix A.1**.

5.2.4 Summary of Identified Concerns and Mitigation Measures

A summary of the potential impacts to the natural, social/economic and cultural environments together with recommended mitigation measures is provided in **Table 5-1**.

Factor	Anticipated Impact	Proposed Mitigation	
Natural Environment:			
Natural Environm Vegetation / Trees	 Removal of existing trees, and other vegetation, including trees which will be removed or potentially impacted along the Trinity Church Corridor (including shelter belts and two gray dogwood cultural thickets). 	 Tree removal, planting and protection during construction will be as per City of Hamilton Public Tree Removal Policy, and the City's Tree Preservation and Protective Measures for Trees Affected by Construction Policy. Trees on private property that may be affected as a result of the road widening or during construction will be identified prior to or during detailed design and may require the development of further strategies for mitigating these impacts. In addition, in an effort to compensate for trees and other vegetation removed, and to enhance the aesthetics of the works and reduce any potential visually intrusive effects, streetscaping will be provided throughout the corridor, as appropriate, in accordance with the City of Hamilton Street Tree Planting Policy – Planning and Design. The work zone will be delineated using construction fencing/tree protection barrier. The application of road salt will be managed to the extent possible. Disturbed areas will be restored with native seed mix. 	
		 Native, non-invasive, complementary vegetation to compensate for vegetation removals will be planted. 	
Wildlife	 Impact on wildlife habitat 	 Within the project limits, the Trinity Church corridor supports wildlife species that are tolerant of urban conditions and human disturbance. Impacts to wildlife associated with this undertaking are therefore considered relatively minor. Vegetation clearing will be avoided during wildlife breeding seasons, primarily March 15 to July 31 to further minimize impacts. Wildlife will be dispersed, captured and relocated prior to vegetation clearing. 	

 Table 5-1: Anticipated Impacts and Proposed Mitigation Measures

Factor	Anticipated Impact	Proposed Mitigation
Fisheries and Aquatic Habitat	 Impact on fisheries or aquatic habitat 	 Since the watercourse crossings along the Trinity Church Corridor are not well defined channels and no aquatic habit has been identified in the crossings, the proposed widening impacts are considered relatively minor.
Surface Water	 Increase in the existing pavement area will result in increase in quantity of runoff Potential negative impact to receiving watercourses 	 Increases in quantity of runoff will not impact existing conditions. Water quality treatment will meet minimum Ministry of the Environment requirements. Provide erosion and sediment control during construction.
Air Quality	 Potential for impacts from dust during construction. 	 To minimize reduced air quality due to dust, apply water and calcium chloride during construction.
Soil Removal, and Contaminants	 Potential for removal of contaminated soils 	 Any soils that are removed during construction should be tested for contaminants that may have been used or dumped along the corridor limits. If the soils are contaminated, the City of Hamilton Contaminated Sites Management Program for Municipal Works measures will be implemented and will follow appropriate soil management practices including testing and disposing of contaminated soils using licensed haulers and disposal facilities.
Social Environme	ent:	
Economic Impact to Businesses	 Economic impact to businesses 	 Maintain access to individual driveways during construction. Full movement to existing properties will not be restricted after construction. Restriction on work hours in the corridors.
Noise Levels	Increase in existing noise levels.	 Future conditions expected with this project result in a predicted noise level of 68 dBA. The biggest change over the existing noise levels results in an increase of >5 dBA. According to the MOE/MTO protocol, mitigation is required for increases of 5 dBA or more. Noise mitigation measures (soundwalls, purchasing the land, etc.) will be investigated during detailed design, where appropriate. Construction activities are to comply with the requirements of the municipal noise by-law 03-020. 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.
Factor	Anticipated Impact	Proposed Mitigation
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Safety concerns	 Safety for pedestrian, 	 To maintain and encourage pedestrian movements,
,	cyclists, motorists	sidewalks will be constructed on both sides of the
	, , , , , , , , , , , , , , , , , , ,	Trinity Church Corridor through the urbanized
		section (north of Rymal Road).
		 Traffic signals will be timed to provide adequate
		crossing time for pedestrians at the intersection with
		Stone Church Road and other locations if signals are
		identified as the preferred traffic control.
		 Splitter islands will be provided to shorten crossing
		distances for roundabouts at the intersection with
		Rymal Road and other locations if roundabouts are
		identified as the preferred traffic control.
		• Cyclists will be accommodated with bike lanes along
		Trinity Church Corridor. The preferred location of
		the bike lanes will be determined during the
		functional design of the installation of bike lanes
		along Pritchard Road.
		• A median will be provided throughout the corridor to
		provide access management. Vehicles will access the
		Trinity Church Corridor from the intersections with
		other road connections.
Property	 Requirement for additional 	 Property will be required from approximately 1
Requirements	property	business, 4 dwellings, and Ontario Realty
		Corporation lands. Formal definition of property
		requirements will be determined during detailed
		design.
Cultural	Discovery of archaeological	Immediately contact appropriate Ministries if any
Cultural	/ human remains not	deenly buried denosits are found
	anticipated	deepty buried deposits are tound.
Streetscaping	Reduced aesthetics	 To address concerns over the aesthetics of the
Succescuping	reduced destrictes	roadway streetscaping is to be provided along both
		sides of Trinity Church Corridor where feasible
		Streetscaping details will be confirmed during
		detailed design. Preliminary streetscaping plans
		include planting trees along the corridors.
Utility	Relocation of existing	• Existing utilities will need to be relocated. Formal
-	utilities	definition of impacts on utilities, specifically
		Enbridge Gas, Union Gas, Hamilton Hydro, Bell
		Canada, Mountain Cable, Cogego Cable, Fiberwired
		and Source Cable will be determined during detailed
		design.
Construction	 Inconvenience during 	 Impacts will be temporary in nature. The City will
Detours	construction	attempt to mitigate impacts as much as possible
		during detailed design and construction, through
		construction staging plans and traffic management
T11 · · ·		plans.
Illumination	Need for additional	Illumination to be provided on Trinity Church
	illumination with a wider	Corridor, as appropriate.
	road	

6. SUMMARY

The Trinity Church Arterial Corridor Environmental Assessment Study Area is bounded by Upper Mount Albion to the east, Stone Church Road-Paramount Drive to the north, Glover Road to the west, and Dickenson Road to the south.

