City of London

Recreational Pathway Crossing of Richmond Street
Municipal Class Environmental Assessment
Environmental Study Report

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Project Number: 60321180

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Executive Summary

Introduction

The City of London (the City), through their consultant AECOM, has completed a Municipal Class Environmental Assessment (Class EA) study to determine an appropriate means of linking recreational pathway terminus points east and west of Richmond Street north of Sunningdale Road. The study area, comprises the existing Richmond Street right-of-way (ROW) and adjacent lands extending east and west.

The long-term recreational pathway objectives for this study area corridor are identified within the City of London's Bicycle Master Plan (BMP). The BMP recommended implementing a major east-west recreational pathway corridor along the northern boundary of the City with a crossing of Richmond Street. Subdivision development in London, north of Sunningdale Road, has progressed to the point where municipal park corridors and large sections of recreational pathways are being implemented. In order to address future public use along this corridor the City needs to determine the most appropriate means of linking this recreational pathway system across Richmond Street.

Consultation

The involvement of the community – residents, agencies, stakeholders, Aboriginal communities, and those who may be potentially affected by a project – is an integral part of the Class EA process. The purpose of the Class EA study consultation process is to provide an opportunity for stakeholder groups and the public to gain an understanding of the study process; contribute to the process for development and selection of alternatives/design concepts; and provide feedback and advice at important stages in the Class EA process. Specifically, the objectives of the consultation efforts are to:

- generate awareness of the project and provide opportunities for involvement throughout the planning process; and
- facilitate constructive input from public and agency stakeholders at key points in the Class EA process, prior to decision-making.

A consultation program was incorporated into the study in order to meet the above objectives. The consultation program included:

- Posting project milestones on the City of London website;
- Conducting meetings with agencies and stakeholders at key phases during the project;
- Publishing notices in The Londoner for all project milestones;
- Notifying stakeholders, affected residents, the general public and review agencies regarding project milestones;
- Conducting two Public Information Centres to inform the public, review agencies and stakeholders and obtain input; and
- Issuing a Notice of Completion.

Identification of the Problem

The Class EA Problem / Opportunity statement provides the basis for the need and justification for this project and is presented below.

> *The City of London Official Plan and BMP convey the City's commitment to develop a transportation system that is environmentally sound and supportive of active, healthy lifestyles. The Master Plan*

further identifies a major east-west recreational pathway corridor along the northern boundary of the City with a crossing of Richmond Street. The Parks & Recreation Master Plan (2009) recommended the need to address gaps within the pathway system.

Recent and ongoing development in north London has increased demand for connected pathways for recreation/commuter bicycle and pedestrian traffic. An opportunity exists to address pathway connectivity in this area before development proceeds to a point where a crossing location and pathway alignment options may become too restricted. This opportunity can provide for a direct, accessible pathway alignment that has minimal impact on the natural environment features within the areas.

Alternative Solutions

The following planning solutions were identified for providing a crossing of Richmond Street for this project:

Alternative 1: Do Nothing
Alternative 2: Underpass Crossing
Alternative 3: Overpass Crossing
Alternative 4: At-grade Crossing

The evaluation process concluded that the preferred solution is **Alternative 3: Overpass Crossing**. Alternative 3 will address the problem/opportunity statement as it addresses the planned recreational pathway network connectivity, it reduces vehicular and pedestrian and cyclist conflict points, it complies with the OP, BMP and other planning documents, it provides a highly visible and safe crossing of Richmond Street and there is potential to create a gateway feature over Richmond Street in north London.

Alternative Design Concepts

Alternative Design Concepts were selected based on three crossing alignments:

- Alternative 1 – North Skew
- Alternative 2 - Perpendicular
- Alternative 3 – South Skew

Pathway alignments were also selected and evaluated based on grading, impacts to environmental features and directness to the existing pathway terminus points.

Preferred Alignment

This project justifies the crossing type, location, general direction for the pathway, structure type and basic preliminary design. This is all done in balance between cost, safety, environmental impacts, user experience and impact on adjacent property owners.

Based on the above, the north skew bridge with pathway route P3 is the preferred project alignment and does not present any significant environmental, technical or social/cultural issues.

The required elevation of the north east bridge abutment is approximately 281.00, the existing property on the east side of Richmond Street has a small knoll that is approximately 280.00 leading to the requirement of a 1000-1500mm abutment face. Alternatively, a southern skew would require a 5000mm abutment face. The capital cost savings of the northern skew is approximately $30,000 and result in lower operational costs. Additionally, potential,

future development for the site could be significantly impacted by the originally recommended crossing and pathway alignments.

P3 is more direct and provides a shorter route to the existing terminus point B. Additionally, less land will be required for the pathway and associated grading if the pathway is routed along the southern edge of the northern wetland complex. The reduction in path length and grading associated with the north skewed bridge would provide better connectivity with the pathway alignment and less travel time for pathway users.

See **Figure E1: Preferred Project Alignment**

Project Enhancements

Three aesthetic design concepts for the crossing were considered and presented at PIC #2. Each concept considered a unique theme specific to the City of London, including the Forest City, Thames River Flow and the Forks of the Thames. These concepts utilized the basic bridge structure with enhancements added according to the theme conveyed.

The evaluation presented in this study provides for a basic bridge design.
The preferred crossing alternative design concept will be further developed during detailed design.
Additional aesthetic details will be addressed that include:

- Additional deck width for the bridge to allow for look outs, sculpture, under lighting, banner attachments
- Curved or haunched girders, thinner deck materials
- Introduction of themed geometry, or graphical imagery
- Sitting Areas
- Plantings and landscaped architectural elements along Richmond Street
- Interpretive look outs providing better views of the Woodland and Wetland areas
- CPTED enhancements
- Way-finding signs.

Cost Estimate

The estimated project cost breakdown for the project is provided below.

Description of Item	Cost ($)
Temporary Shoring	$4,000
Excavation for Foundations	$8,000
Steel Piles	$40,000
Concrete in Footings	$28,000
Concrete in Piers	$53,000
Concrete in Abutments& Wingwalls	$68,000
RSS Retaining Walls	$26,000
Supply, Fabricate & Erect Steel	$280,000
Concrete Deck	$143,000
Vertical Bar Handrail	$69,000
Backfill Abutments	$10,000
Design Features	$195,000
Subtotal - Bridge	**$924,000**
Approach Works/Grading –Trail	$330,000
Traffic Management	$6,000

Ecological Enhancements	$15,000
Landscaping and Feature Lighting	$150,000
Engineering Costs	$250,000
Land Acquisition	$0
Utility Relocations	$25,000
Contingency	$200,000
Total	**$1,900,000**

Pathway Terminus 'B'

P3

Arva Moraine Wetland Complex (UT 15)

Richmond Street Significant Woodland

Preferred Bridge Location and Skew

Property requirements for Bridge and Grading to be determined during detailed design

Lands have been agreed upon and dedicated to the City of London.

Richmond Street Significant Woodland

Arva Moraine Wetland Complex (UT 15)

Roadside Drainage

RICHMOND ST

Roadside Drainage

Uplands Tributary

MCWADE PL

CASTLEHILL CLOSE

SAWGRASS LINK

PEBBLECREEK WALK

TORREY PINES WAY

ROYAL OAKS BEND

VILLAGEWALK BLVD

Pathway Terminus 'A'

0 25 50 100 150 200

Metres

N

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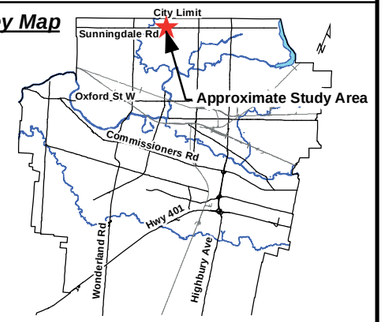
Recreational Pathway Crossing of Richmond Street Municipal Class Environmental Assessment Schedule 'B' Environmental Study Report

Key Map



Legend

- Preferred Pathway Alignment (P3)
- West Side Pathway
- Wetland
- Upland
- Significant Woodland Boundary
- MNR Approved PSW Boundary
- Pathway Terminus

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Figure ES1

Preferred Project Alignment

Scale: 1:2,500

Date: March 2016

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List of Acronyms

AANDC	Aboriginal Affairs and Northern Development Canada
ATRIS	Aboriginal and Treaty Rights Information System
BMP	Bicycle Master Plan
CEAA	Canadian Environmental Assessment Act
CHBDC	Canadian Highway Bridge Design Code
Class EA	Municipal Class Environmental Assessment
CMP	Cycling Master Plan
CPTED	Crime Prevention Through Environmental Design
CUM	Cultural Meadow
CUT	Cultural Thicket
CUW	Cultural Woodland
EA	Environmental Assessment
EAA	*Environmental Assessment Act*
EEPAC	Environmental & Ecological Planning Advisory Committee
EIS	Environmental Impact Study
ELC	Ecological Land Classification
EMP	Environmental Management Plan
ESR	Environmental Study Report
FOD	Deciduous Forest
GIS	Geographic Information System
ha	hectare
HOV	High Occupancy Vehicle
LSNS	London Strengthening Neighbourhoods Strategy
m	metre
MAA	Ontario Ministry of Aboriginal Affairs
MAM	Meadow Marsh
MAS	Shallow Marsh
MEA	Ontario Municipal Engineers Association
MNRF	Ontario Ministry of Natural Resources & Forestry
MOECC	Ontario Ministry of the Environment & Climate Change
MTCS	Ontario Ministry of Tourism, Culture & Sport
MTO	Ontario Ministry of Transportation
OP	Official Plan
P.Eng.	Professional Engineer
PIC	Public Information Centre
PPS	Provincial Policy Statement
PSW	Provincially Significant Wetland
ROW	Right-of-Way
RSS	Retained Soil System
SAF	Shallow Aquatic
SAR	Species at Risk
SARA	Species at Risk Act
SWD	Deciduous Swamp
SWT	Swamp Thicket
TMP	Transportation Management Plan
UTRCA	Upper Thames River Conservation Authority
WMA	Wildlife Management Areas

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1. Introduction

1.1 Background and Purpose of Environmental Study Report

The City of London (the City), through their consultant AECOM, has completed a Municipal Class Environmental Assessment (Class EA) study to determine an appropriate means of linking recreational pathway terminus points east and west of Richmond Street north of Sunningdale Road. The study area, indicated in **Figure 1.1**, comprises the existing Richmond Street right-of-way (ROW) and adjacent lands extending east and west.

The long-term recreational pathway objectives for this study area corridor are identified within the City of London's Bicycle Master Plan (BMP). The BMP recommended implementing a major east-west recreational pathway corridor along the northern boundary of the City with a crossing of Richmond Street. Subdivision development in London, north of Sunningdale Road, has progressed to the point where municipal park corridors and large sections of recreational pathways are being implemented. In order to address future public use along this corridor the City needs to determine the most appropriate means of linking this recreational pathway system across Richmond Street. This Environmental Study Report (ESR) documents the planning and design process followed including study findings and recommendations and how input was received from the public and review agencies.

1.2 Format of this Report

This report was prepared to meet the requirements of the Municipal Engineers Association (MEA) Class EA document (October 2000, as amended in 2007, 2011 and 2015). The report combines all phases of the planning process under one cover and incorporates steps considered essential for compliance with the requirements of the *Environmental Assessment Act* (*EAA*) in the following sections:

- **Section 1** provides background information about the initiation of this study, outlines the format of the report, and describes the study objectives and team organization.
- **Section 2** provides an overview of the Municipal Class EA planning process, including the project planning schedule followed for this study and public review procedures.
- **Section 3** summarizes the public, agency and Aboriginal consultation activities undertaken as part of this Municipal Class EA.
- **Section 4** provides a review of the study area features and considerations, including the existing socio-economic environment, cultural environment and natural environment.
- **Section 5** identifies and describes the problems/opportunities addressed by this Class EA Study.
- **Section 6** describes the alternative planning solutions considered and presents the Phase 2 evaluation of alternative solutions, including the preferred solution.
- **Section 7** describes the alternative design solutions considered and presents the Phase 3 evaluation of alternative solutions, including the preferred solution.
- **Section 8** describes the preliminary design including plan and profile, design criteria, typical cross section, cost estimates, utilities and project recommendations.



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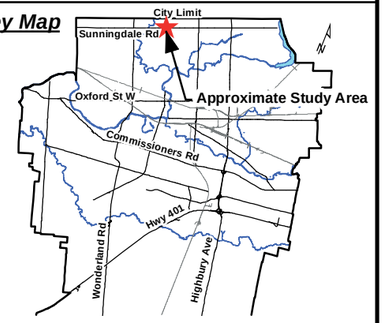
Recreational Pathway Crossing of Richmond Street Municipal Class Environmental Assessment Schedule 'B' Environmental Study Report

Key Map



Legend

- Watercourse
- Railway
- Study Area
- MNR Approved PSW Boundary
- Lot Lines
- Water Body
- Pathway Terminus

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Figure 1.1

Study Area

Scale: 1:5,000

Date: April 2015

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- **Section 9** describes anticipated environmental impacts and proposed mitigation measures as well as permitting and approval requirements.
- **Section 10** describes potential revisions and addenda to the ESR.
- **Section 11** is the study summary.

1.3 Study Objectives

The purpose of this Municipal Class EA study is to provide a comprehensive and environmentally sound planning process which is open to public participation to meet the following objectives:

- Connect existing terminus points of the recreational pathway system in north London; and
- Provide a safe crossing option for cyclists and pedestrians.

1.4 Study Team Organization

This Class EA study was undertaken as a collaborative effort between the City of London and AECOM. General direction was provided by representatives from the City with project team meetings being held at key points throughout the planning process. Key members from the City included the following individuals:

- Karl Grabowski, P.Eng., Project Manager, Transportation Planning and Design;
- Jeff Bruin, OALA, Landscape Architect;
- Jane Fullick, C.E.T., Technologist II, Transportation Planning and Design;

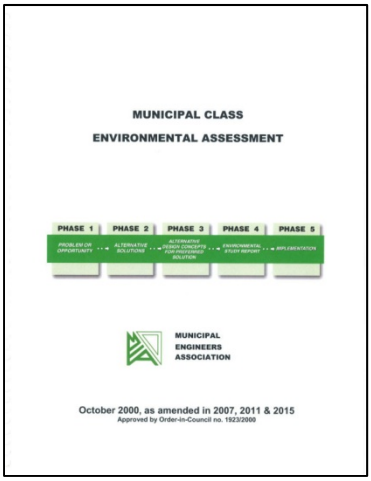
Key AECOM team members included the following individuals:

- Antony Fediw, P. Eng., Project Manager;
- Karl Grueneis, B.A., Senior Environmental Planner;
- Nancy Martin, B.ES., Environmental Planner;
- John Pucchio, P.Eng., Structural Engineer;
- Jillian deMan, B.Sc., Terrestrial Ecologist; and
- Adria Grant, BA, CAHP, Senior Archaeologist.

Additional subject-specific expertise was provided by Golder Associates (geotechnical).

2. Planning Process

2.1 Municipal Class Environmental Assessment Process



The Municipal Class EA process ensures that all projects are carried out with consistency, effectiveness, efficiency, and fairness. This planning process provides a consistent method of identifying and assessing economic, social, and environmental impacts and concerns before improvements or additions to municipal infrastructure are undertaken and ensures that potential impacts from all municipal projects are addressed and mitigated.

The MEA "Municipal Class Environmental Assessment" document (October 2000, as amended in 2007, 2011 and 2015) defines four schedules under which projects may be planned and the associated processes required for each.

2.1.1 Project Classifications

The four types of projects are referred to as schedules with projects classed as Schedule A, A+, B or C, depending on the anticipated level of environmental impact, and for some projects, the anticipated construction costs. The schedule in which a project applies determines the planning and design phases that must be followed.

Schedule A: Projects are limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved and may proceed to implementation without following the Class EA planning process. Schedule A projects generally include normal or emergency operational and maintenance activities where environmental effects of these activities are usually minimal. Examples of Schedule A projects include shaping and cleaning of roadside ditches or road resurfacing with no changes to road alignment.

Schedule A+: The purpose of Schedule A+ is to ensure some type of public notification is provided for projects that are pre-approved under the Class EA. The proponent is required to inform the affected public of municipal infrastructure projects prior to being constructed or implemented in their area. However, there is no ability for the public to request a Part II Order[1]. If the public has any comments, they should be directed to the municipal council where they would be more appropriately addressed. Examples of Schedule A+ projects include construction or operation of sidewalks or bicycle paths or bike lanes within existing rights-of-way, construction of localized operational improvements at specific locations (e.g., addition of a ramp to an existing interchange, turning lanes at an intersection, but not a continuous centre left turn lane) where there is no financial limit.

Schedule B: These projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process, involving mandatory contact with directly affected public and with relevant government agencies to ensure that they are aware of the project and that their concerns are addressed. If there

[1] *Part II Order refers to a request to the Minister of the Environment for a project to comply with Part II (addresses Individual Environmental Assessments) of the Environmental Assessment Act. The need for an Individual EA is based on the conclusion that based on predicted project impacts the MEA Class EA planning process is not sufficient and a more comprehensive EA planning process is required. The requirement to prepare an Individual EA involves the preparation of Terms of Reference and EA document that are submitted to the Ministry of the Environment and Climate Change (MOECC), other government agencies and the public for review.*

are no outstanding concerns, then the proponent may proceed to implementation. Schedule B projects generally include improvements and minor expansions to existing facilities. Examples of Schedule B projects include reconstruction or widening where the reconstructed road or other linear paved facilities (i.e., High Occupancy Vehicle (HOV) lanes) which result in additional lanes and has a construction cost of less than $2.4 million.

At the end of Phase 2, a Project File documenting the planning process followed through Phases 1 and 2 shall be finalized and made available for public and agency review. However if the screening process raises a concern which cannot be resolved, the Part II Order may be requested and considered by the Minister of the Environment and Climate Change (MOECC); alternatively, the proponent may elect voluntarily to plan the project as a Schedule C undertaking.

Schedule C: These projects have the potential for significant adverse environmental effects and must proceed under the full planning and documentation procedures (Phases 1 to 4) specified in the Municipal Class EA document. Schedule C projects require that an ESR be prepared and filed for review by the public and review agencies. If concerns raised cannot be resolved, a Part II Order may be requested and considered by the MOECC to elevate to an Individual Environmental Assessment. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities. Examples of Schedule C projects include construction of new grade separations and construction of underpasses or overpasses for pedestrian, recreational or agricultural use with a construction cost over $2.4 million.

This study was conducted in accordance with **Schedule C** of the Municipal Class EA document. As a Schedule C project, the study preceded under the full planning and documentation procedures in accordance with the following five phases:

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

Figure 2.1 illustrates the Class EA process followed for this project.

Appendix A.1: Overview of the Municipal Class Environmental Assessment Planning Process further expands on the steps required to complete the Municipal Class EA planning process.

