EVALUATION REPORT - COLLECTOR ROAD AND STORMWATER MANAGEMENT ALTERNATIVES

Westhill District

City of Waterloo

Date:

June, 2020

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Executive Summary

MHBC, MTE, WSP, and Paradigm were retained in 2016 on behalf of major landowners with lands within the undeveloped portion of The Westhill District, Waterloo to prepare and submit an Official Plan Amendment application. A property ownership schedule is included as **Figure 1.** The objective of the Official Plan Amendment application is to identify a preferred alignment for the extension of the Boardwalk Avenue. This report summarizes the collector road alignment and stormwater management alternatives that were considered, the evaluation methodology and related criteria, as well as the process relating to the selection of a preferred collector road alignment alternative and preferred stormwater management strategy. Finally, this report also documents a preferred servicing strategy (Functional Servicing Master Plan). The purpose of the Functional Servicing Master Plan is to provide direction to the servicing of undeveloped lands within the Westhill District. In short, this report recommends a preferred collector road network, servicing and stormwater management strategy necessary for the undeveloped lands located within the Westhill District. The Study Area is illustrated on **Figure 2** of this Report.

The specific objectives of this study are as follows:

- Summarize background relating to the need for the Ira Needles Boulevard By-pass;
- Document the planning and evaluation process that was followed;
- Document the existing environment (socio-economic, natural, and cultural environments) within the Study Area;
- Summarize the road network and related alignment alternatives that were evaluated;
- Describe the evaluation criteria and related methodology;
- Recommend a preferred road network and related alignments;
- Provide the basis for identifying a preferred collector road network in the City of Waterloo's Official Plan;
- Describe the preferred road alignment design features;
- Summarize stormwater management alternatives;
- Recommend a preferred stormwater management strategy;
- Identify the potential environmental impacts and recommend mitigation and restoration measures to be implemented;
- Finalize a Functional Servicing Master Plan that will support future development applications;
- Provide direction to additional studies that may be necessary to implement the preferred collector road, servicing and stormwater management strategy.

The need for a collector road network to be constructed within the undeveloped portions of The Westhill District has been documented in the City of Waterloo Official Plan (WOP), the Westhill District Implementation Plan (WDIP), The City of Waterloo's Development Charges Background Study and the Waterloo West Side Integrated Multi-Modal Transportation Study (IMMTS).

Specific Provision (SPA 41) of the WOP applies to part of the Westhill District (**Figure 4**). This provision provides that a planned road network is to be addressed prior to, or in conjunction with any plan of subdivision or site plan application and may necessitate an amendment to the WDIP. The WDIP recommends the implementation of a new collector road (The Ira Needles Boulevard By-pass). The 'Ira Needles Boulevard By-Pass' is included in the Development Charges Background Study (2018) as a growth related project that is to be partially funded by development charges. The project includes a new collector road with related sidewalks, bike lanes and services. The IMMTS also confirms the need for a new road (The Ira Needles Boulevard By-pass) from Thorndale Drive, northerly to intersect with Erb Street and a controlled intersection (roundabout) at the intersection of the Boardwalk Avenue and Erb Street West. IMMTS also confirms the need for active transportation and traffic demand management measures, including cycling and pedestrian facilities.

A properly designed Ira Needles Boulevard By-pass will:

i. Improve traffic flow and connections for West Waterloo;
ii. Improve vehicular circulation and accessibility to lands located in the Westhill District;
iii. Reduce traffic volumes and vehicular movements through the Erb Street / Ira Needles Boulevard roundabout, resulting in improvements to the capacity of this intersection;
iv. Provide a parallel road network to Ira Needles Boulevard resulting in additional road network capacity for northbound and southbound traffic;
v. Improve emergency response and access to/from the Regional landfill;
vi. Improve vehicular access to Waterloo Commons;
vii. Improve cycling and pedestrian connections;
viii. Facilitate the development of employment lands within The Westhill District; and
ix. Satisfy Official Plan policies that direct evaluation of the Westhill District.

This Study has been completed in two phases. Phase 1 documented existing conditions and background information that informs the consideration and evaluation of collector road and stormwater management alternatives. Phase 1 also confirms the Study Area, identifies alternatives to be evaluated and confirms the evaluation methodology and evaluation criteria. Phase 2 includes an evaluation of the alternatives and the preferred

collector road alternative and stormwater management strategy. Phase 2 also recommends mitigation, restoration and enhancement measures for further evaluation to be completed in support of future development applications. The collector road alternatives that were evaluated are included as **Figure 9** and the stormwater management facility alternatives are included as **Figure 11** of this report. This report concludes Phase 1 and summarizes the reports prepared to date by MTE, WSP and Paradigm.

This report and related Appendices summarize Phase 1 and Phase 2 and provide the basis for identifying a preferred collector road network and related alignment on Schedule E – Road Classification System of the WOP (**Figure 8**). The Westhill District Implementation Plan will be updated to reflect the recommended collector road network and stormwater management strategy. Finally, this report includes a recommended Functional Servicing Master Plan to be implemented through future development applications.

1.0 INTRODUCTION

MHBC, MTE, WSP and Paradigm, have been retained on behalf of the major landowners within the Westhill District to coordinate the submission of an Official Plan Amendment application. The purpose of which is to identify a new collector road (The Ira Needles Boulevard By-pass) and to identify a stormwater management and servicing strategy to be implemented through amendment to the Westhill District Plan and future planning applications. A plan which identifies property ownership is included as **Figure 1**.

This Evaluation Report (ER): provides an overview of the studies that have been completed; summarizes existing conditions; reviews the policy framework; identifies road and stormwater management alternatives; confirms the evaluation criteria and study methodology; recommends a preferred collector road network and stormwater management strategy; and identifies potential environmental effects and mitigation and restoration measures.

1.1 Background and Context

The Westhill District is located on the west side of the City of Waterloo and represents one of the City's last remaining undeveloped designated greenfield areas. The Westhill District is within the Grand River Watershed, located south and west of Laurel Creek, and south of Erb Street West and west of Ira Needles Boulevard. The Study Area includes lands located to the north of The Boardwalk / Thorndale Drive roundabout; east of the Hydro Corridor; west of Ira Needles Boulevard; and, south of Erb Street West. The Study Area is approximately 16.06 hectares (40 acres) in area. The Study Area is shown on **Figure 2**. The Study Area is located within the City's designated Urban Area. There are a variety of land use designations including commercial, employment and open space.

The City of Waterloo municipal boundary located to the west delineates the western limit of the Westhill District Study Area. The municipal boundary is connected with Wilmot Line. Wilmot Line generally runs in a north/south direction. Wilmot Line represents a long-term boundary between the City of Waterloo Urban Area and the Countryside located to the west.

Prior to the construction of Ira Needles Boulevard, much of the area was used for agricultural purposes. Historical aerial photos show the lands under agricultural use and identifies the changes to an urban landscape with the construction of roads and services.

Existing commercial development is located north, east and south of the Study Area. The Costco lands, and Canadian Tire development are located to the west and north, some smaller commercial uses are located to the east, and The Boardwalk mixed use development is located to the south.

Existing residential development is located to the east of the Study Area, on the opposite side of Ira Needles Boulevard (Westvale). The Vista Hills and the Rummelhardt neighbourhood are located to the north. These residential neighbourhoods are characterized by primarily low and medium density residential development including single detached dwellings, and street fronting townhouse dwellings. The land uses within the residential developments include open space, parks, natural heritage features and community facilities, such as schools.

Surrounding neighbourhoods have been designed with a modified grid road network, with limited access points to the surrounding arterial road network (Erb Street West and Ira Needles Boulevard (Erbsville Road). Traffic from these neighbourhoods is directed to Erb Street West and Ira Needles / Erbsville Road). There is currently no direct vehicular connection between Vista Hills and Erb Street West.

Development applications, including a Draft Plan of Subdivision, an Official Plan Amendment and Zoning By-law Amendment were submitted for the West Side Employment Lands. These applications have been endorsed by the City of Waterloo and propose a mix of employment uses, resulting in increased traffic. As of the date of this report, the Region has not made a decision with regard to the official plan amendment and subdivision applications.

The Boardwalk Avenue currently terminates at the north end of The Boardwalk development located to the south of the Study Area. The Boardwalk Avenue connects to Ira Needles Boulevard via Thorndale Drive. The existing collector road within The Boardwalk has been established as a common element as part of the overall condominium. The common element is also subject to easements in favour of the City and the Region to ensure public use, including transit service.

Significant public infrastructure, including the Region of Waterloo landfill, the Hydro Corridor / Hydro Substation, has limited the ability to provide north / south road network capacity / alternatives west of Ira Needles Boulevard. As a result, much of the north /

south traffic associated with the West Side of Waterloo is supported by Ira Needles Boulevard and significant traffic volumes travel through the Ira Needles Boulevard / Erb Street roundabout. There are a limited number of accesses connecting The Boardwalk to Ira Needles Boulevard. This was intentional given the objective of internalizing traffic movements within The Boardwalk development. The Thorndale Drive roundabout as constructed, provides for the northerly extension of The Boardwalk Avenue.

Bus transit service is currently provided along Ira Needles Boulevard, Erb Street West and along existing Boardwalk Avenue. A timed bus transfer terminal and related amenities have been constructed central to The Boardwalk development and offers multiple transit routes for areas throughout Kitchener-Waterloo.

1.2 Summary of Need - Collector Road Network

The Boardwalk Avenue currently terminates at the Thorndale roundabout. The roundabout design provides for the northerly extension of the Boardwalk Avenue. The need for the extension of the Boardwalk Avenue to Erb Street West has been identified in the City of Waterloo's Integrated Multi-Modal Transportation Study (IMMTS). The IMMTS identifies the inclusion of a new road (The Boardwalk) from Thorndale Drive, northerly to intersect with Erb Street and a controlled intersection (roundabout) at the intersection of the Boardwalk Avenue and Erb Street West as shown in **Figure 3**. IMMTS Active Transportation and Traffic Demand Management measures include cycling and pedestrian facilities, are to be included.

Specific Provision Area 41 (SPA 41) of the City of Waterloo Official Plan applies to part of the Westhill District, as identified on Schedule A6 – Specific Provision Areas of the Official Plan, included as **Figure 4**. This provision reports that a planned road network is to be addressed prior to, or in conjunction with any plan of subdivision or site plan application and may necessitate an amendment to the WDIP. The WDIP recommends the development of a new collector road to facilitate the Boardwalk Avenue extension to the north and is shown in **Figure 5**. The 'Ira Needles Boulevard By-Pass" is included in the City of Waterloo's Development Charges Background Study (2018) and includes sanitary sewers, water main and storm sewers, a new collector road and related sidewalks, bike lanes, culvert crossing, pond restoration/relocations and a roundabout at Erb Street West.

1.3 Evaluation Report

This Evaluation Report (ER) documents the evaluation and decision making process used to recommend a preferred collector road network and related alignments, associated

infrastructure and stormwater management strategy. This report also assesses potential environmental impacts and recommends mitigation, restoration and enhancement measures, and an implementation strategy to be implemented through detailed design, future planning applications and/or construction.

The Evaluation Report is organized as follows:

- Section 1 introduces the study, including background, the context of the project, study objectives and summarizes the need and rationale for the project;
- Section 2 summarizes the study approach, the scope of the study, and reviews the public consultation and communication process;
- Section 3 provides an overview of existing conditions and includes a review of engineering and environmental considerations within the Study Area;
- Section 4 summarizes the assessment of collector road network alignment alternatives in the context of the evaluation criteria, and recommends a preferred collector road network. Section 4 also summarizes input received from review agencies, including consideration of a modified alternative identified through the circulation of the Official Plan Amendment application;
- Section 5 describes the preferred collector road alignment alternative and proposed design features;
- Section 6 summarizes the assessment of stormwater management alternatives in the context of the evaluation criteria and recommends the preferred stormwater management strategy. Section 6 also summarizes input received from review agencies, including consideration of an additional stormwater management alternative;
- Section 7 describes potential environmental effects, as well as recommended mitigation measures and monitoring;
- Section 8 describes the proposed Functional Servicing Master Plan for the Westhill District;
- Section 9 includes recommendations for the preferred collector road alignment, stormwater management strategy and functional servicing master plan;
- Section 10 includes implementation recommendations to be addressed through future planning applications.

The appendices attached to and forming part of this ER include supplementary and more detailed information relating to the record of public and agency consultation, documentation of study decisions, the evaluation of road network and alignment and

stormwater management alternatives, a functional design for the collector roads and supporting technical reports.

1.4 Purpose of the Study and Project Rationale

The purpose of the Westhill District ER is to determine the preferred alignment for a new public collector road to facilitate the extension of the Boardwalk Avenue from the roundabout at Thorndale Drive to Erb Street West. A master servicing strategy for the Study Area based on the preferred road alignment will be determined. This road and servicing strategy will be implemented by an Official Plan Amendment an update to the Westhill District Implementation Plan. Future development in the Study Area will be subject to further Planning Act applications, by individual land owners.

The objectives of the Study are as follows, and discussed in this Report:

i. Provide context to the Study approach and scope of the Study;
ii. Characterize existing conditions and policy overview;
iii. Identify and assess road alignment and servicing alternatives;
iv. Review established evaluation criteria and determine the preferred road alignment and master servicing strategy;
v. Provide a general description and proposed design features of the recommended road alignment alternatives;
vi. Identify potential environmental effects and proposed mitigation measures to be taken;
vii. Address stormwater management and recommend a proposed functional servicing master plan;
viii. Recommend a preferred road alignment to be implemented.

The need for the Ira Needles Boulevard By-pass relates to:

i. The need to improve traffic flow and connections;
ii. The need to improve vehicular circulation and accessibility to the lands in Westhill, with independent access via the collector road to Erb Street;
iii. The need to provide a secondary vehicular connection for southbound traffic;
iv. The benefits of reduced traffic volumes within the Erb Street / Ira Needles Boulevard roundabout;
v. The benefits of provide improved vehicular access to the Waterloo Commons;
vi. The benefits of improved cycling and pedestrian connections;
vii. The potential to extend transit.

The detailed design and alignment of the collector road and stormwater management facilities will be determined through processing of development applications and/or design.

1.5 Problem and Opportunity Statement

The following Problem and Opportunity Statement was developed for the extension of the Boardwalk Avenue collector road assessment:

> **To determine the preferred alignment of the proposed collector road network, and associated sanitary and water infrastructure, including stormwater management facilities, within the undeveloped portion of the Westhill District. The collector road network will include the northerly extension of The Boardwalk Avenue from its current terminus at Thorndale Drive and related services that will form part of a Functional Servicing Master Plan to support development within the Study Area.**

Comprehensive evaluation criteria were developed and grouped into five categories: natural environment; social-cultural environment; transportation/municipal services and utilities; financial considerations; and technical considerations. The evaluation criteria were applied comprehensively and systematically in order to arrive at a preferred solution to the Problem or Opportunity Statement.

1.6 Need, Justification and the "Do Nothing" Alternative

The 'do nothing alternative' includes the road network identified in the Westhill District Plan and was considered as part of the evaluation process. With the 2031 "do nothing alternative" transportation network and intersection configurations and with the forecast additional traffic arising from the developments, some study area intersections were forecast to operate with delays above desired levels. To mitigate the network and intersection deficiencies, consideration was given to the Regional Transportation Master Plan (RTMP) and IMMTS transportation improvements, including the northerly extension of the Boardwalk as a new collector road. The 'do nothing alternative' was evaluated relative to the other alternatives that have been identified and as the basis to determine if the Westhill Implementation District Plan should be amended.

The Westhill District area forms part of the 'Built-Up Area' and 'Urban Designated Greenfield Area' and is designated as Urban Area in the approved Region of Waterloo Official Plan as shown in **Figure 6.** The Urban Area designation in the Region of Waterloo Official Plan identifies lands required to accommodate potential growth in the Region. The

City of Waterloo Official Plan designates the portion of the Study Area closest to Ira Needles Boulevard as ‘Employment’ and the remainder of the lands ‘Open Space’ as shown in **Figure 7**. The existing commercial development at the corner of Erb Street West and Ira Needles Boulevard and the existing Boardwalk commercial development are designated ‘Commercial’. The City of Waterloo Official Plan identifies Erb Street West and Ira Needles Boulevard as Regional Arterial Roads, Thorndale Drive as a Minor Collector, and Platinum Drive as a Proposed Major Collector, on Schedule E, as shown on **Figure 8**. The Westhill District forms part of the land supply of the City and Region that is intended to accommodate forecasted growth to 2031.

The Regional Transportation Master Plan (2011) promotes the role of public transit as part of a more balanced transportation system and includes a complementary road network plan, which was developed to assist in prioritizing road network improvements including some expansions, widenings, intersection improvements and transit priority improvements. The Regional Transportation Master Plan confirms that as the community grows, congestion will increase throughout the Region and as a result, transit will become a more competitive travel choice if higher quality transit service is provided.

The evaluation of collector road network alternatives should consider vehicular, pedestrian, cycling and potential transit connections to serve the West Side of Waterloo generally and the Westhill District in particular. The design of the collector road should consider the function of the road and alternative modes of travel.

Figure 1

Property Ownership

Evaluation Study Report
Westhill District
City of Waterloo
Region of Waterloo



LEGEND

Parcel Fabric (MPAC)

The INCC Corp. Property Ownership

Area by Property Ownership		
Ownership	***Area (ha)**	**% of Total Area**
The INCC Corp.	0.40	2.5
Waterloo Commons JV Inc.	2.54**	15.8
1130814 Ontario Inc.	5.13	31.9
Home Hardware Development Limited	7.99	49.8
Total	16.06	100

*Area based on Geowarehouse (Teranet) parcel mapping that was compiled using plans and documents recorded in the Land Registry System and is approximate.

**Area includes 0.38 ha SWM Pond currently owned by the Region of Waterloo

Air Photo Source: Bing

DATE: June 18, 2020

FILE: Y594E

SCALE: 1:3,000

DRAWN: DGS

north

K:\Y594E WESTHILL DISTRICT PLAN\RPT\WESTHILL EVALUATION STUDY REPORT JUNE 2020\PROPERTY OWNERSHIP MAP.DWG

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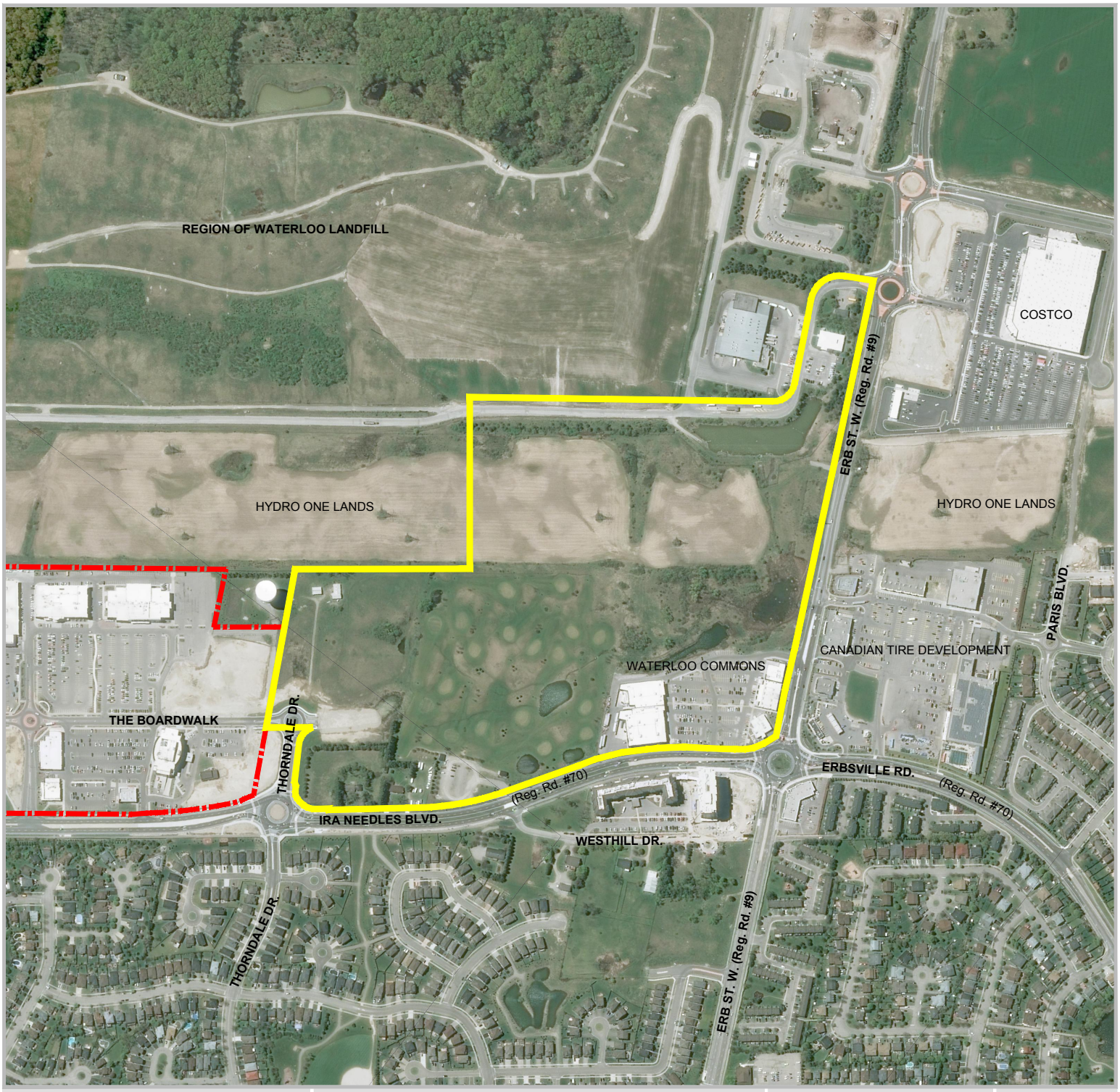


