



Town of Whitchurch-Stouffville Water and Wastewater Master Plan Executive Summary

Prepared
by GM BluePlan for:

Town of Whitchurch-
Stouffville

Project No. 717022

November 2018

EXECUTIVE SUMMARY



Executive Summary

The Water and Wastewater Master Plan comprehensively documents the development and selection of the preferred water and wastewater servicing strategies for the Town of Whitchurch-Stouffville to meet the servicing needs of existing and future growth to 2041.

The Master Plan Report is organized as follows:

Executive Summary

1. Background and Planning Framework
2. Water Master Plan
3. Wastewater Master Plan
4. Further Considerations
5. Public Consultation

1 Introduction

1.1 Background

The Town of Whitchurch-Stouffville is located in Southern Ontario, bordering the City of Markham, Town of Newmarket, Town of Aurora, Town of Richmond Hill, the Town of East Gwillimbury and Durham Region. The Town of Whitchurch-Stouffville is comprised of several communities including Stouffville, Ballantrae, Bloomington, Musselman's Lake, Vandorf-Preston Lake and Gormley.

The Town of Whitchurch-Stouffville water and wastewater servicing is operated under a two-tiered system. York Region is responsible for water supply, transmission mains, storage facilities and booster pumping stations; as well as wastewater treatment and trunk collection system. The Town is responsible for the operation and maintenance of the local water distribution system and local sewer collection systems.

The Town of Whitchurch-Stouffville is part of the Greater Golden Horseshoe (GGH) area situated around the southern end of Lake Ontario that continues to be one of the fastest growing regions in North America. The Government of Ontario's legislative growth plan, *Places to Grow Act 2005*, and recent amendments, identifies substantial population and employment growth for the GGH to the year 2041.

Readily available and accessible public infrastructure is essential to the viability of existing and growing communities. Infrastructure planning, land use planning and infrastructure investment require close integration to ensure efficient, safe and economically achievable solutions to provide the required water and wastewater infrastructure. To balance the needs of growth with the protection and preservation of natural, environmental and heritage resources, the Town of Whitchurch-Stouffville initiated an integrated process to complete a new Water and Wastewater Master Plan.

The Town of Whitchurch-Stouffville retained GM BluePlan Engineering Limited (GM BluePlan) to complete the Water and Wastewater Master Plan which provides the review and development of water and wastewater servicing strategies for servicing within the Town. The Master Plan uses population and employment growth forecasts based on a 2041 planning horizon.

The Study Area for the Master Plan focuses on the existing service areas within the Communities of Stouffville, Ballantrae-Musselman's Lake, but also provides comment on municipal water and sanitary servicing potential for the Town's communities that currently do not have municipal servicing. **Figure ES1** provides a map of the study area.

The 2018 Master Plan builds on previous work undertaken as part of the 2013 Functional Servicing Study (FSS) and the 2013 Development Charges Background Study Report – Water and Wastewater Servicing. The 2018 Master Plan is a critical component in the Town's planning for growth and will provide the framework and vision for the water and wastewater servicing needs to year 2041.

1.1.1 Master Plan Objectives

The Master Plan comprehensively documents the development of the preferred water and wastewater servicing strategies for the Town of Whitchurch-Stouffville to meet the servicing needs of existing users and future development to 2041.

The Master Plan evaluates the ability of existing and planned water and wastewater infrastructure within the Town of Whitchurch-Stouffville to efficiently and effectively service the Town's existing population, service the forecasted growth, and evaluate/develop recommended servicing strategies.