This report documents the Phases 3 and 4 of the Class EA process for the Trinity Church Arterial Corridor study, including the identification and evaluation of design alternatives and the selection of preferred design. This report should be read in conjunction with the Rymal Road Planning Area (ROPA 9) Master Plan (June 2006), which documents Phases 1 and 2 of the Class EA process. The report should also be read in conjunction with the North Glanbrook Industrial Business Park Master Plan addressed the Phase 1 and 2 requirements for the Trinity Church Arterial Corridor, south of Rymal Road.

The ROPA 9 Master Plan identified that a north-south link from the Red Hill Valley Parkway to south of Rymal Road is crucial to the broader road network within the City, and would also serve the local community. Providing adequate capacity in this corridor is critical to planning for the economic growth and well-being of the City. The former Region of Hamilton-Wentworth Official Plan recognizes this need, and has highlighted a future extension of Trinity Church Road to the Red Hill Valley Parkway. The ROPA 9 Master Plan also identified the need for a north-south link from the Red Hill Valley Parkway to south of Rymal Road as a longer term solution to address the traffic operations issues within the Trinity Neighbourhood.

The NGIBP Transportation Master Plan identified the need for a two lane arterial road from Rymal Road to the future Dartnall Road Extension in the vicinity of Trinity Church Road with the protection for four lanes for the arterial road in the longer term.

The technically preferred Design Alternative for the Trinity Church Arterial Corridor includes:

- A new 4 lane (2 through lanes in each direction) arterial corridor from the Red Hill Valley Parkway-Stone Church Road intersection to south of Rymal Road.
- Provision of traffic signals at the intersection with Stone Church Road.
- Provision of a roundabout at the intersections with Highland Road, Midblock Collector, Rymal Road and Twenty Road. The roundabout intersections are subject to further assessment during detailed design. Should the roundabouts be determined unfeasible during detailed design, signalization will be implemented, where warranted.
- Provision of an urban cross-section for the Trinity Church Arterial Corridor north of Rymal Road and a rural cross-section south of Rymal Road.

The timing for implementation of the Trinity Church Arterial Corridor segment between Stone Church Road and Rymal Road was discussed in the Rymal Road Planning Area Master Plan, which identified that additional north-south capacity (equivalent to 2 lanes per direction) is needed in the Trinity Church Arterial Corridor by the 2011 time horizon and should be implemented as soon as possible, given design and funding constraints. The North Glanbrook Industrial Business Park Master Plan identified a need for a longerterm extension of the Trinity Church Arterial Corridor to continue south of Rymal Road to service the Business Park and to allow flexibility for a potential future connection to the airport.

The preliminary design of the technically preferred Design Alternative is outlined in Section 5.1 and Appendix B. The environmental impacts of the preferred Design Alternative are discussed in Section 5.2. To minimize the environmental impacts of the preferred Design Alternative, many mitigation measures will be implemented. These mitigation measures are summarized in Section 5.2.4 and include:

- Tree removal, planting and protection during construction will be as per City of Hamilton Public Tree Removal Policy, and the City's Tree Preservation and Protective Measures for Trees Affected by Construction Policy.
- Trees on private property that may be affected as a result of the road widening or during construction will be identified prior to or during detailed design and may require the development of further strategies for mitigating these impacts.
- In addition, in an effort to compensate for trees and other vegetation removed, and to enhance the aesthetics of the works and reduce any potential visually intrusive effects, streetscaping will be provided throughout the corridor, as appropriate, in accordance with the City of Hamilton Street Tree Planting Policy and **Appendix B**.
- Water quality treatment will meet minimum Ministry of the Environment requirements.
- Provide erosion and sediment control during construction.
- To minimize reduced air quality due to dust, apply water and calcium chloride during construction.
- Any soils that are removed during construction should be tested for contaminants that may have been used or dumped along the corridor limits. If the soils are contaminated, the City of Hamilton Contaminated Sites Management Program for Municipal Works measures will be implemented and will follow appropriate soil management practices including testing and disposing of contaminated soils using licensed haulers and disposal facilities.
- Maintain access to individual driveways during construction.
- Full movement to existing properties will not be restricted after construction.
- Restriction on work hours in the corridors.
- Future conditions expected with this project result in a predicted noise level of 68 dBA. The biggest change over the existing noise levels results in an increase of >5 dBA. According to the MOE/MTO protocol, mitigation is required for increases of 5 dBA or more. Noise mitigation measures (soundwalls, purchasing the land, etc.) will be investigated during detailed design, where appropriate, for existing receptors.
- Construction activities are to comply with the requirements of the municipal noise by-law 03-020. 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.
- Immediately contact appropriate Ministries, if any deeply buried deposits are found.

- Existing utilities will need to be relocated. Formal definition of impacts on utilities, specifically Enbridge Gas, Union Gas, Hamilton Hydro, Bell Canada, Mountain Cable, Cogego Cable, Fiberwired, Source Cable, TransCanada and Trans-Northern Pipelines will be determined during detailed design.
- Impacts will be temporary in nature. The City will attempt to mitigate impacts as much as possible during detailed design and construction, through construction staging plans and traffic management plans.
- Illumination to be provided on Trinity Church Corridor, as appropriate.