Figure 2

Study Area Map

LEGEND

The Boardwalk

Study Area

DATE: June 18, 2020

SCALE: 1:7,500

north

FILE: Y594E

DRAWN: DGS

K:\Y594E WESTHILL DISTRICT PLAN\RPT\WESTHILL EVALUATION STUDY REPORT JUNE 2020\STUDY AREA MAP.DWG

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Westhill District
City of Waterloo
Region of Waterloo

Air Photo Source: Bing

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Base Map Source:
WSP, Waterloo West Side Integrated Multi Modal Transportation Study [Draft]
City of Waterloo (June 2018) Figure 3-5

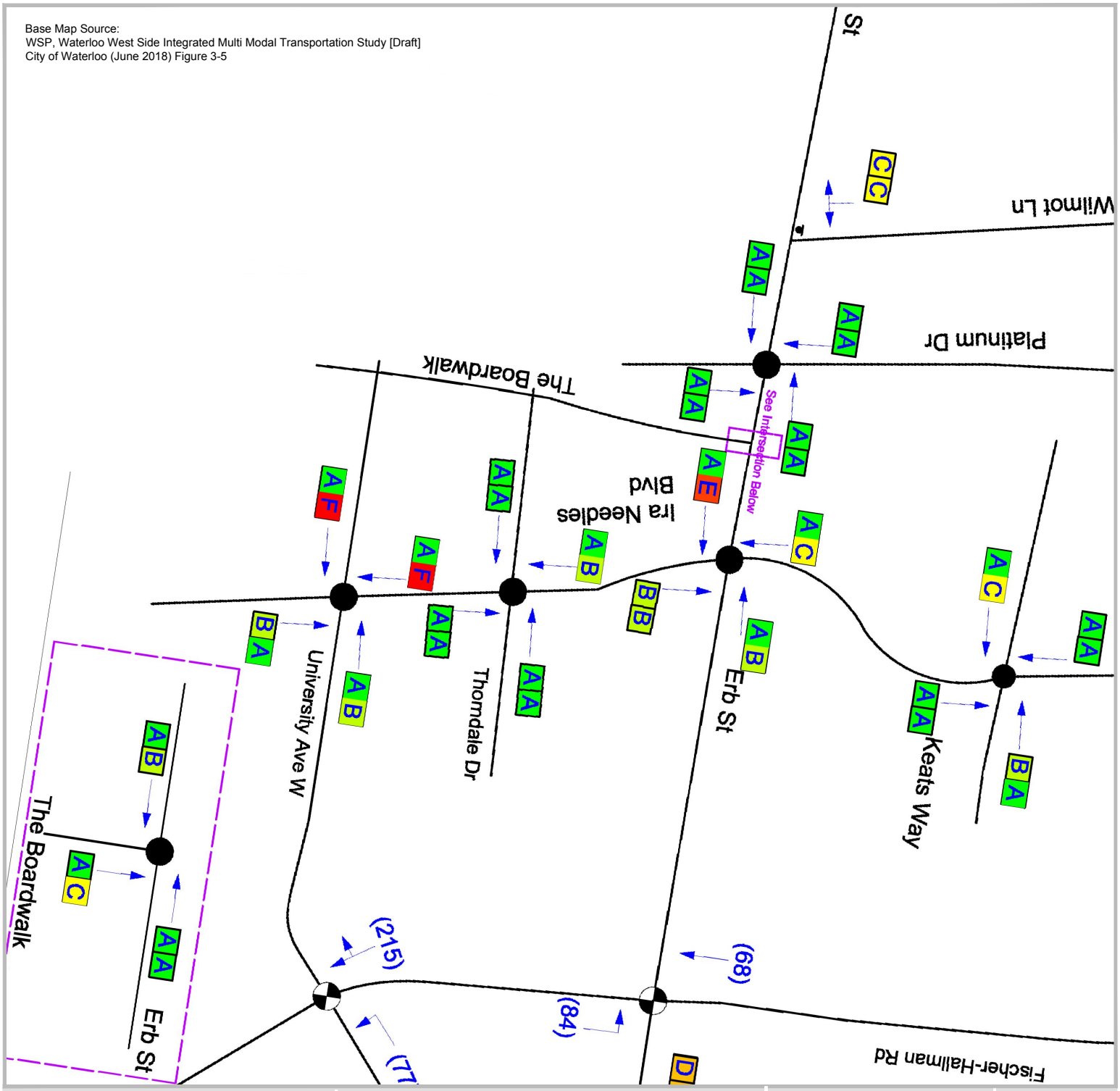


Figure 3

Waterloo West Side Integrated Multi Modal Transportation Study

Figure 3-5
2031 Intersection Operations with Planned Roadway Improvements Plus Additional Recommendations

Evaluation Study Report
Westhill District

City of Waterloo
Region of Waterloo

LEGEND

	LEVEL OF SERVICE (SEC.)		
	SIGNALIZED	UNSIGNALIZED	ROUNDABOUT
A	10/1/2000	0-10	0-10
B	10.1-20.0	10.1-15.0	10.1-20.0
C	20.1-35.0	15.1-25.0	20.1-35.0
D	35.1-55.0	25.1-35.0	35.1-50.0
E	55.1-80.0	35.1-50	50.1-70.0
F	>80	>50	>70

AM|PM
C|E AM & PM PEAK LOS:
- For the Overall Intersection for Signalized and All-Way Stop Control Intersections
- Per Approach for Roundabouts and One-Way Stop Control Intersections

XX (XX) AM (PM) DELAY IN SECONDS OF CRITICAL MOVEMENTS (LOS E/F)

STOP SIGN

TRAFFIC SIGNAL

ROUNDABOUT

DATE: June 18, 2020

FILE: Y594E

SCALE: NTS

DRAWN: DGS

north

K:\Y594E WESTHILL DISTRICT PLAN\RPT\WESTHILL EVALUATION STUDY REPORT JUNE 2020\WATERLOO WEST SIDE TRANSPORTATION STUDY.DWG

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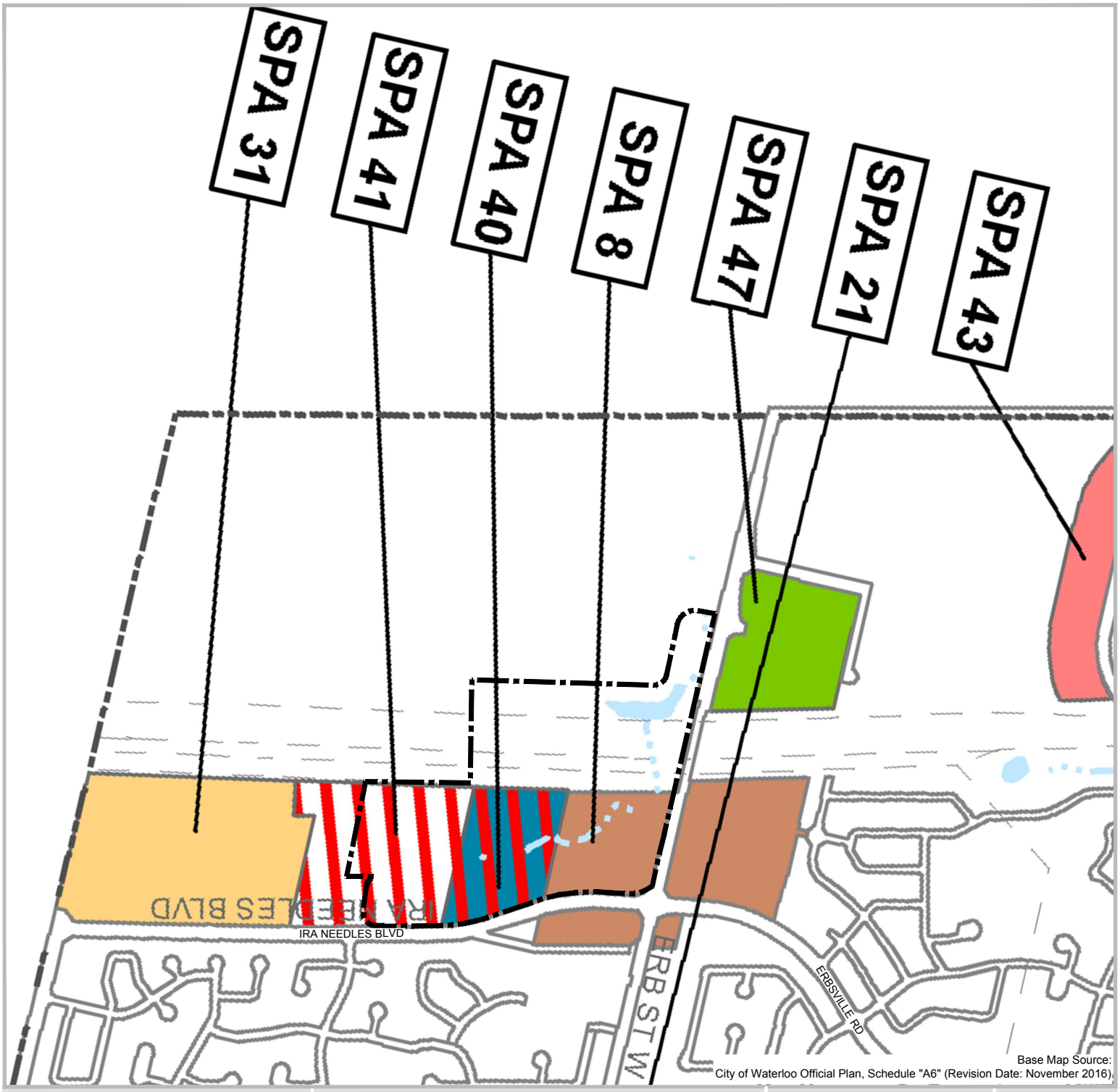


Figure 4

City of Waterloo Official Plan Specific Provision Areas

Schedule "A6"

LEGEND

Subject Lands

SPA — Specific Provision Area

Future Node

DATE: June 18, 2020

FILE: Y594E

SCALE: 1:12,500

DRAWN: DGS

north

K:\Y594E WESTHILL DISTRICT PLAN\RPT\WESTHILL EVALUATION STUDY REPORT JUNE 2020\WATERLOO OP SPECIFIC PROVISION AREAS.DWG

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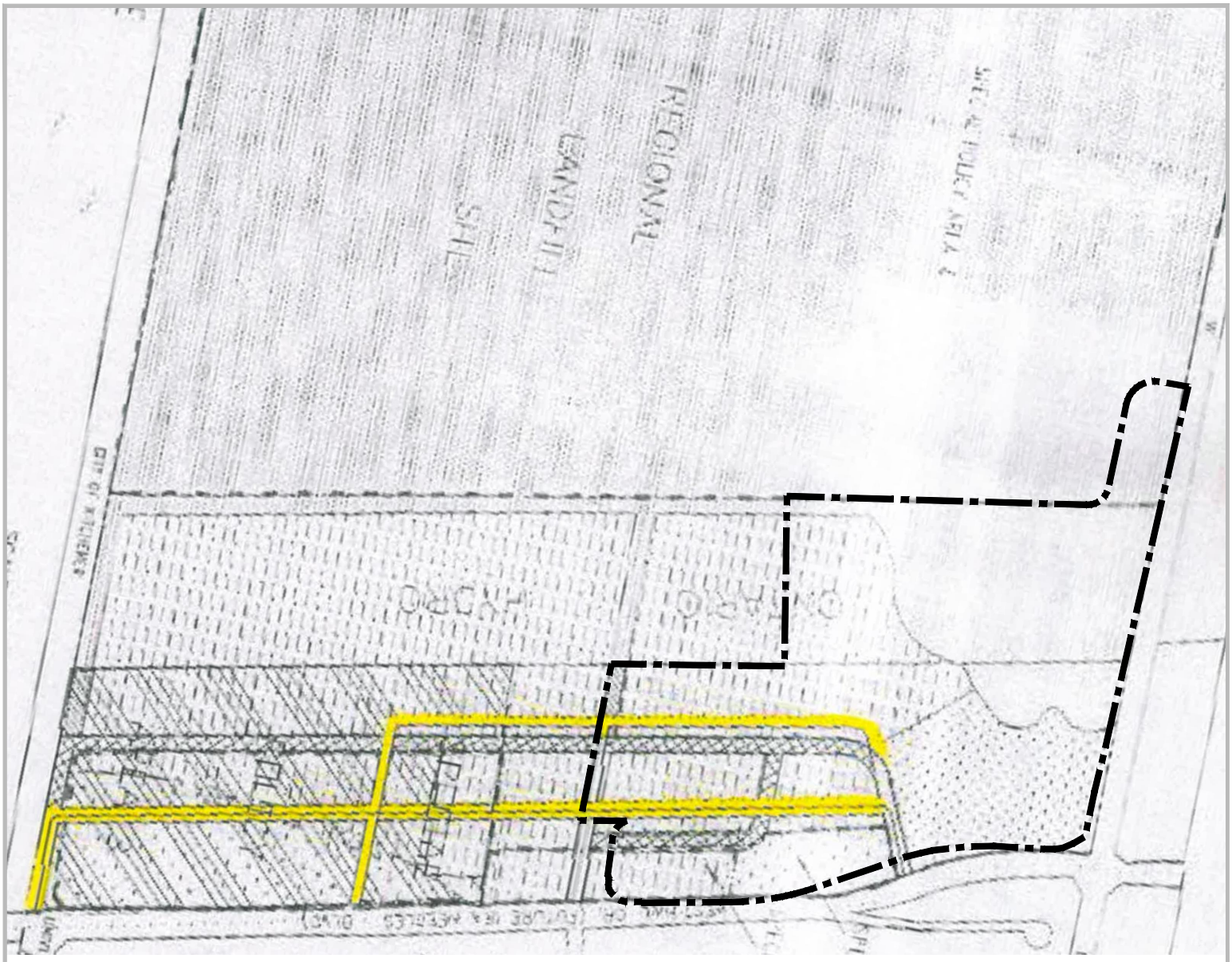


Figure 5

West Hill District Implementation Plan Land Use Concept Plan

Map 1

LEGEND

Subject Lands

DATE: June 18, 2020

FILE: Y594E

SCALE: NTS

DRAWN: DGS

north

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Base Map Source: City of Waterloo DS-09-34, Map 9 (June 15, 2009)

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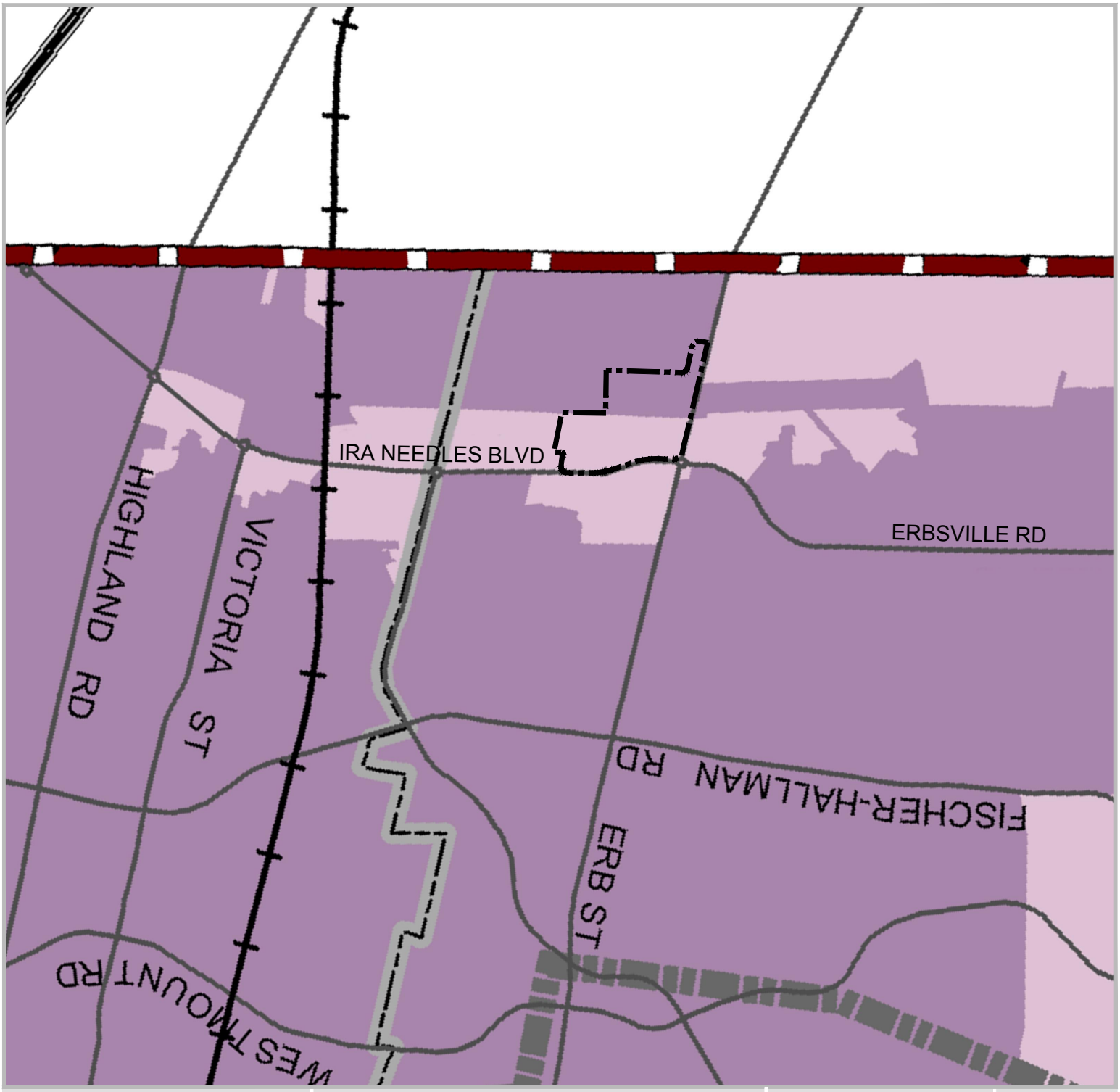


Figure 6

Region of Waterloo Official Plan Urban Area

Map 3a

Evaluation Study Report
Westhill District
City of Waterloo
Region of Waterloo

LEGEND

Subject Lands

Urban Area

- Built-Up Area*
- Urban Designated Greenfield Areas
- Central Transit Corridor Environmental Assessment Study Area
- Urban Area Boundary

Base Map Source:
Region of Waterloo Official Plan, Map 3a Urban Area (June 2015)

DATE: June 18, 2020

FILE: Y594E

SCALE: 1:30,000

DRAWN: DGS

north

K:\Y594E WESTHILL DISTRICT PLAN\RPT\WESTHILL EVALUATION STUDY REPORT JUNE 2020\ROP MAP 3A URBAN AREA.DWG

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
200-540 BINGEMANS CENTRE DR. KITCHENER, ON, N2B 3X9
P: 519.576.3650 F: 519.576.0121 | WWW.MHBCPLAN.COM