The key objectives of the Master Plan are as follows:

- Review planning forecasts to 2041 and determine the impacts on servicing needs for the Town's water and wastewater infrastructure;
- Evaluate the ability of existing and planned water and wastewater infrastructure to efficiently and effectively service the Town's existing users and anticipated growth;
- Undertake a comprehensive review and analysis for both water and wastewater servicing requirements;
- Address key servicing considerations as part of the development and evaluation of water and wastewater servicing strategies including:
 - Level of service to existing users, anticipated future growth to 2041 estimated by the Town
 - Operational flexibility and system security and reliability
 - Mitigation of impacts to natural, social and economic environments
 - Opportunity to meet policy, policy statements, regulations and technical criteria
 - Opportunity to optimize existing infrastructure and servicing strategies
 - Ensuring the strategies are cost effective.
- Utilize new calibrated water and wastewater hydraulic models for the analysis of servicing alternatives;
- Establish a complete and implementable water and wastewater capital program;
- Provide extensive consultation with the public and stakeholders; and
- Complete the Master Plan in accordance with the Municipal Engineers Association (MEA) Class Environmental Assessment (EA) process for Master Plans.

This study was originally planned in accordance with Approach #2 of the Master Planning process as set out in the MEA Class EA (October 2000, as amended in 2007, 2011 &

2015) but was later changed to Approach #1 as outlined in Section A.2.7 (Approach 1 in Appendix 4) of the MEA Class EA based on the strategic level study input. This approach involves the preparation of a Master Plan document at the conclusion of Phase 1 and 2 of the Class EA process. The Master Plan was prepared at a broad level assessment and recognizes that further detailed assessment will be required through separate study or Integrated Planning Approach to satisfy project specific fulfillment of the MEA Class EA requirements for the specific schedule B projects identified within the Master Plan.

1.2 Background and Planning Context

1.2.1 Problem and Opportunity Statement

The Water and Wastewater Master Plan has been initiated to identify servicing requirements for existing service areas and growth areas to 2041 including a review of municipal servicing potential for the Town's communities of Ballantrae-Musselman's Lake, Gormley, Vandorf, and Bloomington.

The Regional Municipality of York is responsible for the planning of the Regional system for water supply, storage and pumping, and wastewater collection and treatment. The Town of Whitchurch-Stouffville is reliant on the Region to provide adequate water supply and wastewater collection for the Community of Stouffville (water supply and wastewater collection) and Ballantrae-Musselman's Lake (water supply).

1.2.2 Study Area

The Town of Whitchurch-Stouffville is located in the Regional Municipality of York, in the southern region of Ontario. The Town is situated in the eastern portion of the Greater Golden Horseshoe (GGH). The Town has a total area of approximately 220 km² with a population of 45,800 persons and employment of 15,200 jobs in 2016. The majority of the population and employment reside within the Community of Stouffville with an approximate population and employment of 31,300 and 7,750 respectively in 2016.

The study area, provided in **Figure ES1**, primarily covers the urban areas within the Community of Stouffville and will consider growth expansion in the rural settlement areas of Ballantrae, Musselman's Lake, Vandorf-Preston Lake, Bloomington and Gormley. The majority of the Town's land is agricultural.

Approximately 80% of the Town is located within the Oak Ridges Moraine Conservation Plan jurisdiction. Development within this region is controlled to ensure the conservation and protection of significant ecological and hydrological features. The Town's southern area is located within the Rouge River watershed.

The Town resides in two (2) conservation authority jurisdictions; Ballantrae, Musselman's Lake, Vandorf-Preston Lake, and parts of Bloomington are located within the Lake Simcoe Region Conservation Authority (LSRCA) jurisdiction. The Community of

Stouffville, Gormley and the rest of Bloomington are located within the Toronto and Region Conservation Authority (TRCA) jurisdiction. The Conservation Authorities Act protects and restricts development in areas adjacent to or nearby wetlands, river, streams and any other significant features.

