

SOPER HILLS SECONDARY PLAN

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**TRANSPORTATION AND  
FUNCTIONAL SERVICING STUDY  
REPORT**

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REVISED DRAFT INTERIM REPORT • JUNE 2020

REPORT PREPARED FOR

**THE MUNICIPALITY OF CLARINGTON**  
40 TEMPERANCE STREET  
BOWMANVILLE, ON L1C 3A6

REPORT PREPARED BY



**THE MUNICIPAL  
INFRASTRUCTURE GROUP LTD.**  
8800 DUFFERIN STREET, SUITE 200  
VAUGHAN, ON L4K 0C5  
(905) 738-5700

TMIG PROJECT NUMBER 19120

REPORT PREPARED IN ASSOCIATION WITH



**SGL PLANNING AND DESIGN**  
1547 BLOOR STREET WEST  
TORONTO, ON  
M6P 1A5

**Clarington**



## EXECUTIVE SUMMARY

To be completed at the conclusion of the study



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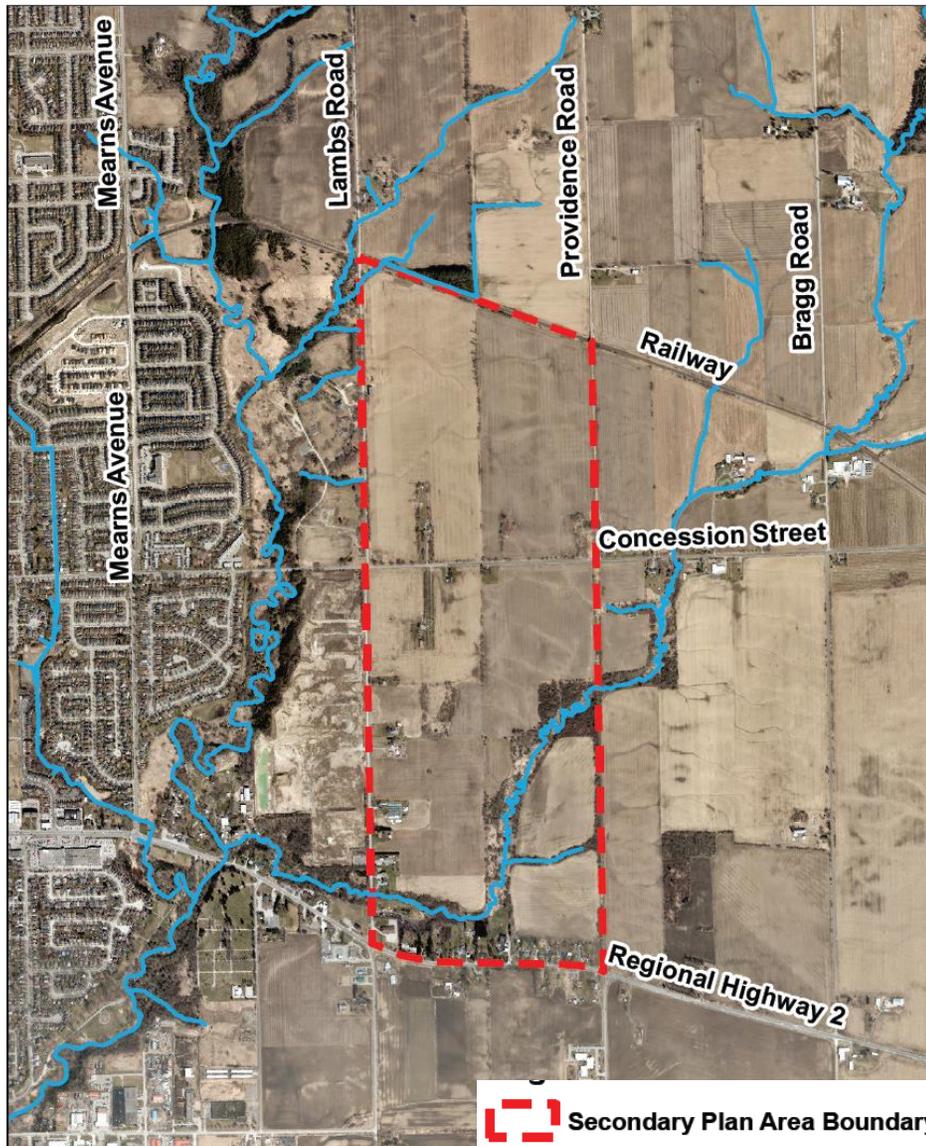
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# 1 INTRODUCTION

The Soper Hills Secondary Plan (SHSP) area is identified as a new development area in the Municipality of Clarington’s Official Plan. The SHSP area general extends from King Street / Highway 2 north to the CP rail line, and from Lamb’s Road east to unopened Bennett Road / Providence Road right-of-way. The study area is illustrated in **Figure 1-1**.

**Figure 1-1 Study Area**



While the SHSP area is designated as ‘Urban Residential’ in the Clarington Official Plan, the type and distribution of land uses through the area have yet to be finalized, and the means by which the planned development will be serviced have not been established.

The Municipal Infrastructure Group (TMIG) was retained by the Municipality of Clarington to prepare a Transportation Study and Functional Servicing Report for the SHSP area. The Transportation and Functional Servicing Study Report (TFSSR) has been prepared to demonstrate how the planned SHSP area can be

efficiently and sustainably serviced, including transportation, water supply and distribution, wastewater and stormwater. This study has been fully integrated with and completed as part of the overall SHSP planning study.

The investigations and analyses completed for this TFSSR have also been closely co-ordinated with the separate but parallel Soper Creek Subwatershed Study (SCSWS). The SCSWS examines the entire Soper Creek watershed, including hydrology, hydrogeology, fluvial geomorphology and aquatic and terrestrial habitat. The overall planning study, SCSWS and other relevant completed and ongoing studies relevant to the SHSP area are described in **Section 2**.

## 2 BACKGROUND

### 2.1 Relevant Studies

The SHSP is identified as a new development area in Clarington’s Official Plan, and a number of studies have been completed or are underway to support the planning and development of the SHSP. These studies are briefly described in the following sections.

#### 2.1.1 Subwatershed Study

**To be completed – Subsequent versions of this report will include a summary of the SCSWS when it is available**

#### 2.1.2 Planning Study

A Secondary Plan is a framework for managing new growth and determines where land use designations, such as residential and commercial uses, will be located within the bounds of the Secondary Plan area. It also establishes the general alignments of the major road networks needed to move people and goods within, to and from the area, considering both vehicular and active forms of transportation. Usually, these primary road networks also provide the spine of the water, wastewater and storm drainage systems needed to service the Secondary Plan area.

This TFSSR has been prepared in support of the SHSP, and has been fully integrated with the planning study underway to establish the land use plan and policies for the SHSP area. The planning study is a four phased process that began in early 2019 and will ultimately lead to a Secondary Plan, and zoning by-law, for the area. These phases are:

- Phase 1: Public Input and Technical Analyses
- Phase 2: Urban Design and Sustainability Principles, Criteria and Alternative Land Use Plans
- Phase 3: Preferred Land Use Plan
- Phase 4: Final Secondary Plan and Zoning By-Law

This Draft Interim TFSSR commenced in the Phase 1 of the planning study and will be updated throughout the study. The transportation and servicing needs and constraints will be considered in the development and evaluation of alternative land use plans, and the final TFSSR will present and justify the transportation network and water, wastewater and storm drainage infrastructure needed to adequately and efficiently service the preferred land use plan.

#### 2.1.3 Clarington Technology Business Park Water and Wastewater Servicing Master Plan

The Clarington Technology Business Park (CTBP) Water and Wastewater Servicing Master Plan (Chisholm Fleming and Associates, 2015) was completed for the Region of Durham. The CTBP extends from Highway 401 north to Highway 2, and from Haines Street east to Bennett Road. The south limit of the SHSP area abuts the CTBP.

The Master Plan determined that water servicing of the CTBP could be provided by the existing watermains within and surrounding the study area, and recommended a new trunk sanitary sewer extending south on Bennett Road from Highway 2 to Baseline Road, and eventually to the Port Darlington Water Pollution Control Plant. The design of the trunk sanitary sewer considered future development of a portion of the SHSP area. More information on the CTBP Servicing Master Plan relevant to the study area can be found in **Section 3.8.2**.

## 2.2 Municipal Class Environmental Assessment Process

The planning of major municipal projects or activities is subject to the Ontario Environmental Assessment (EA) Act, R.S.O. 1990, and requires the proponent to complete an Environmental Assessment, including an inventory and description of the existing environment in the area affected by the proposed activity.

The Municipal Class EA process was developed by the Municipal Engineers Association and approved by the Ministry of the Environment, now Ministry of the Environment, Conservation and Parks (MECP), as an alternative method to Individual Environmental Assessments for recurring municipal projects that were similar in nature, usually limited in scale and with predictable ranges of environmental effects which were responsive to mitigating measures. The latest Municipal Class EA document (October 2000, amended 2007, 2011 & 2015) has been used for this study.

The Class EA provides for the following designations of projects depending upon potential impacts:

- Schedule A:** Projects are limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved. Schedule A projects generally include normal or emergency operational and maintenance activities.
- Schedule A\*:** Projects are within existing buildings, utility corridors, rights-of-way, and have minimal adverse environmental effects. These projects are pre-approved; however, the public is to be notified prior to project implementation.
- Schedule B:** Projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process, involving mandatory contact with directly affected public and relevant review agencies, to ensure they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, then the proponent may proceed to implementation.
- Schedule C:** Projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA document. Schedule C projects require that an Environmental Study Report be prepared and filed for review by the public and review agencies.

The water, wastewater and storm drainage infrastructure needed to service the SHSP area are expected to be classified as Schedule B projects, while the major roads proposed in the SHSP area are expected to be classified as Schedule C activities.

The Municipal Class EA document outlines 5 phases of project planning and implementation. These are

- Phase 1:** Identify the problem (deficiency) or opportunity.
- Phase 2:** Identify and evaluate alternative solutions to address the problem or opportunity by taking into consideration the existing environment, and establish the preferred solution taking into account public and review agency input.
- Phase 3:** Identify and evaluate the design alternatives for implementing the preferred solution by considering the net positive and negative effects of each alternative design concept including mitigation measures.
- Phase 4:** Prepare the Environmental Study Report (ESR) for review by agencies and the public.
- Phase 5:** Complete contract drawings and documents, and proceed to construction and operation; monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facility.

A flow chart describing the Class EA planning and design process is shown in **Figure 2-1**.

Schedule B projects must satisfy Phases 1 and 2 before proceeding to construction (Phase 5), while Schedule C projects must satisfy all 4 phases prior to construction. This TFSSR has been prepared to fulfill

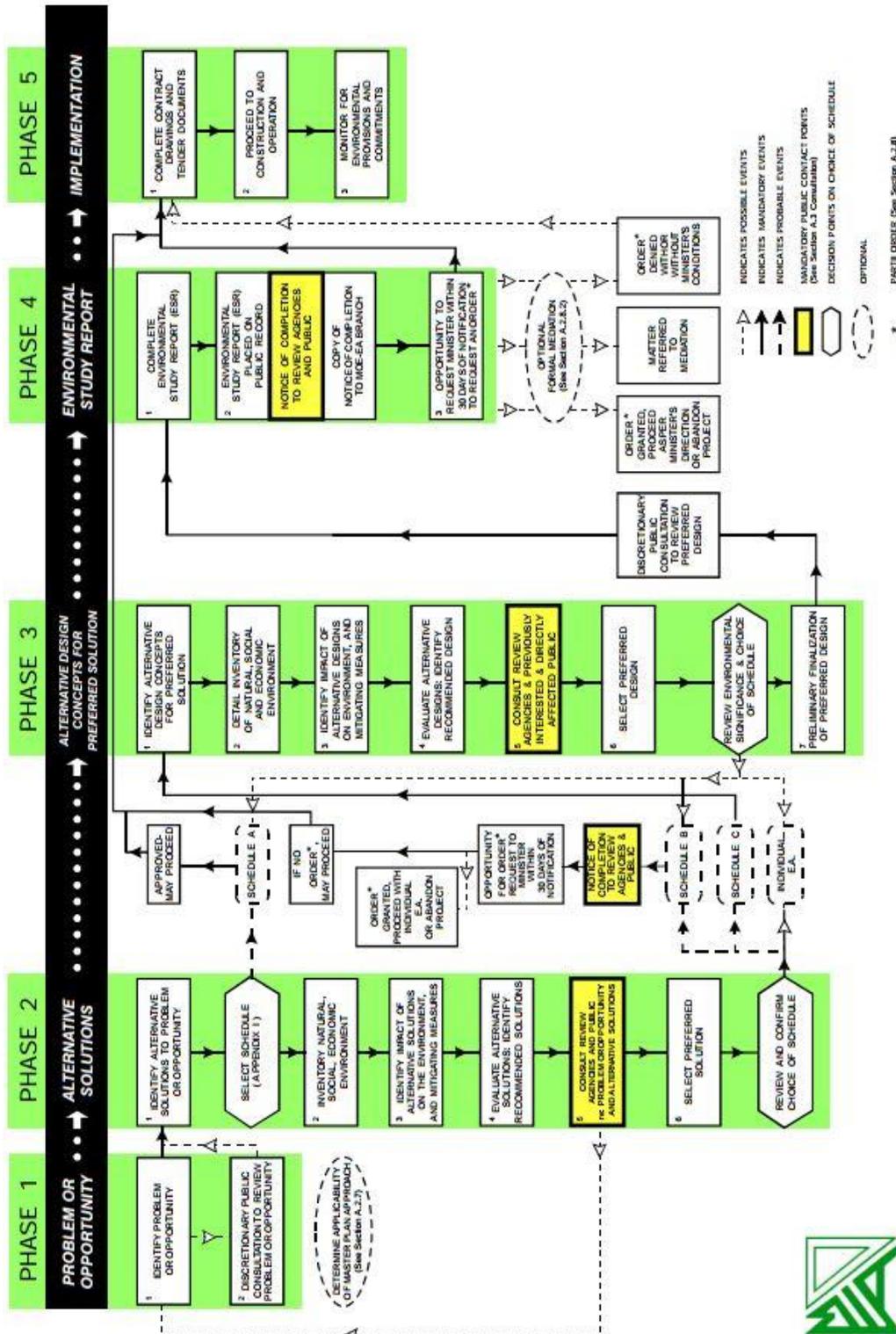
Phases 1 and 2 of the Municipal Class EA process, such that Schedule B projects identified through this study can proceed to construction, while Schedule C projects will need to satisfy Phases 3 and 4 of the process during as part of future studies.