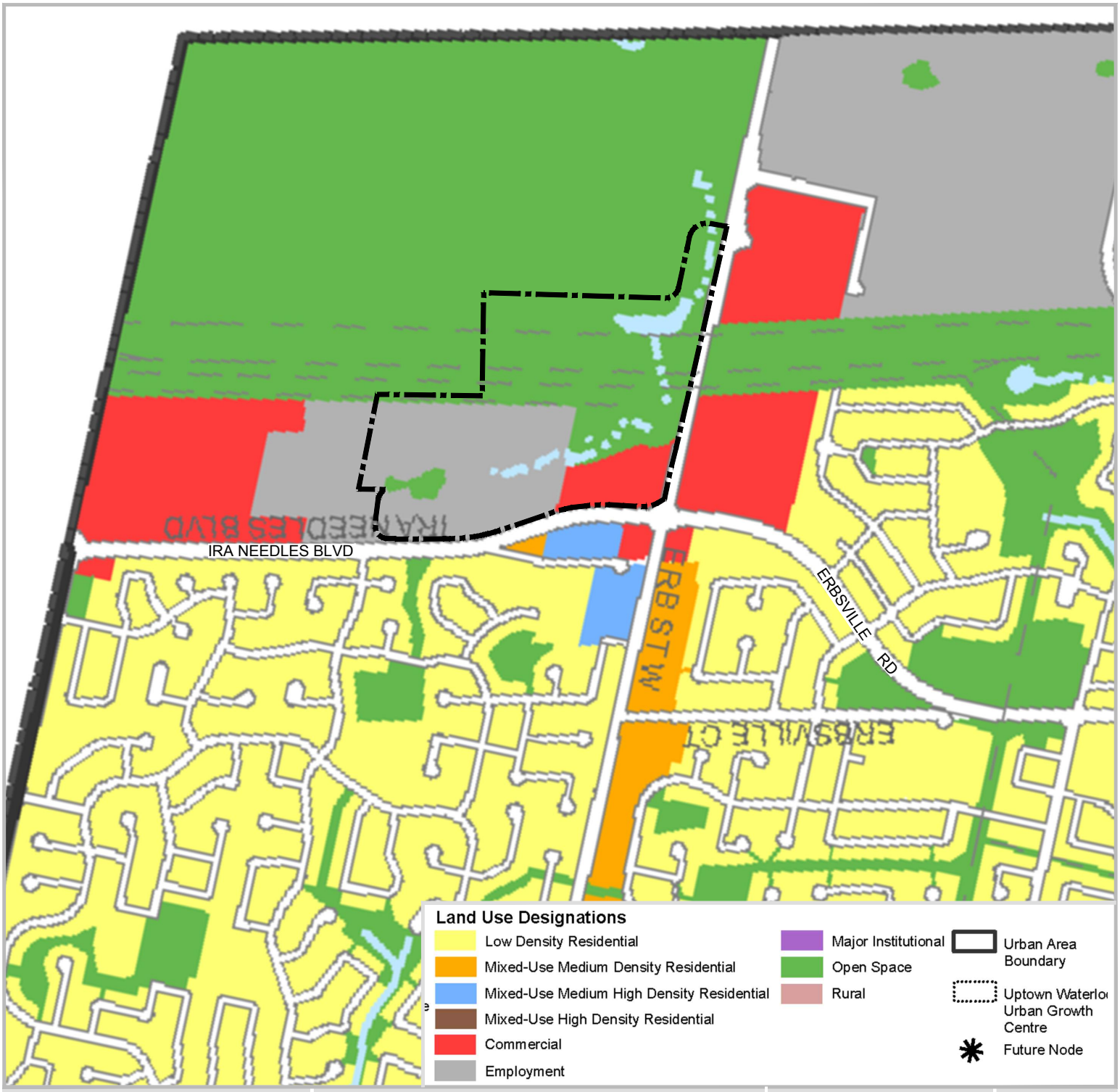


Figure 7

City of Waterloo Official Plan Land Use Plan

Schedule "A"

LEGEND

Subject Lands

DATE: June 18, 2020

FILE: Y594E

SCALE: 1:12,500

DRAWN: DGS

north

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Evaluation Study Report
Westhill District
City of Waterloo
Region of Waterloo

Base Map Source:
City of Waterloo Official Plan, Schedule "A" (Revision Date: September 2019)

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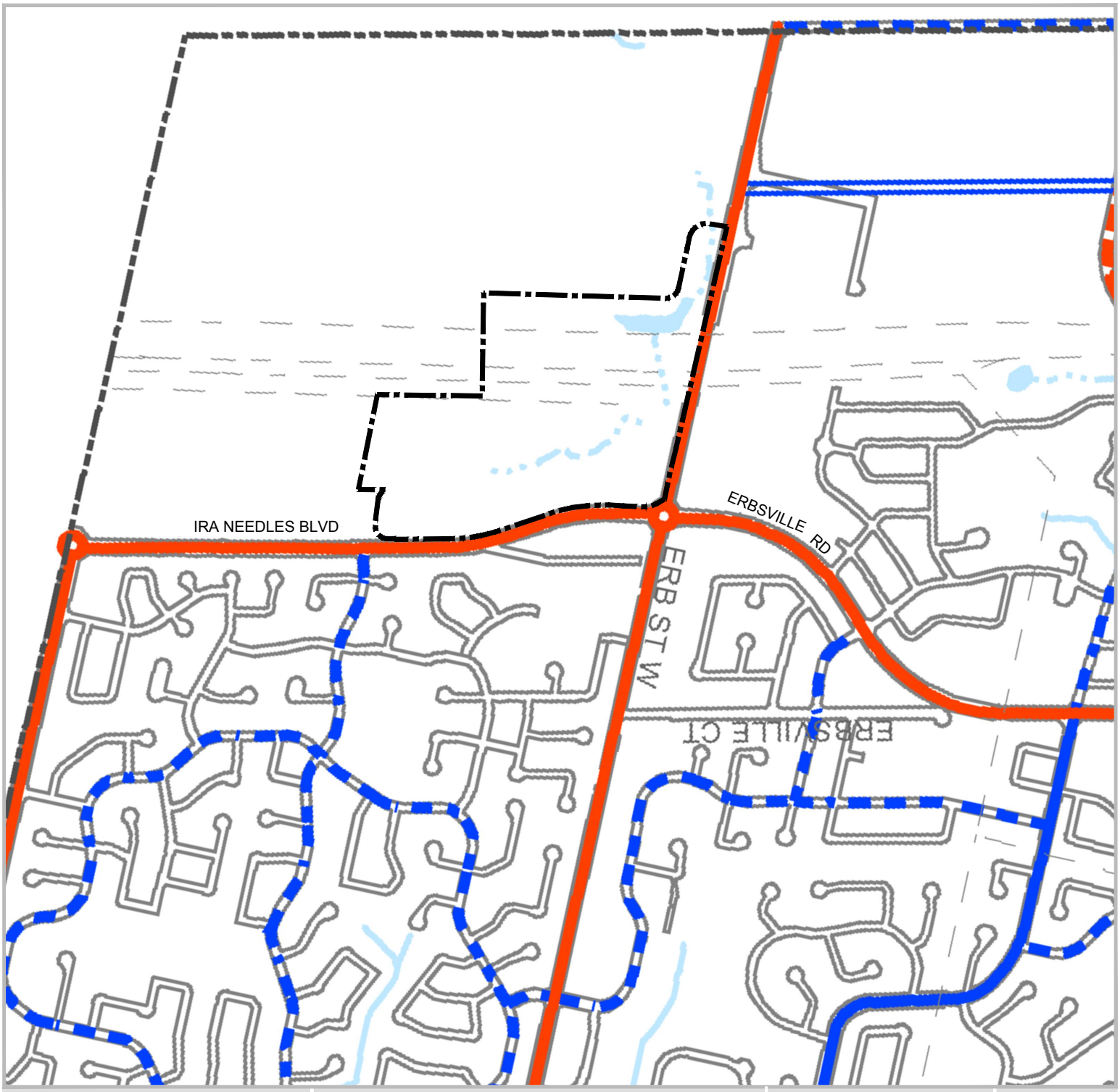


Figure 8

City of Waterloo Official Plan Road Classification System

Schedule "E"

Evaluation Study Report
Westhill District
City of Waterloo
Region of Waterloo

LEGEND

Subject Lands

Road Classification

Secondary Roads	Primary Roads
Local Roads	City Arterial
Potential Future Local Roads	Regional Arterial
Minor Collector	
Proposed Major Collector	
Major Collector	

Base Map Source:
City of Waterloo Official Plan, Schedule "E" (Revision Date: November 2016)

DATE: June 18, 2020

FILE: Y594E

SCALE: 1:12,500

DRAWN: DGS

north

K:\Y594E WESTHILL DISTRICT PLAN\RPT\WESTHILL EVALUATION STUDY REPORT JUNE 2020\WATERLOO OP ROAD CLASSIFICATION SYSTEM MAP.DWG

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2.0 STUDY APPROACH

2.1 A Comprehensive and Multidisciplinary Study Approach and Scope of Study

This study has considered the Municipal Engineers Association Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011 and 2015) (Municipal Class EA). The Municipal Class EA process was developed in accordance with the Environmental Assessment Act for a "class" of projects, including municipal road, water, wastewater and transit projects, that are recurring. The purpose of the Municipal Class EA is to provide for the protection, conservation, and wise management of the "environment", which is broadly defined and includes the natural, social, cultural, built and economic environment.

The environmental assessment planning process approved under the Environmental Assessment Act (EA Act) establishes a planning and decision making framework by which proponents may plan the municipal infrastructure projects to which the Class EA applies.

This report documents the process followed to determine a preferred collector road alignment and related stormwater management strategy within the Westhill District and considerations that were taken into account throughout the planning process.

Principles that were followed include:

- Consultation with affected parties early and throughout the process. Consultation that occurred throughout the planning process is summarized in Section 2.3 of this study and is more extensively documented in **Appendix D** and **Appendix E**;
- A reasonable range of alternatives were identified and systematically evaluated;
- The alternatives were reviewed and evaluated in the context of a number of criteria that were developed in consultation with review departments, agencies and the public;
- The alternatives were evaluated in terms of their advantages and disadvantages to determine their net environmental effects and benefits; and
- Clear and complete documentation of the planning process has been prepared to ensure "traceability" of decision-making with respect to the project.

The evaluation of alternatives is particularly important and relevant in consideration of infrastructure policies including in the City of Waterloo's Official Plan. In this regard,

reference is made to policies 8.2.5 of the WOP which provide criteria for the construction of a road proposed within or contiguous to a Supporting “A” Natural Feature.

2.2 Project Organization

Lands within the Study Area are owned by a number of landowners including; the Region of Waterloo, the City of Waterloo; Waterloo Commons JV Inc., the INCC Corporation, Hydro One, Home Hardware, and 1130814 Ontario Inc.

In consideration of Official Plan policies which direct the resolution of transportation issues, the major land owners in the area have coordinated their efforts and resources resulting in the submission of an Official Plan Amendment (OPA). The purpose of the OPA is to confirm the preferred collector road alignment and stormwater management facility to satisfy Special Policy 8.2.5 in the City of Waterloo Official Plan.

The major property owners have jointly retained a consulting team including the following firms and related disciplines:

- MHBC Planning – planning and public consultation;
- MTE Consultants Inc. – engineering (servicing, storm water management, etc.);
- Paradigm Transportation Solutions Limited – traffic; and,
- WSP (MMM Group Ltd., and Ecoplans Ltd.) – environmental.

2.3 Public Consultation and Communication Plan

The OPA has provided the process framework for receiving input from the public, elected officials, City, Regional and other agency staff. The consulting team has liaised with staff throughout the lengthy planning process. The process has included a City staff review of the applications in deeming the OPA as “complete”, an informal public meeting, circulation of background information to review agencies, agency input to the delineation of the Study Area, the evaluation criteria and the alternatives to be considered, a meeting with review agencies to present the alternatives and receive initial feedback including, comments from Hydro One, and subsequent meetings with City, Region and GRCA staff to review the evaluation of the alternatives and discuss the preliminary preferred collector road network and stormwater management strategy.

This report considers the feedback that has been received and has been prepared as input to City staff’s recommendation relating to the OPA that has been submitted. It is anticipated that this report will be formally presented to “key” review agencies. Revisions to this report may be considered following agency review and input. A formal public meeting to consider the OPA will be formally advertised such that the public and agencies

will receive notification of City Council's consideration of the application. A final draft of this report will be made available to the public, review agencies and City Council in advance of City Council's consideration of a Staff recommendation, potential adoption of an OPA and any Notice of Decision related to same.

A letter deeming the OPA as complete, minutes of the informal public meeting and agency comments that have been received are included as **Appendix B, D and F** respectively.

3.0 EXISTING CONDITIONS

Understanding existing conditions provides a framework for considering the project alternatives, benefits and impacts. This section of the Report summarizes existing conditions within the Study Area including the natural environment, the social cultural environment, municipal transportation services and utilities, financial and technical considerations.

3.1 Study Area

Historical aerial photographs of the Study Area were reviewed to understand the changes in the landscape over time. A component of the review was to understand how the existing detention storage in proximity to Erb Street and related features were formed.

The photos of the Study Area between 1930 and 1971 show no presence of any surface water feature near the location of what is now considered the Erb Street Pond, southwest of the intersection of Erb Street West and Ira Needles Boulevard. Sometime between 1971 and 1975, work began on constructing the Region's landfill site. It appears that the earthworks associated with this construction began to disturb existing drainage paths as well as increase the runoff generated on the previously farmed lands, which would have otherwise absorbed a majority of the annual precipitation. An aerial photo from 1975 demonstrates significant ponding near the Erb Street Pond location. It appears that the pond began to collect surface runoff from the Region's landfill site and the existing golf course located south of Erb Street where other work was completed. In summary, the review suggested that major earthworks associated with the creation of the Region of Waterloo's landfill, located to the west of the pond, are primarily responsible for changes to the landscape and impacting natural stormwater runoff that occurred at that time.

Historically, the properties within the Study Area included multiple topographic low lying depressions with no natural surface runoff outfalls. Following rainfall events, surface water would collect in these depressions and infiltrate back into the ground. In order to prevent surface water from ponding on their properties, the land owners collectively installed a 250mm diameter underground clay tile drain through the properties to drain the excess surface and sub-surface water. The drain was installed in two sections; the first in the 1930s and the second in the 1950s. The completed drain was installed from just south of what is now Westhill Meadows Golf Course and extended north, well beyond Erb Street West. Before major development was undertaken in the area, the drain would outlet into a channel on the north side of Erb Street West and be conveyed north to Clair

Creek. Based on the landowner information, the installation of the tile drain significantly improved the drainage situation on their properties.

In 1982, the landfill construction was underway as well as the reconstruction of Erb Street, at which time, the formation of the Erb Street Pond is evident. These road works created a damming effect south of Erb Street. In 1990, the landfill construction is even more evident, and construction north of Erb Street is approaching from the east. Erb Street Pond is vaguely evident as a much smaller feature and no watercourses, ponds or natural vegetation are evident. No defined watercourse is evident north of Erb Street West.

In the spring of 1996, construction of the Westhill Meadows Golf Course began. The golf course property, 41 Ira Needles Boulevard, was significantly graded and reshaped during this time. It is understood, based on landowner information that the tile drainage was damaged as a result of the golf course construction. This anthropogenic influence alteration to the historic drainage pattern has contributed to ponding in the area.

The City of Waterloo required the owner of the golf course to install a drainage ditch across the course to resolve ponding concerns. The golf course's consultant suggested a 150mm diameter underground pipe that led to an onsite storage pond complete with a control valve. Unfortunately, this system was incorrectly installed at elevations that could only collect surface water. The golf course drain could not properly drain the sub-surface water that was causing problems on the neighbouring sites; which was previously being adequately drained by the underground clay tile drain. After a series of site visits and investigations, it was concluded that the previously installed drain must have been damaged or destroyed by the grading activities that took place to construct the golf course.

An investigation into the downstream wetland, what is now considered the Erb Street Pond, suggested that the overall size of the wetland had dramatically increased due to ongoing activities upstream. However, the wetland water level was measured to be approximately 3.0m lower than the surface ponding on the properties south of the golf course.

In May of 1997, the Region/City of Waterloo staff cleaned the area near the culvert installed under Erb Street West; the outlet for the Erb Street Pond. After debris was removed, water was observed to be draining through the culvert; from the south side of Erb Street West to the north side. A new field survey revealed that the surface water elevations on the properties south of Erb Street West had dropped, but not enough to actually dry out the newly formed wetlands. It was therefore concluded that the condition

of the Erb Street West culvert would have a minimal impact on drainage of these adjacent properties.

Presently, the wetlands which formed on the properties south of the golf course still exist. The location and condition of the original clay tile drain running underneath the golf course is unknown at this time. However, it is evident by the presence of the wetlands that the tile is not functioning as it was originally designed.

In summary, the historical air photo analysis indicates that there a number of changes associated with urban development and grading in the area, which altered the landscape and created the existing features.

3.2 Engineering

3.2.1 Transportation Network

Roads, transit and active transportation infrastructure to support the Westhill District are comprehensively planned through City and Regional Transportation Master Plans and Official Plans.

The main roads within the Study Area include the following:

- Ira Needles Boulevard (Erbsville Road) is a north-south Regional arterial road with a four lane cross-section. Sidewalks are present along both sides of the road for the portion of the road in the City of Waterloo.
- Erb Street is an east-west city arterial road. Further west of the urban boundary, the road has a rural cross section. West of the roundabout, Erb Street is 3-4 lanes, and is constrained to 2 lanes at the Hydro Corridor. Improvements to Erb Street were identified in the Class EA.
- Laurelwood Drive, Columbia Forest Boulevard and Keats Way and several local roads from existing developed areas to Erbsville Road/Ira Needles Boulevard offer additional east-west connections.
- Platinum Drive between Columbia Street and Erb Street is proposed to be constructed from Erb Street West, via a roundabout, to the lands to the north, to service the West Side Employment Lands. The road will have the potential to connect to Columbia Street West to the north in the future.
- There is a northerly street stub extension that terminates at the roundabout of Ira Needles Boulevard and Thorndale Drive.

Bus transit service is currently provided along Ira Needles Boulevard and Erb Street West, offering service throughout Kitchener-Waterloo. There is a transit terminal located within The Boardwalk commercial development. The extension of transit service through the Study Area to Erb Street West provides an alternative route potential that would include the potential to increase service coverage and provide connections to future employment uses.

Pedestrian connections are provided through the existing sidewalk network along Ira Needles Boulevard and through The Boardwalk. A bicycle lane is provided along Ira Needles Boulevard.

3.2.2 Traffic Analysis

The Study Area intersections were analyzed using existing traffic volumes, current geometry and signal timing and phasing plans (**Appendix Q**). The analyses show that under current conditions all intersections operate within acceptable Regional Standards with respect to delay and LOS during all peak hours, except for:

- Ira Needles Boulevard/Erbsville Road and Erb St West eastbound movements operate at LOS F with a v/c > 1.0 during all peak hours. The westbound movements operate at LOS F and v/c > 1.0 during the PM peak hour. The southbound movements operate at LOS F and a v/c of approximately 1.0 during the PM and Saturday peak hours. Overall the intersection operates at a LOS F during the PM and Saturday peak hours;
- Erb Street West and Waterloo Commons Access northbound right-turn movement operates at LOS E during the Saturday peak hour;
- Ira Needles Boulevard and Boardwalk Entrance 2 (Lifestyle Way) eastbound left-turn movement operates at LOS E during the AM peak hour, and LOS F during the PM and Saturday peak hours; and
- University Ave W and Ira-Needles Boulevard northbound movements operate under a v/c > 0.85 during the AM and PM peak hours. The southbound movements operate at LOS F and a v/c of 1.0 during the PM peak hour. These findings are consistent with those drawn in the Waterloo West Integrated Mobility Study for the weekday PM peak hour.

The completion of the Boardwalk as an extension through the Westhill District to Erb Street offers the City an improved network and has the potential to offload some traffic from Erb Street and Ira Needles Boulevard. In addition, this extension will result in other transportation improvements to the area including:

- reducing traffic volumes at the Erb Street/ Ira Needles Boulevard roundabout;
- improving traffic flow and connections;
- providing improved vehicular circulation and accessibility to the lands in Westhill, with independent access via the collector to Erb Street;
- providing a secondary vehicle connection to southbound traffic, for emergency response vehicles and access to/from the Regional landfill;
- providing improved vehicular access to Waterloo Commons;
- providing improved cycling and pedestrian connections; and
- providing an opportunity to increase the number of people, jobs and public places served by public transit.

The Region of Waterloo has recently completed its Transportation Master Plan and has not identified the need for infrastructure upgrades within the primary Study Area, specifically for Erbsville Road and Platinum Drive, over the 2019 to 2031 period. It should be noted that the intersection of Erbsville Road and Keats Way is planned to be upgraded to a roundabout under the infrastructure upgrades. Erb Street Road Municipal Class Environmental Assessment also identified that Erb Street is to be widened to four lanes to Wilmot Line.

3.2.3 Municipal Services and Utilities

Municipal services, including water and sanitary services are existing or planned for expansion for the Study Area. The existing developed Boardwalk lands not including the Thorndale extension is serviced by an Agreement with the City of Kitchener for Water and Wastewater. All new development will be serviced from the Waterloo water and waste water distribution and collection systems. The existing services and opportunities for connections to, or extensions of, the existing services are used to determine the feasibility of certain proposed road alignments.

3.2.3.1 Water *Distribution*

The lands within the Study Area all reside within the City of Waterloo Pressure Zone 6 (Wat Zone 6). Wat Zone 6 receives water from the Zone 6 Reservoir elevated water tank, located at the northwestern end of The Boardwalk development, north of the Landmark Cinemas and adjacent to the hydro corridor.

Twin 450mm diameter watermains connect to exit the elevated water tank and extend to Ira Needles Boulevard. One watermain runs south along Ira Needles Boulevard and eventually connects to the Mannheim PS system, which serves as the principle water source for both pressure zones Kit Zone 6 and Wat Zone 6. The second 450mm diameter

watermain, which services the Wat Zone 6, crosses Ira Needles Boulevard near the Medical Centre at The Boardwalk and connects to a local 400mm diameter watermain running north-south on the eastern side of Ira Needles Boulevard. This watermain extends north along Ira Needles Boulevard and traverses along Westhill Drive, eventually intersecting with Erb Street West. It also runs south along Ira Needles Boulevard until it reaches University Avenue West, where it traverses easterly.

There are also other local watermains which surround the subject lands. The existing residential dwellings and commercial building at 41, 65, and 73 Ira Needles Boulevard are currently serviced by private onsite wells.

Lastly, there is a 200mm diameter PVC Zone 6 watermain along the newly extended Thorndale Drive, which terminates at the northern leg of the newly constructed roundabout at the intersection of Thorndale Drive and The Boardwalk. This local watermain is located in pressure zone Wat 6 and can be extended.

3.2.3.2 Sanitary Servicing

There are no municipal sanitary sewers running along either Ira Needles Boulevard or Erb Street West. The existing residential dwellings and commercial building at 41, 65, and 73 Ira Needles Boulevard are currently serviced by private onsite septic systems. No sanitary outlet currently exists along Ira Needles Boulevard for these properties. The only sanitary sewer servicing any of the subject properties is a 300mm diameter sanitary sewer which runs south-north along a servicing easement through the western portion of the Canadian Tire development lands.