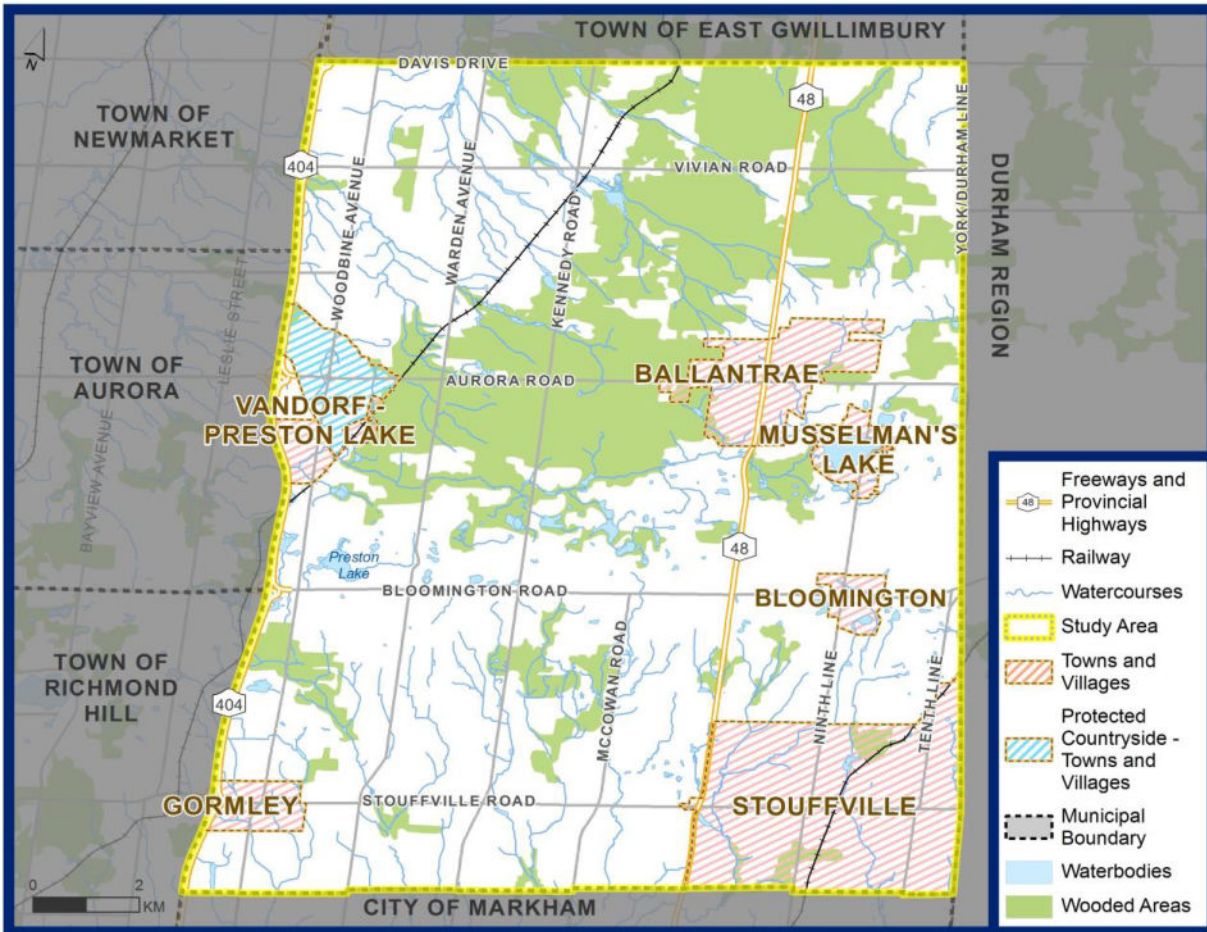


Figure ES1– Study Area

1.2.3 Planning and Growth Projections

The Growth Plan for the Greater Golden Horseshoe has had two amendments since its release in June 2006. The first amendment was released in January 2012 and contained new policies, schedules and definitions. The second amendment was released in June 2013 to update and extend the Growth Plan's vision, policies and population and employment forecasts to 2041 to help communities across the Region better plan for growth and development in a sustainable way. An updated Growth Plan was recently released in May 2017 and came into effect on July 1, 2017, replacing the previous 2006 Growth Plan. The 2017 Growth Plan provides population and employment growth

forecasts to 2041, which have not changed from the Amendment 2 Growth Plan 2006 values.