2.1.2 Class EA Documentation and Filing

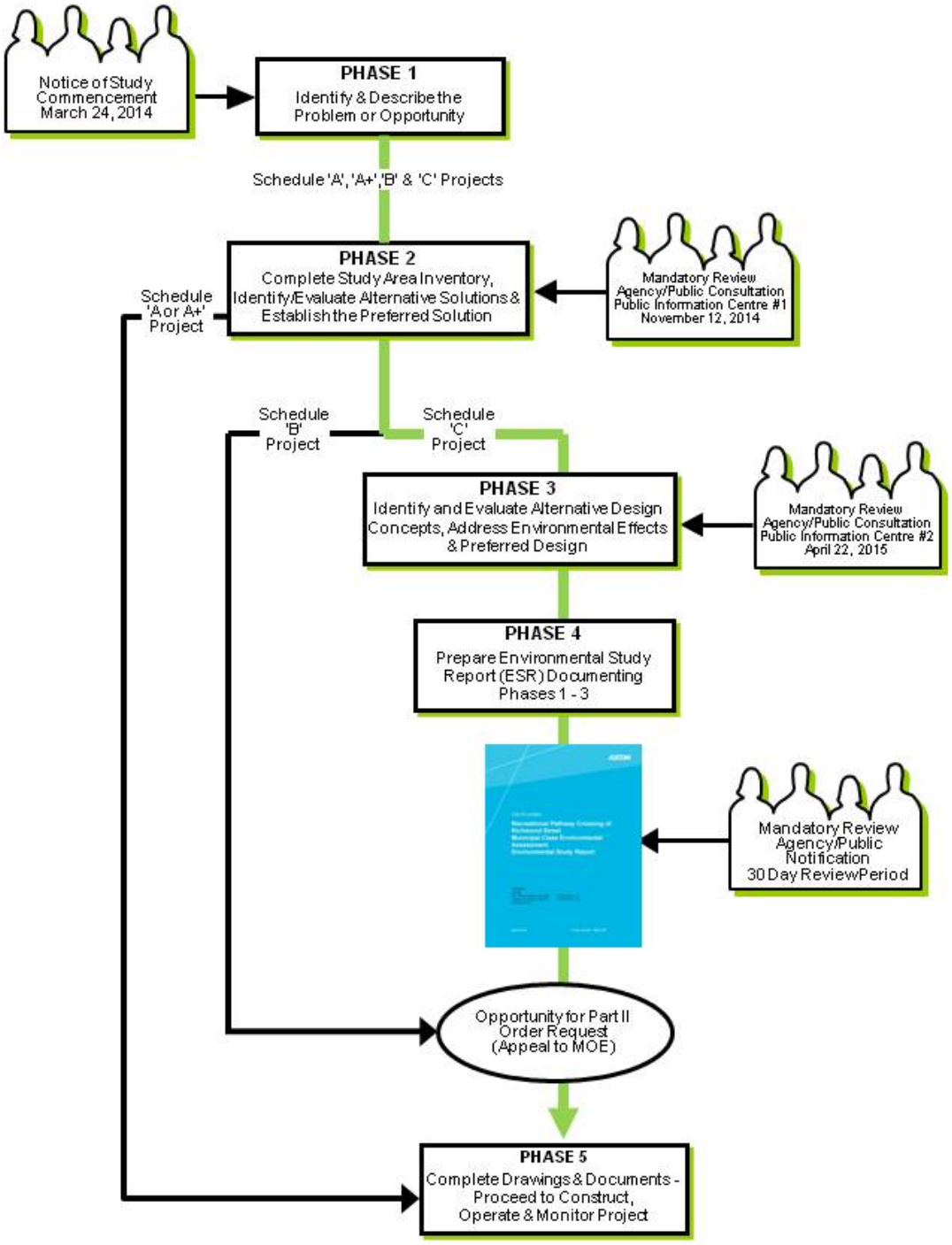
The planning and design process for 'Schedule C' projects are documented within this ESR. The filing of the ESR for public review completed the planning and preliminary design stage for Schedule C projects. The ESR was placed on public record and made available for review for a period of thirty (30) calendar days (minimum) beginning on August 4, 2016 and ending on September 9, 2016. The Notice of Completion was published in The Londoner (August 4, 2016 and August 11, 2016) and sent to those on the mailing list (August 2, 2016). To facilitate public review of the document, copies of the report have been made available for viewing at the following locations and on the City's website at http://www.london.ca/residents/Environment/EAs/Pages/default.aspx.

City of London City Hall
300 Dufferin Avenue, London
City Clerk 3rd Floor

London Public Library (Masonville Branch)
30 North Centre Road, London

Project Website:
http://www.london.ca/residents/Environment/EAs/Pages/Pedestrian-Recreational-Pathway-Crossing-of-Richmond-Street.aspx

Figure 2.1: Overview of the Municipal Class EA Planning Process



The Notice of Completion advises that if, after reviewing the report, stakeholders have questions or concerns they should follow this procedure:

- Contact Karl Grabowski, City of London Project Manager at the address below to discuss questions or concerns; and
- Arrange a meeting with the above, if there are significant concerns that require more detailed explanations.

Karl Grabowski, P.Eng., Project Manager
City of London
300 Dufferin Ave., P.O. Box 5035
London, Ontario, N6A 4L9
519.661.2500 Ext. 5071
kgrabows@london.ca

If major concerns arise, the City will attempt to resolve the issue(s). A mutually acceptable time period to address concerns will be set. If the issues remain unresolved, a person or party may request that the MOECC, by order, to request the City of London comply with Part II of the EAA before proceeding with the project (referred to as a Part II Order). A Part II Order if granted would elevate the project to an individual environmental assessment. The Minister may make one of the following decisions:

- Deny the request with or without conditions;
- Refer the matter to mediation; or
- Require the City to comply.

Anyone wishing to request a Part II Order for the Recreational Pathway Crossing of Richmond Street Class EA may submit a written request by the end of the thirty (30) calendar day review period (date) to the MOECC at the following address, with a copy sent to the City of London.

Minister Glen Murray
Minister of Environment and Climate Change
77 Wellesley Street West, 11th Floor
Toronto Ontario, M7A 2T5

Director, Environmental Approvals Branch
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 12th Floor
Toronto ON, M4V 1P5

Karl Grabowski, Project Manager
City of London
300 Dufferin Ave., P.O. Box 5035
London, Ontario, N6A 4L9

Subject to the completion of the mandatory thirty (30) day review period and no Part II Order requests, the City of London intends to proceed with detailed design and implementation in 2017.

2.1.3 Provincial Planning Studies

The Planning Act (2006) describes the fundamentals of land use planning in Ontario, including how land uses may be controlled and who may control them. Pursuant to the *Planning Act*, the Province of Ontario is the primary planning authority in Ontario. The Act enables the Province to delegate some of its planning authority to upper-tier municipalities (e.g., regional municipalities) while retaining control through the approval process.

Additional details concerning provincial policies relevant to this Class EA are summarized below.

Provincial Policy Statement (2014)

The *Provincial Policy Statement* (PPS) is the complimentary policy document to the *Planning Act*. Issued under the authority of Section 3 of the *Planning Act*, the PPS provides direction on matters of provincial interest related to land use planning and development, and promotes the provincial 'policy-led' planning system that recognizes and addresses the complex inter-relationship among environmental, economic and social factors in land use planning (MMAH, 2005; MMAH Website, 2007). Recent updates to the PPS came into effect on April 30, 2014.

The PPS provides for enhanced protection of the environment by identifying the significance of the natural heritage system and water resources, including natural hazards and water quality, air quality and energy use.

Furthermore, the PPS also contains policies[2] requiring municipalities to:

- Plan public streets, spaces and facilities to be safe, meet the needs of pedestrians, foster social interaction and facilitate active transportation and community connectivity (1.5.1.a);
- Plan and provide for a full range and equitable distribution of publicly-accessible built and natural settings for recreation, including facilities, parklands, public spaces, open space areas, trails and linkages, and where practical, water based resources (1.5.1b); and
- Recognize additional elements of healthy communities, such as community design and planning for all ages (1.1.1).

Where applicable, the policies related to these policies have been incorporated into the generation of planning alternatives and design concepts.

2.1.4 Municipal Policies

The recreational pathway connection is supported at the municipal level through the following policies/guidance documents:

- City of London Official Plan;
- The London Plan (draft V2-2015);
- Parks and Recreation Master Plan (2009);
- Bicycle Master Plan (2005);
- London Strengthening Neighbourhoods Strategy (2009);
- Age Friendly London Action Plan; and
- Smart Moves 2030 Transportation Master Plan.

City of London Draft Official Plan

The City of London Draft (June 2015) Official Plan (OP), London Plan 2014, is the new long-term policy framework for decision making in the City. It sets the context for detailed planning by protecting the environment, managing resources, directing growth and setting the basis for providing services in an efficient and effective manner. The OP provides direction for future planning activities and for public and private initiatives aimed at improving the existing physical environment.

[2] *Provincial Policy Statement, 2014, Ministry of Municipal Affairs and Housing*

The London OP lists objectives for the development of active transportation, including promoting an integrated network of bicycle and pedestrian facilities that enhance quality of life and promote the improved health of residents.

As they relate to this Class EA, relevant transportation/recreation policies have been considered and incorporated into the generation of planning alternatives and design concepts:

- Policy 222 (16) - Create opportunities for connecting London to the surrounding region through on-street and off-street cycling pathways;
- Policy 239 - Neighbourhoods will be designed to incorporate public spaces that serve as mobility linkages through and between such neighbourhoods;
- Policy 265 - The active mobility network is shown on Figure 2.2. This planned network will be considered in the evaluation of all planning and development applications;
- Policy 272 - Cycling routes and pedestrian pathways will provide linkages between open space areas, neighbourhoods, centres, corridors, employment areas and the public transit services and will enhance the convenience, safety and enjoyment of walking and cycling;
- Policy 332 (6) - Plan for, and create, a continuously linked cycling network throughout the City; and
- Policy 332 (8) - Connect neighbourhoods by developing a continuous, linked parks and public open space system throughout the City.

2030 Transportation Master Plan (2014)

The 2030 Transportation Master Plan (TMP) provides transportation improvements within the City for a 20 year planning horizon. The current TMP does not include recommendations to widen Richmond Street north of Sunningdale at this time since the existing road width and ROW are sufficient to meet current and near future needs. However, discussions with City staff indicate future longer term planning horizons may consider increasing the travelled width of Richmond Street from four lanes to six lanes. The ESR has regard for this and has made provisions for this widening with the understanding that this work may be several years from implementation.

Parks & Recreation Master Plan (2009)

The purpose of the Parks and Recreation Master Plan is to provide direction on programs, services, recreation facilities, park infrastructure and community investment into the future.

The following service level recommendations are relevant to this study:

- Determine gaps and needed improvements in services and facilities;
- Ensure programs, facilities and parks are designed with accessibility in mind including adherence to the requirements under the Accessibility for Ontarians with Disabilities Act;
- Continue to expand and improve access to the City's pathway system because it provides low-cost, accessible, multi-generational recreation for all neighborhoods; and
- Maintain a commitment to accessibility, safety and security within its entire parks and pathway system.

Bicycle Master Plan (2005)

The Bicycle Master Plan (BMP) sets out the long term visioning guidelines for on and off road bicycle routes for both commuter and recreational users. The document covers a range of components associated with the bicycle

network including facilities, design standards and implementation. Specifically, the master plan 'provides guidance for the planning of various City-initiated capital transportation projects which will fill 'gaps', provide extensions to the bicycle network or meet interim needs in an alternate fashion'.

The policies of the BMP have been incorporated into the generation of planning alternatives and design concepts, particularly designing to accommodate on-street bike lanes.

Cycling Master Plan – London ON Bikes (draft)

The City is currently updating the BMP with a higher demand for active transportation. London ON Bikes, the Cycling Master Plan (CMP) will examine existing travel routes and will explore future bicycle travel needs and potential bicycle facilities and infrastructure. The City presented a draft version (September 2015) of planned and potential cycling routes. Bike lanes are proposed on Richmond Street north to the city limits (purple lines). Additionally, potential connection routes (red lines) have been suggested east and west of the Richmond Street corridor connecting with existing pathways. The yellow arrows represent future connections to surrounding municipalities.

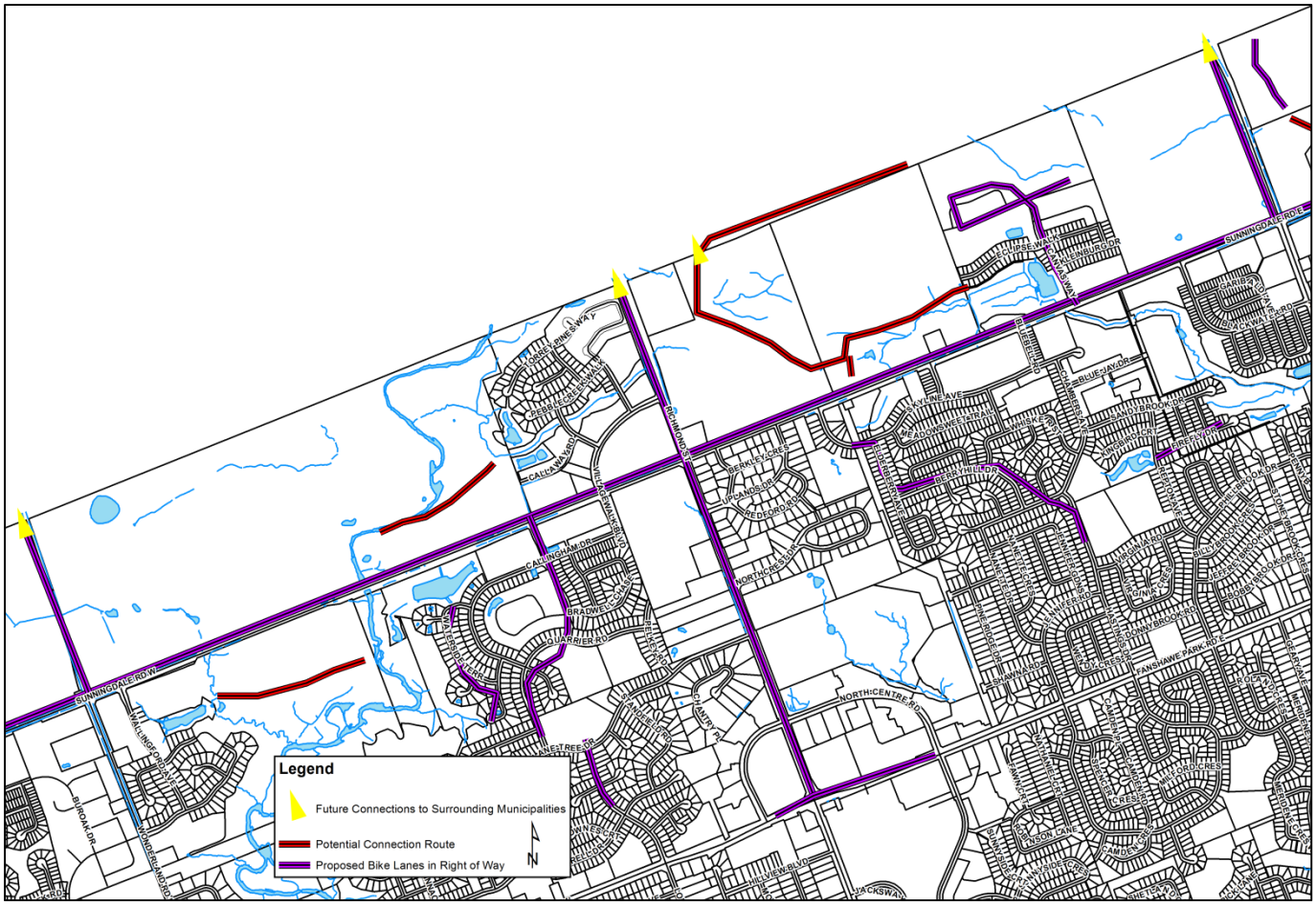


Figure 2.2: Map 1- Candidate Routes (CMP – Draft)

Strengthening Neighbourhoods Strategy (2009)

The London Strengthening Neighbourhoods Strategy (LSNS) identifies a collective vision for the future of London based on community member input and presents elements to build that vision. The elements necessary to realize the vision include both people specific and place specific requirements.

The following development strategies are relevant to this study:

- Celebrate gateways to the City and neighbourhoods;
- Increase opportunities and encourage biking as a means of transportation;
- Increase opportunities and encourage walking as a means of transportation; and
- Improve connectivity between neighbourhoods and to other parts of the City.

Age Friendly London Action Plan

Recommendations in the Age Friendly Action Plan are meant to improve the quality of life for older adults. The action plan recommends improving connectivity of sidewalks, trails and pathways within and between neighbourhoods.

Smart Moves 2030 Transportation Master Plan

One of the key goals of the Smart Moves 2030 Transportation Master Plan is to provide more attractive travel choices for those who live, work and play in London by investing into and improving infrastructure that helps support walking and cycling.

3. Consultation

3.1 Consultation and Communication Program

The involvement of the community – residents, agencies, stakeholders, Aboriginal communities, and those who may be potentially affected by a project – is an integral part of the Class EA process. The purpose of the Class EA study consultation process is to provide an opportunity for stakeholder groups and the public to gain an understanding of the study process; contribute to the process for development and selection of alternatives; and provide feedback and advice at important stages in the Class EA process. Specifically, the objectives of the consultation efforts are to:

- Generate awareness of the project and provide opportunities for involvement throughout the planning process; and
- Facilitate constructive input from public and agency stakeholders at key points in the Class EA process, prior to decision-making.

A summary of the consultation activities undertaken for the Recreation Pathway Crossing of Richmond Street Class EA is provided below.

3.2 Public Consultation Methods

3.2.1 Public Mailing List

A mailing list was developed at the outset of the Class EA study based on a list of public and stakeholder members, as well as a list of homeowners residing within approximately 120m of the study area, provided by the City of London. As the Class EA study progressed, the list was updated to include individuals who requested to be notified of future public consultation efforts and study updates.

3.2.2 Project Website

A project website page (http://www.london.ca/residents/Environment/EAs/Pages/Pedestrian-Recreational-Pathway-Crossing-of-Richmond-Street.aspx) was developed at the outset of this study. Study notices and presentation materials were posted on the project website throughout the project duration.

3.2.3 Public Notices

The following public notifications were undertaken.

Notice of Commencement (**Appendix A.2**)

- Posted on the City of London website and mailed out to agencies and property owners in vicinity of study area July 28, 2014.
- Published in The Londoner on July 31, 2014 and August 07, 2014.

Notice of PIC #1 (November 12, 2014) (**Appendix A.3**)

- Posted on the City of London website and mailed out to agencies and property owners in vicinity of study area on October 25, 2014.
- Published in The Londoner on October 30, 2014 and November 06, 2014.

Notice of PIC #2 (April 22, 2015) (**Appendix A.4**)

- Posted on the City of London website and mailed out to agencies and property owners in vicinity of study area on April 07, 2015.
- Published in The Londoner on April 09, 2015 and April 16, 2015.

Notice of Completion (**Appendix A.5**)

- Posted on the City of London website and mailed out to agencies and property owners in vicinity of study area on August 2, 2016.
- Published in The Londoner on August 4, 2016 and August 11, 2016.

3.3 Agency Consultation

3.3.1 Agency Mailing List

At the initiation of this study, a mailing list was created comprising regulatory agencies and potentially interested stakeholders. Throughout the study, this list was used to notify agencies and stakeholders of study milestones and public consultation events. The list was updated regularly and can be found in **Appendix A.6.**

On July 17, 2014, separate letters were addressed to Amanda McCloskey, District Planner for the Alymer District Ministry of Natural Resources and Forestry (MNRF) and Cari Ramsey, Environmental Regulations Technician for the Upper Thames River Conservation Authority (UTRCA). The following information was requested:

- Presence of Natural Areas including ESAs, Provincially Significant Wetlands (PSW), Significant
- Woodlands, Provincial Parks, Conservation Reserves and Wildlife Management Areas (WMA);
- Species at Risk records/occurrences;
- Presence of critical habitat;
- Species at Risk Recovery Strategies;
- Evaluated Wetlands including wetland evaluation records (if available);
- Thermal and flow regime classification of watercourses (GIS data); and
- Fish collection records.

On July 25th, 2014, a response was received from Cari Ramsey, Environmental Regulations Technician for the UTRCA. Similarly, a response was received by Heather Riddell, District Planner at the MNRF, on September 11, 2014. Both responses provided requested information.

Agency correspondence is provided in **Appendix A.6.**

3.4 Aboriginal Consultation

The following provides a summary of Aboriginal Consultation undertaken for this project. All Aboriginal correspondence is included in **Appendix A.7**.