3.2.3.3 Stormwater Servicing

The terminus of stormwater for the majority of the Study Area is the outlet through the culvert under Erb Street West to the servicing easement along the western portion of the Canadian Tire development lands. Some areas fronting the Study Area are not included in this servicing outlet.

The onsite stormwater runoff generated within the majority of the lands, which make up the Study Area, is all directed towards the Erb Street Pond; whether through interactions with groundwater or surface water features existing on these properties.

The existing Erb Street Pond outlet is a 900mm diameter sewer located in the southern embankment of the Erb Street West right-of-way. It is approximately lined up with the plaza entrance adjacent to the BMO Bank of Montreal and the Shoppers Drug Mart. Before the outlet crosses Erb Street West, additional storm runoff is collected by a series

of 300mm and 375mm diameter sewers installed along Erb Street West, from the Ira Needles Boulevard roundabout to the low point in the road near the pond's outlet. Additionally, 450mm and 525mm diameter CSP culverts collect runoff from a ditch running west along the northern side of Erb Street. Runoff is combined and conveyed through the previously discussed servicing easement through the Canadian Tire lands, which also contains the Study Area's sanitary outlet.

The dedicated 900mm storm sewer does not collect any further stormwater runoff as it travels north through the easement, through the intersection of Bordeaux Place and Paris Boulevard, through the Clair Meadows Subdivision, before outletting directly to Clair Creek - north of the Brandenburg Stormwater Management Facility.

3.2.3.4 Utilities

The proposed road alignment alternatives will be developed with similar conflicts associated with the construction of new roads and municipal services, which include crossings with utilities such as underground Bell wires, hydro wires, and local gas lines. These conflicts will be present with any of the proposed road alignment options as these utilities are located along the western side of Ira Needles Boulevard and the southern side of Erb Street West. A connection point may be available to the existing 100mm diameter high pressure gas main along the north side of Erb Street West, or the 300mm diameter main along the east side of Ira Needles Boulevard.

Concerns with some of the road alignment alternatives that are proposed to cross or encroach on the hydro corridor within the Study Area have been identified. There exists a 400mm gasmain, within a gas easement, running parallel to the hydro corridor along its eastern property line. This is a major Union Gas transmission main which crosses Erb Street West into the Union Gas Station near the southwestern corner of the Canadian Tire development lands. It is understood that Union Gas does not allow any work to be performed atop this transmission main, so agreements would be required to implement any road alignment option that would cross or encroach on the gas easement.

Additionally, there also exist three major high voltage hydro transmission lines and one local hydro line within the hydro corridor. The multiple transmission line towers require a minimum 15m setback from their base and may create conflicts with some of the proposed road alignment alternatives.

3.2.4 Physiography/Geology/Geotechnical

The Westhill District is located within the physiographic region known as the Waterloo Hills. This region primarily consists of sandy hills, some of which are ridges of sandy till and others are kame or kame moraines, with outwash sands in between. The Study Area is located within kame moraines deposits which is consistent with the Waterloo Hills region.

The Quaternary Geology Map identifies the presence of ice-contact stratified deposits of sand and gravel across the most of the City of Waterloo. The Study Area is shown to be located completely within an underlying till unit known as the Maryhill Till. The Maryhill Till, described as a fine textured clay rich till, is closely associated with glaciolacustrine sediments and is subdivided into three units (Upper, Middle, and Lower Maryhill Till). The Maryhill Till is considered to be a significant regional aquitard and will act as a significant barrier to vertical water movement where present in a thickness greater than five metres. The City of Waterloo is underlain by the Salina Formation, composed of carbonate rocks and minor evaporitic sequences of the Salina Formation. The Salina Formation is a shale unit that is grey-brown in colour and can be heavily weathered and/or fractured.

Major geological units beneath the Study Area include bedrock, Canning Drift (ATE1), Catfish Creek Sand and Gravel (AFC1), Lower Maryhill Till (ATC1), Middle Maryhill Till (ATB2), the Waterloo Moraine (AFB1), and the Upper Maryhill Till/ Port Stantley Till/ Tavistock Till deposits (ATB1). Upper Maryhill Till deposits are illustrated to range from 10 to 50 mBGS across the Study Area.

The interpreted regional groundwater flow direction was determined using publically available groundwater data from the GRCA completed as part of a watershed scale study. Groundwater elevations contours are identified to range between 377 m and 381 mAMSL within the Study Area. Shallow groundwater flow direction is generally interpreted to be southerly beneath the Study Area, with the exception of the northern portion where groundwater flow is interpreted to be north-easterly.

3.2.5 Subwatersheds/Surface Water

3.2.5.1 Subwatersheds

The Study Area is located in the upper reach of the Sub watershed 314 – Laurel Creek Watershed and is owned by a variety of landowners, including; the Region of Waterloo, the City of Waterloo, the INCC Corporation, Hydro One, Home Hardware, and the Cressman family.

The Laurel Creek Subwatershed 314 Management Plan concluded that the Erb Street Pond was located in a Constraint Level One Area. An assessment established that the

pond received runoff from the landfill area and future development lands south of Erb Street West. This pond provides significant storage (approximately 150,000m3) before spilling onto Erb Street West. The pond and storm sewer outlet were designed to limit runoff into the Clair Creek tributary, to protect it from things like streamflow erosion. The designed 600mm diameter storm sewer outlet provides detention and settling of the 25mm storm.

It was suggested that this outlet be maintained in its existing location and form, or at least be relocated somewhere to achieve the same levels of control. The Plan concluded that it was imperative that the Region of Waterloo, the City of Waterloo, landowners/developers, and the GRCA prepare a management plan for the Erb Street Pond/wetland and maintain it as a significant storage area for stormwater runoff from the areas south of Erb Street West.

There are currently issues with the Erb Street Pond outlet, which is very frequently clogged with debris and vegetation, which creates an artificial high water level due to perching of the retained stormwater runoff. The Functional Servicing Master Plan will address these issues. All road alternatives include the north south collector road passing through the existing pond's location and the construction of one or multiple new SWM facilities within the Study Area.

3.2.5.2 Surface Water

An analysis of the local watercourses and surface water monitoring program for the drainage area associated with the Study Area was completed by MTE (**Appendix K**).

The Surface Water Monitoring Study Area is located southwest of the intersection of Erb Street and Ira Needles Boulevard, encompassed by Erb Street to the north, Region of Waterloo Landfill to the west, Ira Needles Boulevard to the east and The Boardwalk commercial plaza to the south. The drainage area contains the Westhill Meadows Golf Course and is bisected by the hydro corridor. A groundwater–wetland interaction assessment was completed for the Waterloo Commons wetland feature based on groundwater and surface water data collected from the Study Area.

An in depth assessment of the remaining unevaluated wetland features (HEPC North, HEPC South, and Cressman West) and the SWM Retention Area were not completed based on review of collected surface water level data and the relatively small footprints of the features. Surface water level data at these locations suggest that these features would generally behave as depressional features, retaining water following precipitations events and then becoming dry as a result of evapotranspiration and infiltration losses.

Further discussion regarding the remaining wetland features is provided in the Surface Water Monitoring Technical Memorandum (**Appendix K**).

The interaction of groundwater and surface water is inferred to vary throughout the year, as shown in Hydrograph 5 in Tab 2 of **Appendix K**. Groundwater and surface water elevations measured during dry periods were observed to be generally consistent. This implies that minimal volumes of groundwater can be contributed to the wetland during these periods. Groundwater levels were measured to temporarily increase above surface water levels following significant precipitation events and then gradually recover to lower levels more consistent with surface water levels, therefore resulting in the potential for groundwater to temporarily discharge into the wetland feature.

There are five unevaluated wetlands in the Study Area, as identified on GRCA mapping and confirmed through field investigation: Wetlands 1-4 and the HEPC wetland as identified in the Stage 1 EIS

3.3 Natural Environment

3.3.1 Natural Heritage Features

An analysis of the natural heritage features for the Study Area was completed by WSP and is included as **Appendix J**.

No provincially designated features or regulated water courses were found on or immediately adjacent to the Study Area. There is intermittent drainage from the two SWM facilities towards the outlet / culvert at Erb Street and from a dug pond on the golf course northerly into the wet area adjacent to the Region SWM facility. From the culvert at Erb Street, stormwater runoff is conveyed underground via a piped municipal drain to a SWM pond approximately 750m to the north and ultimately into Clair Creek.

Portions of the Waldau East Wetland Complex (evaluated, non-provincially significant wetland) are located on the landfill lands to the west. This wetland is designated as a Core Natural Feature in Schedule A4 of the City of Waterloo Official Plan and Core Environmental Feature on Map 4 of the Region of Waterloo Official Plan (2015).

Five ponds / unevaluated wetlands are present in the Study Area, as identified on GRCA mapping and confirmed through field investigations. Additional wetlands are present on HEPC lands to the west / southwest. All wetlands (not including the golf course ponds) as mapped by GRCA are regulated by GRCA under O. Reg. 150/06. Regenerating areas in the vicinity of the two SWM ponds are designated as Supporting Natural Features in Schedule A4 of the City of Waterloo Official Plan. The regenerating area in the vicinity of

the Landfill SWM pond is designated as Open Space (Parks and Other Green Space) in Schedule A3 of the City of Waterloo Official Plan. The pond/wetland area in the vicinity of the two SWM facilities (the “Erb Street Pond and Wetland System”) was identified as a Constraint Level 1 feature in the Laurel Creek Subwatershed 314 Management Plan.

Based on input from the City and GRCA, an analysis of the natural features relating to whether the wetlands are *Locally Significant Wetlands* or *Other Wetlands* was completed to identify the applicable policy framework.

Based on analysis included in the Stage 1 EIS, the wetlands within the Study Area are concluded to be:

- *Locally Significant Wetlands*: W1 (comprised of Vegetation Units 3 / 4 / 5 / 7 / 8 / 9), a wetland of anthropogenic origin that provides a stormwater, detention and settling function with a total estimated area of ~ 3.4 ha
- *Other Wetlands*: W2 and W4

Other wetlands:

- W3 – the majority of this wetland was approved for removal in accordance with GRCA Permit No. 755/15
- HEPC south wetland – not in proximity to any of the proposed alignments, and no expected impact

3.3.2 Terrestrial Ecosystem

Based on comprehensive field inventories, a description of existing vegetation, flora and wildlife habitat, and an assessment of natural heritage status and significance was completed as part of the Stage 1 EIS (**Appendix J**).

Wildlife habitat was characterized using results from breeding bird surveys, spring breeding amphibian surveys, turtle emergence and nesting surveys, targeted SAR bat habitat surveys, and general wildlife inventories which involved the recording of all direct wildlife observations and wildlife signs and identified any habitat functions associated with vegetation communities. Structures on the subject lands were inspected for evidence of use by migratory birds and potential Significant Wildlife Habitat (SWH) features were assessed for potential wildlife interaction. Existing background information, including the previously completed NRSI (2003), was also reviewed and informed field investigations.

The following wildlife species were recorded: 32 breeding bird species (mostly generalists); 3 anuran species (frogs and toads) species in low abundance; 2 turtle

species in low abundance (in golf course and SWM ponds); 7 common, urban-adapted mammal species; and 2 invertebrate species of note (Monarch and Chimney Crayfish).

Wildlife Movement Opportunities. The study area is isolated, with built / approved or planned urban development to the north, east and south and landfill / active croplands to the west. In addition, two major roads (Erb Street and Ira Needles Boulevard) to the north and east are barriers to wildlife movement.

No Endangered or Threatened SAR wildlife species were recorded during surveys and we are aware of no recent records within the study area.

Based on field survey results, Significant Wildlife Habitat (SWH) was confirmed for two criteria: Terrestrial Crayfish - Chimney Crayfish confirmed SWH in Unit 2 (CUT) and Unit 4 (SWT); and Special Concern and Rare Wildlife Species - confirmed SWH for Monarch (Special Concern) in Unit 4 (SWT). Anticipated activities will not result in negative impacts to SWH with maintenance of suitable habitat on adjacent lands and habitat restoration.

Vegetation and flora features were identified via field surveys which documented the characteristics of the naturally and culturally influenced vegetation communities with a focus on natural features. Vegetation and flora surveys included detailed botanical inventory and preparation of vascular plant species lists, classification, mapping and evaluation of vegetation communities, and collection of representative photographs and notes.

A total of 116 plant species were identified within the Study Area. Of the 116 species recorded, 69 (61%) were native and 45 (39%) were non-native. These species were a mix of wetland and meadow plants, or non-native species typically consisting of old field and disturbed areas. None of the plant species identified were provincially or nationally rare or a Species at Risk (SAR) subject to the provisions of the ESA (2007) or SARA (2002). One species recorded in the HEPC lands in 2016, Virginia Creeper (*Parthenocissus quinquefolia*), is listed as significant in the Region of Waterloo but was not recorded in 2018 surveys. The majority of naturally occurring native species recorded have a CC value between 2 and 4 4 (i.e., “tolerant” to “moderately conservative”). No “conservative” or “highly conservative” species were recorded.

3.3.3 Species at Risk (SAR)

A screening exercise was undertaken to identify if there was reasonable potential for SAR within the Study Area based on known occurrences and the habitats present. The full

SAR habitat evaluation is provided in **Appendix J**. The screening exercise involved developing a list of SAR known to occur within the vicinity of Study Area or region from review of various sources including: species indicated by MNRF through correspondence, NHIC data extracted from online Biodiversity Explorer tool, MNRF Species at Risk website regional species list, and DFO SAR mapping. No Endangered or Threatened SAR species were recorded during surveys and no recent records within the Study Area were identified.

For all other SAR species with some potentially suitable habitat in the vicinity of the proposed works, but not recorded during field surveys, the likelihood and magnitude of impacts is 'none' or 'minimal' based on the size and/or quality of habitat and the low likelihood of occurrence and presence of abundant (and generally much larger / higher quality) habitat in the local landscape.

3.3.4 Groundwater Recharge and Discharge Areas

Groundwater recharge occurs where precipitation and snowmelt infiltrate into the ground to feed aquifers, watercourses and wetlands. SGRAs are typically associated with coarse-grained soils (i.e. sands and gravels) or very shallow overburden material covering upland areas on the landscape.

The MECP on-line interactive Source Water Protection Information Atlas and GRCA online mapping tool show the Study Area to not be located within a SGRA. Quaternary geology in the area illustrate the Study Area to be located with a fine-textured glaciolacustrine silt and clay unit known as the Maryhill Till, which poorly facilitates infiltration and percolation of surface water to groundwater. The calculated infiltration for the MTE-MW101-18 and MTE-MW102-18 support the identification that the Study Area is not within a SGRA. This is further supported by the presence of the Region of Waterloo Landfill being located adjacently west of the Study Area.

3.4 Social Environment

3.4.1 Land Use

Land uses within the Study Area include vacant former agricultural land, a golf course as an interim use pending development of future employment uses (including a potential home building centre), stormwater facilities, a commercial plaza, the Region of Waterloo Landfill and the Hydro Corridor. Existing commercial development in the larger Westhill District is located to the north, east and south of the Study Area. The Costco lands, and Canadian Tire development are located to the north and west, some smaller commercial

uses are located to the east, and The Boardwalk mixed use development is located to the south.

The Vista Hills and the Rummelhardt neighbourhood are located to the north. These residential neighbourhoods are characterized by primarily low and medium density residential development including single detached dwellings, and street fronting townhouse dwellings. The land uses within the residential developments include open space, parks, natural heritage features and community facilities, such as schools. The Region of Waterloo Emergency Services (EMS) Training and Research Centre is located at 1001 Erbs Road, Waterloo.

Surrounding neighbourhoods have been designed with a modified grid road network, with limited access points to the surrounding arterial road network (Erb Street West and Ira Needles Boulevard (Erbsville Road). Traffic from these neighbourhoods is directed to Erb Street West and Ira Needles / Erbsville Road). There is currently no direct vehicular connection between Vista Hills and Erb Street West.

3.4.2 Agricultural Lands

The lands within the City's Urban Area are not designated for agricultural purposes by the Region's Official Plan. Cultivated land on the Hydro One Corridor lands is used primarily for cash crops (i.e. corn, soybeans, wheat).

3.4.3 Development Applications within the Study Area

No development applications are currently proposed within the Study Area. Any future development applications will be subject to an application process.

3.5 Cultural Environment

3.5.1 Built Heritage and Cultural Landscapes

A portion of the Study Area retains the potential for the recovery of archaeological resources due to the proximity of an historic road and water courses (Waterloo Commons JV Inc. site and Home Hardware site). A review of the City of Waterloo's Municipal Heritage Register, was most recently updated on June 5, 2017 and confirms that there are no heritage properties within or in proximity to the Westhill District Community.

The City of Waterloo finalized its Cultural Heritage Landscapes Study in 2019. No cultural heritage landscapes were identified adjacent to the Westhill District Community. The Primary Study Area has been significantly altered through the development and

associated grading of the development of the golf course. Any archaeological assessment requirement will be completed in advance of submission of the Plan of Subdivision or as part of a complete application for the plan of subdivision.

3.5.2 Archeological Resources

A portion of the Study Area retains the potential for the recovery of archaeological resources due to the proximity of a historic road. The Region's Pre-submission comments (March 27, 2018) requested the submission of an Archaeological Assessment as part of a Complete Application. An archaeological assessment will be completed in advance of submission of the Plan of Subdivision and as part of a complete application for the plan of subdivision.

The completed archaeological assessment may result in recommendations that will be implemented as part of subsequent development application(s), to the satisfaction of the Region. Implementation of recommendations may need to be secured through a development agreement or other mechanisms acceptable to the Region.

4.0 IDENTIFICATION AND ASSESSMENT OF COLLECTOR ROAD ALIGNMENT ALTERNATIVES

4.1 Evaluation Criteria and Related Scoring Methodology

Table 1 of this report includes the final evaluation criteria for assessing the collector road network and stormwater management alternatives. The evaluation criteria have been grouped into five factor categories including: natural environment; socio-economic environment; cultural environment; transportation/municipal services and utilities; and financial / technical considerations. Within each category, there are various factor groups.

The Numerical Evaluation approach was used as the preferred methodology relating to the selection of a collector road network and stormwater management alternative. This methodology requires a “must score” approach. For each criteria/factor the least preferred alternative received a score of 1 and the most preferred alternative received a score of 10. All other alternatives were scored between these values with ties permitted.

It was recognized that different factor categories and factor groups do not have the same number of criteria/factors and as a result certain factor categories and factor groups could be weighted. To address this issue, a normalized scoring approach was adopted wherein the total score for each factor group was averaged in order to calculate an average category score. The average category scores were then added together to determine the total normalized score for each alternative. The alternative with the highest total normalized score emerged as the overall preferred alternative and the alternative with the lowest total normalized score was determined to be the least preferred alternative.

The numerical evaluation methodology provides for an initial evaluation of alternatives for which short-listing can occur. Short-listing is intended to achieve a more refined analysis using the same set of evaluation criteria combined with additional design, related analysis and more focused input.