The Regional Municipality of York updated their Water and Wastewater Master Plan in November 2016. The Region used the population and employment forecasts identified in the Amendment 2 to the Growth Plan for the GGH (2013) mentioned above, as well as provided estimates for the Town of Whitchurch-Stouffville to 2041 (**Table ES1**).

Table ES1: Population and Employment Estimates to 2041

	Population		Employment	
	2015*	2041	2015	2041
Whitchurch-Stouffville	44,900	64,500	14,800	23,000
Region of York	1,156,200	1,790,000	577,600	900,000

Source: Regional Municipality of York Water and Wastewater Master Plan Update, 2016

*2015 values are the current population and employment values as of mid-year 2015; 2041 population and employment growth forecasts were assumed and used in the York Region Water and Wastewater Master Plan Update.

Based on the Town's on-going planning studies, development and pre-submission consultation, growth analysis and targets, the Town updated their population and employment growth forecasts to the year 2041 for use in the Master Plan.

Planning estimates for the Town of Whitchurch-Stouffville, distributed throughout the hamlets of the Community of Stouffville, Ballantrae, Musselman's Lake, Gormley, Preston Lake, Vandorf and Bloomington, were the basis for the water and wastewater demand and flow projections for this Master Plan. **Table ES2** and **Table ES3** provide an overview of the projected population and employment estimates to 2041. For the purpose of this study, 2016 has been used as the base year.

Table ES2: Projected Population to 2041

	2016	2021	2026	2031	2036	2041
Ballantrae	3,357	3,637	3,927	4,006	4,006	4,192
Bloomington	211	313	415	415	415	415
Gormley	124	124	124	124	124	124
Musselman's Lake	1,670	1,679	1,679	1,679	1,679	1,679
Other	7,685	7,790	7,823	7,823	7,823	7,823
Stouffville	31,312	40,385	46,309	49,490	50,826	51,932
Vandorf-Preston	1,479	1,488	1,488	1,488	1,488	1,488

	2016	2021	2026	2031	2036	2041
Total	45,838	55,416	61,765	65,025	66,361	67,653

Note: Town of Whitchurch-Stouffville Water and Wastewater Master Plan population estimates.

Table ES3: Projected Employment to 2041

	2016	2021	2026	2031	2036	2041
Ballantrae	253	287	323	332	332	332
Bloomington	171	183	195	195	195	195
Gormley	1,350	1,631	1,931	2,509	2,509	2,509
Musselman's Lake	26	27	27	27	27	27
Other	3,856	3,917	3,921	3,921	4,221	4,448
Stouffville	7,753	9,854	12,021	12,965	13,283	13,490
Vandorf-Preston	1,792	1,796	1,796	1,796	2,338	2,668
Total	15,201	17,695	20,214	21,745	22,629	23,669

Note: Town of Whitchurch-Stouffville Water and Wastewater Master Plan employment estimates.

1.3 Servicing Principles and Policy

Development of water and wastewater principles and policies are integral to provide guidelines and direction to the Master Plan process, as well as to the identification and development of servicing strategies. Through the course of the Master Plan, priority policy areas were brought forward including:

- Health and safety;
- System reliability and security;
- Reserve capacity for operational flexibility and level of service;
- Impacts of climate change;
- Source water protection;
- Considerations to energy use and efficiency;
- Recognition of impacts from water efficiency and conservation; and
- Addressing issues related to the full lifecycle of water and wastewater services.

1.4 Servicing Strategy Development

Opportunities and constraints for the water and wastewater systems were identified at the outset of the Master Plan and were used as a starting point for identifying servicing alternatives. The identification and assessment of servicing alternatives is a critical component of the master planning process. It enables a comprehensive review of various servicing solutions and should be documented to ensure the process has been carried out in a transparent and defensible manner.