3.4.1 Aboriginal Organizations

Aboriginal Affairs and Northern Development Canada (AANDC) maintains a record of information related to Aboriginal treaty information, claims and litigation data. In addition, the location of Aboriginal communities and Aboriginal groups is also recorded by AANDC. A request for information related to consultation was issued to AANDC early in the study (November 03, 2015). Email correspondence received from AANDC advised that a search of the Aboriginal and Treaty Rights Information System (ATRIS) be conducted to confirm the location and nature of established and potential Aboriginal and Treaty rights which may relate to the study area. A subsequent search confirmed the absence of Aboriginal or treaty rights which may apply.

A letter was sent to the Ministry of Aboriginal Affairs (MAA) on November 03, 2014 detailing the study and requesting information on Aboriginal communities that may have an interest in the study. Based on the response received, the following Aboriginal communities and/or organizations were contacted at the study commencement stage and throughout the project:

- Aamjiwnaang;
- Bkejwanong Territory;
- Chippewas of Kettle and Stony Point First Nation;
- Oneida Nation of the Thames;
- Chippewas of the Thames First Nation;
- Munsee-Delaware First Nation;
- Delaware Nation (Moravian of the Thames); and
- Caldwell First Nation.

4. Existing Conditions

4.1 Socio-Economic Environment

4.1.1 Land Use

The study area is located in north London and is comprised of the Richmond Street ROW between Sunningdale Road and the City limits and adjacent lands east and west of the Richmond Street corridor. Existing land uses consist of residential on the west side of Richmond Street (Upper Richmond Village) and primarily agriculture, open space, natural heritage and single family residential on the east side. Schedule A of the City of London's OP shows the study area land use as a mixture of high and medium density residential, low density residential, community commercial node and open space. The land located at the southwest corner of the study area is designated as a community commercial node. Open space present within the study area is associated with the Uplands Tributary and the wetland feature present east of Richmond Street which are further described in Section 4.3.



City limits facing south.

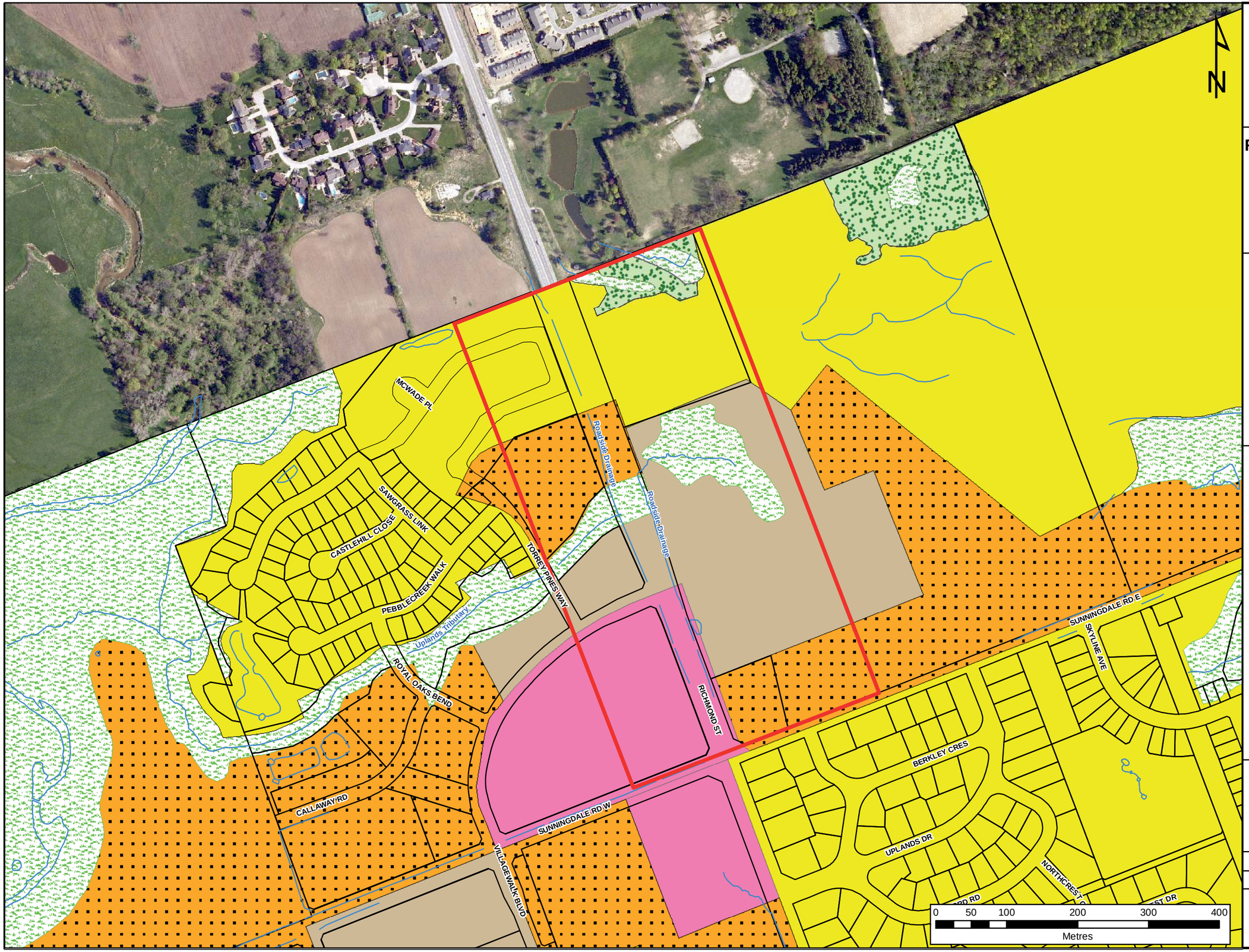
See **Figure 4.1: Schedule A Land Use.**

Richmond Street is identified as an arterial road on Schedule C of the OP. Arterial roads are designed to accommodate high volumes of intra-urban traffic at moderate speeds, contain moderate volumes of inter-neighbourhood traffic and contain limited accesses, coupled with provision of transit and pedestrian services.

4.2 Cultural Environment

4.2.1 Archaeology

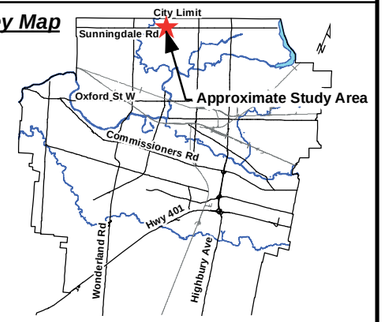
A Stage 1 Archaeological Assessment has been conducted to document any registered archaeological sites within the study area and to identify areas of high archaeological potential for future assessment. The evaluation of archaeological potential for the study area has resulted in the determination that there is moderate to high potential



London CANADA

Recreational Pathway Crossing of Richmond Street Municipal Class Environmental Assessment Schedule 'B' Environmental Study Report

Key Map



Legend

Study Area

LandUse

- Community Commercial Node
- Environmental Review
- Low Density Residential
- Multi Family High Density Residential
- Multi Family Medium Density Residential
- Open Space

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Figure 4.1

Existing Land Use Schedule A of the City of London Official Plan

Scale: 1:5,000

Date: April 2016

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for the recovery of pre-contact and contact period Aboriginal archaeological resources based on the proximity to known archaeological sites and potable water sources, including Medway Creek and the Thames River. In addition, the historical documentary evidence from the first European settlers and surveyors to the area indicates the long history of occupation here by First Nations people. The potential for Euro-Canadian archaeological resources is also judged to be high based off the early settlement of the area by Euro-Canadian settlers and proximity to the historic town of London, historic roadways and the Thames River.

While it has been determined that the general area has high potential for the recovery of archaeological resources, the construction of Richmond Street has removed archaeological potential within the entire road ROW. In addition, the western portion of the study area located on private lands outside of the ROW on Lot 17, Concession 6 was previously assessed by Archaeologix in 2004 and has since been extensively disturbed by subdivision development. However, small areas of flat agricultural and wooded lands east of Richmond Street on Lot 16, Concession 6 within the study area limits remain intact and, therefore, retain archaeological potential. Any areas to the east of Richmond Street which have not been subject to previous assessment will require further Stage 2 archaeological assessment prior to any ground disturbance activities.

4.3 Natural Environment

A portion of the tributary to Medway Creek, approximately 100 m in length, is located within the subject lands, and flows from east to west through the property, receiving water from the Arva Moraine Provincially Significant Wetland located east of Richmond Street. The tributary appears to have a permanent flow, but exhibited signs of low flow during warm periods with dry algae observed in sections of the watercourse. Studies have identified the tributary as a tolerant warm water community. Background studies also suggest that the tributary to Medway Creek within the study area provides direct fish habitat and contributes flow and nutrients to fish habitat in the Medway Creek.

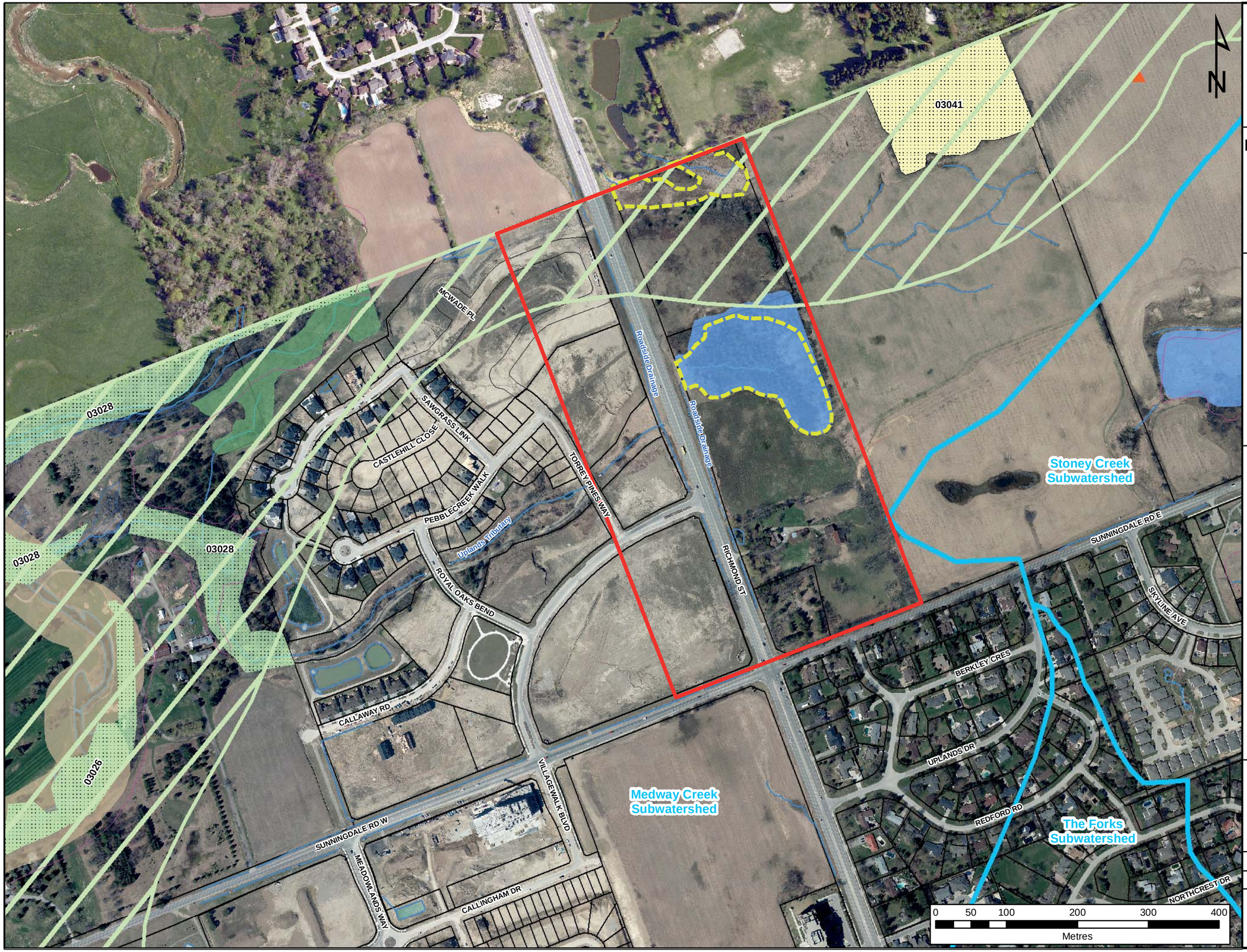


Richmond Street – east side.

Schedule B-1 of the City of London's OP shows the Arva Moraine Provincially Significant Wetland (PSW) within the east portion of the study area. Lands north of the PSW are designated as Big Picture Meta-cores and Meta-corridors.

Schedule B-2 of the City of London's OP indicates that a majority of lands within the eastern portion of the subject property are within the UTRCA's Regulation Limits. These limits continue along the tributary to Medway Creek and Medway Creek, located at the western boundary of the study area.

See **Figure 4.2: Identified Natural Heritage Features Schedule B1 of the City of London Official Plan.**



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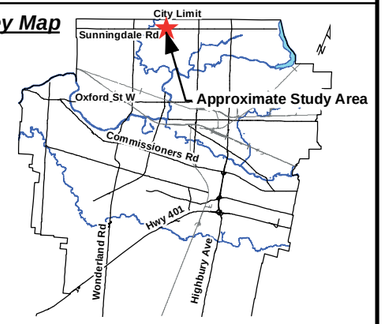
Recreational Pathway Crossing of Richmond Street Municipal Class Environmental Assessment Schedule 'B' Environmental Study Report

Key Map



Legend

- Study Area
- Maximum Hazard Line
- Big Picture Meta-Corridors
- Potential ESA
- PotentialNaturalizationArea
- Provincially Significant Wetland
- Significant Corridor (Significant River, Stream and Ravine Corridor)
- Unevaluated Wetland
- Unevaluated Vegetation Patches and ID
- Woodland
- MNR Approved PSW Boundary
- Subwatershed Boundary

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Figure 4.2

Identified Natural Heritage Features Schedule B1 of the City of London Official Plan

Scale: 1:5,000

Date: April 2016

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4.3.1 Terrestrial Environment



Black Swallowtail



Eastern Gartersnake



Spotted Joe Pye Weed

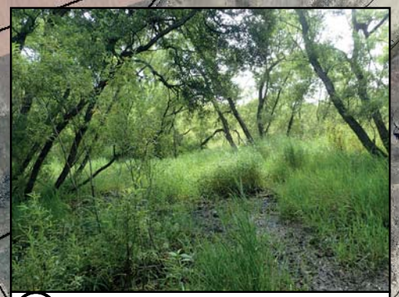
A total of 13 vegetation communities were delineated within the study area, 7 of which make up a portion of the Provincially Significant Arva Moraine Wetland Complex. The north and south vegetation patches east of Richmond Street are connected by a small cultural thicket located on the east side of the property. The observed vegetation communities can be further divided into three cultural areas, one forest area, four marsh areas, two swamp thickets, one deciduous swamp and one floating-leaved shallow aquatic community. Although these patches, individually, may be small in size, together they total of 4.9 hectares (ha) encompassing a good diversity of vegetation communities represented across nine different community series. This ecological diversity is beneficial not only for plants but for several wildlife species that will take advantage of the presence of the different community types and plant associations to carry out their life processes. A total of 80 plant species were observed, of which 61 are considered native, with one Provincially Endangered (butternut). Species with a high sensitivity ranking are skunk cabbage, wild coffee and swamp dock. These species were observed within vegetation communities which are being protected and will not be affected by the pedestrian pathway as discussed further within this report.

Figure 4.3: Ecological Land Classification provides the delineation of the ELC communities within the study area.

Code	Description	Area (ha)
CUM1-1	Dry-Moist Old Field Meadow Type	0.42
CUT1	Mineral Cultural Thicket Ecosite	0.09
CUW1	Mineral Cultural Woodland Ecosite	1.29
CUP3	Coniferous Plantation	0.09
FOD8-1	Fresh-Moist Poplar Deciduous Forest Type	0.56
MAM2		0.12
MAM2-2	Reed-canary Grass Mineral Meadow Marsh Type	0.14
MAM2-10	Forb Mineral Meadow Marsh Type	0.13
MAS2-1	Cattail Mineral Shallow Marsh Type	0.53
SAF1-3	Duckweed Floating-leaved Shallow Aquatic Type	0.05
SWT2	Mineral Thicket Swamp Ecosite	0.72
SWD4	Mineral Deciduous Swamp Ecosite	0.76
Total Area		4.9



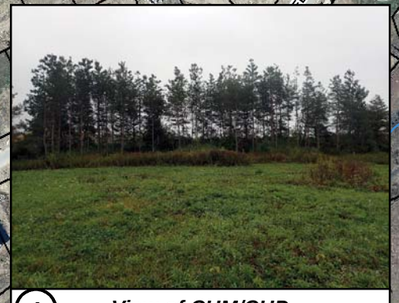
1 *View of SAF1-3*



2 *View of SWD4*



3 *View of Mowed Field*



4 *View of CUM/CUP*



5 *View of MAS2-1*



6 *View looking South West*

0 25 50 100 150 200
Metres

N

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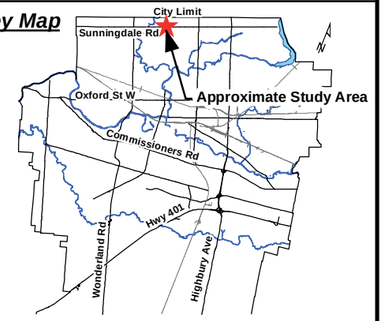
Recreational Pathway Crossing of Richmond Street Municipal Class Environmental Assessment Schedule 'B' Environmental Study Report

Key Map



Legend

- Watercourse
- Railway
- Tree Row
- Lot Lines
- Water Body
- MNR Approved PSW Boundary
- 1 Photo Location and ID

ELC Communities Code

- CUM - Cultural Meadow
- CUP - Cultural Plantation
- CUT - Cultural Thicket
- CUW - Cultural Woodland
- FOD - Deciduous Forest
- MAM - Meadow Marsh
- SAF - Duckweed Floating-Leaved Shallow Aquatic Type
- MAS
- SWD - Deciduous Swamp
- SWT
- Scattered Trees

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Figure 4.3

Ecological Land Classification

Scale: 1:2,587

Date: April 2016

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4.3.2 Aquatic Environment

The wetland communities located within the study area are considered part of the Arva Moraine PSW complex, a complex which is comprised of the former Ballymote Wetland, Winder/Sunningdale Wetland, Gibbons Wetland and Powell Drain Wetlands. These wetland communities are contained within an overall woodland patch.

The boundaries of the wetland were assessed in the field and surveyed. During this time, MNRF completed a mapping exercise of the overall wetland complex, including the area within the Richmond Street Pedestrian Pathway study area. Overall, the wetland boundary defined by MNRF and AECOM coincide. There is a slight difference along the east side of the main wetland patch where MNRF's line encroaches slightly within a community designated by AECOM as black walnut cultural woodland. Considering this slight discrepancy, for the purposes of this report, MNRF's wetland line will be used for definition of the wetland within the study area. See **Figure 4.4 Wetland Boundary.**

4.3.3 Species at Risk

The Species at Risk Act (SARA) is a federal regulation. The goal of SARA is to monitor and protect disappearing species; provide recovery strategies for Extirpated, Endangered or Threatened species, as well as to manage Species of Special Concern.

Based on a combination of agency correspondence and background information compiled, a total of 49 SAR were determined to potentially occur within the City of London. Following the aquatic and terrestrial characterization of the study area through background review and field investigations, a habitat assessment was completed for these species to assess whether suitable habitat is present in the study area. It was determined that 30 species have the potential, based on habitat preferences, to be found within the study area.