Table 1 – Final Evaluation Criteria/Factors

Factor Category	Indicator/Measure
1. Natural Environment	
1.A Terrestrial Ecosystems	
• Wetlands	- Impact on feature and function of PSWs or other wetlands (area; classification/quality, relative extent in relation to entire complex)
• Designated areas or areas that meet criteria for designation – natural heritage features per City and Region Official Plans, Environmentally Sensitive Policy Areas, Areas of Natural and Scientific Interest, Significant Woodlands, Significant Wildlife Habitat	- Impact on feature and function of designated / potentially designated areas (area; relative extent in relation to entire designated area)
• Vegetation & Flora	- Impact on feature and function of vegetation communities and flora (area, type quality, composition, relative extent; and potential for mortality, stress, composition change, - Impacts to species of conservation concern [SCC])
• Wildlife Habitat	- Impact on feature and function of wildlife habitat (amount, type, composition, quality) - Impact on feature and function of and/or reduction of interior habitat (area; fragmentation) - Effects on wildlife movement corridors or corridors between critical habitat features (e.g. foraging areas /breeding ponds) (number of crossings)
1.B Aquatic Ecosystems	
• Waterbodies and Watercourses providing fish habitat (including food / shelter)	- Number of water bodies and watercourse crossings, sensitivity of fish/fish habitat and thermal regime (warm, cool or cold water) - Extent (area) and function of riparian habitat removed

Factor Category	Indicator/Measure
	- Potential impact to aquatic SCC - Extent and type of fish habitat (in-stream) altered/displaced at water bodies and watercourse, including importance to aquatic ecosystem (e.g. spawning, nursery areas)
• Water Quality, Thermal Regime and Baseflow	- Encroachment on headwater areas (1st or 2nd Order Streams) (area) - Degree of interference with known groundwater discharge areas that contribute to creek baseflow - Effects on surface drainage/floodplain contributions to fish habitat subject to the Fisheries Act (i.e., downstream of the study area),
1.C Groundwater Resources	
• Ground Water Recharge Areas	- Encroachment on significant groundwater resources (Regional Recharge Area) (removal/disruption of function – area; depth)
• Groundwater Quality	- Potential for impacts to vulnerable areas (area)
• Shallow Groundwater Movement	- Potential for interference with existing flow patterns (baseflow) relative to proximity to surface water and significant groundwater discharge areas
1.D Surface Drainage	
• Watercourses; Drainage Catchments	- Need for diversion/channelization of existing drainage and catchment area impacts (area)
• Floodplain Function	- Impacts to Regulatory Floodplain
• Stormwater Management	- Opportunities to enhance roadway stormwater management measures, including coordination with/use of adjacent development facilities
1.E Species at Risk (SAR)	
• Vegetation Species at Risk	- Effects on plant SAR or habitat - Requirement for SAR permit under the Endangered Species Act
• Wildlife Species at Risk	- Effects on wildlife SAR or habitat

Factor Category	Indicator/Measure
	- Requirement for SAR permit under the Endangered Species Act
• Aquatic Species at Risk	- Effects on aquatic Species at Risk - Requirement for an ESA Permit - Requirement for a Species At Risk Act (SARA) Permit
• Species at Risk permits required for construction	- Permit requirement (yes, no); probability of obtaining permit(s) (high, medium, low); degree of associated risk to project implementation
2. Socio-economic Environment	
2.A Land Use Policy	
• Land use/resource designations and policies	- Degree of compatibility with Provincial, Regional and City growth/development goals/objectives policies (high, medium, low)
2.B Existing and Approved Land Uses	
• Existing or proposed business operations	- Business infrastructure/employees displaced (type; number) - Changes (+/-) in business exposure/viability
• Approved or proposed development proposals	- Impacts on approved development lands (area; exposure/viability)
• Planned Land Uses	- Impacts on planned land uses
2. C Communities	
• Impacts to individual properties/communities	- Encroachment on individual properties (number/area)
• Community connectivity (cultural/social linkages)	- Physical changes (+/-) to established community connectors (trails/roads) - Changes to delivery of community services (emergency; school transportation)
• Business & Employment opportunities	- Changes (+/-) in access to business & employment areas
2. D Noise	
• Noise Sensitive Areas	- Noise sensitive receptors experiencing increases (5 dB ranges) in sound levels over pre-existing conditions

Factor Category	Indicator/Measure
	- Noise sensitive receptors experiencing resultant absolute noise levels over 60 bDA
2. E Response Time for Emergency Services	
• Community Connectivity	- Changes to delivery to emergency services
3. Cultural Environment	
3.A Archeological Resources	
• Known and/or potential archaeological sites	- Number/type/significance of direct/indirect impacts to registered archaeological sites - Number/type/significance of direct/indirect impacts to known archaeological resources and/or areas of high archaeological potential
3.B Built Heritage	
• Built Heritage Features	- Number/type/significance of direct/indirect impacts to built heritage resources
3.C Cultural Heritage Landscapes	
• Cultural Heritage Landscapes	- Number/type/significance of direct/indirect impacts to cultural heritage landscapes
4. Transportation / Municipal Services and Utilities	
4.A Transportation Network/Infrastructure	
• Transportation Network	- Relieve future demand on other arterial / collector roads within the community - Potential impacts to local roads/intersections
• Traffic Operations	- Road safety and accessibility (sight distance; turning movements)
• Transportation policy initiatives • Capacity/capability to accommodate forecast traffic demand. • Provides for appropriate access to existing properties	- Capability to support municipal policy initiatives (transit, active transportation, roundabouts) - Impact on access to existing properties - Connectivity to Ira Needles Boulevard and Erb Street
4. B Municipal Services and Utilities	

Factor Category	Indicator/Measure
• Municipal Services	- Opportunities for connections to or logical extension of existing services - Provision of standard cross-section locations for services - Provision of continuous services
• SWM Facilities	- Ability to coordinate with road construction - Flexibility to implement SWM
• Utilities	- Degree of exposure of utilities and/or utility conflicts with SWM design
5. Financial / Technical	
5. A Financial	
• Cost	- Estimated capital cost ($) - Road length - Property requirements (number, area) and ease of acquisition - Extraordinary operations and maintenance requirements/costs (e.g., differences in the number of valves and water treatment requirements; collector road maintenance) - Species at Risk mitigation/overall benefit - Cultural heritage mitigation measures
5. B Technical Complexity	
• Roadway geometric design requirements	- Conformance to TAC and City of Waterloo/RMOW standards
• Structural/foundation/pavement design requirements	- Conformance to TAC and City of Waterloo standards - Requirements for pavement depth and/or foundation footprint, based on soil conditions - Structural requirements relative to capital cost and long term maintenance requirements
• Topographic; extent of cut/fill	• Potential for excessive borrow quantity or excessive off-site disposal of earth material (volume)

Factor Category	Indicator/Measure
	• Requirements for excessive (steep) grades (length) • Ability to maintain positive drainage, in combination with number of suitable drainage outlets
• Constructability	
• Legal Permissibility/Ability to Implement	

4.2 Development of Collector Road Alignment Alternatives

The WOP provides policies for the construction of infrastructure that will result in widespread adverse environmental impacts to Supporting “A” Natural Features or ecological functions but have demonstrated need. The Ira Needles Boulevard By-pass has been identified in the Westhill District Plan, City of Waterloo Official Plan, as identifed by Special Provision 41, and the City of Waterloo Integrated Multi-Modal Transportation Study.

The collector road alignment and stormwater management alternatives were developed having regard for a number of considerations including, feasibility, technical, environmental and financial criteria. Regard was also had to the following principles:

Natural Environment: The impact on the features and functions of terrestrial and aquatic ecosystems, groundwater resources, surface drainage and species at risk as it relates to the overall natural environment for West Waterloo, the Westhill District and surrounding area. The impacts were evaluated together with other considerations to determine if there are other alternatives: that have less impact on the natural environment; are feasible; and can appropriately address the problem / opportunity statement.

Transportation Network and Servicing Efficiency: The role of the preferred collector road alignment within the Study Area must also be considered as it relates to the overall broader transportation network for West Waterloo, the Westhill District and surrounding area.

Integration with the Existing Transportation Network: The preferred collector road alignment should be a logical extension of existing road patterns. The collector road should integrate with the existing and planned road network to the north, south and east. The transportation infrastructure developed will support appropriate road connections and facilitate pedestrian, cycling and potential transit route expansion.

Alternative to Increase Broader Road Network Capacity: The preferred collector road alignment should function to provide an alternative to efficiently disperse traffic to the existing arterial and collector road network without going through the Erb Street / Ira Needles roundabout.

Feasibility and Constructability: The preferred collector road alignment and stormwater management facility should be planned and designed to address the requirements of Hydro, Region and City and in a manner that can be implemented.

Agency Requirements and Comments: The proposed alternatives were circulated to agencies and evaluated in the context of comments received.

4.2.1 Summary of Alignment Alternatives

In response to agency input, the alternatives were categorized into two sections, including the north section and the south section allowing for a more robust evaluation of each section which could then be combined into a preferred road network. The collector road alternatives to be evaluated are shown on **Figure 9**.

Three collector road alternatives where initially identified for the north section and a fourth alternative was included in response to comments received from review agencies (Alternative N-4).

The four collector road alternatives (north section) are summarized as follows:

Waterloo Commons Connection (Alternative N-1)

This alignment would travel immediately east of and parallel to the Hydro One lands, including a crossing through a secondary environmental feature identified as a locally significant wetland and terminating at Erb Street West adjacent to the Waterloo Commons development to the east. Two intersection control alternatives were considered, including a signalized intersection and a roundabout. To assist the evaluation, an intersection control study was completed. It was concluded that a roundabout is preferred.

Hydro One Lands Connection (Alternative N-2)

This alignment includes an extension partially into the Hydro One corridor with the road then running parallel to and within the Hydro One Lands, terminating at Erb Street West. In consideration of the intersection control study that was completed, a roundabout at this intersection was also assumed.

Region of Waterloo Landfill Lands Connection (Alternative N-3)

This alignment includes a crossing through the Hydro One Lands extending through the Hydro corridor and into the Region of Waterloo Landfill. The alignment would then travel around the Region's Training Facility and Waste Management Offices terminating at the existing roundabout located at the entrances to the landfill and the West Waterloo Centre (Costco site).

Waterloo Commons Connection Adjustment (Alternative N-4)

This alternative was identified based on input from review agencies and in particular the Region of Waterloo and GRCA. Alternative N-4 is similar to Alternative N-1 with an adjustment to the alignment that is intended to minimize impacts on the locally significant wetland. This alignment runs through a portion of the Waterloo Commons development and intersects with Erb Street West at a location that is closer to the Erb Street / Ira Needles Boulevard roundabout compared to the other alternatives. In consideration of the intersection control study that was completed, a roundabout at this location was also assumed.

Four collector road network alternatives where developed for the south section and are summarized as follows:

(Alternative S-1)

This alignment would connect to the north-west roundabout at Thorndale Drive and travel immediately north through the 1130814 Ontario Inc. lands and Home Hardware lands. A right-in right-out intersection is assumed where this road intersects with Ira Needles Boulevard. Input at the public meeting included a request to consider a roundabout at this intersection. There is some merit to this suggestion. Ultimately, the Region will make a decision regarding the preferred intersection control.

(Alternative S-2)

This alignment includes a connection to the north-west roundabout at Thorndale Drive and crosses through the 1130814 Ontario Inc. lands and a portion of the Home Hardware lands. The alignment connects to the portion of the north section alternative that is in common with each of the south section alignment alternatives. As noted, a member of the public has requested the north section alternative intersection at Ira Needles Boulevard be developed as a roundabout.

(Alternative S-3)

This alternative is similar to S-2 with a variation in the alignment such that the road runs adjacent to the existing SWM retention area. This alignment provides a connection to the north-west roundabout which currently terminates at Thorndale Drive.

(Alternative S-4)

This alternative connects to the south-west roundabout at Thorndale Drive and crosses through the 1130814 Ontario Inc. lands and Home Hardware lands to the south. This alignment is furthest removed from Ira Needles Boulevard and has the longest length of all south section alternatives.

4.3 Evaluation of Collector Road Alignment Alternatives

Alignment alternatives were systematically assessed and evaluated relative to all criteria and factors in accordance with the selected methodology. Key agency staff, including City, Region and GRCA, were involved for preliminary input. A complete, thorough and extensive systematic evaluation of all alternatives was completed which led to the evaluation scores and alternative ranking.

The evaluation also considers relevant policies including (but not limited to) Policy 8.2.5 of the City of Waterloo's Official Plan and policies 8.4.6 and 8.4.7 of GRCA's Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation.

Policy 8.2.5 of the City of Waterloo Official Plan acknowledges there are circumstances in which infrastructure may impact Supporting "A" Natural Features. The City of Waterloo Official Plan sets out a process whereby a study is to be completed that considers the need for the infrastructure project, identifies alternatives to implement the project and evaluates the alternatives from a variety of perspectives. This report and related appendices has been prepared in satisfaction of the study requirements set out in Policy 8.2.5 of the City of Waterloo Official Plan.

Policy 8.4.6 and 8.4.7 of the GRCA's Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation provides direction for circumstances where public infrastructure within a wetland may be permitted. This report and related appendices has been prepared to demonstrate that alignment alternatives were evaluated and wetland boundaries were precisely identified to minimize wetland loss and interference. Mitigation, restoration and enhancement measures have been identified to address the removal of wetland areas within the Study Area.

The GRCA provides policies for the construction of public infrastructure, including roads, within a wetland. Construction may be permitted where a comprehensive plan supported by the GRCA demonstrates that all alternatives to avoid wetland loss or interference have been considered and that the proposed alignment minimizes wetland loss or interference to the greatest extent possible. Where the construction of public infrastructure in a wetland is unavoidable, it must be demonstrated that intrusions on significant natural features or hydrological or ecological functions are minimized and that best management practices will adequately restore and enhance features and functions.

4.3.1 Evaluation of Northern Alignment Alternatives

Appendix M includes the detailed evaluation and scores for each alternative. **Table 2** summarizes the evaluation scores and evaluation rankings for the northern alignment alternatives.

Table 2 - Evaluation Score for Northern Alignment Alternatives

Collector Road Alignment	Evaluation Score	Evaluation Ranking
Alternative N-1	**44.4**	**1**
Alternative N-2	**30.4**	**2**
Alternative N-3	**26.2**	**4**
Alternative N-4	**26.3**	**3**

It became clear through the evaluation process and ongoing consultation with review agencies, that alternatives N-2, N-3 and N-4 are not feasible from a variety of perspectives. Hydro One and the Region of Waterloo has confirmed road alignments that extend into the Region of Waterloo landfill site and/or that run parallel to and within the hydro corridor would not be supported. The Region of Waterloo has also confirmed that Alternative N-4 would not be supported given technical considerations relating to intersection spacing and proximity to the Erb Street/Ira Needles Boulevard roundabout. Alternative N-4 would also result in significant impacts to the Waterloo Commons development, the Canadian Tire Plaza as well as the anthropogenically created and locally significant wetland.

Based on the evaluation, Alternative N-1 is recommended as the preferred north section road alignment. It is acknowledged that Alternative N-1 will result in impacts to the anthropogenically created and locally significant wetland and that particular focus should be given to mitigation measures, restoration and enhancement measures. Section 7 of

this report includes recommended mitigation, restoration and enhancement measures to be implemented.

4.3.2 Evaluation of Southern Alignment Alternatives

Appendix M includes the detailed evaluation and scores for each alternative. **Table 3** summarizes the evaluation scores and evaluation rankings for the southern alignment alternatives.

Table 3 - Evaluation Score for Southern Alignment Alternatives

Collector Road Alignment	Evaluation Score	Evaluation Ranking
Alternative S-1	**29.6**	**3**
Alternative S-2	**42.0**	**2**
Alternative S-3	**45.3**	**1**
Alternative S-4	**25.8**	**4**

Based on the evaluation, Alternative S-3 is recommended as the preferred south section road alignment.

- From an environmental perspective, none of the alignments would impact PSW wetland, Species of Conservation Concern or their habitats or other high quality / sensitive vegetation communities or wildlife habitat. For some natural heritage factors, there is no difference among alternatives (i.e., aquatic habitat, water quality, groundwater resources, plant SAR, aquatic SAR). Since Alignment S-4 removes the greatest amount of habitat, including wetland W4 and potential wildlife SAR habitat, it is rated lowest for all applicable measures.

Alternative S-3 provides: a direct connection to the northern section of the collector road; appropriate spacing between intersections; regularly shaped development parcels; and can be coordinated with services and stormwater management facilities required for the development of the Westhill District.

4.3.3 Recommended Alignment Alternative

Figure 10 illustrates the recommended collector road alignment alternative for both the northern and southern sections.

The primary benefit observed from the use of the collector road alternatives is the diversion of traffic from Ira Needles Boulevard onto the proposed Boardwalk extension between Erb Street West and Thorndale Drive. From the analysis that was completed (**Appendix Q**), it was found that the preferred collector road would divert the greatest amount of traffic from the Ira Needles corridor at about 65% of the site traffic.

The preferred alternative was forecast to have the highest usage and divert the highest volumes from Ira Needles Boulevard resulting in the greatest benefit to the corridor. Microsimulation results indicate that compared to the "do nothing alternative", the preferred alternative reduces: the forecast overall network travel time by as much as 7.4% (Saturday Peak hour); overall travel delay by 7.8% (Saturday Peak hour); and fuel consumption by 7.3% (AM Peak hour). From a transportation planning perspective, the preferred alternative best addresses the problem/opportunity statement. From a technical and implementation perspective, the preferred alternative represents the most viable alternative.

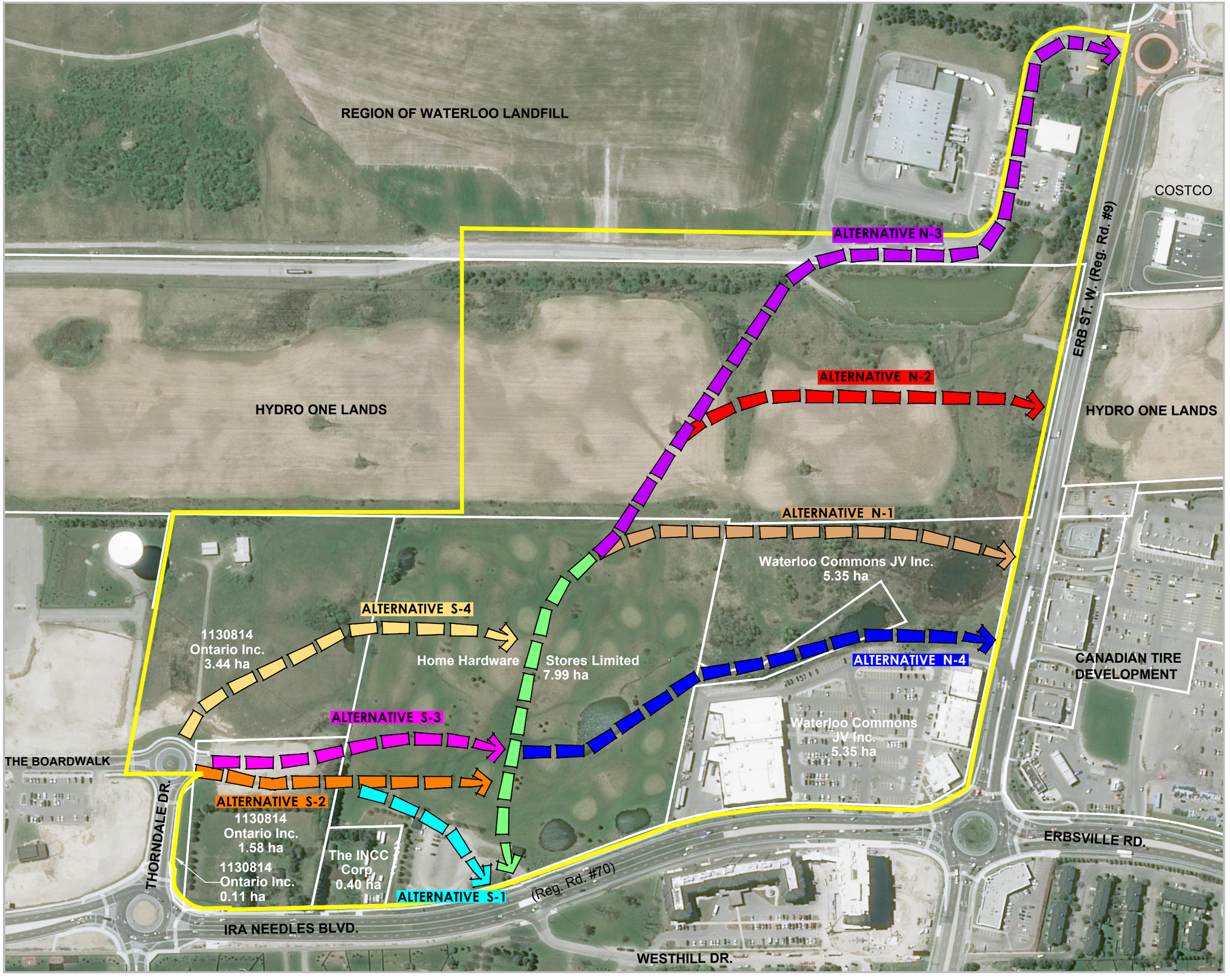
The preferred collector road alternative will result in a number of other transportation improvements in the area, including:

- Reduced traffic volumes at the Erb Street/ Ira Needles Blvd roundabout;
- Improved traffic flow and connections;
- Improved vehicular circulation and accessibility to the lands in Westhill, with independent access via the collector to Erb Street;
- Provides provision of a secondary vehicle connection to southbound traffic, for emergency response vehicles and access to/from the Regional landfill;
- Improved vehicular access to Waterloo Commons;
- Improved cycling and pedestrian connections; and
- Provides an opportunity to increase the number of people, jobs and public places served by public transit.