### **2.2.1 Integrated Approach with the Planning Act**

There are several points in the Municipal Class EA process where consultation with the public and relevant agencies is required, and the Municipal Class EA document outlines an approach of integrating the Planning and EA processes. This TFSSR has followed the integrated process, where notices and public information centres have satisfied the requirements of both the Municipal Class EA and Planning Act, and the development and evaluation of alternative transportation and functional servicing strategies have been fully integrated with the corresponding alternative land use plans. More information on the stakeholder notifications and consultations can be found in **Section 7**.

***To be completed - Subsequent versions of this report may be revised to ensure consistency with the approach for the Southeast Courtice study***

Figure 2-1 Municipal Class EA Planning Flow Chart



### 3 EXISTING CONDITIONS

#### 3.1 Land Use

Land use in the study area is primarily agricultural. There are a number of residential homes on the north side of Highway 2, and a place of worship at the north-east corner of Highway 2 and Lamb's Road.

The lands surrounding the study area are also primarily rural and agricultural. However, the lands on the west side of Lamb's Road, north of Highway are approved for residential development, and the lands south of Highway 2 are approved for employment uses as part of the Clarington Technology Business Park.

The Clarington Official Plan designates the lands in the SHSP area as 'Urban Residential', with the lands fronting onto Highway 2 designated as a 'Regional Corridor' and the Soper Creek valley system as Environmental Protection Area. In addition, Lambs Road and portions of Concession Street and the unopened right-of-way of Bennett Road/Providence Road are considered "Local Corridors" in the Clarington Official Plan.

The Durham Region Official Plan designates King Street and Lambs Road as Type 'B' Arterial Roads, and Providence Road (including the unopened road allowance to King Street / Bennett Road) and Concession Street as Type 'C' Arterial Roads. The road designations are discussed further in **Section 3.9.1**

Also of note is the Jury Lands / Camp 30 site located on the west side of Lamb's Road, north of Concession Street. This was the site of the former Bowmanville Boys School and a World War II internment camp. More information on the Jury Lands / Camp 30 is included in **Section 3.2**.

#### 3.2 Archaeology and Cultural Heritage

##### 3.2.1 Archaeological Assessment

A Stage 1 Archaeological Assessment (AA) has been completed for the SHSP area (ASI, 2019). The AA determined that approximately 70% of the SHSP area has Indigenous and/or Euro-Canadian archaeological resource potential. The Stage 1 AA recommended a further Stage 2 AA be completed prior to any works within the areas identified as having archaeological potential.

##### 3.2.2 Heritage Impact Assessment

A Cultural Heritage Resource Assessment Study has been completed for the SHSP area (ASI, 2019). The study noted that a portion of the Bowmanville POW Camp (also known as Camp 30) was located within the SHSP area, and one building remains standing at 2273 Lambs Road that may be historically linked to the Camp. Three additional properties within the study were identified as having potential cultural heritage resources and require evaluation under Ontario Regulation 9/06 to determine whether they contain cultural heritage value. The study also identified three properties adjacent the study area as potential cultural heritage resources, and noted four properties adjacent the study area on the south side of Highway 2 that have been recognized by the Municipality of Clarington and are included on its Heritage Inventory.

#### 3.3 Topography and Drainage

***To be completed – Subsequent versions of this report will include a summary of the relevant information from the SCSWS when it is available***

### 3.4 Soils and Groundwater

***To be completed – Subsequent versions of this report will include a summary of the relevant information from the SCSWS when it is available***

#### 3.4.1 Surficial Geology

#### 3.4.2 Hydrogeology

#### 3.4.3 Groundwater Supported Natural Features

#### 3.4.4 Water Budget

#### 3.4.5 Source Water Protection

### 3.5 Surface Water

***To be completed – Subsequent versions of this report will include a summary of the relevant information from the SCSWS when it is available***

#### 3.5.1 Fluvial Geomorphological Assessment

### 3.6 Natural Environment

***To be completed – Subsequent versions of this report will include a summary of the relevant information from the SCSWS when it is available***

#### 3.6.1 Significant Wetlands

#### 3.6.2 Significant Woodlands

#### 3.6.3 Fish Habitat

#### 3.6.4 Species at Risk

### 3.7 Water Supply and Distribution

The Bowmanville Drinking Water System provides potable water to consumers in Town of Bowmanville in the Municipality of Clarington. There is one water supply plant (Water Treatment Plant) with an approved capacity of 36,368 m<sup>3</sup>/day. This plant feeds a Distribution system and trunk distribution system. This system and plant are owned and operated by Regional Municipality of Durham. The source water for this plant is drawn from Lake Ontario.

### 3.7.1 Existing Water Distribution Infrastructure

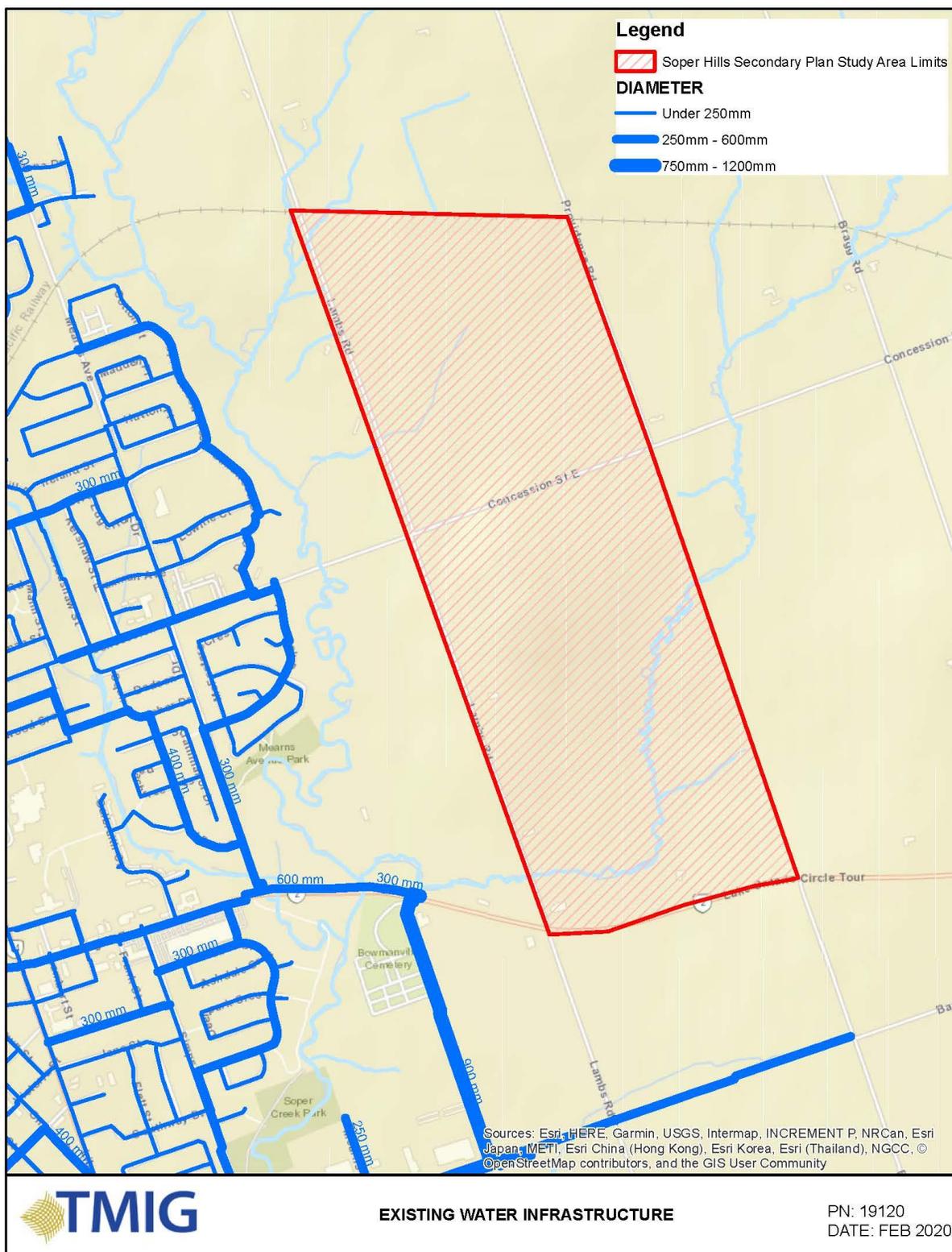
The current water network covers the developed area of Bowmanville, with watermains ending approximately near King St E / Highway 2 and Haines Street, west of the study area. There are no existing watermains within or adjacent to the study area. There is an existing 300mm along Haines Street and an existing 600mm on King St E/Highway 7 west of Haines Street.

The water system in Bowmanville has two zones. Everything south of the railway is serviced via Pressure Zone 1. As the entirety of the Study Area is south of the railway, it is assumed that the Zone 1 hydraulic grade line will be appropriate for the entire SHSP area. According to Durham Region, the Zone 1 top water level is 150 m and the maximum ground elevation for Zone 1 service is 120 m +/- . The Zone 2 top water level is 180 m and the maximum ground elevation for Zone 2 service is 150 m +/- .

The water in Bowmanville and the Municipality of Clarington is supplied from Lake Ontario through the Bowmanville Water Treatment Plant and a network of transmission and supply mains.

**Figure 3-1** shows existing water infrastructure near the Soper Hills Secondary Plan area. The information shown on the figure is from GIS files provided by the Region.

Figure 3-1 Existing Water Infrastructure



### 3.7.2 Planned Water System Improvements

#### 3.7.2.1 Durham Region Capital Projects

The Region of Durham updated its Development Charge (DC) Background Study in 2018. This study is to establish the future development-related capital projects. Several projects were identified in the Town of Bowmanville. The Bowmanville DC water projects are summarized below in **Table 3-1** and shown in **Figure 3-2**.