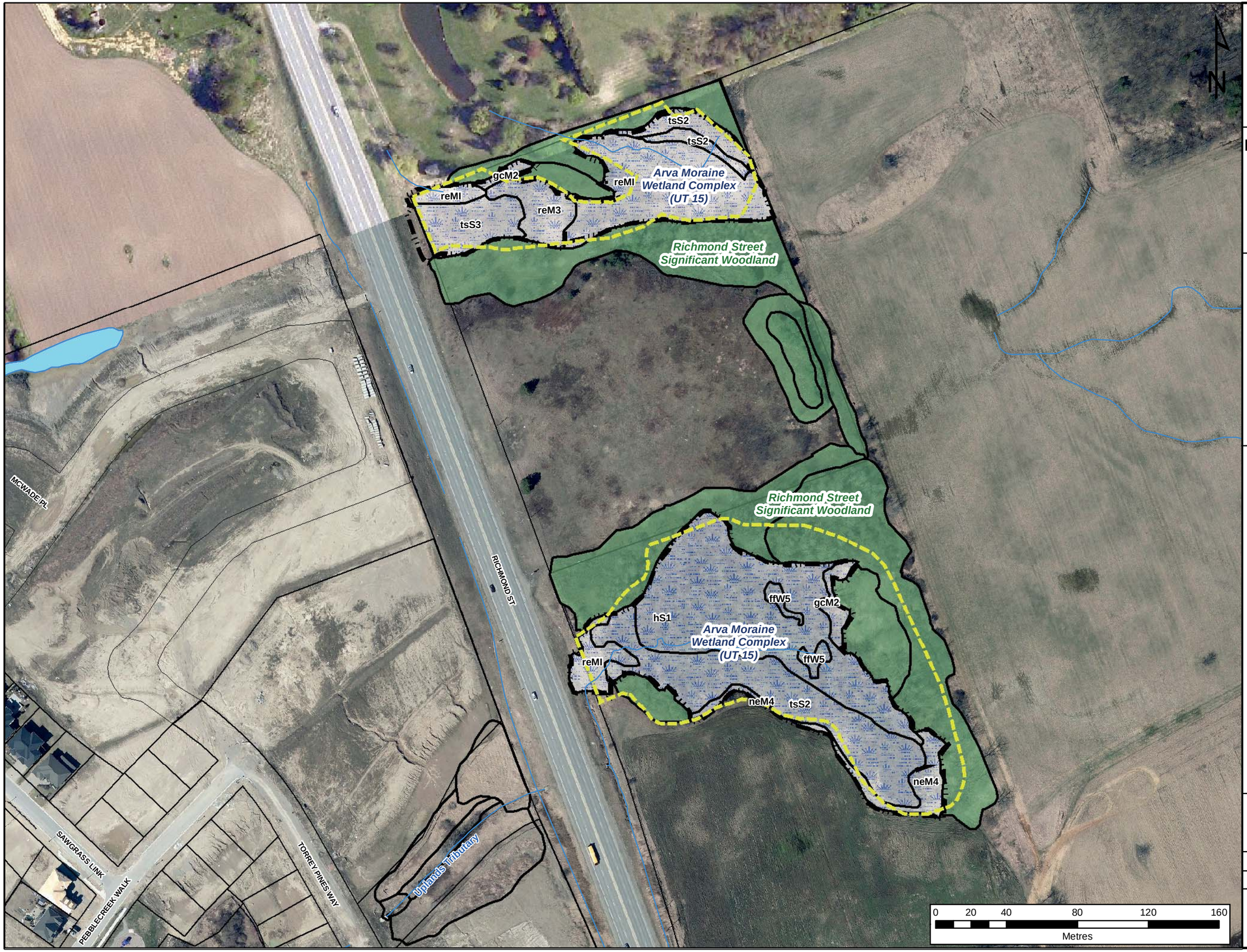
Six Provincially ranked Species at Risk (SAR) were observed during AECOM field investigations:

- Barn Swallow – Threatened;
- Bank Swallow – Threatened;
- Eastern Meadowlark – Threatened;
- Bobolink – Threatened;
- Butternut – Endangered; and
- Monarch – Special Concern, confirmed in cultural meadow community.

The remaining 24 species were screened out as part of our Species at Risk Screening process.

4.3.4 Significant Wildlife Habitat Assessment

A total of three (3) Significant Wildlife Habitats were confirmed within the study area including Amphibian Breeding Habitat (Woodland), Terrestrial Crayfish Habitat and Monarch Butterfly Habitat. The first two habitats were confirmed within the Arva Moraine PSW. Monarch Butterfly habitat is present within the cultural meadow communities at the northeast portion of the subject property.



London
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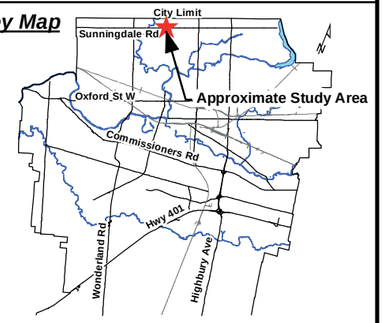
Recreational Pathway Crossing of Richmond Street Municipal Class Environmental Assessment Schedule 'B' Environmental Study Report

Key Map



Legend

- Watercourse
- Railway
- MNR Approved PSW Boundary
- Surveyed Wetland Boundary
- Wetlands
- Significant Woodlands
- Lot Lines
- Water Body

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Figure 4.4

Wetlands

Scale: 1:2,000

Date: April 2016

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4.3.5 Significant Woodlands

The Richmond Street Woodland Patch was evaluated according to the City of London's *"Guideline Document for Evaluation of Ecologically Significant Woodlands", Score Sheet for Significant Woodland Evaluation* (March 2006). The woodland patch evaluation resulted in a total of 6 High and 2 Medium scores. To be considered significant, a woodland patch must receive a score of at least 1 High. Therefore, the woodland patch east of Richmond is considered significant and herein referred to as the Richmond Street Significant Woodland.

Figure 4.5 provides the delineation of the woodland boundary according to the City of London's Guideline Documents for Environmentally Significant Areas Identification, Evaluation and Boundary Delineation.

4.4 Technical Environment

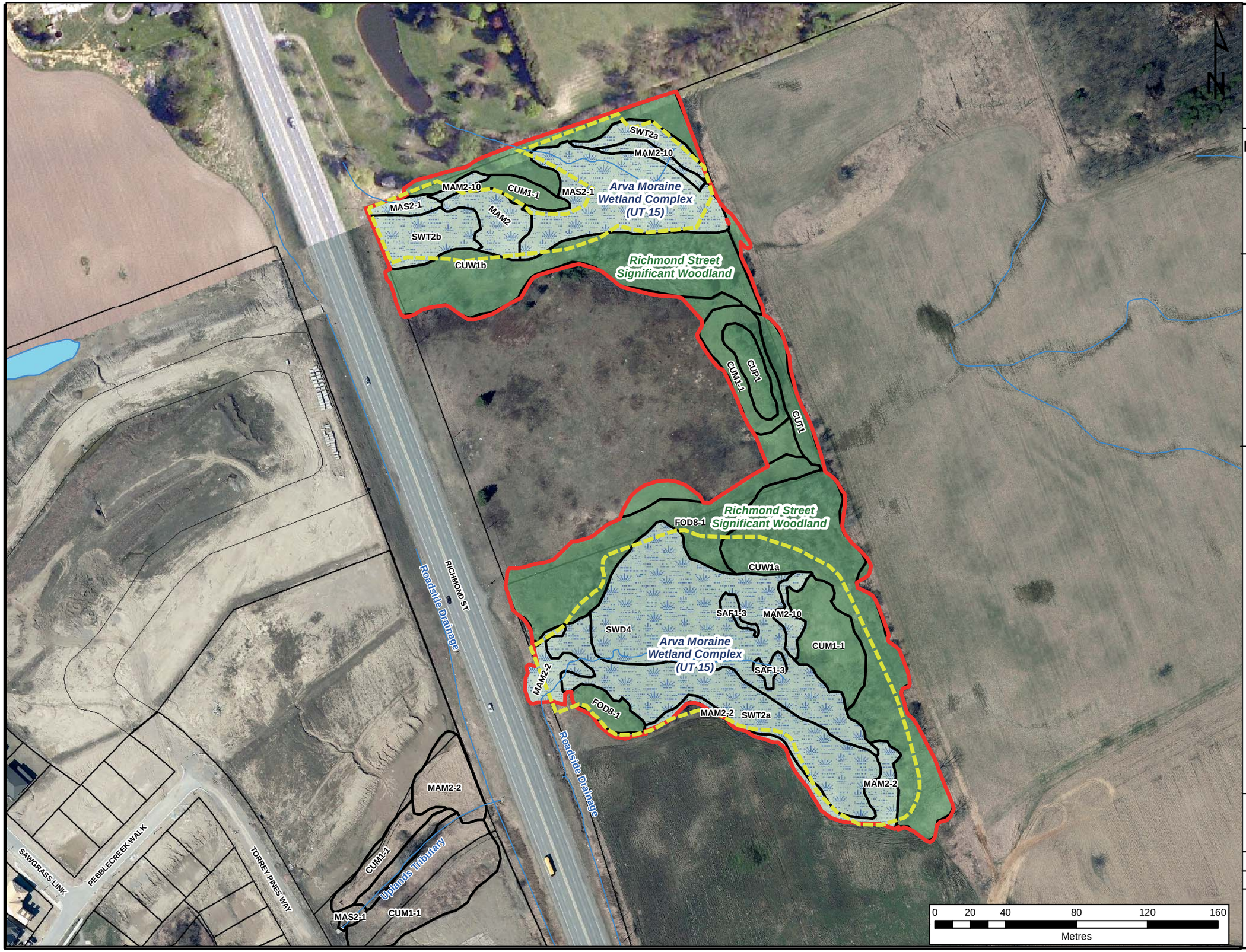
4.4.1 Pedestrian and Cycling Infrastructure

The City of London has developed a far reaching network of on-road bike lanes, routes and multi-use pathways that connect active transportation users to all areas of the city. Within proximity to the study area, on-road bike lanes are located on Western Road south of Richmond Street, on Wonderland Road south of Fanshawe Park Road and on Adelaide Street north from Grenfell Drive to Sunningdale Road A sharrow lane is located on Richmond Street between Western Road and Fanshawe Park Road. Pathways adjacent to the street are located along Fanshawe Park Road from Medway Creek east to Adelaide Street and north on Adelaide to where the bike lanes begin. Currently, an existing pathway extends north from Fanshawe Park Road east of North Centre Road and terminates on the south side of Sunningdale Road. Recreational pathways are located within the Richmond Village North development.

The Municipality of Middlesex Centre completed a Trails Master Plan in 2014. The purpose of this master plan is to create an interconnected trail system and supporting amenities within the municipality. The focus of the system will be on pedestrian pathways, sidewalks and trail connections.

Immediately north of the study area, east of Richmond Street is Weldon Park in the Town of Arva. Weldon is a large municipal park with both passive and active amenities. Trails exist along the south limit of the park where it abuts the Richmond Street study area. These paths snake north along the east boundary of the park. Also within the park, the master plan has identified two trail opportunity areas. Potential exists to connect the pathway/trails systems of both municipalities to increase active transportation amenities in this area.

This study has regard for the existing and proposed trails identified in the Trails Master Plan. See **Figure 4.6** below.



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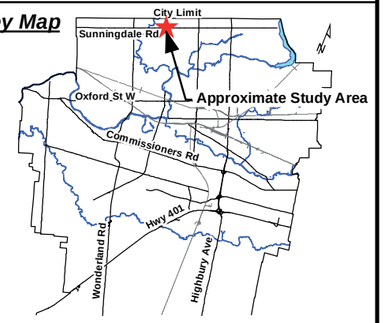
Recreational Pathway Crossing of Richmond Street Municipal Class Environmental Assessment Schedule 'B' Environmental Study Report

Key Map



Legend

- Watercourse
- Railway
- MNR Approved PSW Boundary
- Significant Woodland Boundary
- ELC Boundary
- Wetlands
- Upland

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Figure 4.5
Significant Woodland Boundary Delineation

Scale: 1:2,000

Date:April 2016

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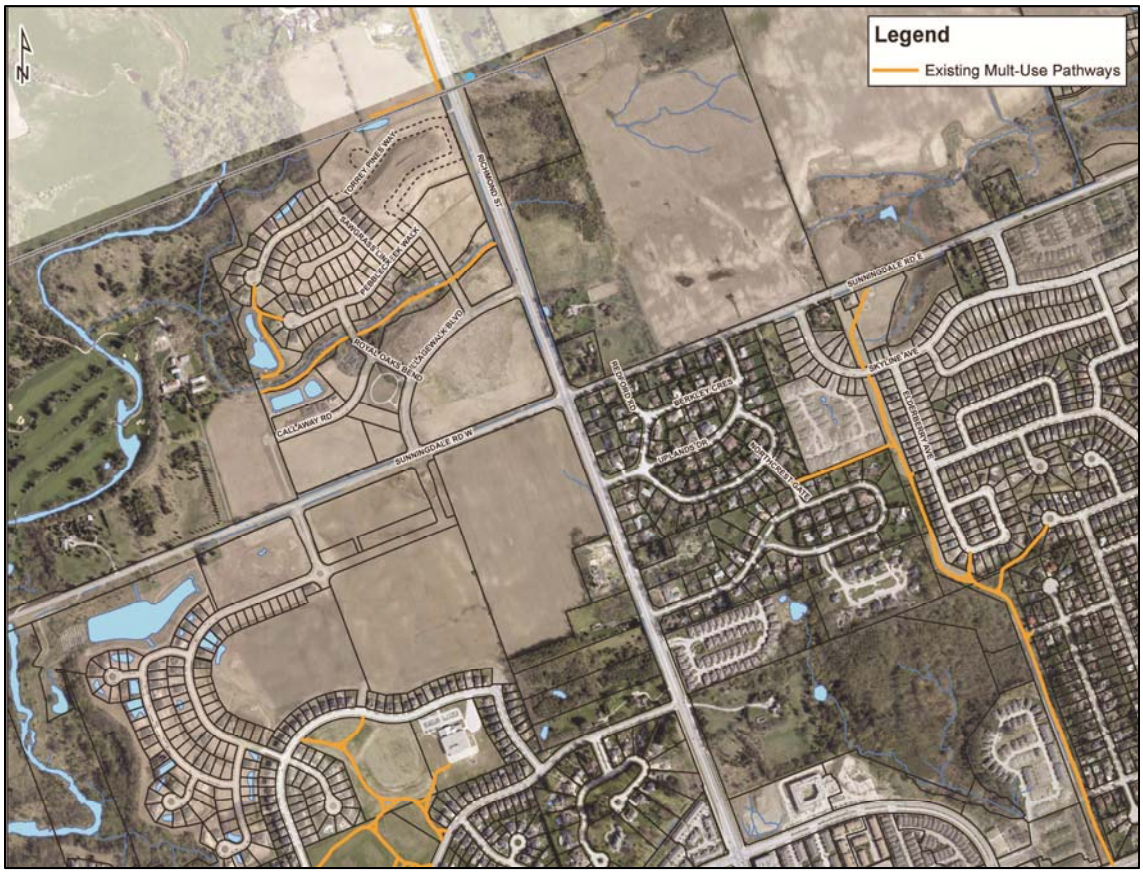

Figure 4.6: Existing Multi-use Pathways

4.4.2 Geotechnical

Golder Associates undertook a preliminary geotechnical assessment of the study area using topographical mapping, soils and bedrock mapping, geological data and site-specific geotechnical data from previous investigations carried out at the site.

The site is generally located in the physiographic region of Southwestern Ontario known as the Arva Moraine associated with the Stratford Till Plain. The soils along this portion of Richmond Street North generally consist of shallow deposits of fine sands, silt, clayey silt and silty clay over clayey silt till.

4.4.3 Existing Infrastructure

Richmond Street is a major north south arterial road ranging in width from 38m to 55m. North of Sunningdale Road, Richmond Street has a rural cross section and carries approximately 12,000 vehicles per day. Street lights along this section of road exist only at the intersections with Sunningdale Road and Torrey Pines Way.

The following utilities exist within the current Richmond Street corridor:

- 300mm watermain on the west side from Sunningdale Road to Villagewalk Boulevard;

- 750mm storm sewer at the northeast corner of the intersection at Sunningdale Road. The sewer runs from a catchbasin located on the west side of Richmond Street east along Sunningdale Road to Redford Drive;
- 150mm sanitary forcemain is located along the west side of Richmond Street through the entire length of the study area;
- Twin 1050mm watermains cross Richmond Street at the northern limit of the Urban Growth Boundary;
- An Imperial Oil pipeline runs north along the west side of Richmond Street; and
- Hydro lines are located on the east side of Richmond Street.

5. Phase 1: Project Need and Justification

As part of Phase 1 of the Class EA process, the problem or deficiency to be addressed is identified to provide a clear understanding of the problem and/or opportunity which may not be entirely obvious. Therefore, it is necessary to document all factors which lead to the conclusion that an improvement or change is necessary. This section of the report defines the need and provides justification for the City to undertake this Municipal Class EA study.

5.1 Background Studies

The recreational pathway connection is supported at the municipal level through the following policies/guidance documents:

- City of London Official Plan;
- The London Plan (draft V2-2015);
- Parks and Recreation Master Plan (2009);
- The London 2030 Transportation Master Plan (2013);
- Bicycle Master Plan (2005);
- Cycling Master Plan (draft); and
- London Strengthening Neighbourhoods Strategy (2009).

5.2 Problem/Opportunity Statement

The Class EA Problem / Opportunity statement provides the basis for the need and justification for this project and is presented below.

The City of London OP and BMP convey the City's commitment to develop a transportation system that is environmentally sound and supportive of active, healthy lifestyles. The Master Plan further identifies a major east-west recreational pathway corridor along the northern boundary of the City with a crossing of Richmond Street. The Parks & Recreation Master Plan (2009) recommended the need to address gaps within the pathway system.

Recent and ongoing development in north London has increased demand for connected pathways for recreation/commuter bicycle and pedestrian traffic. An opportunity exists to address pathway connectivity in this area before development proceeds to a point where a crossing location and pathway alignment options may become too restricted. This opportunity can provide for a direct, accessible pathway alignment that has minimal impact on the natural environment features within the areas.

6. Phase 2: Alternative Solutions

Phase 2 of the Class EA process requires the identification and evaluation of the alternative solutions to address the identified problem and/or opportunity statement. Alternative solutions represent planning options for addressing the indentified problems and opportunities. The problem/opportunity statement identified the need to improve network connectivity east and west of Richmond Street for pedestrians and cyclists in order to promote sustainable active transportation options to residents.

A number of planning alternatives are identified and subjected to a screening process to determine whether they would improve pedestrian and cyclist network connectivity within the study area and serve the needs of the community in the surrounding area and the residents of the City at large.

6.1 Identification of Alternative Solutions

The following list of alternative solutions was identified as having potential to address the problems and opportunities within the study area. All crossing alternatives are shown on **Figure 6.1**.

Table 6.1: Alternative Planning Solutions

Alternative Planning Solutions		Description
Alternative 1	Do Nothing	This alternative demonstrates what would happen if no action was taken to improve the pedestrian and cyclist network connectivity within the study area. This alternative has been included to provide a base to which the other alternatives can be compared. Under this alternative, no measures would be taken to connect the east and west sections of the pathways adjacent to Richmond Street.
Alternative 2	Underpass Crossing	This alternative involves the construction of a recreation connection through a tunnel under Richmond Street. Two potential locations were selected for the placement of the underpass based on existing grades. **Alternative 2A** – located at the north limits of the City approximately 720m north of Sunningdale Road. **Alternative 2B** - located at Villagewalk Boulevard approximately 320m north of Sunningdale Road.
Alternative 3	Overpass Crossing	This alternative involves the construction of a recreational overpass within the Richmond Street ROW. The selection of the location of the overpass was once again based on the existing grades along Richmond Street. **Alternative 3** - located at Torrey Pines Way approximately 560m north of Sunningdale Road.