Figure 9

Potential Collector Road Alignment Alternatives - Evaluation

West Hill District
City of Waterloo
Region of Waterloo



LEGEND

- Study Area
- Parcel Fabric (MPAC)
- The INCC Corp. Property Ownership

Air Photo Source: Bing

DATE: June 18, 2020
FILE: Y594E
SCALE: 1:3,000
DRAWN: DGS

north

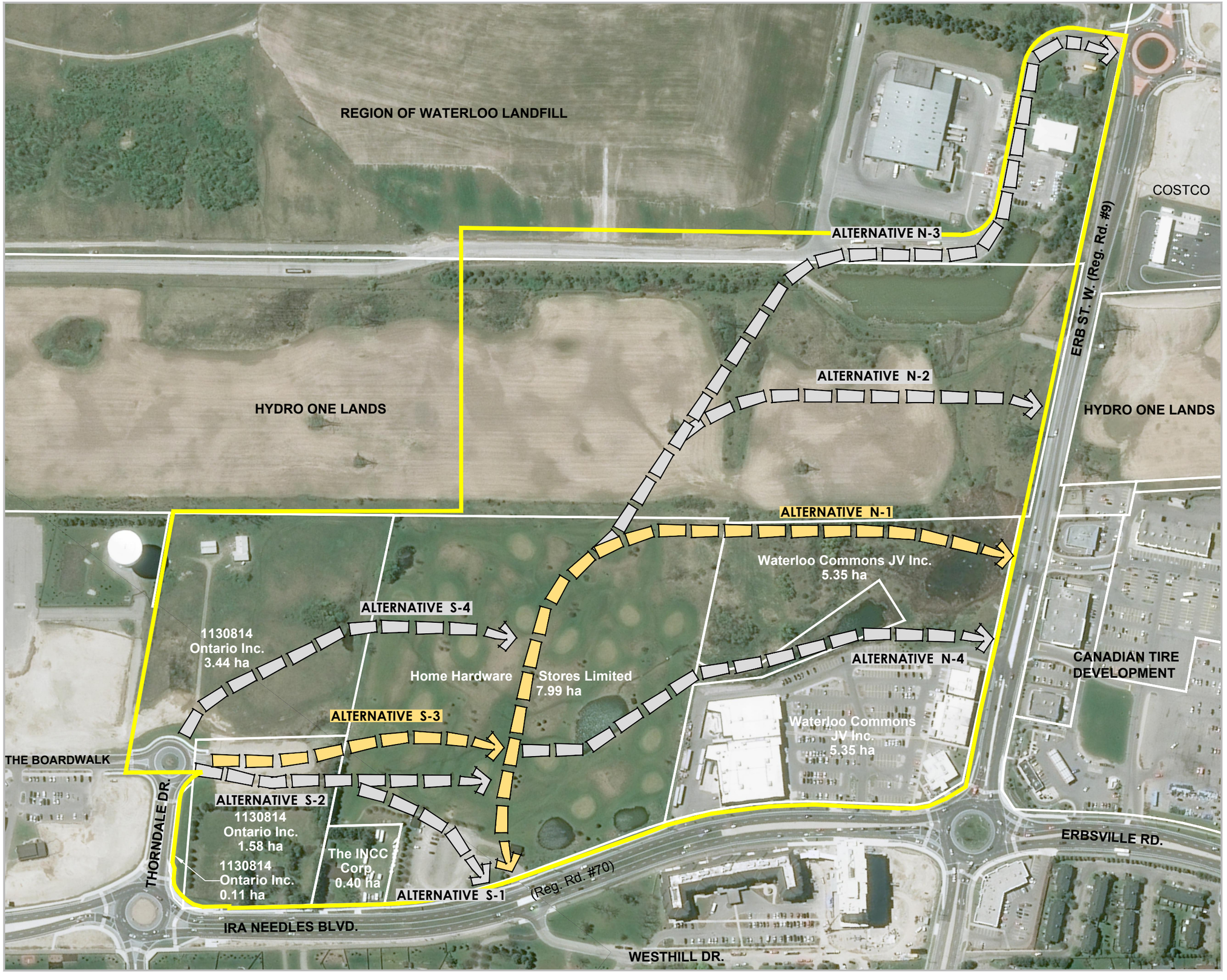
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Figure 10

Collector Road Alignment Alternatives - Preliminary Preferred Alignment

West Hill District
City of Waterloo
Region of Waterloo



LEGEND

- Study Area
- Parcel Fabric (MPAC)
- The INCC Corp. — Property Ownership
- Collector Road Preliminary Preferred Alignment

Air Photo Source: Bing

DATE: June 18, 2020
FILE: Y594E
SCALE: 1:3,000
DRAWN: DGS

north

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5.0 GENERAL DESCRIPTION AND DESIGN FEATURES OF THE PREFERRED ROAD ALIGNMENT ALTERNATIVES

5.1 General Description

The extension of the Boardwalk is being planned and designed as a City collector road and will facilitate pedestrian, bicycle and vehicular movements between Erb Street and Ira Needles Boulevard. Access to abutting properties will be permitted. The road allowance will be designed to accommodate two-way traffic flow with one travel lane in each direction. In addition to vehicular traffic, the road allowance will also accommodate bicycle lanes in either direction. The preferred alternative includes a combination of one bicycle lane and a multi-use trail on opposite sides of the road.

In consideration of the intersection control study that was completed (**Appendix L**), the intersection of the collector road at Erb Street will be designed as a roundabout consistent with other roundabouts within this section of the Erb Street corridor. The intersection control study includes a preliminary roundabout design was completed by MTE Consultants as part of the study.

The recommended road network requires a crossing through environmental features, and would travel immediately east of the Hydro One lands, with a terminus at the intersection of Erb Street West adjacent to the commercial development. The recommended road network includes alternatives N-1 and S-3 identified in **Figure 10**.

5.2 Road Geometry, Cross-Section and General Design Criteria

The recommended collector road is classified and is to be constructed as a minor collector road. The minor collector road will have a 22 metre right-of-way and comply with the City of Waterloo collector road design standards. Road cross-sections are to be in accordance with City of Waterloo Development Engineering Manual, as may be amended from time to time, and TAC guidelines with adjustments as necessary to appropriately transition to

existing right-of-way widths based upon the City's general geometric standards. All other geometric standards are to be in accordance with the City of Waterloo Development Engineering Manual (2013) as may be amended from time to time.

5.3 Road Right-of-Way Requirements

The collector road will have a minimum right-of-way width of 22 metres. The collector road will terminate at Erb Street as a roundabout. The preliminary functional design of the roundabout prepared by MTE and dated August, 2019 will be used as input to Walter Fedy in preparing a final roundabout design on behalf of the Region of Waterloo. The local street that connects the collector road to Ira Needles Boulevard will have a minimum right-of-way width of 20 metres. Daylight triangles associated with the local road intersection with Ira Needles Boulevard will be determined through detailed design and at the subdivision stage. At this time, consideration may be given to developing a roundabout at the intersection, or alternatively, this intersection will be developed as a right-in/right-out movement.

Final land requirements and any temporary construction easements will be confirmed during the detailed design phase and as part of engineering submissions associated with subdivision approvals and/or the reconstruction of Erb Street.

5.4 Road Network Changes, New Intersections, Existing Property Access and Staging Considerations

The EA for the reconstruction of Erb Street has been finalized and anticipates a roundabout at the intersection of the new collector road and Erb Street may be constructed. The reconstruction of Erb Street is planned to occur in two phases. Phase 1 includes the section of Erb Street located to the east of the Ira Needles Boulevard / Erb Street roundabout. Phase 1 is scheduled to commence in 2020. Phase 2 includes the section of Erb Street located to the west of the Ira Needles Boulevard / Erb Street roundabout and includes the anticipated roundabout on Erb Street at the intersection with the new collector road. There are advantages and efficiencies to coordinating the construction of the roundabout with the Phase 2 improvements.

The balance of the collector road can be staged based on development objectives. Each section of road construction should be coordinated with stormwater management facilities necessary to attenuate the collector road as it is built. Servicing infrastructure such as watermains and sanitary sewers are to be coordinated with road construction. Sanitary drainage is generally from west to east and as a result, any staging of the collector road would generally be from east to west and would be constructed together with each stage of development.

6.0 IDENTIFICATION AND ASSESSMENT OF STORMWATER MANAGEMENT FACILITIES

6.1 Stormwater Management Existing Conditions and Overview

Storm servicing for the Study Area is to be coordinated with the preferred collector road alignment. The Study Area's storm outlet is located at the north end of the Study Area and includes an existing 900mm diameter storm sewer and a smaller diameter orifice. The storm sewer conveys storm runoff northerly through the Clair Meadows Subdivision and discharges directly to Clair Creek.

There are currently two stormwater management ponds within the Study Area, including:

- A SWM pond located in proximity to Erb Street. This storm pond was installed prior to 2004, is owned and operated by the Region of Waterloo, and attenuates runoff from Ira Needles Boulevard, Waterloo Commons and lands east of Ira Needles Boulevard.
- A westerly SWM pond located in the hydro corridor. This storm pond was installed in the early/mid 1990s, is owned and operated by the Region of Waterloo, and treats runoff from the Regional landfill site.

Historically, the lands which are now developed as the Region's landfill site did not pond in the vicinity of Erb Street. Drainage patterns have changed as a result of the landfill development. This change, in combination with the raised invert elevation of the previous culvert and the smaller diameter of the more recently constructed orifice associated with the storm sewer, has resulted in the creation of the wetland located on the south side of Erb Street. This wetland functions in its entirety as a stormwater management detention facility, provides a settling function and is considered to be an anthropogenic wetland. This wetland is regulated by GRCA and designated as a Supporting "A" Natural Feature in the City of Waterloo Official Plan. MTE's report included as **Appendix O** provides a more detailed history and background relating to the creation of the anthropogenic wetland. Regardless of the background relating to this feature, GRCA's Policy (Policies 8.4.6 and 8.4.7) and the City of Waterloo's Official Plan (Policy 8.2.5) set out process

considerations for removing wetlands that are impacted by infrastructure projects such as roads and stormwater management facilities.

6.2 Evaluation Criteria and Related Scoring Methodology

Two objectives of this study include determining a preferred alignment of a collector road network and stormwater management strategy. A process for evaluating collector road and stormwater management alternatives was developed and included the systematic evaluation of the alternatives using the selected evaluation criteria and relevant planning considerations.

Table 1 of this report includes the final evaluation criteria for assessing the collector road network and stormwater management alternatives. The evaluation criteria have been grouped into five factor categories including: natural environment; socio-economic environment; cultural environment; transportation/municipal services and utilities; and financial / technical considerations. Within each category, there are various factor groups.

The Numerical Evaluation approach was used as the preferred methodology relating to the selection of a collector road network and stormwater management alternative. This methodology requires a “must score” approach. For each criteria/factor the least preferred alternative received a score of 1 and the most preferred alternative received a score of 10. All other alternatives were scored between these values with ties permitted.

It was recognized that different factor categories and factor groups do not have the same number of criteria/factors and as a result certain factor categories and factor groups could be weighted. To address this issue, a normalized scoring approach was adopted wherein the total score for each factor group was averaged in order to calculate an average category score. The average category scores were then added together to determine the total normalized score for each alternative. The alternative with the highest total normalized score emerged as the overall preferred alternative and the alternative with the lowest total normalized score was determined to be the least preferred alternative.

The numerical evaluation methodology provides for an initial evaluation of alternatives for which short-listing can occur. Short-listing is intended to achieve a more refined analysis using the same set of evaluation criteria combined with additional design, related analysis and more focused input.

6.3 Development of Stormwater Management Alternatives

The collector road alignment and stormwater management facility alternatives were developed based on feasibility from a technical, environmental and financial perspective and included having regard for following principles:

Natural Environment: The impact on the features and functions of terrestrial and aquatic ecosystems, groundwater resources, surface drainage and species at risk as it relates to the overall natural environment for West Waterloo, the Westhill District and surrounding area. The impacts will be understood and evaluated together with other considerations to determine if other alternatives that have less impact on the natural environment are feasible, appropriately address, the problem / opportunity statement and to develop appropriate mitigation, restoration and enhancement strategies.

Socio-Economic Environment: The proposed stormwater management facilities should be integrated with the existing and planned development of The Boardwalk and balance of the Westhill District. The facilities should be cost effective both from a construction and long-term maintenance perspective, be implementable and designed in a manner that provides for the efficient use of land.

Cultural Environment: The proposed stormwater management facility should be designed to mitigate against significant or direct impacts to archaeological resources and/or built heritage features and cultural heritage landscapes.

Transportation / Municipal Services and Utilities: The stormwater management facilities within the Study Area must consider runoff from development and the transportation network and be coordinated with the cost effective provision of municipal services and utilities.

Feasibility and Constructability: The collector road network, servicing and stormwater management strategy must be planned to address the requirements of Hydro, the Region and the City in a manner that can be implemented. This is particularly important since the collector road, services and stormwater management facilities will ultimately be owned and maintained by the City of Waterloo and some of the alternatives are located on lands owned by Hydro and the Region. The expropriation of lands necessary to implement those alternatives located on lands owned by Hydro and the Region highly unlikely.

Agency Requirements and Comments: The proposed alternatives were circulated to agencies and evaluated in the context of comments received.

6.3.1 Summary of Stormwater Management Alternatives

Five stormwater management facility (SWMF) alternatives were developed and are shown on **Figure 11**. The five alternatives are summarized as follows:

Alternative 1 (SWM-1)

This alternative is considered the 'Do Nothing' alternative. In this alternative, the preferred north section of the collector road will bisect the existing regional storm detention storage area and the wetland area north of the Waterloo Commons. The preferred south section collector road does not have a water quality control system upstream of the wetland and will outlet to the existing Erb Street SWMF. In this alternative flooding will occur over the preferred north section of the collector road in the vicinity of Erb Street.

Alternative 2 (SWM-2)

This alternative will be serviced by seven private SWM facilities and three public SWM facilities. The private SWM facilities will be located as follows: two private SWM facilities will be located on the east and west sides of the collector road on the 1130814 Ontario Inc. Lands; one private SWMF will be located on The INCC Corp. lands; one private SWMF will be located on the Waterloo Commons JV Inc. Lands to the east of collector road; and three private SWM facilities will be located on the Home Hardware Lands - one SWMF will be located to east of the south collector road alternative and two SMW facilities will be located on the east and west side of the north collector road alternative. The public SWM facilities will be located as follows: two publicly owned SWM facilities will be located on the east (owned by the Region) and west (owned by the City) sides of the collector road alternative within the Waterloo Commons JV Inc. lands and part of the Hydro One lands; and one public SWMF will be located entirely on the Hydro One lands to the west of the collector road alternative.

Alternative 2 will provide for a dual sewer within the municipal right of way and will allow for two water sewers. One sewer will operate as a "clean" water sewer for treated water from private sites and the other sewer will operate as a "dirty" water sewer for road drainage. The public SWM facilities will be located downstream of roadway with drainage towards Erb Street. Alternative 2 will allow for double routings for large storm events. This alternative will also require extensive infrastructure with on-site private SWMF and public SWMF. In this alternative flooding will likely occur over the preferred north section of the collector road in the vicinity of Erb Street.

Alternative 3 (SWM-3)

This alternative will be serviced by six public SWMF with dedicated storm outlets for each facility. The location of the SWM facilities on the Study Area will be as follows: one public (owned by the City) SWMF will be located on the Cressman lands on the west side of the collector road alternative; one public (owned by the City) SWMF will be located on the Home Hardware Lands on the east side of the collector road alternative; three SWM facilities (one owned by the Region and two owned by the City) will be located on the Waterloo Commons JV Inc. Lands; and one SWMF will be located on the Hydro One lands to the west of the collector road alternative.

Similar to Alternative 2, Alternative 3 will provide dual sewers that operate with a “clean” water sewer for treated water from private sites and a “dirty” water sewer for road drainage. Dual sewers will be provided for the Cressman SWMF, Home Hardware SWMF and road drainage.

Alternative 4 (SWM-4)

This alternative proposes three public SWM facilities with dedicated storm outlets for each facility. Two of the SWM facilities will be located to the east of the collector road network on the Home Hardware Lands and Waterloo Commons JV Inc. Lands. The other SWMF will be located within the Hydro One Lands to the west of the collector road network. A dual sewer system will service the collector roadway section in the Waterloo Commons JV Inc. Lands. This alternative will remove two existing SWM facilities on the Waterloo Commons JV Inc. lands and Hydro One lands. This alternative will minimize infrastructure cost and maintenance by providing the minimal number of municipal SWM facilities and providing a smaller section of dual sewer systems.

Alternative 5 (SWM-5)

This alternative was developed in consideration of feedback received from the City of Waterloo. City Staff raised concern with the total number of SWM facilities as well as the attenuation of the collector road within the hydro corridor. This alternative includes attenuating existing drainage from the Region’s landfill within the hydro corridor as it now exists and constructing two new stormwater management facilities. One stormwater management facility will be publically owned and located on the Home Hardware Lands. The other facility will be privately owned and located on the Waterloo Commons property. Drainage from the collector road will be directed to the two new facilities. The stormwater management ponds will be designed as extended detention wetland facilities to reduce impacts associated with phosphorus, suspended solids and bacteria and to provide thermal mitigation.

6.4 Evaluation of Stormwater Management Alternatives

Stormwater management alternatives were systematically assessed and evaluated relative to all criteria and factors in accordance with the selected methodology. Key agency staff, including City, Region and GRCA, were involved for preliminary input. A complete, thorough and extensive systematic evaluation of all alternatives was completed which led to the evaluation scores and alternative ranking.

Policy 8.4.14 of the GRCA's Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation provides direction for circumstances where SWM facilities (quantity control only) may be permitted within a wetland. In the current condition the wetland provides both a detention and settling (quality control) function. SWM facilities may be permitted where a comprehensive plan supported by the GRCA demonstrates that all alternatives to avoid wetland loss or interference have been considered and that the proposed SWM facilities minimize wetland loss or interference to the greatest extent possible. This report and related appendices has been prepared to demonstrate that stormwater alternatives were evaluated and wetland boundaries were precisely identified to minimize wetland loss and interference. Construction of SWM facilities in a wetland in the Study Area is unavoidable and the supporting studies referenced herein demonstrate how the hydrologic and ecological functions of the wetland will be protected, restored and/or enhanced,

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6.4.1 Evaluation of Stormwater Management Facility Alternatives

Appendix N includes the detailed evaluation and scores for each stormwater management alternative. Table 4 summarizes the evaluation scores and rankings.

Table 4 - Evaluation Score for Stormwater Management Facility Alternatives

SWM Facility Alternatives	Evaluation Score	Evaluation Ranking
SWM - 1	**30.8**	**5**
SWM - 2	**32.9**	**3**
SWM - 3	**33.3**	**4**
SWM - 4	**39.6**	**2**
SWM - 5	**42.8**	**1**

Based on the evaluation, Alternative SWM-5 is recommended as the preferred stormwater management alternative.

Alternative SWM-5 replaces the existing Erb Street Detention Facility with two new SWM facilities to the east of the preferred north section road alignment. Existing storage within the hydro corridor will be maintained, but this option will eliminate all storage east of the preferred road alignment (relative to the current condition where a substantial area is flooded). The preferred alternative minimizes the total number of new facilities to be maintained by the City of Waterloo and will satisfy stormwater management objectives outlined in the current Ministry of the Environment SWM Planning and Design Manual (2003) as well as other objectives outlined in the Subwatershed 314 Management Plan. To this end, the recommended stormwater management strategy will result in a net benefit to Clair Creek as enhanced level quality control and extended detention will be provided. The recommended stormwater management strategy coordinates other elements of the storm drainage system with the collector road network in a manner that is both cost effective and efficient. The recommended collector road and stormwater management alternatives are supported by land owners and achieves an acceptable pattern of development.

6.4.2 Recommended Stormwater Management Alternative

Figure 12 illustrates the recommended stormwater management alternative for the Study Area. MTE has prepared a companion report entitled: “Westhill District Plan – Preliminary Stormwater Management Report” (May 22, 2020). The Preliminary Stormwater Management Report: sets out existing conditions and background information; confirms stormwater management objectives; confirms stormwater management design criteria; elaborates upon the preferred stormwater management strategy; includes a stormwater management design; and details erosion and sediment control measures as well as facility maintenance and operation recommendations.

This report together with MTE’s Preliminary Stormwater Management Report are the guiding documents to be considered in the preparation of functional servicing and stormwater management reports that are to be required to support development applications within the Study Area.

The recommended stormwater management alternative has the following benefits:

1. The total number of stormwater management facilities to be maintained by the City of Waterloo is minimized.

2. Existing detention storage within the hydro corridor is maintained and additional land acquisition is not required.

3. There is flexibility with respect to staging and implementation recognizing that storm flows associated with Ira Needles Boulevard can be attenuated by either Wetland 1 or Wetland 2.

4. The storm ponds will be designed as wetlands and will reproduce the wetland function associated with the existing detention storage that occurs within the anthropogenic wetland.

5. Habitat creation can occur through the design of the proposed storm ponds and recommendations to this effect are included in Section 7 of this report.