As part of this Master Plan, water and wastewater alternative servicing strategies were reviewed for existing and future growth areas in order to select the servicing strategies that:

- Make best use of existing infrastructure to avoid new infrastructure where possible
- Minimize cost of new infrastructure
- Consider operation and maintenance costs to ensure financial sustainability
- Ensure long term reliability and security of the water and wastewater system
- Avoid/minimize environmental crossings and other disruptions to the environment.

1.5 Water Servicing Strategy

1.5.1 Overall Water Servicing Strategy Summary

The recommended water servicing strategy can be broken down into various components that have different aims but each contributing to the overall improvement of the existing system and service the projected growth to 2041.

1.5.1.1 Community of Stouffville

The preferred servicing strategy was developed to ensure that extension of the water distribution system follows the existing sub-trunk looping strategy, that existing infrastructure can support intensification within the downtown core and follows an integrated approach with the Town's state of good repair (SOGR) program.

In general, the water servicing strategy for the Community of Stouffville consists of:

- Aligning the intensification strategy with the ongoing SOGR projects in the downtown core.
- Continuation of the Main Street upgrades. This will significantly improve the available fire flows along the Main Street corridor.
- Build off the existing system configuration of sub-trunk looping. Applying this approach to the proposed Greenfield growth areas will allow for critical looping

within each quadrant of the system, along the servicing boundaries. This strengthens the overall system and provides greater operational flexibility.

- Build off the Regional storage strategy of supplementing Zone 2 from Zone 1.

Key capital projects required to achieve this strategy includes:

- 3 km of watermain upgrades along Main Street corridor. Primarily replacing of old cast iron watermains.
- New watermain along Highway 48 to connect Main Street to Zone 3. New pressure reducing valve (PRV) required.
- New 300 mm diameter watermains along Bethesda Road, at the northern limits of the servicing boundary, to connect Tenth Line to Highway 48.
- Two new Zone 1 to Zone 2 PRVs.

1.5.1.2 Community of Ballantrae-Musselman's Lake

The water servicing strategy for the Community of Ballantrae-Musselman's Lake consists of:

- Strengthen the trunk network from the Musselman's Lake Elevated Tank to the centre of the distribution system.

Key capital projects required to achieve this strategy includes:

- 2 km of new 300 mm diameter watermains along Ninth Line and Lakeshore Road. A twinning of the existing watermain.

1.5.1.3 Servicing of Highway 48

It is recommended that the Region and Town complete a joint study to investigate the opportunity to decommission the Highway 48 Booster Station and service existing Highway 48 customers from the Ballantrae-Musselman's Lake system.

The water servicing strategy for servicing of existing Highway 48 customers:

- Improve pressures along Highway 48 and eliminate the operational and maintenance challenges associated with the Highway 48 Booster Station by connecting the existing dead end to the Ballantrae-Musselman's Lake system.

Key capital projects required to achieve this strategy includes:

- 1 km of new 250 mm diameter watermains along Highway 48
- New PRV along Highway 48, in proximity of Bloomington Road
- Decommissioning of Highway 48 Booster Station.