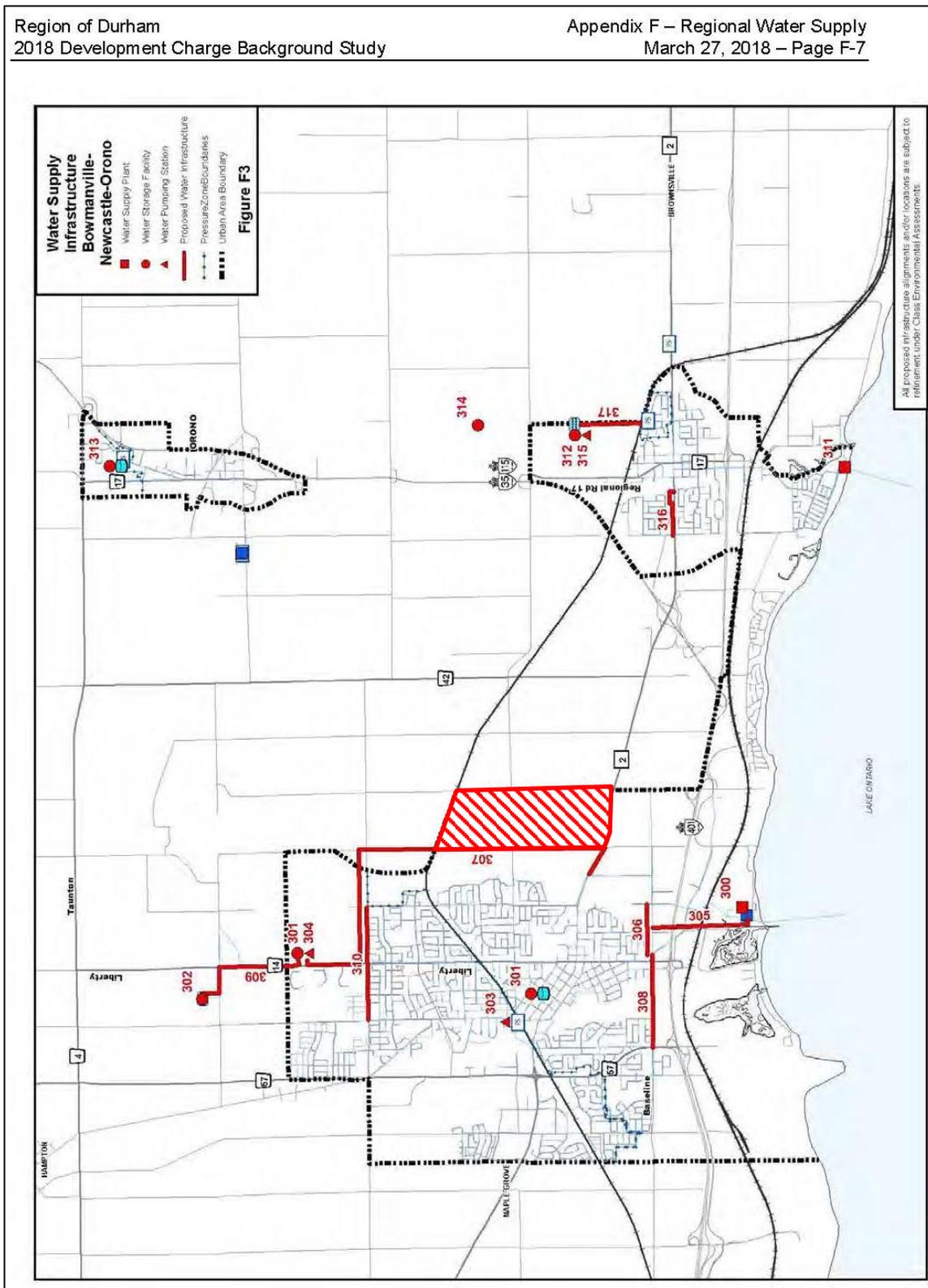
**Table 3-1 Bowmanville DC Projects - Water**

ID	Description	Year Construction is to Commence									
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
300	Expansion to Bowmanville WSP					X		X		X	
301	New Liberty St. N. Zone 1 Reservoir and demolish existing elevated tank <sup>(1)</sup>		X								
302	Expansion of Zone 2 Reservoir								X		
303	Expansion of Concession St Zone 2 PS							X		X	
304	New Zone 2 PS at Zone 1 Reservoir							X		X	
305	Zone 1 Feedermain from Bowmanville WSP to Baseline Rd.							X		X	
x306	Zone 1 Feedermain on Baseline Rd from Wharf St to Mearns Ave.									X	
307	Zone 1 Feedermain on Hwy 2 (King St), Lambs Rd, Third Concession Rd to Liberty Zone 1 Reservoir		X								
308	Zone 1 Feedermain on Baseline Rd from Liberty St to RR 57			X		X					
309	Zone 2 Feedermain from Zone 2 PS to Zone 2 Reservoir							X		X	
310	Zone 2 Feedermain on Concession Rd 3 from Middle Rd/Scugog St to Mearns Ave (Region Share)	X									

- Project 301 shown in two locations on the DC Figure. The northern-most point (Liberty Street, at the limit of the Urban Boundary) is the proposed new reservoir location. The point in Central Clarington (south of the railway) is the existing elevated tank, which will ultimately be demolished.

Project 307 is adjacent to the west limit of the study area on Lambs Rd. This project is a feedermain to the Zone 1 reservoir. From the 2018 Study report, this project was scheduled for 2019 and would bring water to the study area adjacent to the Soper Hills Secondary Plan Area.

Figure 3-2 Region of Durham – DC Water Projects



### 3.7.2.2 Timber Trails

GHD prepared a Functional Servicing Report (FSR) to support the development of the Timber Trails subdivision by Farsight Homes. The Timber Trails subdivision is bounded by King Street East/Highway 2 to the south, Lambs Road to the east, Concession 3 to the north and Soper Creek to the west.

As part of the Timber Trails FSR, a new 300mm watermain is proposed along King Street East from Haines Street to Lambs Road, and north along Lambs Road to the proposed development at Limba Way. This watermain will be extended to Concession 3 in future phases of the Timber Trails development. This watermain would provide for water servicing for the Soper Hills Secondary Plan Area.

### 3.7.2.3 Clarington Technology Business Park

The Clarington Technology Business Park (CTBP) is located to the south of the Soper Hills secondary plan study area. The business park is bounded by Highway 2 in the north, Bennett Road in the east, Highway 401 in the south and Haines Street in the west. This area is within Township of Clarington Zone 1 and there is an existing watermain within the business park area along Baseline Road.

The CTBP Class EA makes note that areas north and east of the business park (which would include Soper Hills Secondary Plan Area) will require an extension of a feedermain independent of the CTBP servicing (future EA's).

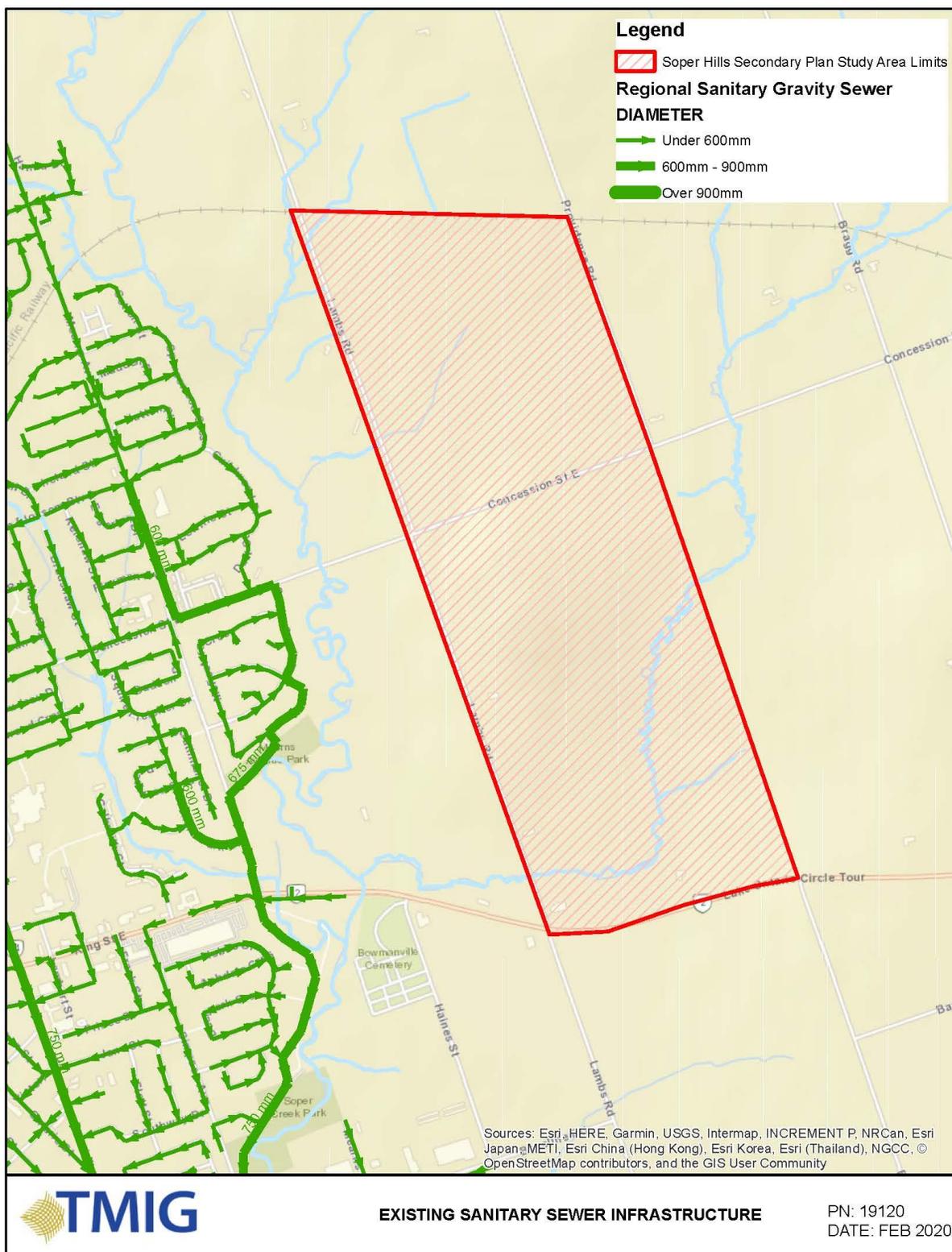
## 3.8 Sanitary Infrastructure

### 3.8.1 Existing Sanitary Services

The current sanitary sewer network covers the developed area of Bowmanville, with sanitary sewers ending approximately near King St E / Highway 2 and Haines Street, west of the study area. There are no existing sanitary sewers within or adjacent to the study area. The nearest existing sanitary sewer is a 200mm sewer on King St E / Highway 2 west of Haines Street.

**Figure 3-3** shows existing sanitary infrastructure near the Soper Hills Secondary Plan area. The information shown on the figure is from GIS files provided by the Region.

Figure 3-3 Existing Sanitary Sewer Infrastructure



### 3.8.2 Planned Sanitary System Improvements

#### 3.8.2.1 Durham Region Capital Projects

The Region of Durham updated its Development Charge Background Study in 2018. This study is to establish the future development-related capital projects. Several projects were identified in the Town of Bowmanville. The Bowmanville DC sanitary projects are summarized below in Table 3-2 and shown in **Figure 3-4**.

**Table 3-2 Bowmanville DC Projects - Sanitary**

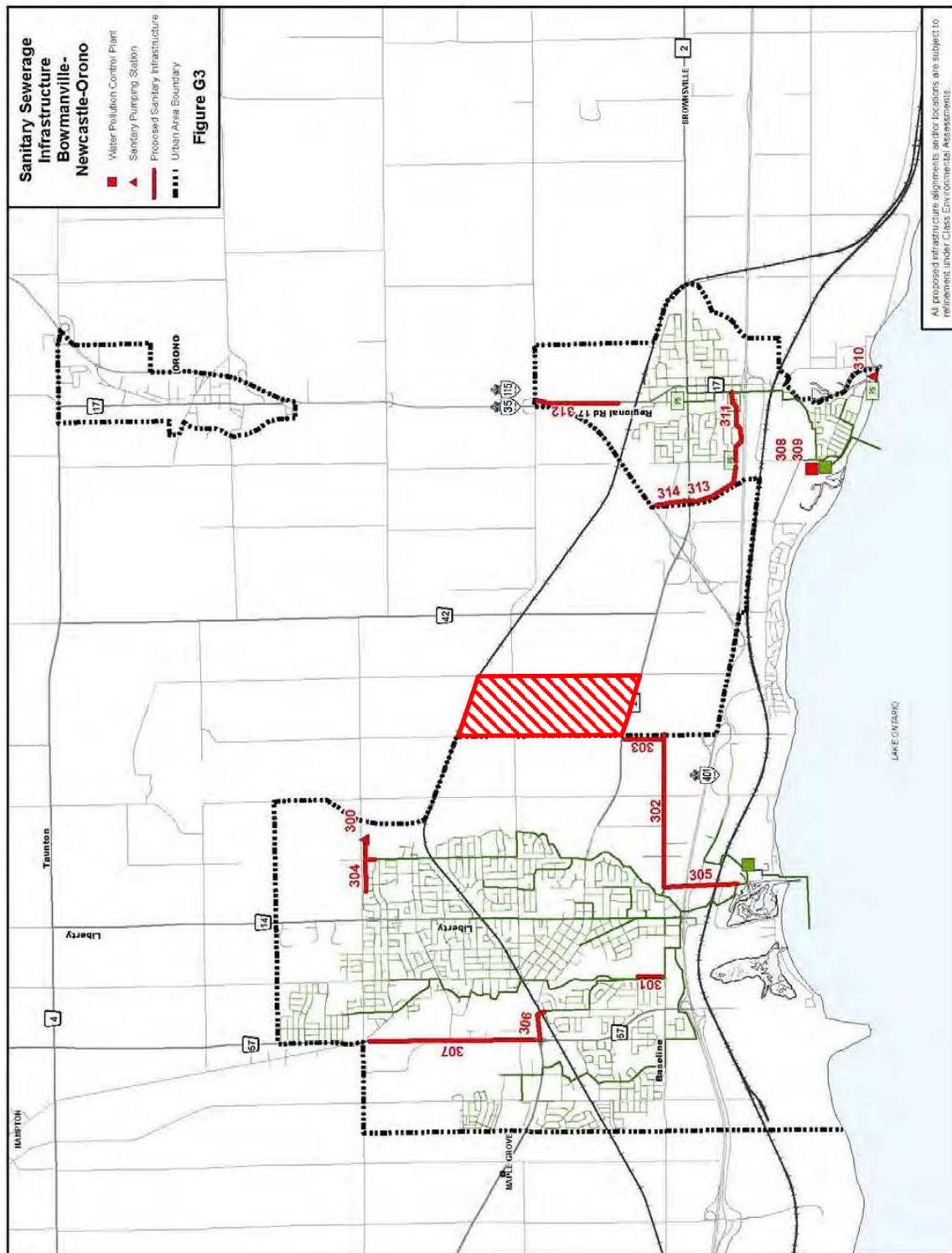
ID	Description	Year Construction is to Commence									
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
300	Northeast SSPS, forcemain allowance									X	
301	Twinning of trunk sewer Spry Ave, from Baseline Rd to N/L Spry Ave										X
302	Baseline Rd trunk sewer from Simpson Ave to Bennett Rd (Region share)			X		X					
303	Bennett Rd trunk sewer from Baseline Rd to Highway 2 (Region share)										X
304	Soper Creek trunk sewer on Mearns Ave from Freeland Ave to Concession Rd 3, and on Concession 3 from Mearns Ave to 450m west of Mearns Ave (Region share)								X		
305	Port Darlington Rd trunk sewer from Baseline Rd to existing easement			X		X					