MTE FILE No: 34280-101-MS11.0
PRELIMINARY SWM ALTERNATIVE 3
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EXISTING REGION OF WATERLOO LANDFILL POND

HYDRO CORRIDOR

KW ZONE 6 ELEVATED TANK

87 IRA NEEDLES BOULEVARD

41 IRA NEEDLES BOULEVARD

WATERLOO COMMONS

66 IRA NEEDLES BOULEVARD

THE BOARDWALK

73 IRA NEEDLES BOULEVARD

65 IRA NEEDLES BOULEVARD

THORNDALE DRIVE

ERB STREET

WESTHILL DRIVE

IRA NEEDLES BOULEVARD

750mmø 825mmø 900mmø 900mmø

LEGEND

- PROPERTY BOUNDARY
- EXISTING REGIONAL STORM DETENTION STORAGE AREA
- EASEMENT
- EXISTING SPOT ELEVATIONS/CONTOURS
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING STORM SEWER
- EXISTING EMBANKMENT (SLOPE AS NOTED)
- LIMIT CONSTRAINT LEVEL 1
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.0

Scale: 1:2500
Date: OCT.16/18

The Westhill Landowners Group

101 IRA NEEDLES BOULEVARD WATERLOO, ON

WESTHILL DISTRICT PLAN
ERB STREET CONNECTION REVIEW

ERB STREET WATERLOO, ON

EXISTING CONDITIONS

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March 6, 2020 - 1:02 p.m. - Plotted By: jahoerner

MTE FILE No: 34280-101-MS11.1.1
PRELIMINARY SWM ALTERNATIVE 1
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March 6, 2020 - 1:58 p.m. - Plotted By: jshaver

EXISTING
REGION OF WATERLOO
LANDFILL POND

HYDRO CORRIDOR

KW ZONE 6
ELEVATED TANK

87 IRA NEEDLES
BOULEVARD

41 IRA NEEDLES
BOULEVARD

1-1
77.15

WATERLOO
COMMONS

66 IRA NEEDLES
BOULEVARD

THE
BOARDWALK

THORNDALE DRIVE

73 IRA NEEDLES
BOULEVARD

65 IRA
NEEDLES
BOULEVARD

IRA NEEDLES BOULEVARD

WESTHILL DRIVE

ERB STREET WEST

750mmø 825mmø
900mmø 900mmø

LEGEND

- EXISTING REGIONAL STORM DETENTION STORAGE AREA
- CONCEPTUAL STORM SEWER(UNTREATED)
- STORM SEWER(TREATED)
- COLLECTOR ROAD
- X — REMOVE SWM POND
- P — (PRIVATE) SWM POND OWNERSHIP
- C — (CITY) SWM POND OWNERSHIP
- R — (REGION) SWM POND OWNERSHIP
- 1-1 / 19.00 — CATCHMENT I.D. CATCHMENT AREA (HA)
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.1.1

Scale: 1:2500
Date: OCT.16/18

The Westhill
Landowners Group

101 IRA NEEDLES BOULEVARD WATERLOO, ON

WESTHILL DISTRICT PLAN
ERB STREET CONNECTION
REVIEW

ERB STREET WATERLOO, ON

ALTERNATIVE 1
CATCHMENT FIGURE

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PRELIMINARY SWM ALTERNATIVE 1
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March 6, 2020 - 1:04 p.m. - Plotted By: jshaver

EXISTING
REGION OF WATERLOO
LANDFILL POND

HYDRO CORRIDOR

KW ZONE 6
ELEVATED TANK

87 IRA NEEDLES BOULEVARD

41 IRA NEEDLES BOULEVARD

WATERLOO COMMONS

66 IRA NEEDLES BOULEVARD

THE BOARDWALK

THORNDALE DRIVE

73 IRA NEEDLES BOULEVARD

65 IRA NEEDLES BOULEVARD

IRA NEEDLES BOULEVARD

WESTHILL DRIVE

ERB STREET WEST

750mmø 825mmø 900mmø 900mmø 900mmø

LEGEND

- EXISTING REGIONAL STORM DETENTION STORAGE AREA
- CONCEPTUAL STORM SEWER COLLECTOR ROAD
- (P) (PRIVATE) SWM POND OWNERSHIP
- (C) (CITY) SWM POND OWNERSHIP
- (R) (REGION) SWM POND OWNERSHIP
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.1

Scale: 1:2500
Date: OCT.16/18

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101 IRA NEEDLES BOULEVARD WATERLOO, ON

WESTHILL DISTRICT PLAN
ERB STREET CONNECTION REVIEW

ERB STREET WATERLOO, ON

ALTERNATIVE 1
FIGURE

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MTE FILE No: 34280-101-MS11.2
PRELIMINARY SWM ALTERNATIVE 3
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EXISTING
REGION OF WATERLOO
LANDFILL POND

HYDRO CORRIDOR

KW ZONE 6
ELEVATED TANK

87 IRA NEEDLES
BOULEVARD

41 IRA NEEDLES
BOULEVARD

WATERLOO
COMMONS

66 IRA NEEDLES
BOULEVARD

THE
BOARDWALK

73 IRA NEEDLES
BOULEVARD

65 IRA
NEEDLES
BOULEVARD

THORNDALE DRIVE

IRA NEEDLES BOULEVARD

WESTHILL DRIVE

ERB STREET

750mmø
825mmø
900mmø
900mmø
900mmø

LEGEND

- PROPOSED STORM DETENTION STORAGE AREA
- CONCEPTUAL STORM SEWER(UNTREATED)
- STORM SEWER(TREATED)
- COLLECTOR ROAD
- (P) (PRIVATE) SWM POND OWNERSHIP
- (C) (CITY) SWM POND OWNERSHIP
- (R) (REGION) SWM POND OWNERSHIP
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.2

Scale: 1:2500
Date: OCT.16/18

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101 IRA NEEDLES BOULEVARD WATERLOO, ON

WESTHILL DISTRICT PLAN
ERB STREET CONNECTION
REVIEW
ERB STREET WATERLOO, ON

ALTERNATIVE 2
FIGURE

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March 6, 2020 - 1:57 p.m. - Plotted By: jshaver

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PRELIMINARY SWM ALTERNATIVE 3
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HYDRO CORRIDOR

EXISTING
REGION OF WATERLOO
LANDFILL POND

KW ZONE 6
ELEVATED TANK

87 IRA NEEDLES BOULEVARD

41 IRA NEEDLES BOULEVARD

73 IRA NEEDLES BOULEVARD

65 IRA NEEDLES BOULEVARD

66 IRA NEEDLES BOULEVARD

WATERLOO COMMONS

THE BOARDWALK

THORNDALE DRIVE

ERB STREET WEST

IRA NEEDLES BOULEVARD

WESTHILL DRIVE

750mmø 825mmø 900mmø 900mmø 900mmø

3-7 52.51
1-4 3.530
1-5 1.682
1-7 1.122
1-6 3.231
1-8 1.521
1-3 0.701
1-1 0.397
1-2 1.369
3-1 5.480
2-1 5.561

LEGEND

- SWM FACILITIES
- CONCEPTUAL STORM SEWER(UNTREATED)
- STORM SEWER(TREATED)
- COLLECTOR ROAD
- X — REMOVE SWM POND
- P — (PRIVATE) SWM POND OWNERSHIP
- C — (CITY) SWM POND OWNERSHIP
- R — (REGION) SWM POND OWNERSHIP
- 1-1 / 19.00 — CATCHMENT I.D. CATCHMENT AREA (HA)
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.2.1

Scale: 1:2500
Date: OCT.16/18

The Westhill Landowners Group
101 IRA NEEDLES BOULEVARD WATERLOO, ON

WESTHILL DISTRICT PLAN
ERB STREET CONNECTION REVIEW
ERB STREET WATERLOO, ON

ALTERNATIVE 2
CATCHMENT FIGURE

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PRELIMINARY SWM ALTERNATIVE 3
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EXISTING
REGION OF WATERLOO
LANDFILL POND

HYDRO CORRIDOR

KW ZONE 6
ELEVATED TANK

87 IRA NEEDLES BOULEVARD

41 IRA NEEDLES BOULEVARD

WATERLOO COMMONS

66 IRA NEEDLES BOULEVARD

THE BOARDWALK

73 IRA NEEDLES BOULEVARD

65 IRA NEEDLES BOULEVARD

THORNDALE DRIVE

IRA NEEDLES BOULEVARD

WESTHILL DRIVE

ERB STREET

750mmø 825mmø 900mmø 900mmø 900mmø

WEST

LEGEND

- SWM FACILITIES
- CONCEPTUAL STORM SEWER(UNTREATED)
- STORM SEWER(TREATED)
- COLLECTOR ROAD
- (P) (PRIVATE) SWM POND OWNERSHIP
- (C) (CITY) SWM POND OWNERSHIP
- (R) (REGION) SWM POND OWNERSHIP
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.3

Scale: 1:2500
Date: OCT.16/18

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101 IRA NEEDLES BOULEVARD WATERLOO, ON

WESTHILL DISTRICT PLAN
ERB STREET CONNECTION REVIEW

ERB STREET WATERLOO, ON

ALTERNATIVE 3
FIGURE

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EXISTING
REGION OF WATERLOO
LANDFILL POND

HYDRO CORRIDOR

3-7
52.51

KW ZONE 6
ELEVATED TANK

87 IRA NEEDLES
BOULEVARD

41 IRA NEEDLES
BOULEVARD

1-2
7.99

2-1
5.561

1-1
5.53

THE
BOARDWALK

THORNDALE DRIVE

73 IRA NEEDLES
BOULEVARD

65 IRA
NEEDLES
BOULEVARD

3-1
5.480

WESTHILL DRIVE

IRA NEEDLES BOULEVARD

WATERLOO
COMMONS
66 IRA NEEDLES
BOULEVARD

ERB STREET WEST

750mmø 825mmø
900mmø 900mmø

ERB STREET

IRA NEEDLES BOULEVARD

LEGEND

- SWM FACILITIES
- CONCEPTUAL STORM SEWER(UNTREATED)
- STORM SEWER(TREATED)
- COLLECTOR ROAD
- X — REMOVE SWM POND
- P — (PRIVATE) SWM POND OWNERSHIP
- C — (CITY) SWM POND OWNERSHIP
- R — (REGION) SWM POND OWNERSHIP
- 1-1 19.00 — CATCHMENT I.D. CATCHMENT AREA (HA)
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.3.1

Scale: 1:2500
Date: OCT.16/18

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101 IRA NEEDLES BOULEVARD WATERLOO, ON

WESTHILL DISTRICT PLAN
ERB STREET CONNECTION
REVIEW

ERB STREET WATERLOO, ON

ALTERNATIVE 3
CATCHMENT FIGURE

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MTE FILE No: 34280-101-MS11.4
PRELIMINARY SWM ALTERNATIVE 3
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HYDRO CORRIDOR

EXISTING
REGION OF WATERLOO
LANDFILL POND

KW ZONE 6
ELEVATED TANK

87 IRA NEEDLES BOULEVARD

41 IRA NEEDLES BOULEVARD

WATERLOO COMMONS
66 IRA NEEDLES BOULEVARD

THE BOARDWALK

73 IRA NEEDLES BOULEVARD

65 IRA NEEDLES BOULEVARD

THORNDALE DRIVE

IRA NEEDLES BOULEVARD

WESTHILL DRIVE

ERB STREET WEST

750mmø 825mmø 900mmø 900mmø 900mmø

P
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C
R

LEGEND

- SWM FACILITIES
- CONCEPTUAL STORM SEWER(UNTREATED)
- STORM SEWER(TREATED)
- COLLECTOR ROAD
- (PRIVATE) SWM POND OWNERSHIP
- REMOVE SWM POND
- (CITY) SWM POND OWNERSHIP
- (REGION) SWM POND OWNERSHIP
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.4

Scale: 1:2500
Date: OCT.16/18

The Westhill Landowners Group

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WESTHILL DISTRICT PLAN
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ERB STREET WATERLOO, ON

ALTERNATIVE 4
FIGURE

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MTE FILE No: 34280-101-MS11.4.1
PRELIMINARY SWM ALTERNATIVE 3
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HYDRO CORRIDOR

EXISTING
REGION OF WATERLOO
LANDFILL POND

KW ZONE 6
ELEVATED TANK

87 IRA NEEDLES BOULEVARD

41 IRA NEEDLES BOULEVARD

73 IRA NEEDLES BOULEVARD

65 IRA NEEDLES BOULEVARD

66 IRA NEEDLES BOULEVARD

WATERLOO COMMONS

THE BOARDWALK

THORNDALE DRIVE

ERB STREET WEST

IRA NEEDLES BOULEVARD

WESTHILL DRIVE

750mmø 825mmø 900mmø 900mmø 900mmø

3-7
52.51

1-1
7.99

2-1
5.561

3-1
5.480

LEGEND

- SWM FACILITIES
- CONCEPTUAL STORM SEWER(UNTREATED)
- STORM SEWER(TREATED)
- COLLECTOR ROAD
- X — REMOVE SWM POND
- P — (PRIVATE) SWM POND OWNERSHIP
- C — (CITY) SWM POND OWNERSHIP
- R — (REGION) SWM POND OWNERSHIP
- 1-1 19.00 — CATCHMENT I.D. CATCHMENT AREA (HA)
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.4.1 Scale: 1:2500 Date: OCT.16/18

The Westhill Landowners Group

101 IRA NEEDLES BOULEVARD WATERLOO, ON

WESTHILL DISTRICT PLAN
ERB STREET CONNECTION REVIEW

ERB STREET WATERLOO, ON

ALTERNATIVE 4
CATCHMENT FIGURE

MTE
Engineers, Scientists, Surveyors

Project No.: 34280-101

March 6, 2020 - 1:12 p.m. - Plotted By: jshaver

MTE FILE No: 34280-101-MS11.5
PRELIMINARY SWM ALTERNATIVE 5
P:\P\34280\101\WORKING\XXX\34280-101-MS11_XXX-WAR-03-2020.DWG

EXISTING REGION OF WATERLOO LANDFILL POND

HYDRO CORRIDOR

SIGNIFICANT WILDLIFE HABITAT (WSP) (TYP.)

SUPPORTING 'B' FEATURES (WSP; PER WATERLOO OP) (TYP.)

KW ZONE 6 ELEVATED TANK

87 IRA NEEDLES BOULEVARD

41 IRA NEEDLES BOULEVARD

OTHER WETLANDS (WSP; PER WATERLOO OP) (TYP.)

SUPPORTING 'A' FEATURES (WSP; PER WATERLOO OP) (TYP.)

WATERLOO COMMONS

66 IRA NEEDLES BOULEVARD

THE BOARDWALK

THORNDALE DRIVE

73 IRA NEEDLES BOULEVARD

65 IRA NEEDLES BOULEVARD

IRA NEEDLES BOULEVARD

WESTHILL DRIVE

ERB STREET WEST

750mmø 825mmø 900mmø 900mmø 900mmø

C C X R

LEGEND

- SWM FACILITIES
- EXISTING REGIONAL STORM DETENTION STORAGE AREA
- CONCEPTUAL STORM SEWER(UNTREATED)
- STORM SEWER(TREATED)
- COLLECTOR ROAD
- X — REMOVE SWM POND
- P — (PRIVATE) SWM POND OWNERSHIP
- C — (CITY) SWM POND OWNERSHIP
- R — (REGION) SWM POND OWNERSHIP
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.5

Scale: 1:2500
Date: Feb. 26/20

The Westhill Landowners Group
101 IRA NEEDLES BOULEVARD WATERLOO, ON

WESTHILL DISTRICT PLAN
ERB STREET CONNECTION REVIEW
ERB STREET WATERLOO, ON

ALTERNATIVE 5 FIGURE

MTE
Engineers, Scientists, Surveyors

Project No.: 34280-101

March 6, 2020 - 1:11 p.m. - Plotted By: jshaver

MTE FILE No: 34280-101-MS11.5.1
PRELIMINARY SWM ALTERNATIVE 5
P:\P\34280\101\WORKING\XXX\34280-101-MS11_XXX-WAR-03-2020.DWG

EXISTING REGION OF WATERLOO LANDFILL POND

R

HYDRO CORRIDOR

3-1
52.51

KW ZONE 6 ELEVATED TANK

C

1-1
19.00

87 IRA NEEDLES BOULEVARD

41 IRA NEEDLES BOULEVARD

X

2-1
5.561

C

750mmø 825mmø 900mmø 900mmø 900mmø

WEST

WATERLOO COMMONS

66 IRA NEEDLES BOULEVARD

ERB STREET

IRA NEEDLES BOULEVARD

THE BOARDWALK

THORNDALE DRIVE

73 IRA NEEDLES BOULEVARD

65 IRA NEEDLES BOULEVARD

IRA NEEDLES BOULEVARD

WESTHILL DRIVE

THORNDALE DRIVE

LEGEND

- EXISTING REGIONAL STORM DETENTION STORAGE AREA
- SWM FACILITIES
- CONCEPTUAL STORM SEWER(UNTREATED)
- STORM SEWER(TREATED)
- COLLECTOR ROAD
- X — REMOVE SWM POND
- P — (PRIVATE) SWM POND OWNERSHIP
- C — (CITY) SWM POND OWNERSHIP
- R — (REGION) SWM POND OWNERSHIP
- 1-1 / 19.00 — CATCHMENT I.D. CATCHMENT AREA (HA)
- STANDING WATER w/ ECOLOGICAL VEGETATION/FUNCTION
- STANDING WATER

MS11.5.1

Scale: 1:2500
Date: Feb. 26/20

The Westhill Landowners Group

101 IRA NEEDLES BOULEVARD WATERLOO, ON

WESTHILL DISTRICT PLAN
ERB STREET CONNECTION REVIEW

ERB STREET WATERLOO, ON

ALTERNATIVE 5
CATCHMENT FIGURE

MTE
Engineers, Scientists, Surveyors

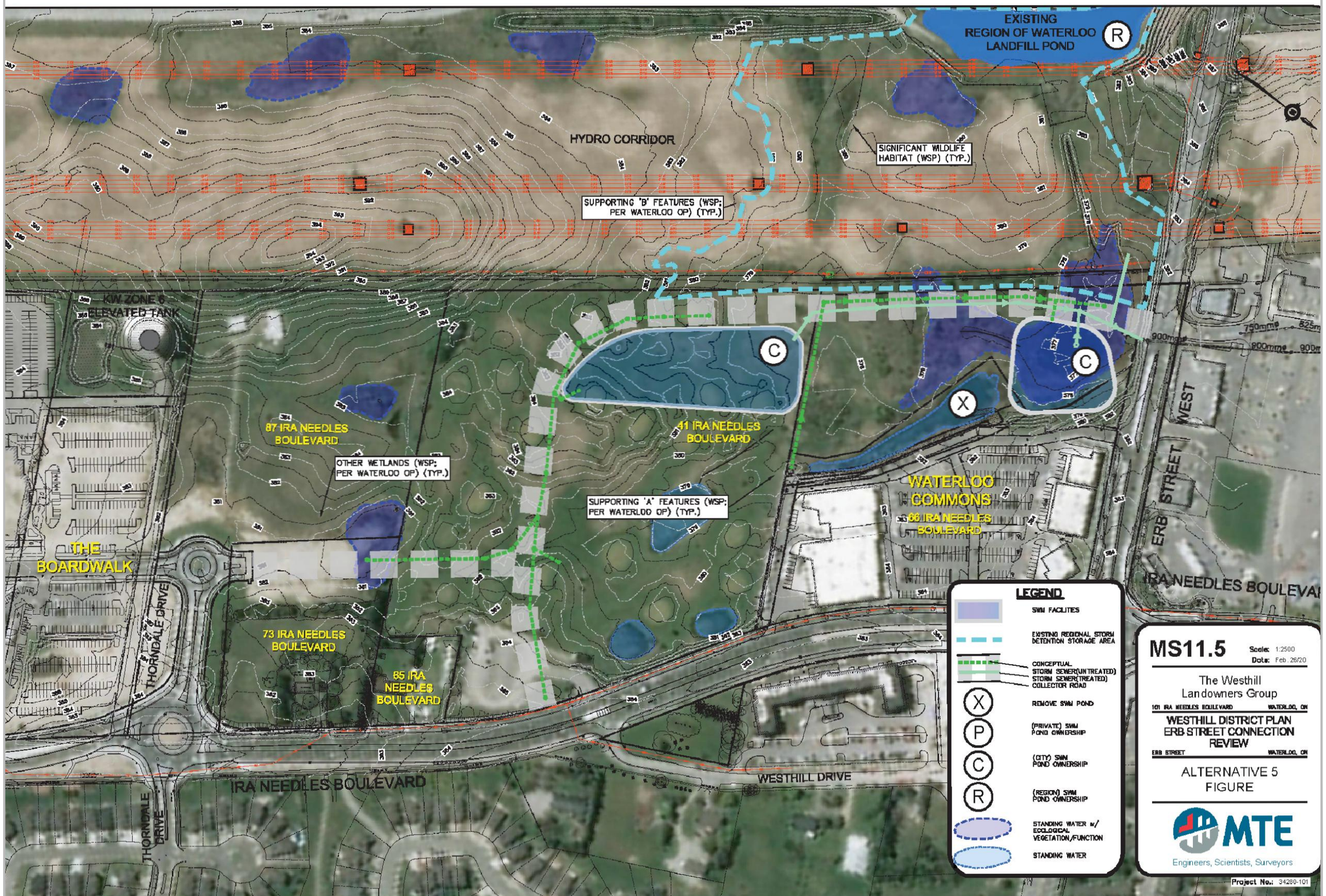
Project No.: 34280-101

March 6, 2020 - 1:18 p.m. - Plotted By: jshaver

Figure 12

Preferred SWM Facility

Evaluation Study Report
Westhill District
City of Waterloo
Region of Waterloo



Source: MTE

DATE: June 18, 2020

FILE: Y594E

SCALE: NTS

DRAWN: DGS

north

K:\Y594E WESTHILL DISTRICT PLAN\RPT\WESTHILL EVALUATION STUDY REPORT JUNE 2020\PREFERRED SWM FACILITY MTE.DWG

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
200-540 BINGEMANS CENTRE DR. KITCHENER, ON, N2B 3X9
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7.0 ENVIRONMENTAL IMPACT ASSESSMENT AND PROPOSED MITIGATION, RESTORATION AND ENHANCEMENT MEASURES

The recommended collector road alignment and stormwater management facility alternatives were selected based on an evaluation of the potential impacts to the natural environment, socio-cultural environment, transportation/municipal services and utilities, financial and technical. Methods to for potential mitigation and enhancements measures were considered.

7.1 IMPACT ASSESSENT

A Stage 1 EIS (December, 2018) has been prepared by WSP Canada Group Ltd. (WSP) and is included as **Appendix J**. WSP have also prepared a Natural Environment Report - Stage 2 Evaluation of Alternatives and Impact Assessments which evaluates the collector road and stormwater management facility alternatives, assesses impacts on the natural environment and recommends mitigation, restoration and enhancement measures. This report is included as **Appendix P**.

The WSP reports summarize natural heritage field work and findings and detail mitigation measures for the preferred collector road alignments and stormwater management facility alternatives. Specific mitigation measures are detailed below.