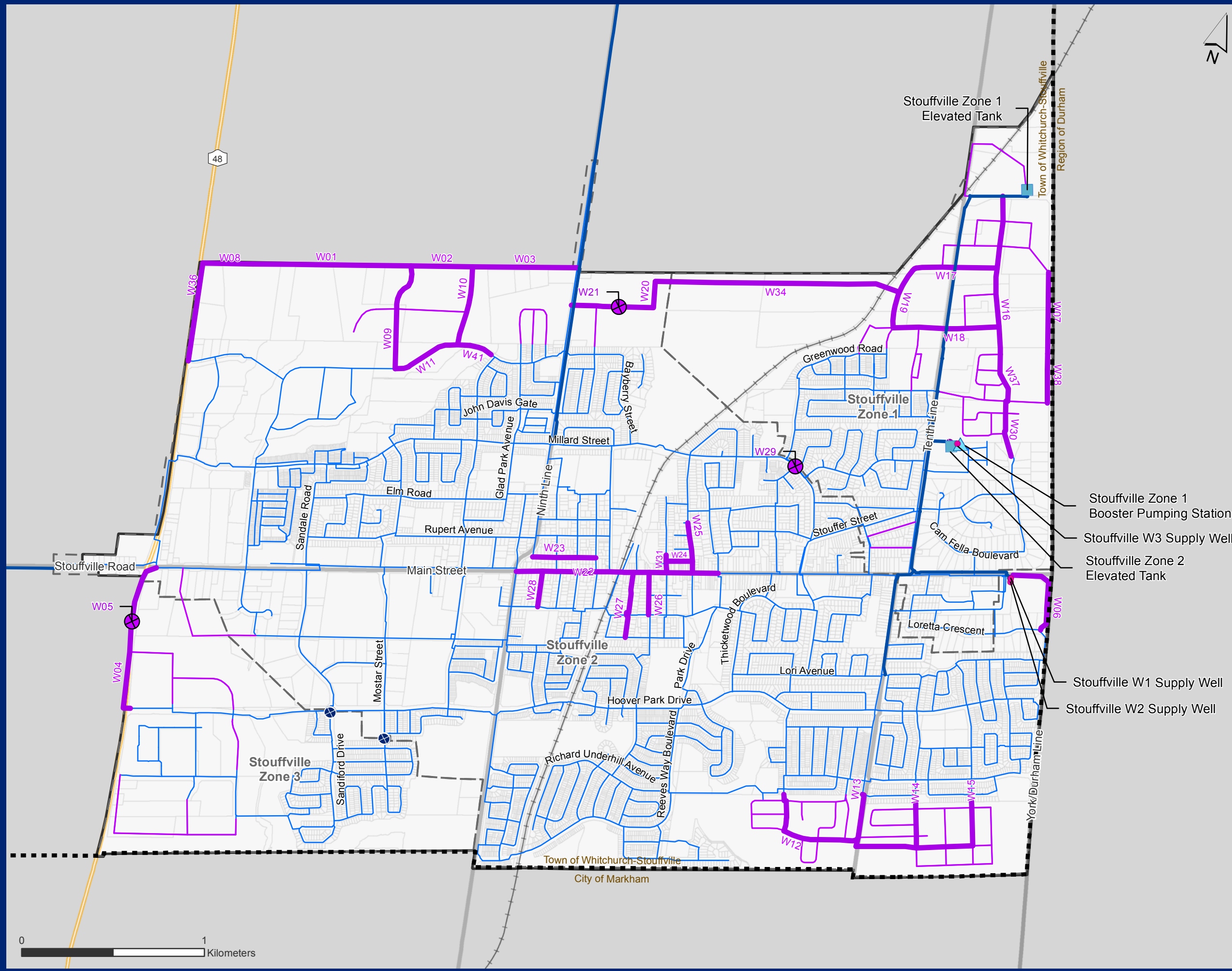
In addition to the key capital projects, several other projects and upgrades are included within the water servicing strategy to address existing and future capacity needs within

the collection system. The complete Preferred Water Strategy for the Town of Whitchurch-Stouffville is presented in **Figure ES2** and **Figure ES3**. Each capital project is listed along with its respective estimated capital cost in **Table ES4**.

The Master Plan recommends that a separate study be carried out to evaluate the potential for municipal water and wastewater services in the current unserved communities within the Town of Whitchurch-Stouffville, including Vandorf-Preston, and Gormley. The study should be undertaken through the coordination and collaboration at the municipal, regional, and provincial levels in order to provide a comprehensive review of servicing solutions for these areas.