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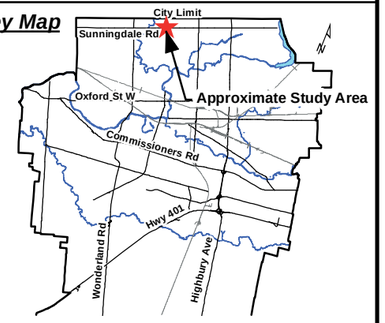
Key Map



Legend

- Bridge Crossing
- At Grade Crossing
- Tunnel Crossing
- Watercourse
- Railway
- MNR Approved PSW Boundary
- Study Area
- Lot Lines
- Water Body

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Figure 6.1

Crossing Alternatives

Scale: 1:3,382

Date: April 2015

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Alternative 4	At Grade Crossing	This alternative would involve the placement of a recreational crossing of Richmond Street at street level without the construction of tunnels or bridges. **Alternative 4A** – located south of Villagewalk Boulevard 210m north of Sunningdale Road. **Alternative 4B** - located at the Sunningdale Road and Richmond Street intersection.

6.2 Identification of Assessment Criteria for Alternative Solutions

An evaluation framework was developed and is presented in **Table 6.2**, including technical considerations and environmental components that address the broad definition of the environment as described in the *Environmental Assessment Act*. The existing environment was taken into consideration leading to a descriptive or qualitative assessment based on criteria developed within the following categories.

Table 6.2: Evaluation Factors and Description

FACTOR	CRITERIA	DESCRIPTION/MEASURE
SOCIAL / CULTURAL	Safety	• Potential pedestrian/cyclist conflict with vehicular traffic • Level of personal safety associated with crossing and pathways (Crime Prevention Through Environmental Design - CPTED) • Disruption/inconvenience to public during construction • Potential to connect with existing pathways
	Cultural Heritage Resources	• Disruption of site/structures having significant archaeological, historical, or architectural value
	Aesthetics	• Visual appearance of crossing & potential to provide gateway into City • Potential lighting, landscaping and architectural features of crossing and pathways • Urban Design • Visual impact to adjacent properties/land uses
	Aboriginal Issues	• Land Claims/Treaty Rights
NATURAL ENVIRONMENT	Terrestrial Wildlife / Vegetation	• Effects on wildlife and habitat • Effects on significant trees and/or ground flora
	Aquatic Life/Vegetation	• Effects on aquatic life and habitat • Effects on aquatic vegetation
	Groundwater	• Dewatering during construction
	Designated Natural Heritage Areas	• Impacts to PSW
	Species at Risk	• Amount and quality of SAR and/or habitat removal or disruption
TECHNICAL	Design	• Location of crossing • Utility impacts • Property impacts (temporary & permanent easements)

		• Access to Richmond Street
	Construction	• Implementation • Construction access • Staging
	Timing	• Ability to construct within a reasonable timeframe
	Approval Requirements & Regulatory Requirements	• Permits and/or agency approvals/agreements and coordination
ECONOMIC / FINANCIAL	Initial Capital Costs	• Total Project Costs (design/construction) (ie: quantities and unit costs for crossing, ramps, pathways, landscaping, engineering and contingencies)
	Operating and Maintenance Costs	• Costs associated with operation and maintenance

6.3 Use of Descriptive Information and Qualitative Evaluation

The alternatives were assessed using the reasoned argument method of evaluation. This method identifies and highlights differences in net impacts associated with the various alternatives. The relative significance of the impacts is examined to provide a clear rationale for the selection of a preferred alternative. The criteria have been put forward based on their ability to identify the potential environmental effects of each alternative and distinguish the advantages and disadvantages between them.

Table 6.3 presents the assessment table used to evaluate the three Alternative Solutions, as well as the Do Nothing Alternative. Through this table, technical, socio-economic, cultural and natural environment criteria are used to evaluate and compare impacts of each of the solutions. A recommendation was made for the Preferred Alternative Solution based on the results presented in this table.

6.4 Preferred Alternative Solution

Based on the detailed comparative evaluation, **Alternative 3: Overpass Crossing** is recommended to be carried forward as the Preferred Solution.

- Alternative 1 was not recommended as it does not address the problem/opportunity statement presented in Section 5.2. Specifically it would not enhance the recreational pathway network connectivity, as outlined in the OP and the BMP.

- Alternative 2 was not recommended as there would be potentially greater concerns for personal safety and potential impacts to the natural environment, including the open space corridor, the Arva Moraine PSW, SAR habitat and aquatic life and vegetation. Additionally, this option would have impacts on the existing sanitary forcemain and would require considerable grading.

Table 6.3– Evaluation of Alternative Solutions

Potential Evaluation of Alternative Solutions						
ALTERNATIVE	ALTERNATIVE 1 DO NOTHING	ALTERNATIVE 2 UNDERPASS CROSSING		ALTERNATIVE 3 OVERPASS CROSSING	ALTERNATIVE 4 AT-GRADE CROSSING	
EVALUATION CRITERIA		ALTERNATIVE 2A	ALTERNATIVE 2B		ALTERNATIVE 4A	ALTERNATIVE 4B
SOCIAL-CULTURAL						
Safety • Potential pedestrian/cyclist conflict with vehicular traffic • Level of personal safety/security associated with crossing (CPTED)	• Minimal potential for conflict with vehicular traffic at signalized intersection. However, potential for conflict increases if users choose mid-block crossing. • Provides low level of personal safety due to high potential for pedestrian/cyclist and vehicular conflict. • No changes to existing conditions.	• Low potential for conflict with vehicular traffic. • Provides low level of personal security due to low visibility within tunnel. • Perception of personal safety is reduced in tunnels. • Limited disruption to public during construction. Temporary lanes reduction required. • Provides access across Richmond Street, therefore addresses problem statement.	• Low potential for conflict with vehicular traffic. • Provides low level of personal security due to low visibility within tunnel. • Perception of personal safety is reduced in tunnels. • Limited disruption to public during construction. Temporary lanes reduction required. • Provides access across Richmond Street, therefore addresses problem statement.	• Low potential for conflict with vehicular traffic. • Provides high level of personal security due to high visibility of overpass. • Disruption to public during construction. Temporary road closure required. • Provides access across Richmond Street, therefore addresses problem statement.	• Highest potential for conflict with vehicular traffic. • Provides low level of personal safety due to high potential for pedestrian/cyclist and vehicular conflict. • Limited disruption to public during construction with temporary traffic lane reduction. • Provides access across Richmond Street, therefore addresses problem statement.	• Highest potential for conflict with vehicular traffic. • Provides low level of personal safety due to high potential for pedestrian/cyclist and vehicular conflict. • Limited disruption to public during construction with temporary traffic lane reduction. • Provides access across Richmond Street, therefore addresses problem statement. • No improvement to pedestrian/cycling connectivity as users will be required to travel indirectly to connect with existing pathway.
Cultural Heritage Resources • Disruption of site/structures having significant archaeological, historical, or architectural value	• No impacts to cultural heritage resources as no changes to existing conditions will occur.	• Potential impacts to cultural heritage resources if crossing approaches are located outside of existing ROW. • Potential impacts associated with pathway alignment outside of ROW. • A Stage 2 archaeological assessment may be required.	• Potential impacts to cultural heritage resources if crossing approaches are located outside of existing ROW. • Potential impacts associated with pathway alignment outside of ROW. • A Stage 2 archaeological assessment may be required.	• Potential impacts to cultural heritage resources if crossing approaches are located outside of existing ROW. • Potential impacts associated with pathway alignment outside of ROW. • A Stage 2 archaeological assessment may be required.	• No impacts to cultural heritage resources as all work will be implemented within the existing ROW.	• No impacts to cultural heritage resources as all work will be implemented within the existing ROW.
Aesthetics • Visual appearance of crossing & potential to provide gateway into City • Urban design • Visual impact on adjacent properties/land uses	• No changes to existing conditions. • No potential for gateway opportunity. • No potential for urban design. • No impacts to adjacent properties.	• Low potential for gateway opportunity. • Low potential for urban design opportunities. • No negative impacts to adjacent properties.	• Low potential for gateway opportunity. • Low potential for urban design opportunities. • No negative impacts to adjacent properties.	• Highest potential for gateway opportunity. • Highest potential for urban design opportunities. • Potential positive impacts to adjacent properties.	• No potential for gateway opportunity. • No potential for urban design opportunities. • No negative impacts to adjacent properties.	• No potential for gateway opportunity. • No potential for urban design opportunities. • No negative impacts to adjacent properties.
Aboriginal Issues • Land claims/treaty issues	• No known impacts to Aboriginal land claims or treaty rights.	• No known impacts to Aboriginal land claims or treaty rights.	• No known impacts to Aboriginal land claims or treaty rights.	• No known impacts to Aboriginal land claims or treaty rights.	• No known impacts to Aboriginal land claims or treaty rights.	• No known impacts to Aboriginal land claims or treaty rights.
NATURAL ENVIRONMENT						
Terrestrial Wildlife & Vegetation • Effects on wildlife and habitat • Effects on significant trees/ground flora	• No impacts to terrestrial wildlife & vegetation.	• No impacts to terrestrial wildlife. • Possible impacts to open space corridor as a result of pathway alignment.	• No impacts to terrestrial wildlife. • Possible impacts to open space corridor as a result of pathway alignment.	• No impacts to terrestrial wildlife. • Possible impacts to open space corridor as a result of pathway alignment.	• No impacts to terrestrial wildlife. • Possible impacts to open space corridor as a result of pathway alignment.	• No impacts to terrestrial wildlife. • Possible impacts to open space corridor as a result of pathway alignment.

Potential Evaluation of Alternative Solutions						
ALTERNATIVE	ALTERNATIVE 1 DO NOTHING	ALTERNATIVE 2 UNDERPASS CROSSING		ALTERNATIVE 3 OVERPASS CROSSING	ALTERNATIVE 4 AT-GRADE CROSSING	
EVALUATION CRITERIA		ALTERNATIVE 2A	ALTERNATIVE 2B		ALTERNATIVE 4A	ALTERNATIVE 4B
Aquatic Life & Vegetation • Effects on aquatic life and habitat • Effects on aquatic vegetation	• No impacts to aquatic life and vegetation.	• Possible impacts to aquatic life & vegetation as a result of pathway alignment.	• Possible impacts to aquatic life & vegetation as a result of pathway alignment. • Potential indirect impacts to tributary with respect to construction runoff.	• Possible impacts to aquatic life & vegetation as a result of pathway alignment.	• Possible impacts to aquatic life & vegetation as a result of pathway alignment.	• Possible impacts to aquatic life & vegetation as a result of pathway alignment.
Groundwater • Dewatering during construction	• No dewatering required.	• Surficial water seepage into excavation may be encountered. Dewatering required.	• Surficial water seepage into excavation may be encountered. Dewatering required.	• Low potential for surficial water seepage into excavation. Dewatering may be required.	• No dewatering required.	• No dewatering required.
Designated Natural Heritage Area • Impacts to PSW	• No impacts to designated natural heritage areas.	• Potential indirect impacts to Arva Moraine Provincially Significant Wetland with respect to construction runoff.	• Potential indirect impacts to Arva Moraine Provincially Significant Wetland with respect to construction runoff.	• No impacts to designated natural heritage areas.	• No impacts to designated natural heritage areas.	• No impacts to designated natural heritage areas.
Species at Risk • Amount and quality of SAR and/or habitat removal or disruption	• No impacts to Species at Risk.	• Species at Risk habitat assessment to be completed.	• Species at Risk habitat assessment to be completed.	• Species at Risk habitat assessment to be completed.	• Species at Risk habitat assessment to be completed.	• Species at Risk habitat assessment to be completed.
TECHNICAL						
Design/Function • Location of crossing • Utility impacts • Property impacts (temporary & permanent easements) • Access onto Richmond Street • Potential to connect with existing paths	• No changes to existing conditions. • No improvements to pathway connectivity across Richmond Street. Does not address problem statement for this project.	• Potential approximate distance from existing pathway terminus points - 700 m. • Significant construction impacts to sanitary forcemain. Installation of protective insulation required or relocation. • Significant grading impacts due to location of approaches and deep siting of culvert. • Property taking may be required to accommodate necessary grading. • Retaining walls may be required to access Richmond Street. • Improvement to pedestrian/cycling connectivity with existing pathway.	• Potential approximate distance from existing pathway terminus points - 665 m. • Significant construction impacts to sanitary forcemain. Installation of protective insulation required or relocation. • Significant grading impacts due to location of approaches and deep siting of culvert. • Property taking may be required to accommodate necessary grading. • Retaining walls may be required to access Richmond Street. • Improvement to pedestrian/cycling connectivity with existing pathway.	• Potential approximate distance from existing pathway terminus points - 625 m. • Minor construction impacts to sanitary forcemain. Installation of protective insulation required or relocation. • Minor grading impacts due to location of approaches. • Property taking may be required to accommodate necessary grading on east side of Richmond. West side property previously acquired. • No retaining walls required to access Richmond Street. • Improvement to pedestrian/cycling connectivity with existing pathway.	• Potential approximate distance from existing pathway terminus points - 820 m. • On street routing of cycling pathway. • Least complicated design/construction. • No geotechnical issues associated with this option. • No impacts to existing utilities. • No property impacts. • Sidewalk access to Richmond Street. • No improvement to pedestrian/cycling connectivity as users will be required to travel indirectly to connect with existing pathway.	• Potential approximate distance from existing pathway terminus points - 1120 m. • On street routing of cycling pathway. • Least complicated design/construction. • No geotechnical issues associated with this option. • No impacts to existing utilities. • No property impacts. • Sidewalk access to Richmond Street. • No improvement to pedestrian/cycling connectivity as users will be required to travel indirectly to connect with existing pathway.
Construction • Implementation • Construction access • Staging	• No impacts.	• Temporary shifting of northbound/southbound traffic during construction. • Construction access potentially through ESA. • Construction staging within ROW.	• Temporary shifting of northbound/southbound traffic during construction. • Construction access potentially through ESA. • Construction staging within ROW.	• Temporary (12 hour) road closure required but can be mitigated by placing beams for bridge construction at night. • Construction access from Richmond Street and Torrey Pines Way. • Construction staging within ROW.	• Easiest option to implement. • Possible temporary reduction in traffic lanes if refuge island considered. • Construction access from Richmond Street. • No construction staging required.	• Easiest option to implement. • Possible temporary reduction in traffic lanes if refuge island considered. • Construction access from Richmond Street. • No construction staging required.
Timing • Ability to construct within a reasonable timeframe	• No impacts.	• The use of pre-cast elements would significantly reduce construction timing. • Longest construction time required	• The use of pre-cast elements would significantly reduce construction timing. • Longest construction time required	• Medium length of construction time – approximately 30 days.	• Shortest construction time – approximately 10 days.	• Shortest construction time – approximately 10 days.

Potential Evaluation of Alternative Solutions						
ALTERNATIVE	ALTERNATIVE 1 DO NOTHING	ALTERNATIVE 2 UNDERPASS CROSSING		ALTERNATIVE 3 OVERPASS CROSSING	ALTERNATIVE 4 AT-GRADE CROSSING	
EVALUATION CRITERIA		ALTERNATIVE 2A	ALTERNATIVE 2B		ALTERNATIVE 4A	ALTERNATIVE 4B
		- approximately 50 days.	- approximately 50 days.			
Approval Requirements & Regulatory Requirements • Permits and/or agency approvals/agreements and coordination	• No approvals required.	• UTRCA approval may be required for potential pathway alignment.	• UTRCA approval may be required for potential pathway alignment.	• UTRCA approval may be required for potential pathway alignment.	• No approvals required.	• No approvals required.
ECONOMICS						
Initial Capital Costs • Total project costs (design/construction)	• No cost associated as no changes would occur.	• Highest cost alternative due to complex design of crossing. • $900K to $1.4M.	• Highest cost alternative due to complex design of crossing. • $900K to $1.4M.	• Medium cost alternative due to complex design of crossing. • $800K to $1.2M.	• Lowest cost alternative due to simple design of crossing. • $30K to $50K.	• Lowest cost alternative due to simple design of crossing. • $30K to $50K.
Operating & Maintenance Costs • Costs associated with operation/maintenance	• No cost associated as no changes would occur.	• $3000 required annually for seasonal maintenance of underpass and pathway. • Potential additional cost may be required to remove graffiti.	• $3000 required annually for seasonal maintenance of underpass and pathway. • Potential additional cost may be required to remove graffiti.	• $1000 required annually for seasonal maintenance of underpass and pathway.	• $500 required annually for seasonal maintenance of pathway.	• $500 required annually for seasonal maintenance of pathway.
OVERALL SUMMARY	**NOT PREFERRED - DOES NOT ADDRESS PROBLEM STATEMENT**	**NOT PREFERRED - GREATER DESIGN CHALLENGES, HIGHEST COST, REDUCED PERCEPTION OF PERSONAL SAFETY**	**NOT PREFERRED - GREATER DESIGN CHALLENGES, HIGHEST COST, REDUCED PERCEPTION OF PERSONAL SAFETY**	**CARRIED FORWARD - REDUCED CONFLICTS BETWEEN VEHICLES AND PEDESTRIANS/CYCLISTS, MODERATE COST**	**NOT PREFERRED - HIGHEST CONFLICTS BETWEEN VEHICLES AND PEDESTRIANS/CYCLISTS**	**NOT PREFERRED - HIGHEST CONFLICTS BETWEEN VEHICLES AND PEDESTRIANS/CYCLISTS**

- Alternative 3 is expected to address the problem/opportunity statement as it addresses the planned recreational pathway network connectivity, it reduces vehicular and pedestrian and cyclist conflict points, it complies with the OP, BMP and other planning documents, it provides a highly visible and safe crossing of Richmond Street and there is potential to create a gateway feature over Richmond Street in north London.

- Alternative 4 was not recommended as there would be a higher propensity for conflict with vehicular traffic. This may also result in decreased perception of personal safety for pedestrians and cyclists, making active transportation modes less attractive.

6.5 Public Information Centre #1

The public and stakeholders were invited to comment on the study through Public Information Centre #1 (PIC) held on November 12, 2014 at Mother Teresa Catholic Secondary School. The purpose of PIC #1 was to identify the purpose and scope of the project, confirm the project need, and identify alternatives and any further issues or concerns to be addressed. A total of 12 participants signed in at the PIC with the majority of the attendees being local developers. Other attendees included representatives from the Cycling Advisory Committee and residents. Comments are summarized below and located in **Appendix A.3**. **Table 6.4** provides a summary of the comments received.

Table 6.4: PIC #1 Comments

Comments		Response
Pathway connection	Creates a long and continuous pathway system in North London.	Comments noted.
	Provides a much needed pathway connection.	Comments noted.
At-grade crossing (Option 4)	Dangerous even at traffic lights.	Comments noted.
	A natural at-grade crossing will be provided when Villagewalk Blvd is extended east.	Villagewalk Blvd. will be extended east as development occurs on the east side of Richmond.
	Preferred crossing (least cost and future maintenance costs).	Comments noted.
	Install a crosswalk until traffic signals are installed at the future road intersection.	Comments noted.
Overpass (Option 3)	Nice gateway feature opportunity.	Comments noted.
	Safer than a tunnel (Option 2).	Comments noted.
	Preferred as it has the least impact on Richmond Street property.	Comments noted.
	Overpass not needed in this location.	Comments noted.
	Overpass will only be used by a few residents.	Comments noted.
Gateway	There are less expensive options to create a gateway to the City.	Comments noted.
Miscellaneous	Consider a design competition for bridge.	Comments noted.
	Wait until area develops more to create crossing.	Comments noted.
	Money could be better spent on other items (to purchase parkland or park equipment).	Comments noted.

7. Phase 3: Alternative Design Concepts

This section of the report discusses the alternative design concepts that were identified, developed and evaluated for the Preferred Solution. These alternative design concepts are described below followed by an evaluation and comparison between alternatives. Details of the Preferred Design are presented in **Section 8.0**.