Project 303 is located on the south-east corner of the study area and conveys sewage south on Bennett Rd to Baseline Rd.

Figure 3-4 Region of Durham – DC Sanitary Projects

Region of Durham  
 2018 Development Charge Background Study

Appendix G – Regional Sanitary Sewerage  
 March 27, 2018 – Page G-7

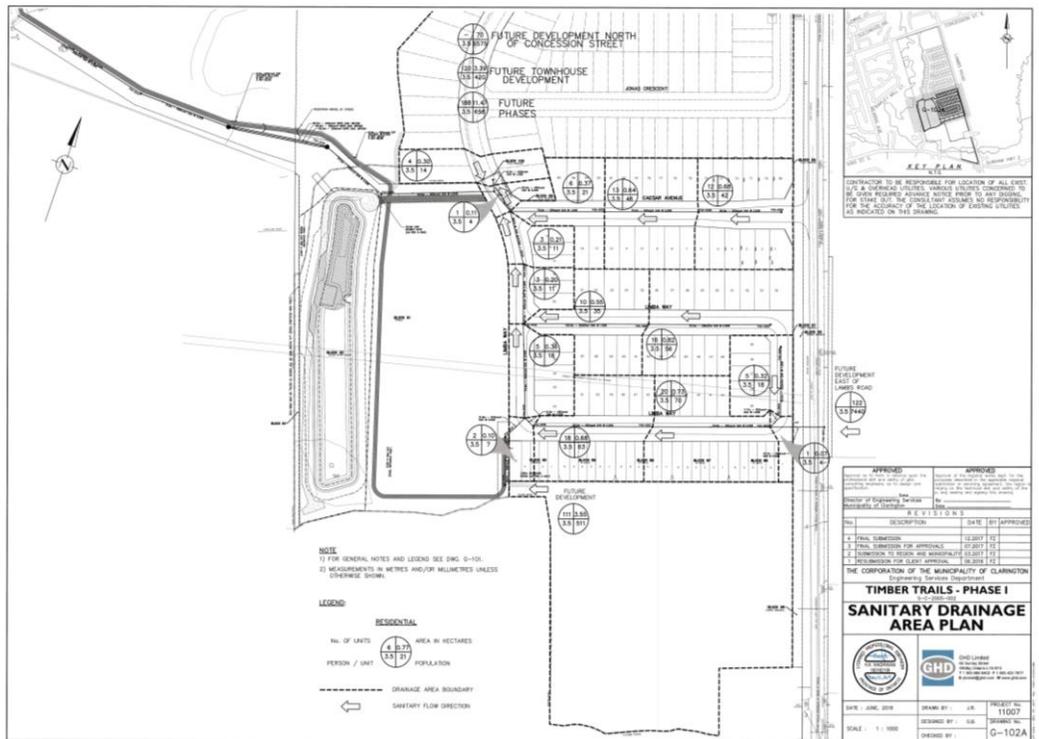


3.8.2.2 Timber Trails Community

GHD prepared a Functional Servicing Report (FSR) to support the development of the Timber Trails subdivision by Farsight Homes. As part of that FSR, the existing sanitary sewer will be extended from Barley Mills Crescent through a syphon across Soper Creek to the east side of the creek. The proposed sanitary for the Timber Trails development will all be directed towards this syphon. According to the sanitary drainage area plan for Timber Trails – Phase 1, these proposed sanitary sewers will be extended to Lambs Road and has allowance for the future development east of Lambs Road. This drainage map accounts for 122 ha, and 7,440 people (3.5 people per unit).

The drainage map is included in **Figure 3-5**.

**Figure 3-5 Sanitary Drainage Area Plan from Timber Trails Subdivision (GHD)**



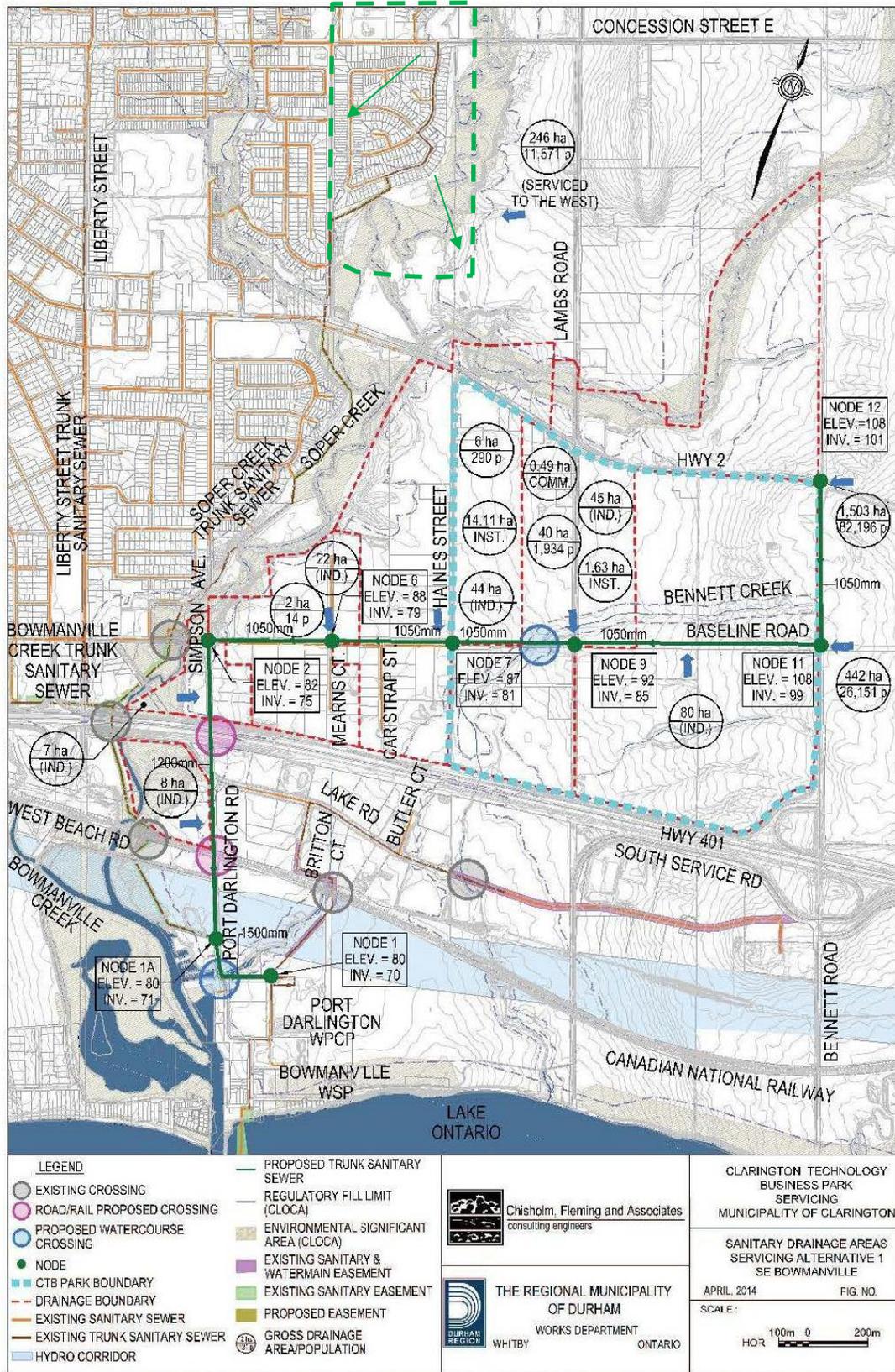
3.8.2.3 Clarington Technology Business Park Servicing Municipal Class EA

The Clarington Technology Business Park (CTBP) is located to the south of the Soper Hills secondary plan study area. The business park is bounded by Highway 2 in the north, Bennett Road in the east, Highway 401 in the south and Haines Street in the west.

There are no existing sanitary sewer within the business park land. The closest sanitary sewer is the Soper Creek Trunk sanitary sewer, which, according to the Clarington Technology Business Park Servicing Municipal Class EA (Chisholm Fleming, June 2015), has very little available capacity. The Lake Road Trunk Sanitary Sewer is south of Highway 401 and runs west and south to the Port Darlington WPCP.

The sanitary drainage area map from CTBP is shown in **Figure 3-6**.

Figure 3-6 Sanitary Drainage Area – Clarington Technology Business Park



NOTE: THIS MAP DEPICTS LOCAL PROXIMITY OF SERVICES AND EASEMENTS ONLY. THIS MAP HAS BEEN PRODUCED FROM A VARIETY OF SOURCES AND IS NOT A PLAN OF SURVEY.

Within the provided drainage map, there are two things to note:

- The area north of the business park (which includes the Timber Trail area and the majority of the Soper Hills Secondary Plan area) is identified as being serviced to the west.
- The area in the south-east corner of the Soper Hills Secondary Plan, which is south of the creek/natural feature, is included in “drainage boundary” outline.

At the corner of Highway 2 and Providence Rd/Bennett Road, the drainage map notes the addition of 1,503 ha and a population of 82,196 people. Further consultation with Durham Region is required to determine how those numbers were calculated, but it is reasonable to assume that this includes the southeast corner of the SHSP area.

The preferred alternative from the Class EA includes the construction of new sanitary trunk sewers south on Bennett Road (from Highway 2 to Baseline Rd), west on Baseline Road to Simpson Road, south on Simpson Road under the Highway 401, and continue south on Port Darlington Rd to the Port Darlington WPCP.

Through the public consultation centre, this preferred alternative was modified to remove the section on Bennett Road from Highway 2 to Baseline Road, as that section could be considered a local sewer and would be built when development requires it. The drainage/area/population previously applied to Highway 2 and Bennett Rd was added to the values at Baseline Rd and Bennett Rd. The revised design sheet is included in **Figure 3-7**.

It is worth noting that the significant elevation difference between the south-east portion of the SHSP area and the corner of Providence Road/Bennett Road at Highway 2 would make a connection to this proposed infrastructure difficult (i.e. very deep sewer or sanitary pumping station). Refer to **Section 5.4.2** for more information regarding this servicing constraint and the recommended sanitary servicing plan for the SHSP area.