1.5.2 Water Capital Program

A summary of the water servicing strategy capital program is provided in the following table. The capital program table contains project descriptions, dimensions, proposed timing, and estimated total project cost.



**Town of Whitchurch-Stouffville
Water and Wastewater Master Plan**

**Recommended Strategy - Water System
Community of Whitchurch-Stouffville**

Figure ES2

Proposed Water System

-  MP Capital Project - Pressure Reducing Valves (PRV)
-  MP Capital Project - Booster Pumping Station (BPS)
-  MP Capital Project - Watermain
-  Future Local Network

Existing Water System

All pumping stations, water storage, and supply wells are owned by the Region.

Regional Owned

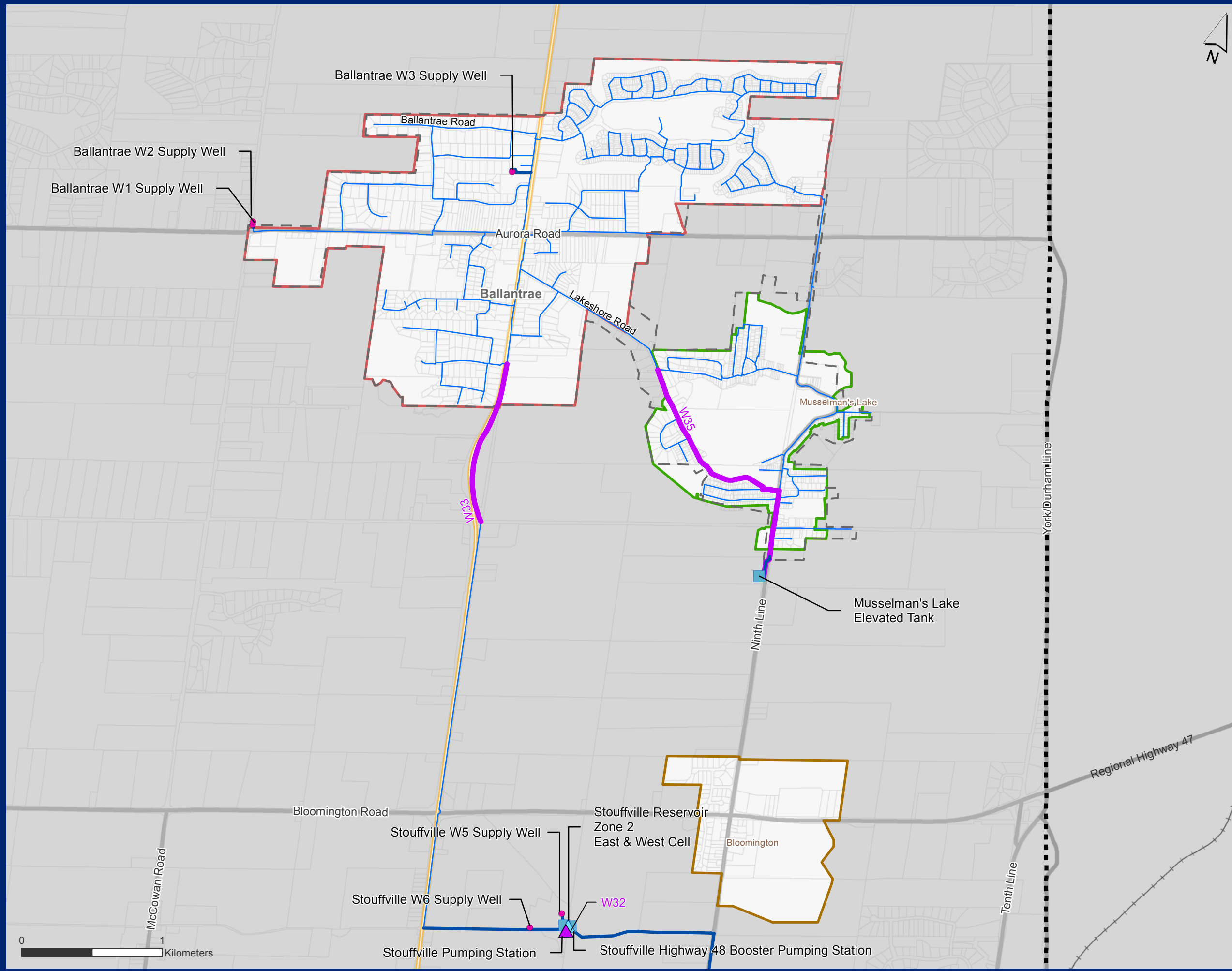
-  Pumping Station
-  Water Storage
-  Supply Well
-  Pressure Reducing Valves (PRV)
-  Watermains (Regional)