7.1 Preliminary Design Criteria

The design of the structure will be carried out in accordance with the Canadian Highway Bridge Design Code (CHBDC) – CAN/CSA-S6-06 and subsequent revisions. Design details shall be in accordance with the MTO Structural Manual. The Preliminary Design Criteria is presented in **Table 7.1** below.

Table 7.1: Preliminary Design Criteria

Crossing Structure Geometry Requirements	*Richmond Street Geometry Requirements*

• 4 m clear width (between curbs or walls) which exceeds the following minimum path requirements:
  o 1.82 m for pedestrian only bi-directional
  o 1.525-1.600m range of suggested wheel chair standards
  o 2.53 m for pedestrian and cycle uni-directional
  o 3.53 m for pedestrian and Cycle bi-directional
  o (Consideration may be given to matching path widths approaching structure. Above noted widths are intended for high volume urban areas with reductions considered on a project specific basis).
• Maximum longitudinal approach gradient of 12H:1V, for accessibility requirements.
• Use of line marking to separate direction of traffic (and/or bicycles).
• For structure arrangement above Richmond Street:
  o Secondary access to structure by stairs.
  o Side curb height of 200 mm.
  o Pedestrian / Cyclist Railing 1.37 m high (including curb), extended a minimum of 3
	• Minimum total street section of 31.3 m, square to the roadway centreline (accommodates 1.5 m median, 6-through traffic lanes at the ultimate section, 1.5 m bike lanes, curb/gutter and 1.8 m sidewalks).
	• Roadside safety enhancements not required for 3.9 m separation to edge of traveled lane (assuming the sidewalk, curb/gutter and bike lanes are integrated with the road section).
	• Minimum vertical clearance to the bridge structures of 5.1 m above paved road surface (for structure arrangement above Richmond Street).
	• Minimum vertical clearance of 3.0 m (for structure arrangement below Richmond Street).
	Surface Materials
	• Asphalt (with waterproofing)
	• Alternatives may include:
	  o Timber
	  o Concrete (decorative or plain)
	  o Composite plastics
	Surface Drainage
	• No ponding. Runoff water shall be conveyed effectively without erosion to discharge locations.

m beyond the structure. • For structure arrangement below Richmond Street: o Hand railing mounted on both walls. o Drainage channel each side along the walls. o Lighting.	• Minimum 2% crossfall to sides. • Minimum 0.5% longitudinal grade. *Design Life* • Minimum 80 years
Structure Superstructure Material Types	*Aesthetic Enhancements*
• Concrete girders (“I” or box), precast or cast in place. • Steel girders (“I” or box). • Structural steel truss.	• Typical considerations including: o Colour o Railing enhancements o Concrete shape and form liners

7.2 Identification and Description of Alternative Design Concepts

7.2.1 Crossing Alignments

Alternative Design Concepts were selected based on three crossing alignments as described below and illustrated in **Figure 7.1**.

- Alternative 1 – North Skew
- Alternative 2 - Perpendicular
- Alternative 3 – South Skew

Table 7.2 presents the evaluation of the three crossing alignments.

Table 7.2: Crossing Alignment Alternatives

Crossing Alignment	Evaluation
Alternative 1 – North Skew	▪ Longer crossing, deeper bridge deck required. ▪ Crossing and pathway alignment may directly impact future development east of Richmond Street. ▪ Bridge orientation results in a slightly less direct pathway alignment. ▪ Higher cost (23% more).
Alternative 2 - Perpendicular	▪ Shortest crossing. ▪ Crossing and pathway alignment may directly impact future development east of Richmond Street.



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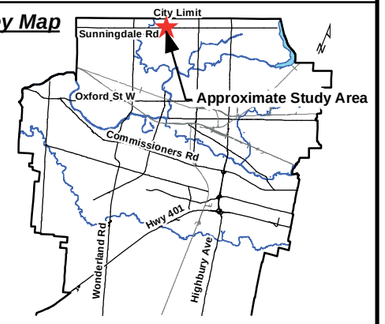
Recreational Pathway Crossing of Richmond Street Municipal Class Environmental Assessment Schedule 'B' Environmental Study Report

Key Map



Legend

- Potential Bridge Location and Skew
- Watercourse
- Railway
- MNR Approved PSW Boundary
- Study Area
- Lot Lines
- Water Body

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Figure 7.1

Crossing Alignment Alternatives

Scale: 1:2,500

Date: April 2015

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	▪ Bridge orientation results in a slightly less direct pathway alignment. ▪ Requires users to make sharp turn and provides poor sight distances for higher speed bicycles and CPTED issues ▪ Lowest cost.
Alternative 3 – South Skew	▪ Longer crossing, deeper bridge deck required. ▪ Bridge orientation accommodates a direct and very functional pathway alignment. ▪ Highest impact due to grading needs. ▪ Highest property requirement from developer on aast side of Richmond street. ▪ Impact on conceptual buried infrastructure proposed by developer in concept drawings. ▪ Highest impact on existing farm entrance that may be used as temporary entrance to property. The property will be accessed by local streets to the east not Richmond Street when fully developed. ▪ Higher cost (23%).

7.2.2 Recommended Crossing Alignment

Alternative 3 skewed crossing (south alignment) of Richmond Street was carried forward as the recommended alternative as it has less impact on the surrounding property and natural environment.

Note: This alternative was presented at PIC #2 as the recommended alternative. However, following additional meetings with the City and further analysis, the alternatives were re-evaluated and **Alternative 1**: skewed crossing (north alignment) was selected as the preferred alignment. See Sections 7.4 and 8 for further information.

7.2.3 Pathway Alignment

Potential pathway alignments were also considered to connect the proposed Richmond Street crossing with the pathway terminus points east and west of the crossing. **Figure 7.2** illustrates these alignments and **Table 7.3** provides an evaluation summary.

Table 7.3: Pathway Alignment Alternatives

Pathway Alignment	Evaluation
Option P1	▪ Approximate pathway length to terminus point B: 425m. ▪ Requires narrow wetland crossing at a location that is very disturbed. ▪ Requires crossing upland area. ▪ Most expensive option. ▪ Pathway would be located within a required development



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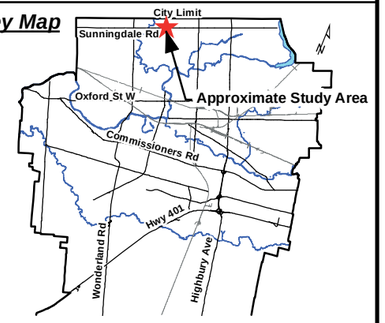
Key Map



Legend

- P1 Pathway Alignment Alternative
- Watercourse
- Lot Lines
- Significant Woodland Boundary
- Upland

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Figure 7.2

Pathway Alignment Alternatives

Scale: 1:2,200

Date: April 2015

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	setback from upland and wetland features. No additional property required. ▪ Minimal grading required. ▪ Most direct linkage to proposed County trail network. ▪ Pathway alignment avoids sensitive natural features.
Option P2	▪ Approximate pathway length to terminus point B: 400m. ▪ Does not require wetland crossing but would have impact to adjacent wetland and tributaries to the wetland. ▪ Does not cross upland area. ▪ Medium expensive option (grading, walls and wetland crossing). ▪ Some impact to future development east of Richmond Street. ▪ Requires highest amount of grading. ▪ Direct linkage to proposed County trail network but not as direct as Option C. ▪ Less attractive pathway alignment. ▪ Pathway alignment along existing arterial road and future development.
1. Option P3	▪ Approximate pathway length to terminus point B: 370m. ▪ Does not require wetland crossing but would have impact to adjacent wetland and tributaries to the wetland. ▪ Does not cross upland area. ▪ Least expensive option (grading, walls and wetland crossing). ▪ Some impact to future development east of Richmond Street. ▪ Requires minimal amount of grading. ▪ Direct linkage to proposed County trail network but not as direct as Option C. ▪ Most attractive pathway alignment.

7.2.4 Recommended Pathway Alignment

The preferred pathway alignment, P1 includes less grading, has a lower cost for retaining walls and provides better connectivity and shorter distance to the east side pathway terminus. The preferred pathway alignment has been selected to minimize impacts to the natural environment by:

- avoiding the Richmond Street Significant Woodlot to the greatest extent possible;
- protecting all trees including those within the Richmond Street Significant Woodlot;
- avoiding the Arva Moraine PSW; and
- avoiding Species at Risk habitats and Significant Wildlife Habitats.
- Least affect on development on both sides of Richmond Street in terms of grading and size of footprint due to routing of path along edge of protected habitat areas.

Note: This alternative was presented at PIC #2 as the recommended alternative. However, following additional meetings with the City and further analysis, an additional pathway alignment was considered (P3) and selected as the preferred alignment. See Sections 7.4 and 8 for further information.

7.2.5 Structural Crossing Type

The Structural Crossing type will be determined during detailed design however two structure types have been considered.

7.2.5.1 Box Girder

This proposed structure is shown in **Figure 7.3**. It is based on a single 46m span integral abutment structure with 2H:1V foreslopes, and 10 m clear zones to Richmond Street. The structure consists of a 1400 mm deep welded steel box girder and a 200 mm thick concrete deck slab that are supported on steel H-piles. A retaining soil system (RSS) or false abutment will be situated in front of the piles

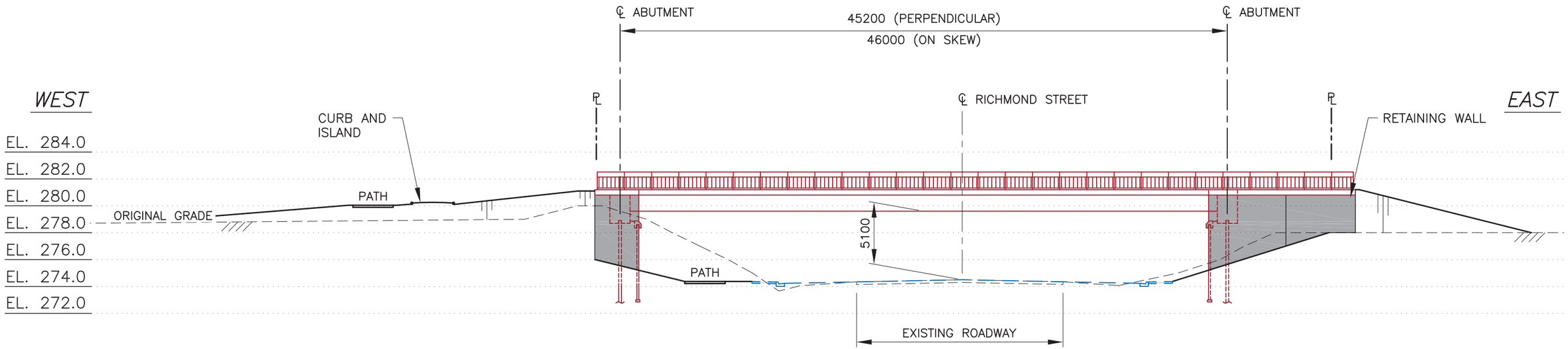
7.2.5.2 Steel Truss

This structure alternative is shown in **Figure 7.4**. The structure includes a single span (46) truss structure with 2H:1V foreslopes and a 10 m clear zone to Richmond street. The steel truss structure has a 200 mm concrete deck slab and is supported by concrete spread footings.

Table 7.4 shows a comparative evaluation for different structure type alternatives: the Steel Box Girder and the Steel Truss. The table includes information about cost, material properties and availability, construction staging and traffic disturbance, maintenance and aesthetics for the associated structure type.

Table 7.4: Girder vs. Steel Truss Comparison

Factor/Criteria	Girder	Steel Truss
Cost	**$1,020,000**	**$1,370,000**
Material Availability	▪ Available in Ontario	▪ Available in Ontario
Material Technology	▪ Girders have a high torsional rigidity. ▪ Girder splices are not necessary with cast in place concrete decks (for continuity).	▪ Truss arrangement would be a wider and taller superstructure, but relatively light. ▪ Splicing of truss superstructure in the field may be required for continuity. ▪ Trusses are more complex to design and



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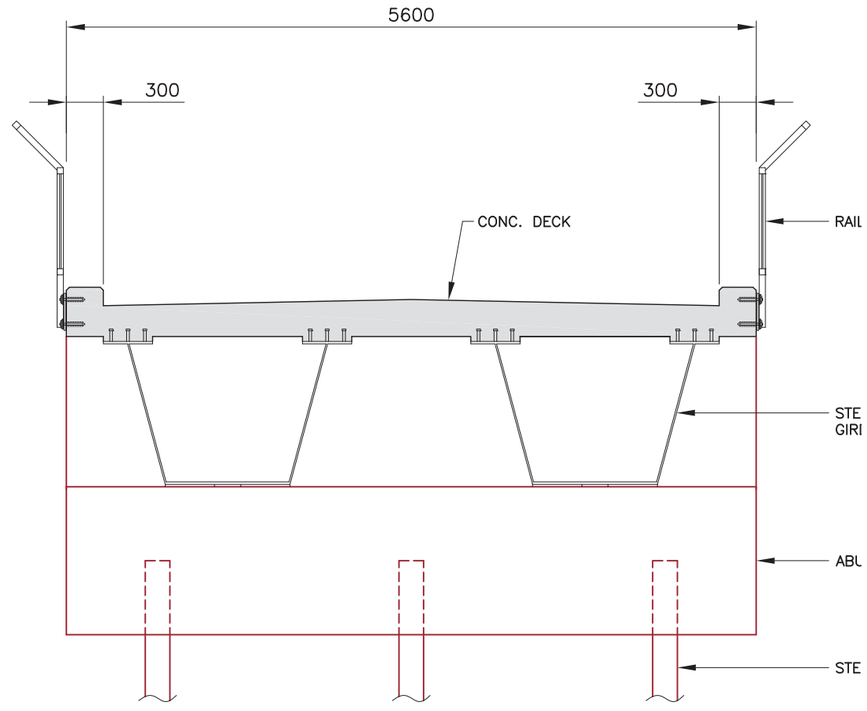

SECTION

PEDESTRIAN RECREATIONAL CROSSINGS
RICHMOND STREET

GENERAL ARRANGEMENT
OPTION 9A - ELEVATION AND SECTION

FIGURE No.
Figure 7.3 - Box Girder

Date:
MARCH 2016

DRAWING FILE: P:\60321180 CoL Richmond Street Pedestrian\900-Work\920-929 (GIS-Graphics)\Report_Figures\Figure 7-3 Box Girder

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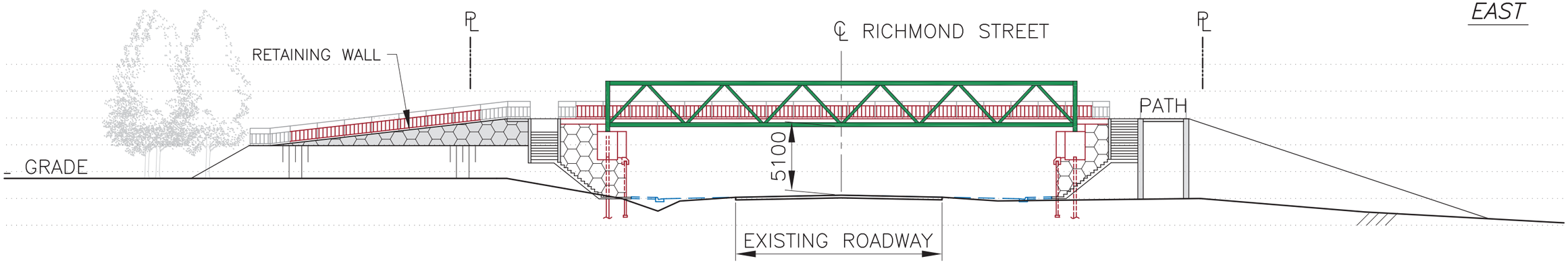
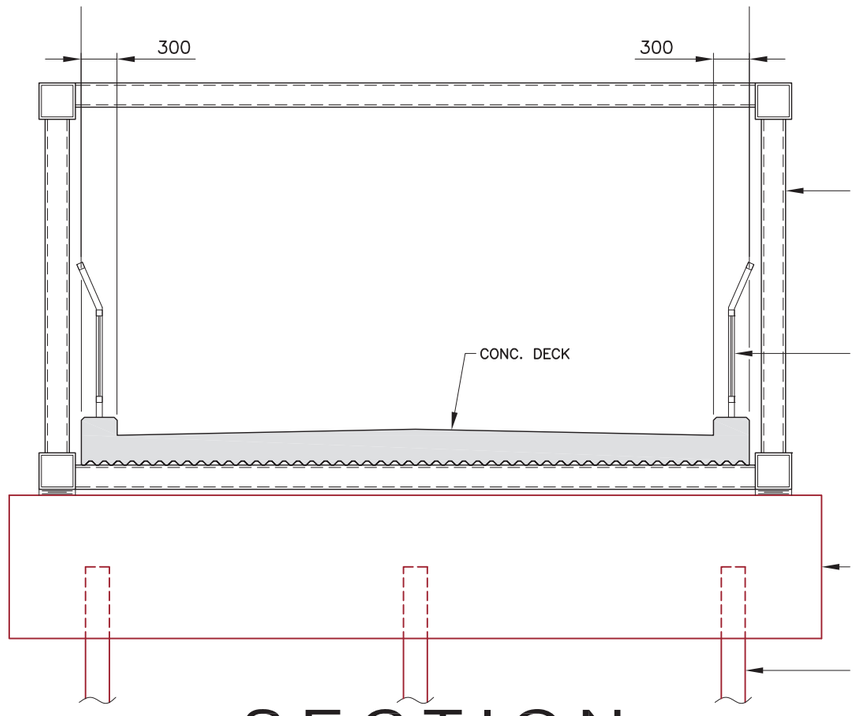


ELEVATION



SECTION

DRAWING FILE: P:\60321180 CoL Richmond Street Pedestrian\900-Work\920-929 (GIS-Graphics)\Report_Figures\Figure 7-4 Steel Truss

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PEDESTRIAN RECREATIONAL CROSSINGS
RICHMOND STREET

GENERAL ARRANGEMENT
ELEVATION AND SECTION

FIGURE No.
Figure 7.4 - Steel Truss

Date:
MARCH 2016

	▪ Cast in place concrete deck construction is more common and an efficient method of construction. ▪ Precast deck panels are an option to eliminate use of temporary formwork and access below the structure. Grouting and post-tensioning operations would be required (making this a more expensive option).	involves increased levels of fabrication. ▪ Cast in place concrete deck construction is more common and an efficient method of construction ▪ Permanent steel decking and precast deck panels are options to eliminate use of temporary formwork and access below the structure.
Construction Staging and Traffic Disturbance	▪ Temporary short duration closures area required for girder/truss erection. ▪ Temporary short duration lane closures are required for formwork.	
Maintenance	▪ Low maintenance and monitoring requirements are associated with slab and girder construction due to simple construction and few components. ▪ Bracing elements located within a confined space of box girders would require non-frequent inspection efforts.	▪ Numerous amount of connections which are subject to corroding, rusting and exposure to the elements ▪ Potentially higher maintenance and inspection costs
Aesthetics	▪ Structure is more visually appealing due to being more slender and having a smooth bottom surface	▪ Overall appearance of truss may be perceived as overly busy and congested. ▪ Trusses may obscure view from the bridge.
RECOMMENDATION	**RECOMMENDED ALTERNATIVE**	**NOT RECOMMENDED MORE MAINTENANCE REQUIRED IN THE LONG-TERM, NOT AS VISUALLY APPEALING**

The structure types will be compared to one another in the following section, with recommendation provided for the preferred structure. The structure type will be finalized in the detail design stage.

7.3 Public Information Centre #2

The public and stakeholders were invited to comment on the recommended crossing and pathway alignment alternatives through PIC #2 held on April 22, 2015 at Mother Teresa Catholic Secondary School. The purpose of PIC #2 was to confirm the preferred solution from Phase 2 and to present the design alternatives, the advantages and disadvantages of each alternative and the selection of the preferred alternatives. A total of 19 participants signed in at the PIC with a mix of residents and developers and agencies in attendance. Comments are summarized below and located in **Appendix A.4**.