Figure 3-7 Conceptual Design Sheet – Revised Alternative



MUNICIPALITY OF CLARINGTON  
 PROJECT: CLARINGTON TECHNOLOGY BUSINESS PARK SERVICING  
 FROM: BENNETT ROAD & BASELINE ROAD INTERSECTION  
 TO: FORT DARLINGTON WPCP

CONTRACT No. \_\_\_\_\_

DESIGNED BY: MH  
 CHECKED BY: AC  
 MANNING'S "n": 0.013  
 DATE: Dec-14  
 REVISED: Apr14/15

**REGIONAL MUNICIPALITY OF DURHAM  
 SANITARY SEWER DESIGN SHEET  
 (METRIC)**

5) EXISTING CONDITION INCLUDES COMMITTED DEVELOPMENT  
 6) USE ACTUAL METRIC I.D. PIPE SIZE IN mm  
 7) COMMERCIAL FLOOR SPACE INDEX-50% UNLESS OTHERWISE KNOWN

1) MINIMUM VELOCITY = 0.60 m/s  
 2) MAXIMUM VELOCITY = 3.05 m/s  
 3) INFILTRATION 0.52 l/s = 45.0 m<sup>3</sup>/ha/day (Foundation Drain Connections)  
 4) INDUSTRIAL 1.04 l/s (trunk sewers)  
 1.04 l/s (trunk sewers)

AREA	RESIDENTIAL					COMMERCIAL			INDUST.			FLOW IN LITRES PER SECOND					ALTERNATIVE 1 - REVISED									
	GROSS AREA (Ha)	POP. DENSITY (persons/ha)	POPULATION		PEAK FLOW FACTOR	FLOOR SPACE INDEX	LOT AREA (Ha)	FLOOR AREA (Ha)	LOT AREA (Ha)	INDUST. AREA (Ha)	RESIDENTIAL FLOW		COMML. SEWAGE	INDUS. 1.04 l/s	INSTIT. 1.30 l/s	TOTAL FLOW l/s	ACT. PIPE SIZE (mm)	SLOPE %	Q l/s	V m/s	% FULL					
			Cumulative Area	Cumulative Pop.							INFIL. 0.52 l/s	SEWAGE 0.0042 l/s														
NODE 11	1945	56	108347	108347	1.97	0	0.00	0.00	80	0	505.70	897.20	0.00	83.20	0.00	1488.10	1050	0.50	1930.91	2.23	78.09%					
NODE 9	40	48	1934	110281	1.97	0.49	0.10	0.05	125	1.83	518.07	910.34	0.10	130.00	2.11	1558.83	1050	0.60	2115.21	2.44	73.65%					
NODE 7	6	48	290	110571	1.96	0.49	0.10	0.05	169	15.74	517.63	912.31	0.10	175.79	20.40	1626.21	1200	0.30	2135.42	1.89	76.15%					
NODE 6	2	7	14	110585	1.96	0.49	0.10	0.05	191	15.74	518.15	912.41	0.10	198.84	20.40	1646.70	1200	0.30	2135.42	1.89	77.25%					
NODE 2 to NODE 1A - Flows from North	0	0	0	110585	1.96	0.49	0.10	0.05	206	15.74	518.15	912.41	0.10	214.24	20.40	1665.30	1200	0.40	2465.77	2.18	67.54%					
Node 1A - Existing Flows from East																1332.14										
Existing Flows from Lake Road																98.53										
Total - Node 1A To WPCP																3065.97						1800	0.13	4160.40	1.63	74.42%

Additional Notes Specific to this Study:

- Institutional Flow: 1.30 l/s = 11.2m<sup>3</sup>/gross ha/day (including infiltration and peaking factor)
- Commercial Flow: 2.08 l/s = 180 m<sup>3</sup>/gross floor area ha/day (including infiltration and peaking effect)
- See Figure 7 for Commercial Floor Area (Ha). Floor space was calculated using Lot Area and Floor Area (from previous study)
- Area to the south of the CNR tracks assumed to be serviced by a separate system
- Area to the south of the CNR tracks assumed to be serviced by a separate system
- Ex. Flow Soper Creek Trunk = 1332.14 l/s (Regional Sanitary Sewerage Planning Study, TSH, 1992)
- Ex. Flow Lake Road Trunk = 98.53 l/s (Regional Sanitary Sewerage Planning Study, TSH, 1992)

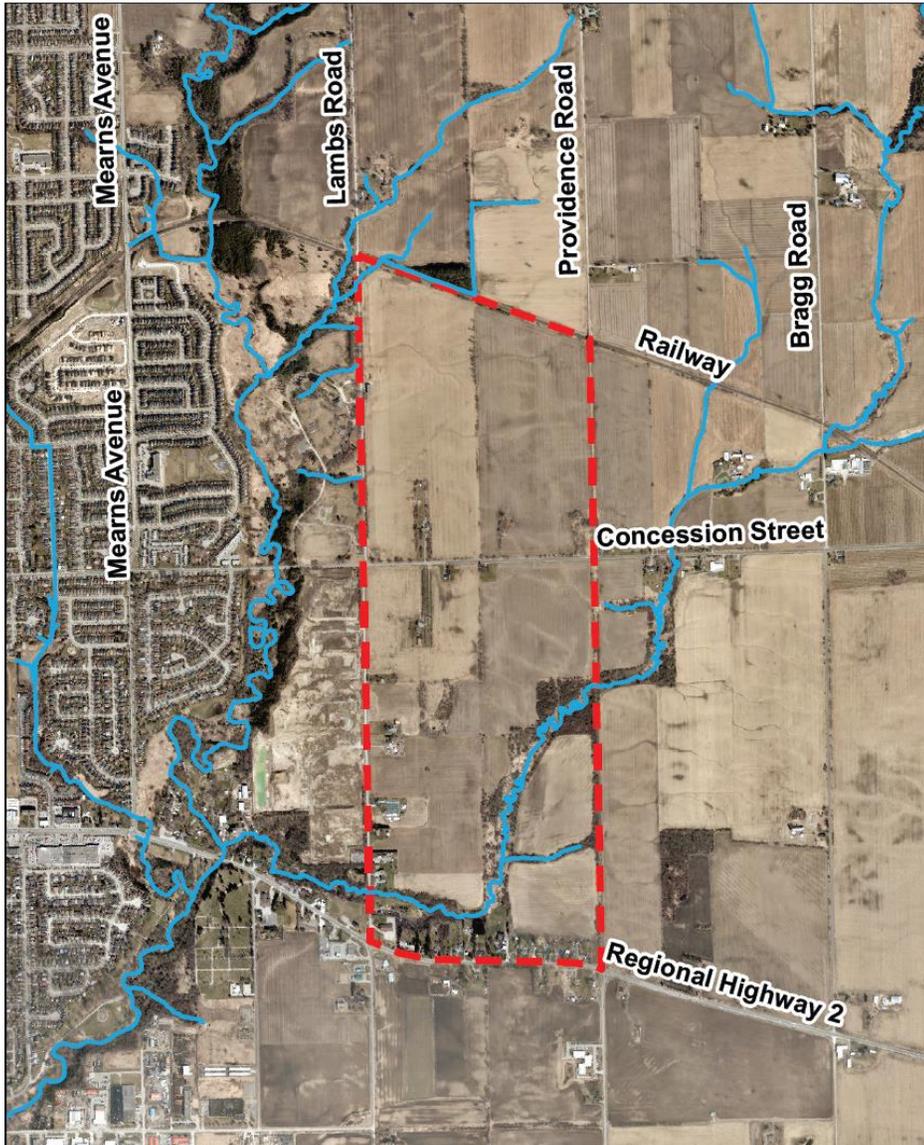
### 3.9 Transportation

#### 3.9.1 General Road Network Description

The existing transportation network surrounding the SHSP area consists of rural roads which access agricultural lands and large residential frontage properties. It is bordered by the Canadian Pacific Railway (CPR) to the north, Lambs Road to the west, Bennett Road / Providence Road unopened road allowance to the east and Highway 2 to the south.

Figure 3-8 below illustrates the existing road network in the SHSP area.

Figure 3-8 Study Area Road Network



#### 3.9.2 Existing Area Road Network

Within the study area boundary, there are four existing roadways. These roadways are described as follows:

**Regional Highway 2** is an east-west Type B Arterial road with a two-lane cross-section under the jurisdiction of the Regional Municipality of Durham. The roadway exhibits a rural cross-section with an approximate

pavement width of 8.0 metres with wide soft shoulders and ditches along both sides. Highway 2 is an important primary route spanning much of Southern Ontario and has posted maximum speed limit of 70 km/h within the study area limits. Highway 2 is known as King Street East, from Martin Road to Lambs Road, through Bowmanville and west of the SHSP area.

**Concession Street East** is an east-west arterial road that operates with a two-lane cross section (one lane per direction) under the jurisdiction of the Municipality of Clarington. Concession Street is classified as a Type C Arterial road west of Lambs Road, from Scugog Street to Lambs Road, and a Type B Arterial road, east of Lambs Road to Highway 35/115. The eastern section was deferred by Durham Region, resulting in the re-designation of the road to a Type B Arterial.

Concession Street East exhibits a rural cross-section with an approximate pavement width of 7.0 metres with narrow soft shoulders and ditches along both sides. The roadway spans from Wellington Street to Darlington Clarke Townline and provides an important connection to the Bowmanville community with a bridge crossing at Soper Creek. Concession Street operates with a posted speed limit of 70 km/h within the study area with the exception of a 50 km/h posted speed in the vicinity of Lambs Road.

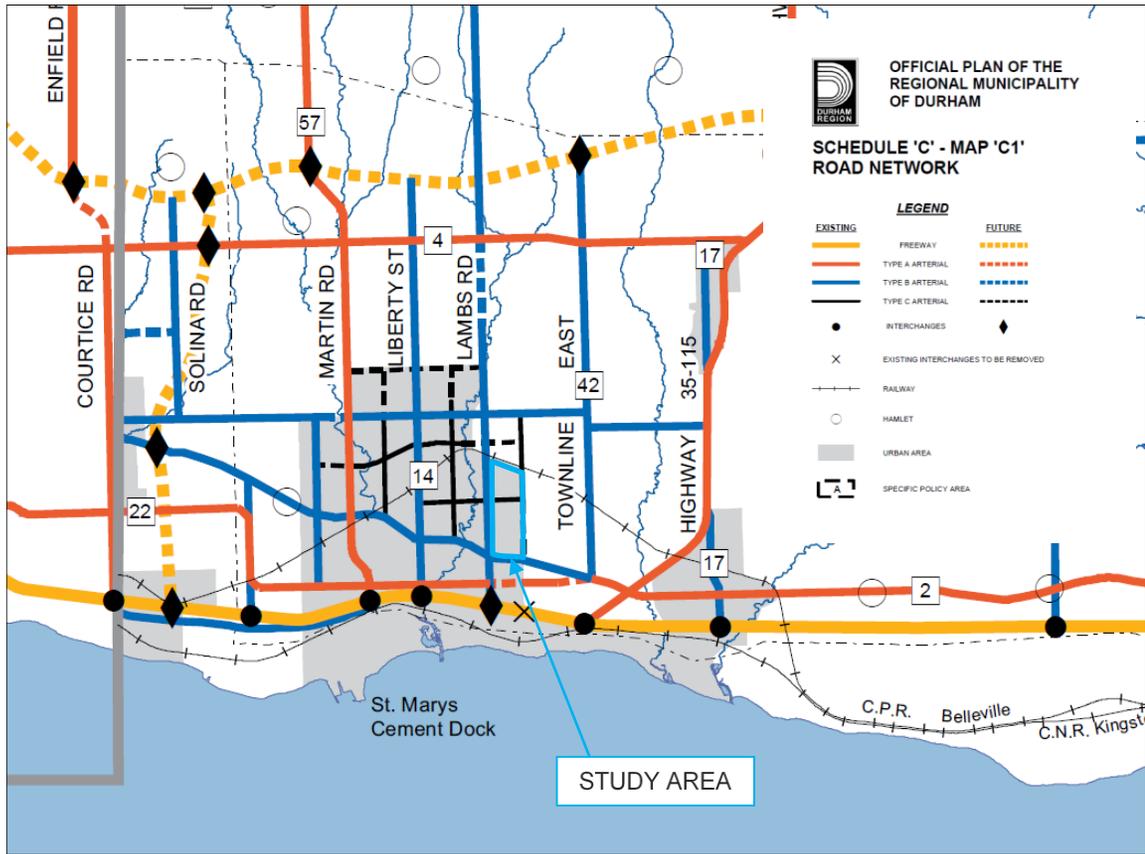
**Lambs Road** is a north-south Type B Arterial road within the study area that operates with a two-lane cross-section (one lane per direction) under the jurisdiction of the Municipality of Clarington. Lambs Road exhibits a rural cross-section with an approximate pavement width of 7.0 metres with narrow soft shoulders and ditches along both sides. The roadway spans from Concession Road 4, terminating slightly north of Highway 401. Lambs Road crosses the CPR corridor at a level crossing at the northern extent of the study area and has a posted limit of 60 km/h.

**Providence Road** is a north-south gravel roadway from Concession Road 3 extending south to Concession Street East. Providence Road is classified as a Type C Arterial under the jurisdiction of the Municipality of Clarington. There is a recently decommissioned bridge crossing the CPR corridor.

None of the roadways in or abutting the SHSP area have sidewalks or paved shoulders that would facilitate active modes of transportation.

**Figure 3-9** and **Figure 3-10** illustrate the existing Road Network classifications, as per the Region of Durham and Municipality of Clarington Official Plans, respectively.