7.1.1 Direct Impacts

Impacts from the proposed works on vegetation, wildlife / habitat and aquatic habitat are anticipated to be minor, considering the anthropogenic origin and high level of disturbance in the study area. A general summary of the impacts assessed is summarized below:

Vegetation	Removal of portions of existing anthropogenic wetland habitat in: Wetland W1 (Vegetation Units 3, 4, 5, 7, 8 and 9, consisting of Reed-Canary Grass Meadow Marsh, Swamp Thicket, Poplar Mineral Deciduous Swamp, European Common Reed Mineral Meadow Marsh and Pondweed Submerged Shallow Aquatic); and Wetland W3 (Vegetation Unit 12 and 13, consisting of Bulrush Shallow Marsh and Reed-Canary Grass Meadow Marsh).
Wildlife	Removal of habitat for predominantly tolerant, common wildlife including generalist avifauna, several herpetofaunal species in low abundance and a small amount of SWH for Monarch and Chimney Crayfish.
Aquatic habitat	Removal of a small amount of anthropogenic, low quality aquatic habitat. No direct impact to regulated watercourses or fish habitat subject to the Fisheries Act.

Residual impacts will be mitigated through:

- retention of habitat which provides the same functions in the local landscape, including habitat for species of conservation concern; and
- implementation of proposed wetland habitat restoration as described in Section 7.2.
- removal of invasive Phragmites

7.1.2 Indirect Impacts

Indirect impacts from the proposed works on vegetation, wildlife / habitat and aquatic habitat are considered to be minor, and will be mitigated with proposed measures summarized below.

The potential for indirect impacts related to construction activities to adjacent retained vegetation features during and following construction, include, but are not limited to the following:

- ‘During-construction’ impacts:
    - Vegetation clearing / damage beyond the working area;

        - Addressed by mitigation measures listed in Section 7.2 (e.g., vegetation protection fencing)

    - Spills of contaminants, fuels, and other materials that may reach semi-natural areas;

        - Addressed by mitigation measures listed in Section 7.2 (e.g., ESC, spills management)

    - Potential impacts to wildlife

        - Addressed by mitigation measures listed in Section 7.2 (e.g., timing, fencing)

    - Release of construction-generated sediment to adjacent habitats;

        - Addressed by mitigation measures listed in Section 7.2

    - Short term dewatering during construction is expected.

        - Addressed by mitigation measures listed in Section 7.2 and best management practices, including isolation of the works

- Edge impacts to adjacent wetland

    - Not of concern given the nature of vegetation and degree of existing disturbance (i.e., tolerant, anthropogenically derived and with evidence of existing edge impacts)

- Potential for elevated chlorides with a new road

    - Given the site context (existing development, parking lots and major roads) and presence of existing SWM facilities treating runoff from Ira Needles Boulevard and Erb Street, there are elevated concentrations of sodium and chloride at W1 in the current condition. Vegetation in this area is comprised primarily of tolerant and/or adventive species. No sensitive community types or flora are present.

- Notwithstanding this, a chloride management plan will be required as part of future development application(s).

- Potential impacts on downstream aquatic habitat

    - Mitigated by ‘during-construction’ mitigation measures listed above

    - The proposed SWM strategy is considered a net enhancement relative to existing conditions and will result in improved downstream water quality, maintenance of surface water inputs and mitigation of potential erosion impacts

No residual impacts to vegetation, flora, wildlife or aquatic habitat are anticipated with implementation of proposed protection, mitigation and restoration / enhancement measures. The attributes and functions currently provided will continue post-construction, providing habitat for species currently found in or using the impacted areas.

7.2 Mitigation Measures

To mitigate potential impacts to natural heritage features and functions, the following measures are recommended:

- Minimizing the disturbance footprint to the extent possible, via grading and design
- Avoiding significant and/or sensitive natural areas to the extent possible, in consideration of other evaluation factors
- Implementing a Stormwater Management Strategy to mitigate potential impacts on natural features (i.e., alterations to surface water quality and quantity), including several key elements:

    - Maintenance of surface flows to downstream receiving areas (ultimately Clair Creek)

    - Improved surface water quality treatment, relative to the current condition (where some filtering of sediment flowing through the wetland may be provided)

Notwithstanding this, it is recommended that chloride management plans be prepared for future development applications.

    - Restoration of wetland habitat

- Mitigation of flooding impacts relative to current condition
- Enhanced surface water temperature and dissolved oxygen in downstream aquatic habitat relative to the current condition – achieved through SWM design measures

- Timing of works to minimize impacts to wildlife

    - Breeding birds: undertake grading and vegetation removals in compliance with the Migratory Birds Convention Act, MBCA. Where possible, works (including vegetation removals) that have the potential to harm breeding birds will respect timing windows for breeding birds subject to the MBCA (i.e., removals undertaken outside of the approximate nesting period from early April through late August).

    - Herpetofauna: where possible, works in aquatic habitat should avoid the herpetofauna hibernation period (~ early September through late May)

    - Bats: undertake tree removals outside the SAR bat active period (i.e., removals undertaken between October 1 and March 31)

    - Fisheries Timing Window: not anticipated to be required. To be confirmed with MNRF prior to construction.

- Re-stabilizing and re-vegetating all exposed surfaces as soon as possible following construction, using appropriate seed mixes and planting or other appropriate cover.

- **Fish removal**

    - It is recommended that a fish removal be conducted by qualified biologists under a License to Collect Fish for Scientific Purposes (LTCF) issued by the Ontario Ministry of Resources and Forestry (MNRF). This is a best effort approach, undertaken in accordance with MNRF directives specified in the LTCF.

- **Wildlife rescue:**

    - It is recommended that a wildlife rescue (turtles and other herpetofauna) be conducted prior to removals of wetland (pond) habitat and SWM pond / storage areas

- The wildlife rescues should be conducted under a Wildlife Scientific Collectors Authorization permit issued by the MNRF. Prior to conducting the wildlife rescue, a protocol should be developed in conjunction with the MNRF to ensure proper handling and care of any wildlife captured, prior to release to suitable habitats outside of the construction area.

- Where possible, the removal of the existing forebay (including draw-downs and fish removal / wildlife rescues) should occur within a timing window to avoid disturbing hibernating reptiles and amphibians (i.e., completed during summer months, between June 1 and September 1 of any given year).

- Implementing additional construction Best Management Practices (BMPs) including:

  - Erosion and Sediment Control Plan - This strategy will mitigate impacts on vegetation, wildlife (including wildlife habitat) and downstream waterbodies by: installing ESC fencing at grading limits; preventing sedimentation in adjacent natural features; installing erosion blankets on steep slopes, where required; installing temporary rock check dams in swales; timely re-vegetation of exposed soils; and regular site inspection, maintenance and reporting to ensure the controls are working properly. Preliminary guidance is provided in the Section 6.0 of the SWM report (MTE, June 2020), with the final plan to be prepared at detailed design.

  - Tree and Vegetation Protection - Temporary tree and vegetation protection fencing (which can often be combined with E&S fencing) is recommended to prevent damage to adjacent natural areas during construction (i.e., mechanical damage, soil compaction). To be prepared at detailed design.

  - Vegetation clearing limits are to be clearly delineated on contract drawings, with on-site direction and confirmation during construction

  - Wildlife exclusion fencing – the ESC / vegetation protection fencing will also function as interim (during construction) wildlife exclusion fencing.

  - Spills Management Plan - A *Spills Management Plan* should be prepared at final design and implemented throughout construction to reduce potential for contamination of groundwater, receiving waterbodies and adjacent vegetation.

- Wetland Restoration. Implementing appropriate remedial measures to restore and enhance features and functions of the wetlands impacted by installation of the preferred alignment and SWM strategy, as outlined in Section 7.3.

7.3 Wetland Restoration

Wetland restoration is proposed as a remedial measure for impacts to regulated wetlands (i.e., portions of W1 and W3), namely the loss of wetland habitat which has the following attributes and functions:

- Overall: anthropogenically derived vegetation / habitats that currently function as storage for the existing SWM facilities; young, tolerant habitats with a prevalence of invasive species

- Hydrologic functions:

    - W1 is a surface water feature resulting from the perched culvert at Erb Street. It is part of a larger storage / detention area for surface runoff (minor, major and Regional storm events) to mitigate downstream erosion

    - Provides surface water inputs to downstream waterbodies (i.e., Clair Creek and Clair Lake)

- Vegetation:

    - Several anthropogenically influenced / derived wetland vegetation community types are present – predominantly marsh and thicket, with some open water and small areas of treed swamp

    - No SAR and no provincially or nationally rare species are present; habitats are dominated by mostly 'tolerant' species (i.e., low CC)

    - Phragmites dominates open water areas, and is likely expanding

- Wildlife:

    - Habitat for a common suite of generalist birds; no confirmed breeding habitat for area-sensitive species or habitat specialists

    - Habitat for breeding anurans and turtles (low abundance)

- Provides a small amount of marginal habitat for Species of Conservation Concern (Monarch, Chimney Crayfish, potential SAR bat habitat); this habitat is well-represented in the local landscape, including the HEPC and landfill lands

- Aquatic habitat:

  - The impacted features are an anthropogenic pond (storage for the existing Erb St. SWM facility) and intermittent drainage features which provide a small amount of low quality aquatic habitat.

  - The Erb St. SWM facility provided some habitat for common warmwater fish, though it is 'disconnected' from downstream fisheries (i.e., Clair Creek and Clair Lake), due to intervening piped sections and SWM facilities.

  - Surface water flow from the study area is conveyed downstream via a culvert at Erb Street West and a municipal drain for more than 750 m, outletting to a SWM Pond outside the study area. Ultimately, this runoff is conveyed to Clair Creek, a tributary of the Grand River.

7.3.1 Conceptual Restoration Strategy

The conceptual strategy is to restore habitat to replace habitat impacted by the road and SWM installation, including both open water habitat and marsh habitat. The restored habitat will be provided within the two recommended SWM facility blocks. Key elements of the restoration are as follows, with additional details and design to be provided at final design:

- Net improvement to aquatic habitat in downstream receiving areas (Clair Creek) due to improved water quality treatment relative to the current condition

- Enhancement to vegetation communities with removal of invasive Phragmites

- Provision of habitat for wildlife species using existing habitats, including avifauna, herpetofauna and other wildlife guilds

- Creation of targeted wildlife habitat areas or elements including for example: turtle nesting areas; turtle basking features (logs, rocks); suitable substrates for herpetofaunal overwintering; host-plants and nectaring plants for Lepidoptera and

Odonata; open areas for thermal basking and foraging of Lepidoptera and Odonata.

- Provision of additional botanical diversity through planting of appropriate native species within the ponded areas and berms

- Consideration of seedbank salvage in appropriate areas where removals will occur (i.e., where no evidence of invasive non-native species is present)

7.4 Recommendations for Implementation of Preferred Collector Road and Stormwater Management Alternative through Future Site Specific Applications

As input to final design of the collector road and recommended SWM strategy or as part of future site specific applications, the recommended mitigation, protection and ecological restoration measures will be confirmed or refined, then implemented through the proposed works. Specific tasks include:

- Final Wetland Restoration Plan

- Spills Management Plan

- Erosion & Sediment Control Plan

- Chloride Management Plan

- Dewatering plans and application for Permit to Take Water, if required

- GRCA Permit under O. Reg. 150/06

    - An updated Environmental Impact Study will be required in support of specific site plans, based on existing conditions and applicable policy / guidance at the time of the application submission.

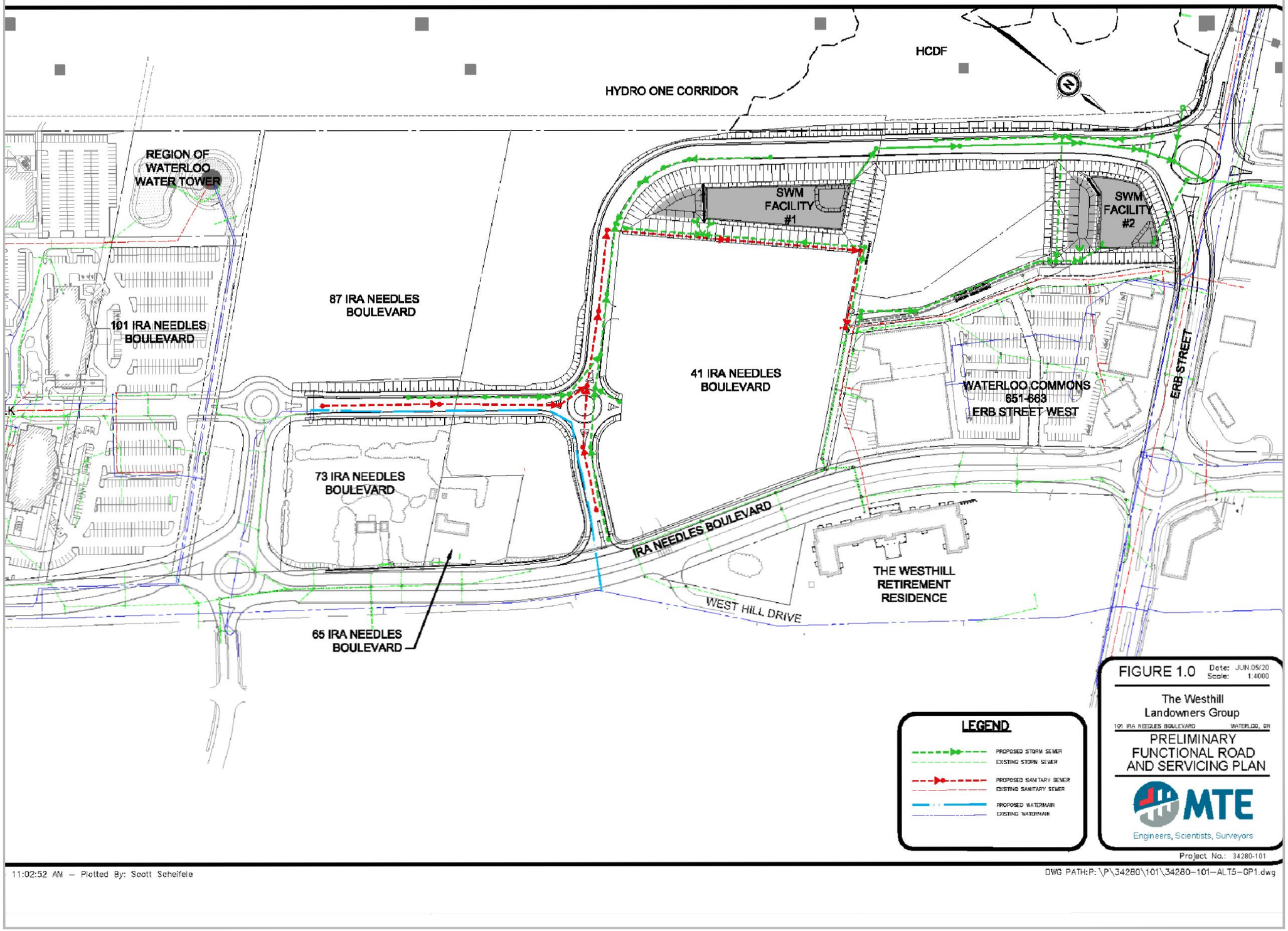
8.0 PROPOSED FUNCTIONAL SERVICING MASTER PLAN

A ‘Master Plan’ approach for servicing and storm water management will be developed to provide a comprehensive infrastructure plan to guide future development in The Westhill District. The plan provides direction for all of the lands within the Study Area, including water mains, sanitary sewer and stormwater management with the objective that more detailed design will occur through the review and approval of subsequent planning applications (i.e. Plan of Subdivision). A preliminary Functional Road and Servicing Plan is shown on **Figure 13**.

Figure 13

Preliminary Functional Road and Servicing Plan

Evaluation Study Report
Westhill District
City of Waterloo
Region of Waterloo



Source: MTE

DATE: June 18, 2020

FILE: Y594E

SCALE: NTS

DRAWN: DGS

north

K:\Y594E WESTHILL DISTRICT PLAN\RPT\WESTHILL EVALUATION STUDY REPORT JUNE 2020\PRELIMINARY FUNCTIONAL ROAD AND SERVICING PLAN MTE.DWG

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9.0 RECOMMENDATIONS – PREFERRED COLLECTOR ROAD ALIGNMENT, STORMWATER MANAGEMENT STRATEGY AND FUNCTIONAL SERVICING MASTER PLAN

The following recommendations are made in consideration of the analysis that has occurred and the input that has been received:

9.1 Recommendations

1) That the collector road alignment (the Ira Needles Boulevard By-pass) be approved as shown on **Figure 10** and the preliminary functional design shown in **Appendix L**. The collector road and related road network is to be comprised of:

   - Alignment S-3
   - Alignment N-1
   - A roundabout at the intersection of Alignment N-1 and Erb Street.
   - A local street that connects the collector road to Ira Needles Boulevard.
   - Subject to approval from the Region, consideration may be given to designing the local street intersection with Ira Needles Boulevard as either a right in/right out intersection or a roundabout.
   - A roundabout at which the local street and collector road intersect.

2) That approval of the collector road alignment and related road network satisfy Policy 8.2.5 of the City of Waterloo Official Plan.

3) That Schedule E of the City of Waterloo Official Plan and any effected schedule of the Westhill District Plan be amended to include the collector road as shown on **Figures 10** and **11**.

4) It is intended that there will be some flexibility and refinements to the precise alignment of the collector road shown on **Figure 10** and roundabout design in **Appendix L** such that engineering and other relevant technical considerations can be addressed through final engineering design.

5) That any refinements to the alignment of the collector road be considered through subsequent planning and development applications such as the submission of draft plans of subdivision.

6) That the detailed engineering design of the collector road be addressed and approved by the City of Waterloo through the review of subsequent planning and development applications.

7) That the Region of Waterloo finalize the detailed design to the roundabout at the intersection of Alignment N-1 and Erb Street.

8) That the submission of subsequent planning and development applications be supported by an EIS that builds upon the mitigation measures recommended in Section 7 of this report.

9) That the construction of the collector road may be staged provided that road construction is coordinated with related services including stormwater management facilities.

10) That the construction of the roundabout at the collector road/Erb Street intersection should be coordinated with adjacent Erb Street.

11) That if necessary, aspects of the roundabout such as multi use trails and/or sidewalks may be phased with the objective of ensuring travel lanes associated with the roundabout can be coordinated with adjacent Erb Street improvements.

12) That lands necessary for the construction of the roundabout on the Waterloo Commons property be conveyed directly to the Region and/or the City of Waterloo for nominal consideration with the objective of expediting and coordinating construction of the roundabout with adjacent Erb Street improvements.

13) That the recommended stormwater management strategy detailed in this report and the Preliminary Stormwater Management Report prepared by MTE Consultants Inc (May 22, 2020) be approved and implemented through subsequent planning and development applications.

14) That the detailed design and location of Stormwater Management Facilities Number 1 and 2 will be confirmed through final approval of development applications associated with lands that include these facilities.

15) That the Stormwater Management Facilities are to be conveyed to the City of Waterloo as public infrastructure.

16) That the recommended stormwater management strategy be implemented to the satisfaction of the City of Waterloo, prior to commencement of servicing and road construction within each respective subcatchment drainage area.

17) That other lands necessary for the construction of the collector road be conveyed to the City of Waterloo for nominal consideration as a condition of development approval.

18) That lands necessary to implement the recommended stormwater management strategy be conveyed to the City of Waterloo for nominal consideration and as a condition of development approval.

19) That subject to approval and implementation of a new stormwater facility that accommodates the same catchment area associated with Ira Needles Boulevard, the existing Erb Street Detention Facility and related lands be declared surplus provided the new facility is operational to the satisfaction of the City of Waterloo and Region of Waterloo.

20) That the stormwater management strategy detailed in this report be used to guide and support subsequent planning and development applications and be implemented by conditions of development approval.

21) That the Preliminary Functional Servicing Plan included as **Figure 13** of this report be approved and further, that the Preliminary Functional Servicing Plan be used to guide servicing plans to be prepared in support of subsequent planning and development applications and be implemented through conditions of development approval.

22) That mitigation, restoration and enhancement measures outlined in Section 7 of this report be approved and implemented through detailed road and stormwater management design, future development applications and/or road construction.

10.0 IMPLEMENTATION AND RECOMMENDATION FOR FUTURE PLANNING APPLICATIONS

10.1 Official Plan Amendment

This Evaluation Report has been completed in support of an official plan amendment application to identify and delineate a preferred collector road alignment and stormwater management facility for the Ira Needles Boulevard By-pass from Thorndale Drive to Erb Street West. This report responds to direction from City and Regional staff to complete a report that includes background information and existing conditions to identify a recommended road alignment and stormwater management facility for the Study Area. The official plan amendment application will delineate the recommended collector road network and related alignment on Schedule E – Transportation Schedule of the Official Plan.

10.2 Westhill District Plan Update

The Westhill District Implementation Plan will be updated to reflect the recommended collector road network and stormwater management facility. A Functional Servicing Master Plan will provide a comprehensive infrastructure plan to guide future development in the Westhill District and related servicing.

10.3 Future Planning Applications

Future planning application(s) will be property-specific with focused evaluation to implement the preferred collector road network and stormwater management facilities. This report recognizes that there is flexibility regarding the precise location and configuration of stormwater management facilities. The detailed design and location of Stormwater Management Facilities Number 1 and 2 will be confirmed through final approval of development applications associated with lands that include these facilities. Similarly, the detailed design of the collector road network will be finalized through approval of development application.