Table 7.5 provides a summary of the comments received.

Table 7.5: PIC #2 Comments

Comments		Response
Pathway Connection	Pathway must avoid wetland and woodlands (EEPAC). Fencing, railings and thorny plants should be used to separate pathway from natural areas (EEPAC).	Recommendations will be considered and added to the Environmental Impact Study (EIS).
Bridge Alignment	South skew alignment is the best option and bridge location makes sense.	Comment noted.
	Include measures to minimize negative impact on the natural features from winter snow and ice removal (Nature London).	Will be addressed in the EIS.
	A bridge deck that crosses perpendicular to Richmond Street and meets its abutments straight on would be “technically” simpler to construct / fabricate and install. Perpendicular crossing would end with a ramp/pathway heading south on Richmond instead of north and then cross the land on the east side in proximity to the green upland area. Cost savings could be used for higher aesthetic and landscaping.	The City’s preference is to avoid multi-use pathways within ROWs whenever possible. If the bridge skew is perpendicular, a portion of the pathway will be required within the ROW either directed north to the City limits or south to an alignment along the natural areas. Additionally, these routes will encounter poor soil conditions and require costly retaining walls.
Miscellaneous	Wayfinding and educational signs should be provided (Environmental and Ecological Planning Advisory Committee-EEPAC).	Recommendation will be considered and added to the EIS
	Preserve the PSW and maintain the hydrological balance (Nature London).	Will be addressed in the EIS.

7.4 Preferred Alternative

This project justifies the crossing type, location, general direction for the pathway, structure type and basic preliminary design. This is all done in balance between cost, safety, environmental impacts, user experience and impact on adjacent property owners.

Development on the west side of Richmond Street has progressed rapidly and building activity is well defined making routing of the pathway and measuring its impacts easily defined. However, development on the east side of Richmond Street remains at the conceptual stage. The study team undertook meetings with property owners throughout the study process to determine potential impacts to future development.

Initially the recommended bridge skew and path route directed users south along the boundary of the Richmond Street Significant Woodland and PSW as presented at PIC #2.

Following PIC #2 and meetings with stake holders and the City, it was determined that an addition route (P3) along the southern edge of the northern woodland should be considered. At this location, the existing property slopes downward towards the PSW requiring some grading but less than would be required for the original pathway alignment. Additionally, potential future development within this area could impact infrastructure located at the south end of the property with the placement of fill whereas the northern edge of the property does not contain any existing or conceptual service infrastructure.

P3 is more direct and provides a shorter route to the existing terminus point B. Additionally, less land will be required for the pathway and associated grading if the pathway is routed along the southern edge of the northern wetland complex. The reduction in path length and grading associated with the north skewed bridge would provide better connectivity with the pathway alignment and less travel time for pathway users.

The required elevation of the north east bridge abutment is approximately 281.00, the existing property on the east side of Richmond Street has a small knoll that is approximately 280.00 leading to the requirement of a 1000-1500mm abutment face. Alternatively, a southern skew would require a 5000m abutment face. The capital cost savings of the northern skew is approximately $30,000 and result in lower operational costs. Additionally, potential, future development for the site could be significantly impacted by the originally recommended crossing and pathway alignments.

Based on the above, the north skew bridge with modified pathway route P3 is the preferred project alignment and does not present any significant environmental, technical or social/cultural issues.

See **Figure 7.5: Preferred Project Alignment.**

Section 8.0 provides the conceptual design details for the preferred crossing this option.

Pathway Terminus 'B'

P3

Arva Moraine Wetland Complex (UT 15)

Richmond Street Significant Woodland

Preferred Bridge Location and Skew

Property requirements for Bridge and Grading to be determined during detailed design

Lands have been agreed upon and dedicated to the City of London.

Richmond Street Significant Woodland

Arva Moraine Wetland Complex (UT 15)

Roadside Drainage

Roadside Drainage

Uplands Tributary

Pathway Terminus 'A'

MCWADE PL

CASTLEHILL CLOSE

SAWGRASS LINK

PEBBLECREEK WALK

TORREY PINES WAY

ROYAL OAKS BEND

VILLAGEWALK BLVD

RICHMOND ST

0 25 50 100 150 200

Metres

N

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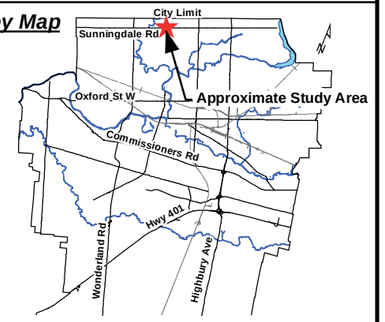
Recreational Pathway Crossing of Richmond Street Municipal Class Environmental Assessment Schedule 'B' Environmental Study Report

Key Map



Legend

- Preferred Pathway Alignment (P3)
- West Side Pathway
- Wetland
- Upland
- Significant Woodland Boundary
- MNR Approved PSW Boundary
- Pathway Terminus

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Figure 7.5

Preferred Project Alignment

Scale: 1:2,500

Date: March 2016

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8. Preferred Design Concept

The preferred design concept is a 46 m single span bridge with a 30 degree skew to carry multi-use pathway users over the future ultimate cross-section of Richmond Street (6 lanes, sidewalks and bicycle lanes). The purpose of this section is to provide preliminary design and details concerning the major features of the preferred alternative design concept.

The design of the structure will be carried out in accordance with the Canadian Highway Bridge Design Code (CHBDC) – CAN/CSA-S6-06 and subsequent revisions. Design details shall be in accordance with the MTO Structural Manual. Aesthetical details and for a signature bridge and gateway feature will not be part of this Environmental Assessment but rather be part of a follow-on exercise and covered by a technical memorandum. All cost estimates in this section of this study refer to a basic structure that may be amended to address enhanced aesthetical features following a future Municipal Council direction.

A preferred structure type is included in Section 8.2 based on the comparative analysis in Section 7.2.5.

8.1 Design Plan

The recreational pathway connection will connect with the existing pathway terminus at Torrey Pines Way and extending 120m easterly to follow Uplands Tributary to the Richmond Street right of way. The pathway will run parallel to Richmond Street in a northerly direction for 170m gently rising in grade at approximately 4% until it intersects Torrey Pines Way. At Torrey Pines Way, the bridge abutment will be placed at an offset of 18m from the centreline of Richmond Street, connecting to the abutment on the east side of Richmond Street at a 30 degree skew and then proceeding northerly for 30m turning east for 220m to the property line and ultimately connecting to the planned multi-use pathway located along the northerly municipal boundary where other planned pathway alignments converge. The bridge is on a skewed alignment 30 degrees to Richmond Street, with a relatively flat horizontal deck.

The Preliminary Design Plan is shown on **Figures 8.1 (A-B)**.

8.2 Profile

The existing and future road profile of Richmond Street has been set and the proposed bridge will have a minimum vertical clearance of 5.3m and require 2H:1V foreslopes . There is a 10.0m offset from the edge of the through lane to the vertical face of the east and west abutments. It is possible that future landscaping may place decorative retaining walls and plantings near the bridge. The proposed bridge foundation will not limit any future decorative retaining wall designs or plantings.

NORTH

PROPERTY LINE

TORREY PINES WAY

+278.59

+278.74

PROPERTY LINE

279.60 +

+277.60

277

279

278

277

276

SIDEWALK

150 FORCE MAIN

DITCH

EX. EDGE OF ASPHALT

EX. EDGE OF ASPHALT

SIDEWALK

RETAINING WALL

280

279

BRIDGE

46000

+281.10

45200

℄ ABUTMENT

℄ ABUTMENT

WIRE FENCE

278

277

275

276

277

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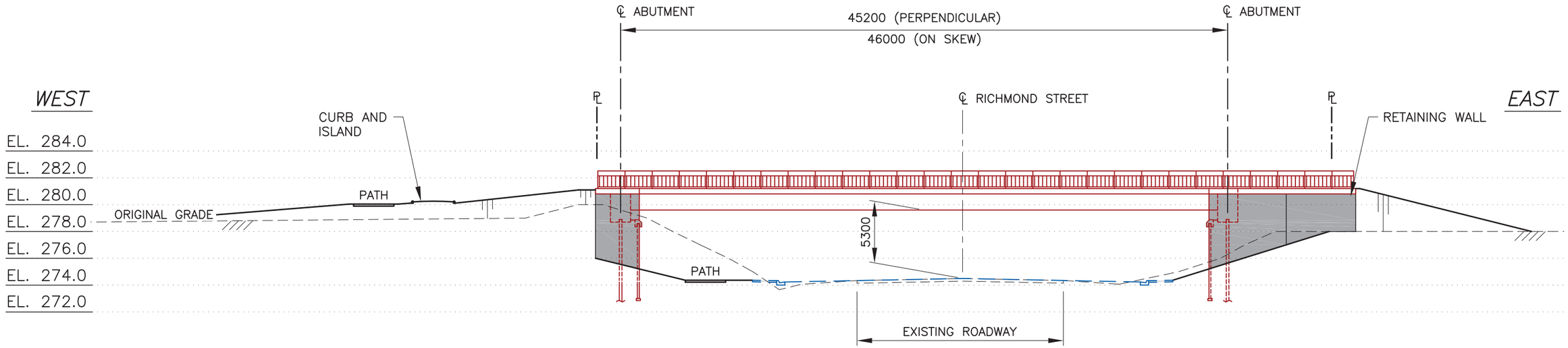
PEDESTRIAN RECREATIONAL CROSSINGS
RICHMOND STREET

GENERAL ARRANGEMENT PLAN

FIGURE No.
FIGURE 8.1A

Date:
MARCH 2016



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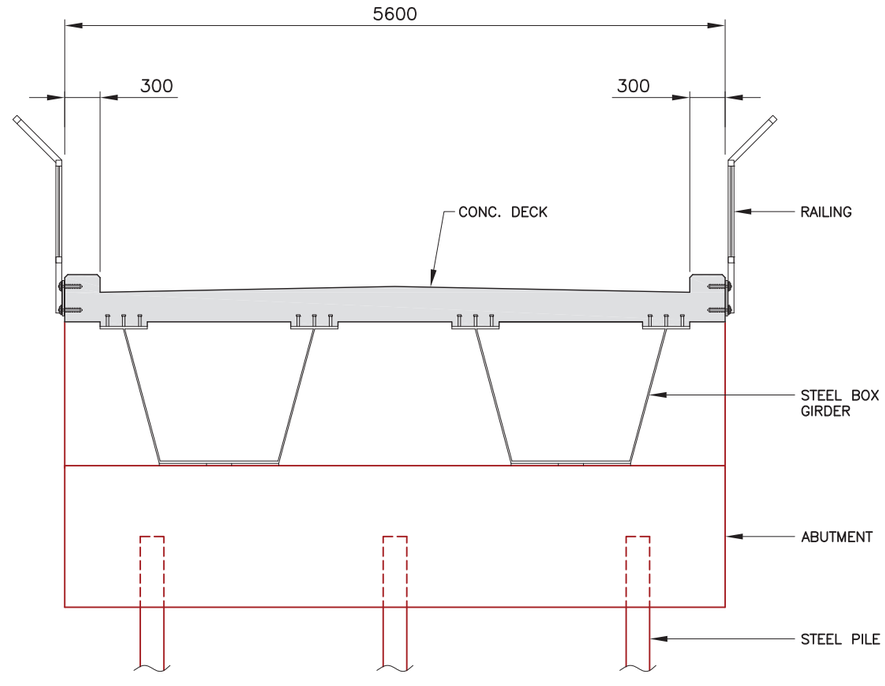

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London CANADA

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PEDESTRIAN RECREATIONAL CROSSINGS
RICHMOND STREET

GENERAL ARRANGEMENT
ELEVATION AND
SECTION

FIGURE No.
FIGURE 8.1B

Date:
MARCH 2016

8.3 Bridge

The bridge crossing of Richmond Street is an overhead pedestrian/bike structure over the ultimate Richmond Street corridor. This will be a single span, integral abutment type structure approximately 46 m long with a 30 degree skew across the road. The superstructure consists of a concrete deck supported on steel box girders, designed to support future decorative enhancements. The bridge railing will be 1.37 m high suitable for bicyclists. The bridge will be positioned in a manner to direct pathway users northeast and along the current boundary of the woodland/PSW patch containing the utility easement. Grading for the pathway will not impact the woodland/PSW patch.

The crossing provides a minimum vertical clearance of 5.3 m across the entire Richmond Street cross section. The 4.0m deck will accommodate a 3.5 m wide recreational pathway, which will allow for two-way travel for all pathway users and ease of maintenance operations.

8.4 Typical Sections

Figures 7.3 and 7.4 illustrate the proposed cross sections for both the Box Girder and Steel Truss structure type alternatives. The proposed cross sections for each crossing alternative would accommodate a 3.5 m multi-use pathway.

The actual bridge type will be confirmed during detailed design, however a recommended preferred design is discussed in Section 8.3.

8.5 Pathway Alignment

The vertical grade on Richmond Street directs drainage to two pronounced low points. Path routing and elevation of path were considered in the selection of the preferred pathway alignment and the study had regard for these to ensure major and minor flows were not impeded.

The proposed pathway will have a clear width of 3 m. Pathway details, such as material to be used to construct the pathway, vegetation and maintenance adjacent to the pathway, retaining walls and/or hand rails, will be determined at the detailed design stage.

8.6 Crime Prevention Through Environmental Design

CPTED is a pro-active crime reducing technique employing proper design and effective use of the built environment to lead to a reduction in the fear and incidence of crime as well as an improvement in the quality of life. The CPTED approach can help reduce exposure to crime and loss by providing ways to better manage the human and physical resources. This, along with the incorporation of CPTED principles and strategies, can reduce the potential for fear and opportunity for crime and through this process, contribute to the development of vibrant, attractive and pleasant public spaces. The physical characteristics of the pathway and crossing surfacing, lighting and signage must be safe and convenient. The spaces that are created along the pathway route must be defensible, safe and accessible.

The proposed recreational pathway and crossing will incorporate Crime Prevention Through Environmental Design (CPTED) policies espoused by the City of London. The goal of these principles is to create a safer, more liveable city. Natural surveillance, natural access control and territorial reinforcement will be taken into account during detailed design. The strategies that can be incorporated into the detailed design are summarized below in **Table 8.1**.

Table 8-1:CPTED Detail Design Strategies

CPTED Strategy	Detail Design
Natural Surveillance	Visibility of Public Realm • Good visibility of pedestrian/cyclist crossing from Richmond Street and surrounding area • Design road profile such that a pedestrian or cyclist entering from one approach can clearly see the opposing side of the crossing. This ensures a clear sightline and avoids isolated or hidden spaces. • Pedestrian lighting uniformly along the pathway and across the bridge • Desire lines to adjacent subdivisions will be maintained allowing for casual surveillance and an active relationship with the neighbourhood • Landscaping/vegetation maintenance along the pathway to ensure sightlines are maintained
Natural Access Control	▪ Signage at both ends of the pathway to identify length of pathway and adjacent circulation routes ▪ Maintain a limited number of entrances and exits to the pathway which can be identified on signage ▪ Desire lines to adjacent neighbourhoods could be formalized to clearly define connectivity
Territorial Reinforcement	Sense of Belonging/Defensible Space • Existing paved area will be maintained to define public vs. natural space and will provide orientation to the north and south Connectivity • Pathway will be integrated into the existing neighbourhood and existing/future planned cycling routes • Desire lines into the adjacent neighbourhoods will be maintained

8.7 Drainage

Deck drainage shall be in accordance with the CHBDC and the MTO drainage manual. Deck drains are not required. It should be noted that the project will result in 'no impact' to the floodplain which is under the jurisdiction of the UTRCA.

8.8 Property

The City of London owns most of the necessary lands for the construction of the project. Some property acquisition is anticipated on the east side of Richmond Street. On the west side of Richmond Street, property has been dedicated for the bridge approach through the subdivision process. The existing lot where the recommended pathway will be built on the east side of Richmond Street is bounded to the north, east and south by a Significant Woodland Boundary. There is approximately 2.2 ha of land outside of the Significant Woodland Boundary that is potentially developable and the pathway would require approximately 0.26ha of this land. The exact limits of land to be acquired will be finalized during Detailed Design.

Through the EA process, meetings have been held with Old Oak Properties, the affected property owner, to explain property requirements and the acquisition process.

8.9 Utilities and Lighting

Buried natural gas lines are situated on the east side of the Richmond Street near the bridge site. Conflicts with the pathway and bridge construction are not anticipated however, consultation with the utility company will be undertaken during detailed design.

A sanitary forcemain is located along Richmond Street from Arva to the Medway Pump Station. Consultation with the Wastewater and Drainage Engineering division suggests that the forcemain will not conflict with the bridge structure or related foundation.

Lighting of the bridge may be added for aesthetic reasons and will be confirmed during the detail design phase.

8.10 Construction Staging

The bridge approaches west of Richmond Street will be constructed in a dedicated empty corridor along Medway Creek and may require some grading and low retaining walls to provide a flat platform . These should be placed in the dry. Hydraulic calculations should be reviewed to ensure no net decrease in water flow across the section of the waterway.

East of Richmond Street work adjacent to the significant wetland should proceed in a manner that will fully protect the wetland from any runoff during open excavations.

The construction of the bridge abutments can be done with little effect on Richmond Street traffic. Erecting of the bridge beams will require a one time 4-6 hour closure of Richmond Street. This could be completed during off peak traffic hours.

8.11 Geotechnical

Excavations for the works proposed at this site may generally encounter surficial topsoil and/or fill materials underlain by sands, silt sand glacial till. Groundwater was encountered in several of the boreholes previously drilled

along Richmond Street North. The groundwater level is subject to fluctuations and the depth of excavation below the groundwater level may depend on the time of year of construction. Surficial water seepage into the excavations should be expected.

Temporary open cut slopes within the silts, sands and clayey silt till will have to be maintained no steeper than 1 horizontal to 1 vertical where they are above groundwater levels. Flatter side slopes or temporary slope protection may be necessary in areas with any loose granular fills and together with dewatering systems where any of these soils are below groundwater levels.

A detailed geotechnical investigation should be carried out during detailed design.

8.12 Recommendation for the Preferred Structure Type

Based on the comparison of the structure types presented in **Table 7.4,** the **Box Girder** is the recommended structure type. While both structures are comparable in terms of cost, material availability and construction staging, there may be additional labour requirements and maintenance associated with the steel truss bridge as opposed to the Box Girder. The Box Girder is also known to be more visually appealing, providing a nicer view of the structure from Richmond Street.

8.13 Project Enhancements

Three aesthetic design concepts for the crossing were considered and presented at PIC #2. Each concept considered a unique theme specific to the City of London, including the Forest City, Thames River Flow and the Forks of the Thames. These concepts utilized the basic bridge structure with enhancements added according to the theme conveyed.

The evaluation presented in this study provides for a basic bridge design.
The preferred crossing alternative design concept will be further developed during detailed design.
Additional aesthetic details will be addressed that include:

- Additional deck width for the bridge to allow for look outs, sculpture, under lighting, banner attachments
- Curved or haunched girders, thinner deck materials
- Introduction of themed geometry, or graphical imagery
- Sitting Areas
- Plantings and landscaped architectural elements along Richmond Street
- Interpretive look outs providing better views of the Woodland and Wetland areas
- CPTED enhancements
- Way-finding signs.

See **Appendix C: Bridge Design Enhancements**

8.14 Preliminary Cost Estimate

The estimated project cost is provided in **Table 8.2.** As shown in this table the total capital cost of the project is approximately $1.9M.