**Figure 3-9 Durham Region Official Plan Road Network (Schedule C)**



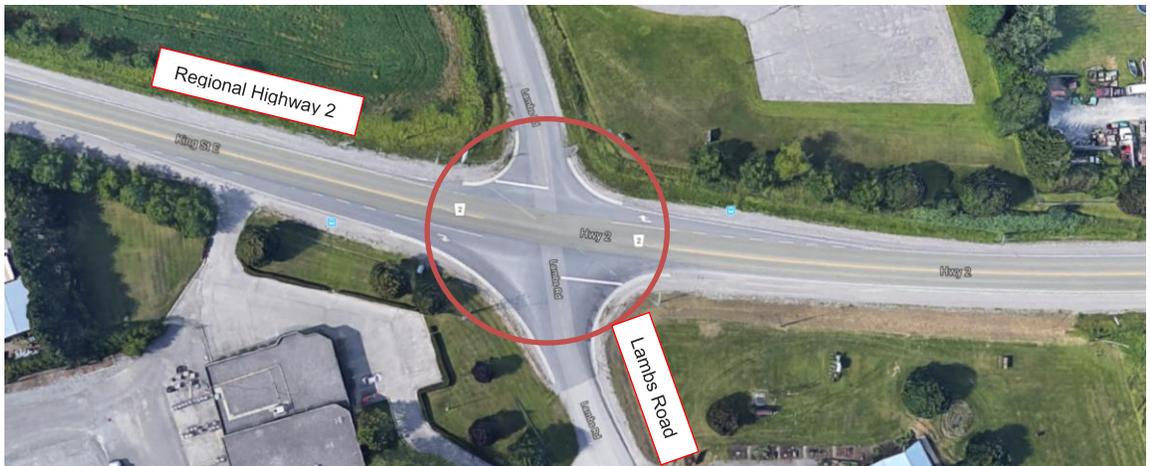


**Figure 3-11 Regional Highway 2 and Bennett Road**



**Regional Highway 2 and Lambs Road** is a four-legged side-street stop controlled intersection with free flow condition along Regional Highway 2. The intersection is skewed as it falls on a curvilinear portion of Regional Highway 2. There are eastbound and westbound exclusive right-turn lanes along Regional Highway 2 with hard, mountable curbs on all four legs on the intersection. An aerial photo of the intersection is provided in **Figure 3-12**.

**Figure 3-12 Regional Highway 2 and Lambs Road**



**Concession Street East and Lambs Road** is a four-legged side-street stop controlled intersection with free flow condition along Concession Road East. The intersection exhibits an approximate 12.0 metre stagger (centreline to centreline). An aerial photo of the intersection is provided in **Figure 3-13**.

**Figure 3-13 Concession Street East and Lambs Road**



**Concession Street East and Providence Road** is a three-legged side-street stop controlled intersection with free flow condition along Concession Road East. An aerial photo of the intersection is provided in **Figure 3-14**.

**Figure 3-14 Concession Street East and Providence Road**



### 3.9.4 Existing Traffic Volumes

Existing traffic conditions have been reviewed throughout the study area. Turning movement counts at key intersections were obtained from Durham Region. Additionally, TMIG collected data for traffic counts for the municipal intersections. Weekday turning movement counts were undertaken at the study area intersections during the a.m. and p.m. peak periods. An inventory of this data is contained in **Table 3-3**.

**Table 3-3 Existing Traffic Data**

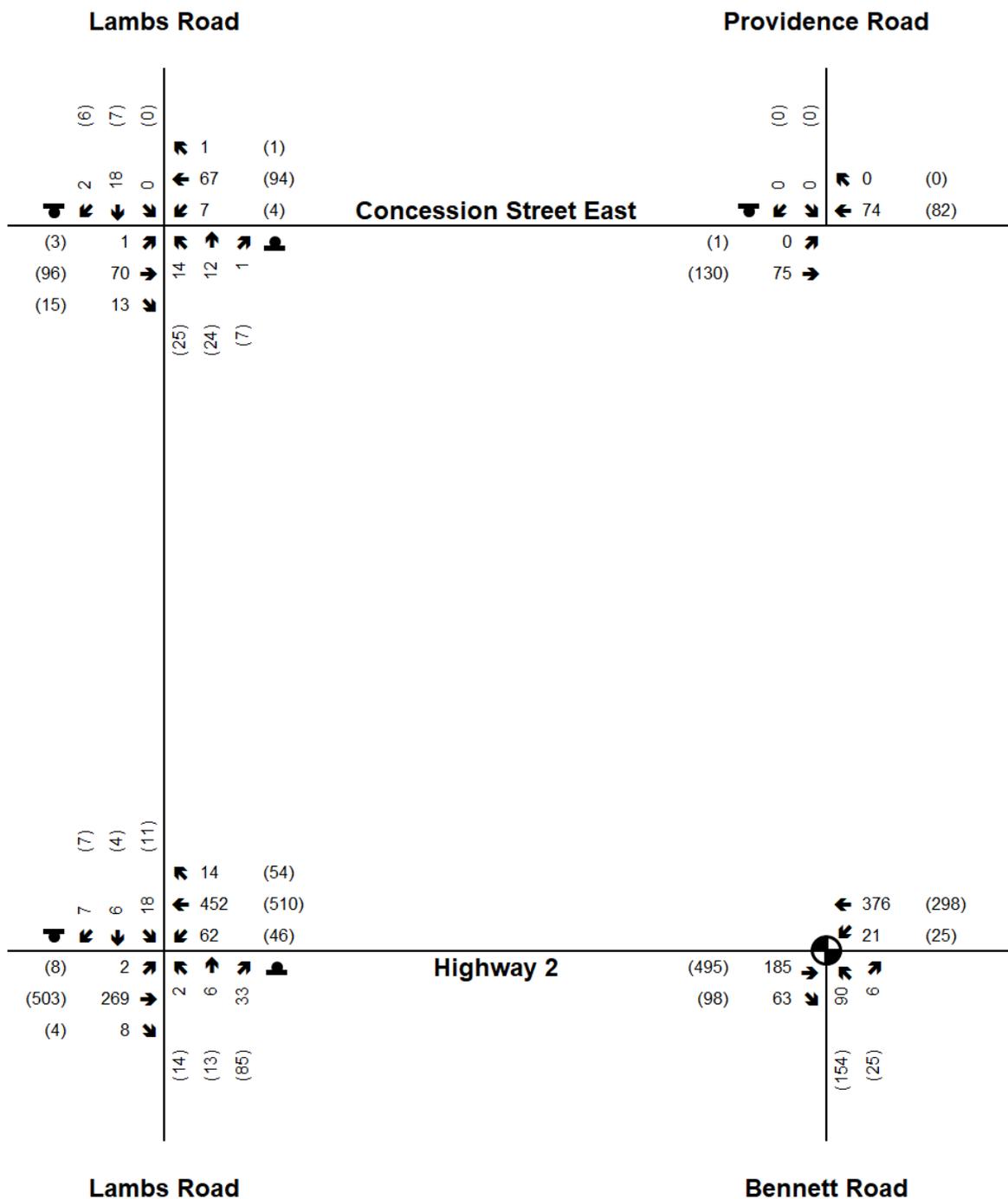
Intersection Name	Intersection Type	Date Counted
Regional Highway 2 & Bennett Road	Signalized	September 25, 2018
Regional Highway 2 & Lambs Road	Unsignalized	May 30, 2019
Concession Street East & Lambs Road	Unsignalized	October 1, 2019
Concession Street East & Providence Road	Unsignalized	October 1, 2019

It is noted that the traffic data for the signalized intersection of Regional Highway 2 and Bennett Road is over a year old, and approaching the two-year threshold for relevant data. However, new turning movement counts were not obtained due to abnormal road conditions at the time of this study caused by the COVID-19 pandemic. In the interim, this data will be adjusted using background corridor growth rates to match projected existing conditions, until such time when road conditions return to relatively normal conditions and new counts can be conducted safely and accurately.

In addition, when new counts are able to be conducted following the COVID-19 pandemic, detailed observations will be made on existing conditions, including existing traffic operations and queueing during peak hours. A summary of these findings will be included in a future version of this report, as required.

**Figure 3-15** summarizes the baseline traffic volumes during each of the weekday a.m. and p.m. peak hours. The traffic data is included in **Appendix E**.

Figure 3-15 Existing 2019 Traffic Volumes



### 3.9.5 Existing Intersection Analysis

The effectiveness of an intersection's operations is measured in terms of average vehicular delay, the volume to capacity ratio (v/c), and vehicle queuing, generally distilled down to a Level-of-Service (LOS), ranging from LOS 'A' to LOS 'F'. LOS 'A' is the 'best' level of operation for an intersection representing little or no delay and generally free flow conditions where the general level of comfort and convenience experienced by motorists is excellent. At the other end of the spectrum LOS 'F' represents an at-capacity condition usually associated

with heavy congestion, and occasionally severe peak period delays and queuing. It should be noted that operations measured as LOS 'A' up to and including LOS 'E' are considered 'acceptable' in most urban (and in many rural) environments.

Volume to capacity (v/c) ratios express an individual performance metric of how specific movements (as well as overall signalized intersections) are operating in relation to their theoretically calculated capacity. A ratio of 1.00 represents an at-capacity condition (demand = capacity), and could have characteristics similar to those described in the above paragraph for LOS 'F'. Anything better than (i.e., below) a v/c ratio of 0.90 is typically considered to be acceptable and even ratios between 0.90 and 1.00, can be acceptable to drivers in many circumstances.

Measures and estimates of vehicle queuing provides yet another layer of information with which to assess traffic operations. In areas where there is tight spacing of intersections or otherwise limited space, even though acceptable LOS or v/c ratios might be reported, vehicle queuing might suggest operational problems (or vice-versa) in the local context. Queuing results, and the way in which they are interpreted, are therefore very case-sensitive and should be viewed specific to road network context.

Intersection capacity analysis were undertaken at the study intersections throughout the study area using the Synchro software package with methodology outlined in the Highway Capacity Manual 2000. Current signal timing plans provided by Durham Region were applied to existing traffic conditions. The existing signal timing plans are included in **Appendix E**.

**Table 3-4** summarizes the analysis results for the study intersections during the weekday AM peak hour during existing 2019 conditions. Movements of interest, having LOS 'E' or 'F' and/or a v/c > 0.85, were identified for each of the intersections examined. Detailed capacity sheets are provided in **Appendix E**.

**Table 3-4 Capacity Analysis of Existing 2019 Traffic Conditions**

Intersection	Movement of Interest	Weekday AM Peak Hour			Weekday PM Peak Hour		
		V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
Regional Highway 2 & Bennett Road (Signalized)	Overall	0.37	8	A	0.50	11	B
	EBT	0.17	5	A	0.48	9	A
	EBR	0.04	4	A	0.08	6	A
	WBL	0.03	4	A	0.06	6	A
	WBT	0.35	6	A	0.30	7	A
	NBLR	0.47	28	C	0.56	26	C
Regional Highway 2 & Lambs Road (Unsignalized)	EBLT	0.00	1	A	0.01	1	A
	WBLT	0.06	2	A	0.06	2	A
	NBLTR	0.10	14	B	0.39	24	C
	SBLTR	0.15	23	C	0.18	37	E
Concession Street East & Lambs Road (Unsignalized)	EBLTR	0.00	1	A	0.00	1	A
	WBLTR	0.01	1	A	0.00	1	A
	NBLTR	0.04	10	B	0.09	11	B
	SBLTR	0.03	10	B	0.02	10	B
Concession Street East & Providence Road (Unsignalized)	EBLT	0.00	0	-	0.00	1	A
	SBLR	0.00	0	A	0.00	0	A

Under existing conditions the study intersections are operating well overall.

The signalized intersection of Regional Highway 2 and Bennett Road experiences an overall v/c ratio of 0.37 and 0.50 and LOS of 'A' and 'B' during the weekday a.m. and p.m. peak hours, respectively. During the

weekday a.m. peak hour, v/c ratios of individual movements do not exceed 0.47 and operate at LOS 'C' or better. During the weekday p.m. peak hour, v/c ratios of individual movements do not exceed 0.56 and operate at LOS 'C' or better. Queue lengths do not exceed 40m during both the weekday a.m. and p.m. peak periods (experienced at the westbound through and northbound left movements).

The unsignalized intersection of Regional Highway 2 and Lambs Road operates well during the weekday a.m. and p.m. peak periods. During the weekday a.m. peak hour, the intersection experiences delays of 23 seconds (LOS 'C') or less. During the weekday p.m. peak hour, with the exception of the southbound left/through/right movement, individual movements experience delays of 24 seconds (LOS 'C') or less. The southbound left/through/right movement experiences a delay of 37 seconds (LOS 'E') during the weekday p.m. peak hour. Queue lengths do not exceed 15m during both the weekday a.m. and p.m. peak periods (experienced at the northbound and southbound movements).

The unsignalized intersection of Concession Street East and Lambs Road operates under excellent conditions during the weekday a.m. and p.m. peak periods. During the weekday a.m. peak hour, the intersection experiences delays of 10 seconds (LOS 'B') or less. The intersection experiences a delay of 11 seconds (LOS 'B') or less during the weekday p.m. peak hour. Queue lengths do not exceed 1 vehicle during the weekday a.m. and p.m. peak periods.

The unsignalized intersection of Concession Street East and Providence Road operates under excellent conditions during the weekday a.m. and p.m. peak periods, with delays not exceeding 1 second (LOS 'A'). Queue lengths do not exceed 1 vehicle during the weekday a.m. and p.m. peak periods.

After conducting the aforementioned capacity analysis of the study area intersections, it can be concluded that under existing conditions, the road network operates under excellent conditions, with all individual movements experiencing minor delays, low v/c ratios, good levels of service, and short queue lengths. No changes to the road network is recommended based on existing traffic volumes.

### 3.9.6 Active Transportation

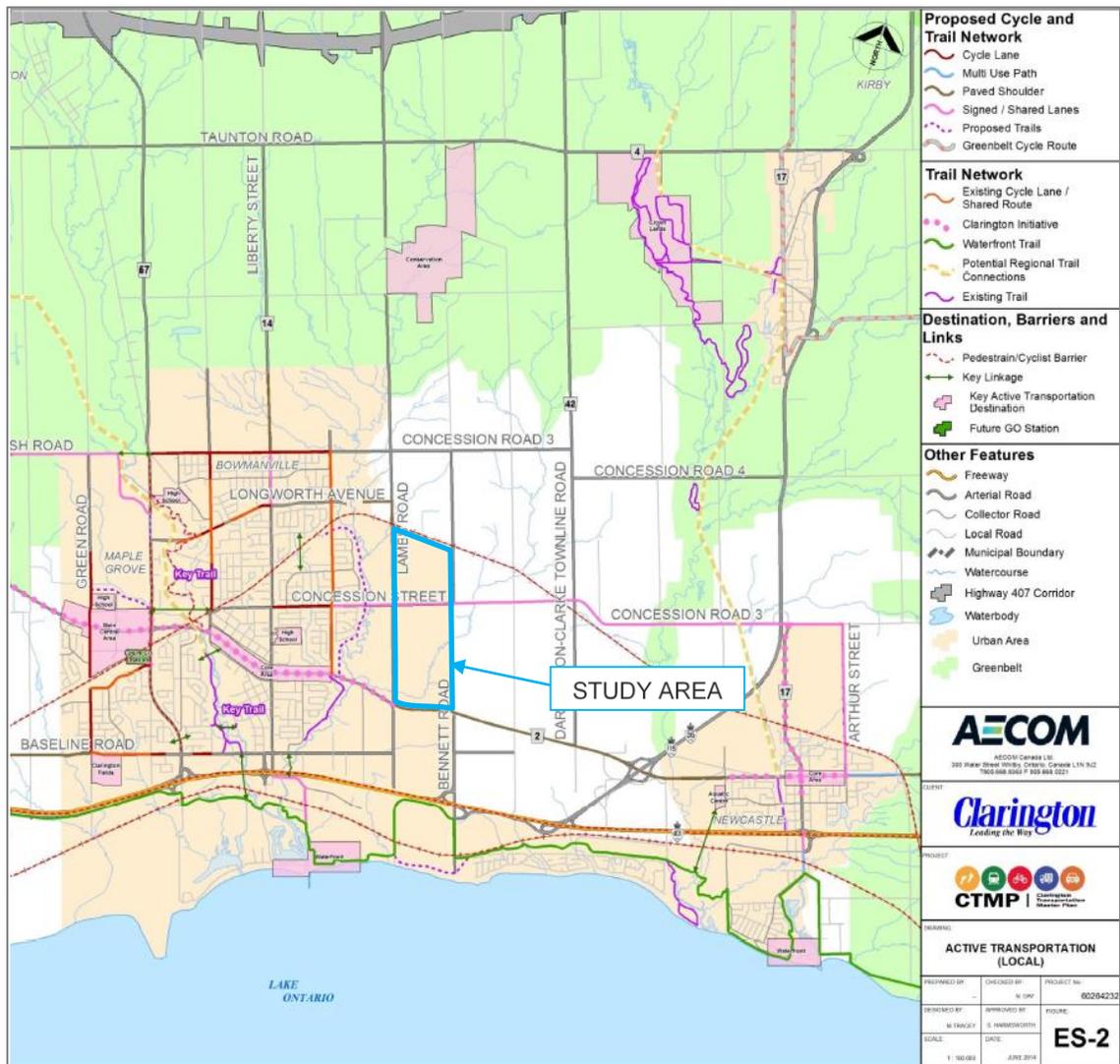
The existing rural conditions of the existing road network at the Lambs Road, Concession Street East, and Providence Road Corridors provide no sidewalks or paved shoulders to safely facilitate active modes of transportation. There is a small portion of Regional Highway 2 near the intersection at Bennett Road that provides approximately 170m of paved shoulder, however this cannot significantly facilitate cycle routes near the study area road network.

There are currently dedicated cycling lanes along Mearns Avenue, located approximately 800m west of the study area from Concession Road 3 to Regional Highway 2, as well as bicycle-friendly routes connecting trails and parks to the urban residential community in Bowmanville. If an east-west cycling connection were to be created along one of the arterial roads passing through the study area, there would be potential to integrate a future cycling facility in the SHSP area to the local network.

The Region of Durham's Regional Cycling Plan (2012) and Municipality of Clarington's Transportation Master Plan outline a series of recommendations for a region-wide cycling network and implementation strategy. Within the hierarchy of facilities identified in the plan, there are Primary Cycling Network (Spines), Regional Trail Network (Trails), and Secondary Cycling Network (Local Routes). "Spines" are routes which are planned to connect major centres, inter-modal facilities and key destinations which are typically located within arterial road corridors. "Trails" are regional scale multi-use routes typically located off-road and used for recreational purposes. "Local routes" connect neighbourhoods enabling short-distance trips, and provide access from neighbourhoods to the Primary Cycling Network.

**Figure 3-16** maps the existing and proposed cycling and trail routes around the Region of Durham in the vicinity of the study area.

Figure 3-16 Existing and Proposed Cycle and Trail Network



### 3.9.7 Transit Services

#### 3.9.7.1 Existing Transit Services

The Municipality of Clarington Official Plan designates King Street / Regional Highway 2 as a Regional Transit Spine, through the Bowmanville Urban Area and terminating at Highway 35/115. Accordingly, a number of local and regional transit routes feed and connect to Regional Highway 2, as detailed below.

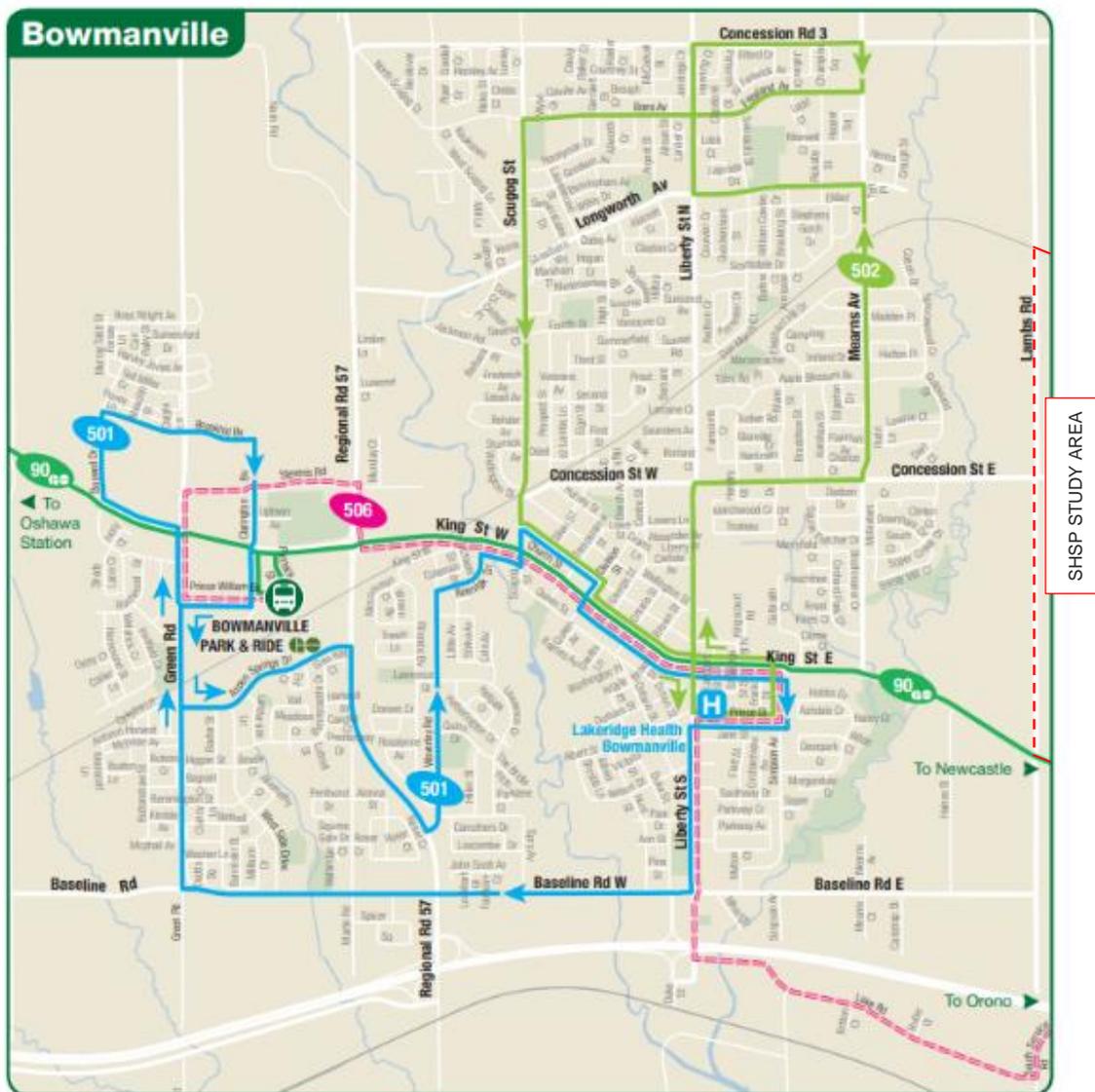
#### Durham Region Transit

Existing Durham Region Transit services are provided in the vicinity of the site via Routes 501, 502 and 506, with the nearest cluster of bus stops located at the intersection of King Street East and Simpson Avenue, approximately 1.5 kilometers from the intersection at Regional Highway 2 and Lambs Road. The closest bus stop to the SHSP area is located at the intersection of Concession Street East and Mearns Avenue, approximately 900m from the intersection at Concession Street East and Lambs Road.

Routes 501 connects west to the Bowmanville Park & Ride GO Transit facility, serving the Bowmanville community located south of Regional Highway 2, and connecting to the regional network. Route 502 runs

north of Regional Highway 2, serving residential communities up to Concession Road 3 where it also loops back around to Regional Highway 2. Route 506 runs from the Bowmanville Park & Ride, along Regional Highway 2 before turning south, crossing Highway 401, and continuing east to Newcastle and north to Orono. In Newcastle, Route 506 connects with the terminal stop for GO Transit’s Route 90 and Route 91 bus services. **Figure 3-17** maps the routes of these Durham Region Transit bus services, located west of the subject site.

**Figure 3-17 Existing Durham Region Transit Bus Operations**



**GO Transit**

Currently, there are GO Bus operations in the vicinity of the site. The existing Bowmanville Park-and-Ride GO Station is located approximately 5 kilometers from the intersection of Regional Highway 2 and Lambs Road. There are transit services provided by GO Bus lines to the subject site via Route 90 and Route 91, with the nearest bus stops for both routes 50 meters or less from the intersection at Regional Highway 2 and Lambs Road as well as at Regional Highway 2 and Bennett Road. **Figure 3-18** shows the locations of existing GO Transit bus stops along Regional Highway 2.