Table 8.2: Preliminary Cost Estimate

Description of Item	Cost ($)
Temporary Shoring	$4,000
Excavation for Foundations	$8,000
Steel Piles	$40,000
Concrete in Footings	$28,000
Concrete in Piers	$53,000
Concrete in Abutments& Wingwalls	$68,000
RSS Retaining Walls	$26,000
Supply, Fabricate & Erect Steel	$280,000
Concrete Deck	$143,000
Vertical Bar Handrail	$69,000
Backfill Abutments	$10,000
Design Features	$195,000
Subtotal - Bridge	**$924,000**
Approach Works/Grading –Trail	$330,000
Traffic Management	$6,000
Ecological Enhancements	$15,000
Landscaping and Feature Lighting	$150,000
Engineering Costs	$250,000
Land Acquisition	$0
Utility Relocations	$25,000
Contingency	$200,000
Total	**$1,900,000**

9. Anticipated Environmental Impacts and Proposed Mitigation Measures for the Preferred Design Concept

It is recognized that the proposed construction of the Recreational Pathway Crossing with preferred Alternative **Alignment B,** and either a 3-span Box Girder or Steel Truss structure, will result in minor impacts on the existing environment. In order to address the effects, the following approach was taken:

1. **Avoidance**
   The first priority is to prevent the occurrence of negative effects (i.e., adverse environmental effects) associated with the implementation of an alternative.
2. **Mitigation**
   Where adverse environmental effects cannot be avoided, it will be necessary to develop the appropriate mitigation measures to eliminate or reduce to some degree, the negative effects associated with implementing the alternative.
3. **Enhancement/Compensation**
   In situations where appropriate mitigation measures are not available, or significant net adverse effects will remain following the application of mitigation, enhancement or compensation measures may be required to counterbalance the negative effect through replacement in kind, or provision of a substitute or reimbursement.

The following mitigation measures are recommended to ensure that any disturbances are managed by the best available methods. These measures will be further confirmed and developed during detail design. **Table 9.1** provides a detailed assessment of the potential impacts associated with the project and the recommended mitigative measures required to reduce these effects.

	Table 9-1: Anticipated Environmental Effects and Proposed Mitigation Measures		
	Environmental Component	**Potential Environmental Effect**	**Potential Mitigation Measures**
Technical	**Safety**	Impacts to safety of cyclists and pedestrians using the crossing	**During Detail Design:** • Railings and illumination will be incorporated into the final design to ensure the safety of users. • The proposed crossing will be constructed in accordance with CHBDC. • City of London CPTED principles will be incorporated into the design of the pathway connection. • The bridge railing will be positioned to ensure safety of users and Richmond Street travelers below.
	Maintenance	Impacts from Snow accumulation	**During Detail Design:** • Open rail design will be used to avoid snow accumulation over the winter months. • Curbs will be used to prevent water from dripping over the sides of the crossing and forming icicles.
	Property/Access	Impacts to residential/private property in the study area	**During Detail Design and Construction:** • Property access will be maintained at all times during project construction. • Follow established City property acquisition process for property takings including temporary easements.
	City of London Coordination		**During Detail Design and Construction:** • The crossing will maintain required City of London clearances over Richmond Street. • Re-vegetation along Richmond Street, if required, will be coordinated with the Transportation and Environmental and Parks Planning.
	Noise	Increase in noise levels from site preparation and construction activities.	• Construction activities to be restricted to daytime and in accordance with applicable noise by-laws. • Use lower noise generating equipment/processes, where possible. • Install silencers/mufflers on equipment intakes and exhausts, where possible. • Minimize drop heights of materials. • If it is determined that there is a need to further reduce noise effects during construction (e.g., if complaints arise), the following additional mitigation measures will also be considered by the contractor and implemented, as appropriate: – Implement noise compliance checks of construction equipment. – Implement additional source noise mitigation (e.g., optimize silencer/muffler/enclosure performance). • Avoid unnecessary revving of engines and switch off equipment when not required (do not idle). • Issue contact numbers to public for any questions or complaints.

			• Investigate and respond to noise complaints.
	Vibration	Increase in vibration as a result of site preparation and construction	• Preconstruction surveys. • Monitor vibration to confirm problems-complaints. • Address by staging within acceptable levels. • Modify/change construction techniques, as required.
	Air Quality	Potential for decrease in localized air quality due to construction dust.	**During Construction:** • Apply water and non-chloride dust suppressants during construction, as needed. • During construction, vehicles/machinery and equipment should be in good repair, equipped with emission controls, as applicable, properly maintained and operated within regulatory requirements.
	Archaeology	Loss or disruption to archaeological resources	**During Construction:** • Complete Stage 2 Archaeological Assessments, as required. • If any archaeological and/or historical resources are discovered during the performance of the work, work in the area of the discovery is to halt. The MTCS Archaeology Unit will be notified for an assessment of the discovery. Work in the area of the discovery will not resume until cleared to do so by the Ministry.
	Erosion and Sedimentation	Potential for erosion and sedimentation.	**During Detail Design:** • Develop erosion and sedimentation control strategy. • Confirm groundwater management requirements and prepare dewatering plan. • Follow Environmental Management recommendations as presented in Section 9.1. **During Construction:** • Implement and monitor the erosion and sedimentation control strategy, including appropriate phasing to avoid impacts to Fletcher's Creek, west of the study area. • Any areas disturbed by construction will be restored and stabilized as soon as practically possible.
	Waste Management and Control of Inadvertent Spills	Potential inadvertent spill of hazardous materials during construction.	**During Construction:** • Store all oils, lubricants, fuels and chemicals in secure areas. • Contact appropriate regulatory agencies in event of a spill to the environment.
	Monitoring		• Environmental inspection and monitoring and construction monitoring requirements will be provided during Contract Administration as outlined by the City of London. • Post construction monitoring will be required following construction to ensure that any disturbances within the regulated flood plain have been properly restored (e.g., grading, seeding and plantings).

9.1 Environmental Management Recommendations

The work associated with the Richmond Street Recreational Pathway Connection will be limited to the pathway and bridge structures. The environmental management recommendations developed for the project are, therefore, specific to those works and are intended to avoid, mitigate and compensate for any potential impacts to features and functions within the Richmond Street Significant Woodland and Arva Moraine PSW.

The following section outlines the environmental management recommendations for the Richmond Street Recreational Pathway Connection project. The intent of these recommendations is to provide protection of the natural
heritage features identified in the Richmond Street Recreational Pathway Connection study area.

The recommendations have been copied from the Richmond Street Recreational Pathway Connection Subject Land Status Report (AECOM, March 2015) and Environmental Impact Study (AECOM, March 2016).

9.1.1 Subject Land Status Report Recommendations

The Subject Lands Status Report (SLSR) for the Richmond Street Recreational Pathway Connection provided recommendations for the protection of natural heritage features within the study area, as follows:

1. The uplands and wetland communities associated with the Arva Moraine Wetland Complex should be recommended for inclusion on the City of London's Official Plan Schedule B-1 as Provincially Significant Wetland and Significant Woodland, following review and acceptance by the City's Environmental & Parks Planning staff. Wetland boundaries should follow MNRF's wetland line as provided in the Figures in this report. Appropriate zoning designations should be applied to the Significant Woodland and remaining Open Space, respectively.
2. The evaluation and selection of a preferred pathway connection or any other future works proposed for the subject lands should have regard for the natural heritage features identified for the area in this study.
3. Environmental Impact Study Issues Scoping should consider the following requirements for any works proposed for areas within the subject lands of this study should they affect their potential habitat:
    a) Snake hibernaculum surveys and area surveys;
    b) Species-specific surveys of the Species at Risk identified as having potential habitat within the study area to confirm presence or absence. These species include: Little Brown Myotis – Endangered, Northern (Long-eared) Myotis – Endangered, Eastern Ribbonsnake Special Concern, Milksnake – Special Concern, and Snapping turtle – Special Concern;
    c) Confirmation of candidate habitat (e.g., snake hibernaculum).
    d) If butternut specimens are directly affected by the proposed pathway, a Butternut Health Assessment is to be undertaken by a certified Butternut Health Assessor.
4. Restoration and enhancement of Monarch butterfly habitat within the study area to naturalize along the pedestrian pathway. Plantings of the monarch host plant, common milkweed are recommended to enhance existing monarch habitat.
5. Habitat for Shrub/early successional habitat should be maintained within the study area to further support existing bird species such as Brown Thrasher and Savannah sparrow which are considered Level One species within Middlesex County.

9.1.2 Environmental Management Plan Recommendations

The following section outlines the environmental management recommendations for the Richmond Street Recreational Pathway Connection study area. The intent of these recommendations is to provide protection of the

natural heritage features identified and to mitigate any potential impacts of the proposed pathway connection.

The Environmental Management Plan (EMP) recommendations for the Richmond Street Recreational Pathway Connection project include the following:

1. Natural Heritage Protection Zones;
2. Pathway Route Detailed Design & Management Recommendations;
3. Construction Mitigation Recommendations;
4. Ecological Enhancement Recommendations; and
5. These recommendations are outlined in the following sections.

Figure 9 of the EIS in **Appendix B.2** presents the EMP recommendations.

9.1.2.1 Natural Heritage Protection Zones

The Richmond Street Significant Woodland represents the primary natural heritage feature to be protected within the study area. Located within the boundaries of the Richmond Street Significant Woodland is a portion of the Provincially Significant Arva Moraine Wetland Complex. This feature being located within the boundaries of the Significant Woodland will therefore also be protected. The boundaries of the Richmond Street Significant Woodland and Arva Moraine Wetland Complex within the study area are delineated on **Figure 9 (EIS)**.

The following recommendations are provided with respect to the Natural Heritage Protection Zones:

Recommendation 1 – Natural Heritage Protection Zones
The Richmond Street Recreational Pathway route shall have regard for the Natural Heritage Protection Zones delineation identified on Figure 9. The pathway alignment shall be maintained outside of the Arva Moraine PSW and keep outside the dripline of the Richmond Street Significant Woodland where feasible. In areas where this is not feasible, mitigation measures such as dense plantings of shrubs within the woodland are recommended.

9.1.2.2 Pathway Route Detailed Design & Management Recommendations

In order to minimize adverse effects to the Richmond Street Significant Woodland, detailed routing and design will require site-specific pathway placement and mitigation measures tailored to existing features and site conditions. The following recommendations are intended to minimize and mitigate potential impacts of pathway routing and design.

Recommendation 2 – Minimize Effects to Mature Trees
Minimizing negative effects to mature trees within the study area is a priority for the City. Therefore, the Richmond Street Recreational Pathway alignment will have regard for large trees and will be located in areas where minimal vegetation removal is required and will be located outside of the Significant Woodland drip-line. No tree removals are required based on the Preferred Pathway Alignment.

Recommendation 3 – Vegetation Barrier
In areas between the Richmond Street Recreational Pathway and the Richmond Street Significant Woodland, a vegetated barrier is to be created along the length of the pathway. This barrier is to be planted with a mixture of native hawthorns such as *Crataegus crus-galli*, *Crataegus mollis* and *Crataegus punctata*. The herbaceous layer should be planted with a native to Ontario seed mix which is to include milkweed. The details of this planting plan should be refined during Detailed Design, however, and could include but not be limited to: black eyed Susan (*Rudbeckia hirta*), Canada goldenrod (*Solidago canadensis*), Canada wild rye (*Elymus canadensis*), blue vervain (*Verbena hastata*), New England aster (*Symphyotrichum novae-angliae*), white goldenrod (*Solidago bicolor*), wild

bergamot (*Monarda fistulosa*). The creation of a vegetated barrier will increase the integrity of the current edge of the Richmond Street Significant Woodland by creating a more pronounced mantle.

Recommendation 4 – Educational Signage
Educational signage or information boards will be provided along the Richmond Street Recreational Pathway to explain the significance of the Arva Moraine Provincially Significant Wetland (PSW) and Richmond Street Significant Woodland. Signage should also note the importance of not disturbing the natural features and their functions.

Recommendation 5 – Proximity of Pathway from Tributary to Medway Creek
Placement of the pathway approximately 5 m from the top of bank or high water mark (whichever is more conservation) will reduce both erosion as well as anthropogenic disturbances to the watercourse.

9.1.2.3 Construction Mitigation Recommendations

Natural areas are most susceptible during the construction phase of any project since this is the time during which site conditions are most significantly altered. Therefore, construction activities need to be mitigated and controlled to avoid significant impacts.

Typical construction mitigation measures for the construction of the Richmond Street Recreational Pathway Connection include:

- Sediment and erosion control measures;
- Peripheral vegetation protection;
- Dust suppression;
- Control of construction vehicles and machinery access;
- Controls on vehicle re-fuelling;
- Root protection during grading and grubbing;
- Wildlife habitat protection and mitigation measures;
- Protection of breeding birds during vegetation removal;
- Mitigation of noise disturbance to wildlife; and
- Species at Risk protection and handling.

Appendix K of the **EIS in Appendix B.2** provides details regarding each of the above-noted construction mitigation measures.

Recommendation 6 – Vegetation Removal with Respect to Wildlife
Restricting construction related activities outside of sensitive periods for local or significant wildlife species can limit disturbance during life cycle stages. Construction related activities should be limited to the daylight hours (i.e., 7:00 am to 7:00 pm) in order to reduce the amount of noise disturbance. Additionally, vegetation clearing should occur outside of April 1st to October 15th in order to avoid impacts to 1) birds during their breeding season, 2) bats during their roosting season, and 3) snakes during the sensitive time before hibernation. No tree removals are required based on the Preferred Pathway Alignment.

In accordance with the *Migratory Birds Convention Act*, vegetation removal shall only be permitted outside the breeding bird period; April 1st to August 31st unless a nest survey is undertaken. Should woody vegetation removal

be scheduled within the months of April through August, comprehensive breeding bird surveys need to be conducted prior to clearing to ensure there is no disturbance of nesting/breeding birds. Surveys should document the location of breeding pairs and potential location of nests. Should nests/ breeding pairs be discovered within the clearing area, the location should be clearly marked/flagged and a 10 m buffer surrounding the nest be implemented. The space within this buffer should be protected until the young are fully fledged. An ecologist with ornithological experience should conduct the surveys and monitor the nests (should nests be discovered) periodically. Clearing can only be undertaken if the ecologist is satisfied there are no breeding/nesting pairs within the affected area.

Recommendation 8 – Construction Mitigation Plan
A detailed Construction Mitigation Plan should be developed, prior to the issuance of contract drawings, wherein the mitigation measures detailed in Appendix K are tailored to the site-specific requirements and conditions of the Richmond Street Recreational Pathway route and included on the drawings.

Recommendation 9 – Snake Survey
Prior to construction a qualified Ecologist should walk the construction area limits to search for snakes. Should any be found, they will be relocated outside of the construction zone and exclusionary fencing will be installed.

9.1.2.4 Ecological Enhancement Recommendations

Ecological enhancement consists of modifying a site to increase and/or improve existing habitat conditions for plants and wildlife. This can include something as simple as installing bird boxes or as complex as creating vernal pools; however, the ultimate end goal is to increase the ecological value of the area in question.

There are several opportunities for overall enhancement. Opportunities for enhancement include the following:

- Native tree and shrub plantings surrounding the Richmond Street Significant Woodland; and
- Provision of bird boxes along the pathway.

Recommendation 10 – Ecological Enhancement
Ecological enhancement of the area can be achieved through an Integrated Ecological Restoration Plan involving an Invasive Species Management Plan, Edge Management Plan and 5-year Monitoring Plan. Proposed enhancement measures should be developed during Detailed Design.

In addition to the vegetation barrier, an Edge Management Plan, designed specifically to address edge effects associated with natural areas, would further benefit the Richmond Street Significant Woodland and Arva Moraine PSW. Removal of non-native, invasive species would increase the relative proportion of native vegetation and reduce impacts associated with invasive species, such as displacement of native plants and wildlife that depend on them. A monitoring plan will work to evaluate the progress and success of restoration efforts and address ongoing management needs. Additional opportunities for restoration outside of the study limits can also be explored during the Detailed Design phase.

9.2 Permits and Approvals

The Richmond Street Recreational Pathway Crossing project is subject to various regulatory approvals including EA requirements under Ontario's *Environmental Assessment Act.* The Canadian *Environmental Assessment Act* (CEAA) was not triggered for this project.

Following successful completion of the Class EA process documented in this ESR prepared under the Municipal Class EA, all requirements will have been met. Other approval requirements will be addressed for the project during detail design which may include:

UTRCA: The study area is located within the UTRCA Regulation Limit, as defined by Ontario Regulation 160/06 Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, therefore, a permit will be required and is to be obtained prior to construction.

MNRF: Based upon the current Class EA recommended route, permitting under the SAR Act is not anticipated (the recommended route avoids impacts to SAR and their habitat).

MTCS: Acceptance of potential Stage 2 Archaeological Assessments will be required from the Ministry.

City of London: Municipal approvals (i.e., site screening, incorporation of Crime Prevention Through Environmental Design Principles, Cycling Committee recommendations), if applicable, will be obtained.

Utilities: Potential notification/permissions from respective utilities with facilities in the area will be obtained prior to construction.

10. Revisions and Addenda to the ESR

There may be circumstances under which this final ESR needs to be reviewed and its validity reconfirmed. The Municipal Class EA process provides for such a process.

10.1 Change in Project or Environment

There may be a need to amend the EA due to unforeseen circumstance that arise during the detailed design stage, such as changes in the environmental conditions, development or new design standards or technologies or mitigation measures or the identification of previously unknown concerns.

Subsequent to the filing of the ESR, any justification to the project change in the environmental setting for the project will be reviewed by the City. Should the change be considered significant and have a potentially negative impact on some aspect of the environment, it will be documented as an addendum to the ESR detailing the circumstances necessitating the change, the environmental implications of the change and any associated mitigation measures. A change resulting in an improvement in the project and a positive environmental impact will not be considered to require an Addendum. A minor change to the EA undertaking could proceed without an addendum.

If an ESR addendum is determined to be appropriate, it will be filed (along with the ESR) and the Notice of Filing of Addendum will be given immediately to all potentially affected members of the public and review agenises as well as those who were notified in the preparation of the ESR. The ESR addendum will be placed on the public record with the City for 30-day review period. A person or party with concern regarding the addendum my make a written request to the MOECC for a Part II Order within this 30-day review period. The Part II Order is a request that the project be subject to a formal governmental review and approval under the EAA.

If no Part II Order request if received or if it is received and addressed to the satisfaction of the Minister of the Environment and Climate Change, the City will be free to proceed with implementation.

10.2 Lapse in Time

According to the Municipal Class EA, “If the period of time from the filing of the Notice of Completion of ESR in the public record of the MOECC’s denial of a Part II Order request(s), to the proposed commencement of construction for the project exceeds ten (10) years, the proponent shall review the planning and design process and the current environmental setting to ensure that the project and the mitigation measures are still valid given the current planning period. The review shall be recorded in an addendum to the ESR which shall be placed on the public record.”

In the event of such a delay, the City will place a Notice of Filing of Addendum on the public record (along with the ESR) and the public and review agencies will be notified of the opportunity for a 30-day public review period. The notice will include the public’s right to request a Part II Order during the 30-day review period. If no Part II Order

request is received, or if it is received and addressed to the satisfaction of the Minister of the Environment and Climate Change, the City will be free to proceed with implementation.

11. Summary

The ESR covers the process required to ensure that the proposed active transportation improvements meet the requirements of the EAA. The Class EA planning process has not identified any significant environmental concerns that cannot be addressed by incorporating established mitigation measures during construction.

The proposed improvements resolve the problem/opportunity statement identified in this report. A preliminary evaluation of potential impacts has been included in the evaluation, which indicates minor and predictable impacts that can be addressed by recommended mitigate measures as presenting in Section 9. The proposed mitigation measure will be further developed at detailed design and will form commitments that will be adhered to by the City. Appropriate public notification and opportunity for comment was provided and no comments were received that could not be adequately addressed. Subject to receiving EA clearance following the 30-day review period, the City will complete the detailed design and permitting-approvals phase and proceed to construction as outlined in the ESR.

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