Figure 3-18 Existing GO Transit Bus Operations

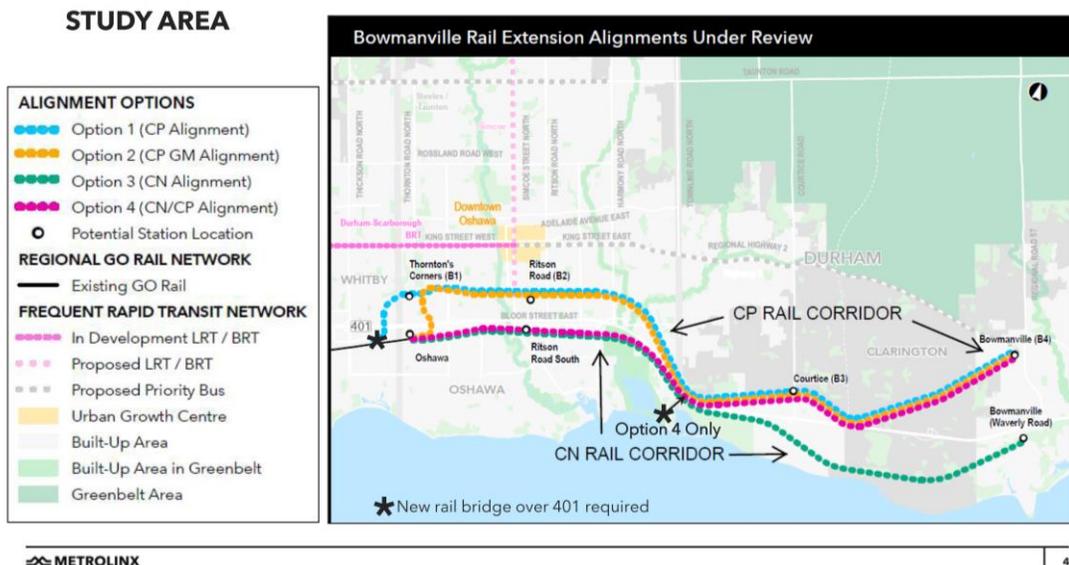


3.9.7.2 Future Transit Network Plans

GO Transit

Looking forward, there are plans in development by Metrolinx, for a GO Transit rail expansion east of Oshawa to Martin Road in Bowmanville. This service expansion would provide Durham Region with more direct connections to downtown Toronto and the larger GO Transit network through proposed two-way all-day service to Bowmanville. The rail expansion was initially scheduled to run rush-hour service only, but has since been revised by the Province, which may considerably enhance access to and from the SHSP area and the Greater Toronto Area region. **Figure 3-19** depicts the four options being considered for this expansion.

Figure 3-19 Future GO Transit Rail Expansion, Alignment Under Review



The four alignments are now under review by the Province of Ontario, with three of four options terminating near the existing Bowmanville Park & Ride facility, which as determined above, is accessible via local transit from the SHSP area. The fourth alignment option would terminate south of Highway 401 at Waverley Road, which is not currently served by local transit. Irrespective of the alignment chosen, the potential future presence of a GO Transit rail station would likely serve as a catalyst for local transit and development, potentially benefitting the SHSP area by proximity. Metrolinx is currently proceeding with a business case for alignment Option 2, shown in yellow in **Figure 3-19**.

### 3.9.8 Study Area Road Network Improvements

Several road network improvements are proposed in the vicinity of the Soper Hills Secondary Plan area.

The Region of Durham's 9 year Capital Road Forecast identifies intersection improvements at Regional Highway 2 and Lambs Road, for construction in 2023. The nature of the improvements will be determined through an Intersection Control Study.

The Region of Durham's Transportation Master Plan (TMP) 2017 identifies a number of improvements to the boundary road network. Intersection improvements are planned by the Region at Highway 2 and Lambs Road, planned for 2023, with details yet to be determined. In addition, Highway 2 is planned to be widened between Mearns Avenue and Highway 35/115 from 2 to 4 lanes beyond 2031.

The Clarington Transportation Master Plan (TMP) also indicates a road expansion plan for the widening of the Lambs Road corridor, from Regional Highway 2 to Baseline Road, from 2 to 4 lanes. This road improvement will only be implemented if the interchange at Highway 401 and Lambs Road is built. Construction phasing is planned between 2021 and 2031; thus, falling within the horizon year.

The Durham TMP and Clarington TMP also propose plans to implement infrastructure to promote active modes of transportation. These include a Regional Cycling Plan Network that would connect along Lambs Road Corridor through Concession Street East and Regional Highway 2 and along Regional Highway 2, connecting through Bennett Road. Additionally, there are plans to implement paved shoulders along Regional Highway 2 from Lambs Road, crossing through Bennett Road. Project implementation phasing is planned between 2017 and 2032; thus, falling within the horizon year.

## 4 PLANNED DEVELOPMENT

*To be completed during subsequent study phases*

### 4.1 Land Use and Transportation Alternatives

### 4.2 Evaluation of Alternatives

### 4.3 Preferred Land Use and Transportation Alternative

Figure 4-1 Preferred Land Use Plan

## 5 PROPOSED SERVICING

### 5.1 Grading

### 5.2 Watercourse Crossings

### 5.3 Water Supply and Distribution

#### 5.3.1 Design Criteria

The water distribution system for the area of Bowmanville and Township of Clarington was designed according to the most recent version of the Region of Durham's Design Specifications for Watermains (April 2019). Relevant criteria from the Region's standards are summarized in **Table 5-1**.

**Table 5-1 Watermain Design Criteria**

<b>Domestic Average Day Demand</b>	364 Lpcd
<b>Maximum Day Demand</b>	550 Lpcd
<b>Commercial generation rate</b>	Shopping centres= 2500-5000 L/day/1000m Hospitals = 900-1800 L/bed/day Schools = 70 – 140 L/student/day
<b>Institutional generation rate</b>	45 m <sup>3</sup> /ha/day – 90 m <sup>3</sup> /ha/day
<b>Minimum Required Fire Flow for single family, detached dwellings</b>	4,500 L/min (75 L/s)
<b>Hazen-Williams 'C' Factor</b>	150mm: C=100 200mm to 300mm: C=110 350mm to 600mm: C=120 Over 600mm: C=130
<b>System Pressure Range under Normal Condition</b>	275 kPa (40 psi) – 700 kPa (100 psi)
<b>Minimum System Pressure under Maximum Day Demand</b>	140 kPa (20 psi)

*\*Based on Region of Durham's Design Specifications for Watermains (April 2019)*

**5.3.2 Water Supply and Boundary Conditions**

**5.3.3 Model Development**

**5.3.4 Model Results**

**Table 5-2 Water Model Output Summary**

Scenario	Minimum Water System Requirements	Modeling Results within SHSP
Maximum Day	550 Lpcd	
Peak Hour		
Max Day + Fire (Pressure > 20 psi)	Residential Fire Flow = 4,500 L/min	
	Commercial Fire Flow = FUS	

**5.4 Wastewater**

**5.4.1 Design Criteria**

The sanitary sewer system Bowmanville and Township of Clarington were designed according to the most recent version of the Region of Durham’s Design Specifications for Watermains (April 2019). Relevant criteria from the Region’s standards are summarized in **Table 5-3**.

**Table 5-3 Wastewater Design Criteria**

<b>Average Domestic Flow</b>	364 Lpcd
<b>Infiltration Rate</b>	22.5 m <sup>3</sup> /gross ha/day (0.26 L/s/day) when foundation drains are not connected to the sanitary sewer; 45.0 m <sup>3</sup> /gross ha/day (0.52 L/s/day) when foundation drains are connected to the sanitary sewer
<b>Peaking Factor</b>	Harmon
<b>Population densities – Detailed information not available</b>	Single Family Dwelling – 60 p/ha Townhouse – 125 p/ha Apartment: Low-density (62 u/ha) – 150 p/ha Med-low density (86 u/ha) – 210 p/ha Med density (124 u/ha) – 300 p/ha High density (274 u/ha) – 600 p/ha
<b>Population densities – Detailed information is known</b>	Single Family Dwelling – 3.5 p/unit Townhouse/stacked townhouse – 3.0 p/unit Apartment: 1 bedroom – 1.5 p/unit 2 bedroom – 2.5 p/unit 3 bedroom – 3.5 p/unit 4 bedroom – 4.5 p/unit
<b>Undeveloped land</b>	Future land use and population based on Region of Durham Official Plan and Secondary Plans of the local municipalities
<b>Commercial</b>	180 m <sup>3</sup> /gross floor area / day (2.08 L/s/day), including infiltration and peaking Floor space index: 0.50 of gross lot area unless otherwise on approved plan
<b>Industrial / Schools and Institutions</b>	Industrial: 180 m <sup>3</sup> /gross floor area / day (2.08 L/s/day), including infiltration and peaking for local sewers 90 m <sup>3</sup> /gross floor area / day (1.04 L/s/day), including infiltration and peaking for trunk sewer

*\*Based on Region of Durham's Design Specifications for Sanitary Sewers (April 2019)*

Other key criteria from the Design Specifications for Sanitary Sewers are that sanitary sewers are required to maintain a minimum slope of 0.5% for all local sewers, and 1.0% on the first upstream run. Flow velocities are to be no less than 0.6 m/s and no more than 3.65 m/s. The minimum pipe size is specified at 200 mm and the minimum depth to the sewer obvert from the road centerline is 2.75 m in all residential areas.

#### **5.4.2 Proposed Sanitary Servicing Plan**

### **5.5 Stormwater**

#### **5.5.1 Applicable Criteria**

#### **5.5.2 Stormwater Management Approach**

#### **5.5.3 Stormwater Management Plan**

#### **5.5.4 Stormwater Management Facilities**

### **5.6 Water Budget**

### **5.7 Transportation**

#### **5.7.1 Travel Demand Forecasts**

#### **5.7.2 Future Total Traffic Volumes**

#### **5.7.3 Future Road Network**

##### **5.7.3.1 Intersection Spacing**

#### **5.7.4 Proposed Collector Road Right-of-Way**

#### **5.7.5 Road Network Phasing**

#### **5.7.6 Future Traffic Conditions**

#### **5.7.7 Transit Plan**

#### **5.7.8 Active Transportation**

#### **5.7.9 Transportation Demand Management**

#### **5.7.10 Summary of Transportation Assessment**

#### **5.7.11 Future Transportation Studies Considerations**

## 6 PHASING AND IMPLEMENTATION

# 7 PUBLIC CONSULTATION

## 7.1 Consultation Approach

As outlined in **Section 2.2.1**, this study has followed the 'Integrated Approach' from the Municipal Class EA, where study notices and public consultation have satisfied the requirements of both the Municipal Class EA and Planning Act.

## 7.2 Notice of Commencement and Public Information Centre # 1

A combined Notice of Commencement and Notice of Public Information Centre (PIC) # 1 was advertised in Clarington This Week for 2 consecutive weeks, first issued on February 20, 2019. The notice was also mailed to residents in and near the study area and relevant agencies and posted on the Municipality of Clarington website.

## 7.3 Public Information Centre # 1

PIC#1 took place on March 6, 2019 at the Garnet B. Rickard Recreation Complex in Bowmanville. The meeting was drop-in format, where attendees could view information boards and ask questions of municipal staff and the consulting team. Information was presented regarding the study area and the processes for both the Secondary Plan and Municipal Class EA.

A total of 27 were recorded on the sign-in sheet. Feedback was solicited from attendees through interactive display boards. Most of the feedback received pertained to the type and form of land use desired in the study area, but some comments were received regarding transportation and connectivity. Preference was given to trails, bike lanes and sidewalks, and travel by bus was not preferred by attendees. Naturalized and landscaped streets were also preferred by attendees.

More information on PIC # 1 can be found in **Appendix A**.

## 7.4 Public Information Centre # 2

To be completed

## 7.5 Notice of Study Completion

To be completed

## 7.6 Consultation with Indigenous Communities

To be completed

## 7.7 Other Stakeholder Consultation

To be completed

- Steering Committee Meetings
- Meetings with Durham Region

# 8 SUMMARY

## 9 REFERENCES

Chapman, L.J. and Putnam, D.F. (1984). 'The Physiography of Southern Ontario – Third Edition.' Ontario Geological Survey, Special Volume 2.



## **APPENDIX A**

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### **NATURAL HERITAGE**

## **APPENDIX B**

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### **HYDROGEOLOGY**

## APPENDIX C

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### ARCHAEOLOGY

## **APPENDIX D**

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### **CULTURAL HERITAGE**

## **APPENDIX E**

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### **NOISE AND VIBRATION**

## **APPENDIX F**

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### **FLUVIAL GEOMORPHOLOGY**

## **APPENDIX G**

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### **STORMWATER MANAGEMENT**

## *APPENDIX G1*

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*Existing Conditions Visual  
OTTHYMO Inputs and Output*

## *APPENDIX G2*

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*Existing Conditions Visual  
OTTHYMO Inputs and Output*

## *APPENDIX G3*

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### *SWM Pond Rating Curves*

## *APPENDIX G4*

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### *Existing Conditions PCSWMM Inputs and Output*

## *APPENDIX G5*

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*Proposed Conditions PCSWMM  
Inputs and Output*

## *APPENDIX G6*

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### *Phosphorus Loading Analyses*

## **APPENDIX H**

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### **HYDRAULICS**

## **APPENDIX I**

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### **WATER SUPPLY AND DISTRIBUTION**

## **APPENDIX J**

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### **WASTEWATER SERVICING**

## **APPENDIX K**

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### **GRADING**

## **APPENDIX L**

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### **TRANSPORTATION**

## **APPENDIX M**

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### **PHASING AND COST ESTIMATES**