Municipal Owned

-  Pressure Reducing Valves (PRV)
-  Watermains (Municipal)
-  Existing Water
-  Pressure Districts

General Features

-  Study Area
-  Municipal Boundary
-  Freeways and Provincial Highways
-  Railway



**Town of Whitchurch-Stouffville
Water and Wastewater Master Plan**

**Recommended Strategy - Water System
Ballantrae and Musselman's Lake**

Figure ES3

Proposed Water System

-  MP Capital Project - Pressure Reducing Valve (PRV)
-  MP Capital Project - Booster Pumping Station (BPS)
-  MP Capital Project - Watermain
-  Future Local Network

Existing Water System

All pumping stations, water storage, and supply wells are owned by the Region.

Regional Owned	Municipal Owned
 Pumping Station	 Pressure Reducing Valves (PRV)
 Water Storage	 Watermains (Municipal)
 Supply Well	 Existing Water
 Pressure Reducing Valves (PRV)	 Pressure Districts
 Watermains (Regional)	

General Features

-  Ballantrae
-  Bloomington
-  Musselman's Lake
-  Municipal Boundary
-  Freeways and Provincial Highways
-  Railway

Table ES4: Water Capital Program

Master Plan ID	Project Name	Project Description	Year in Service	Municipality	Class EA	Size/Capacity	Length (m)	Class Estimate Type	Project Complexity	Area Condition	Base Construction Cost (\$2018)	Crossings (\$2018)	Additional Costs (\$2018)	Soft Costs (\$2018)	Non-Refundable HST (\$2018)	Total Estimated Cost (\$2018)
W01	Bethesda Side Road #1	New 300 mm diameter watermain along Bethesda Side Road from Ninth Line to W10. Two creek crossings.	2023	Stouffville	A+	300 mm	871	Class 4	High	Rural	586,000	243,000	276,000	639,000	30,000	\$ 1,806,000
W02	Bethesda Side Road #2	New 300 mm diameter watermain along Bethesda Side Road from W10 to W09	2023	Stouffville	A+	300 mm	336	Class 4	Low	Rural	226,000	-	50,000	103,000	7,000	\$ 396,000
W03	Bethesda Side Road #3	New 300 mm diameter watermain along Bethesda Side Road from W09 to W08	2023	Stouffville	A+	300 mm	573	Class 4	Low	Rural	385,000	-	83,000	172,000	11,000	\$ 661,000
W04	Hwy 48 #1	New 300 mm diameter watermain along Hwy 48 from Main Street to Hoover Park Drive. One creek crossing	2021-2026	Stouffville	A+	300 mm	862	Class 4	High	Rural	580,000	206,000	258,000	600,000	28,000	\$ 1,693,000
W05	PRV Hwy 48	New Zone 2/3 PRV along Hwy 48, south of Main Street. Exact location to be determined.	2021-2026	Stouffville	A+	0 mm	0	Class 4	Low	Rural	50,000	-	-	18,000	1,000	\$ 69,000
W06	York Durham Line #1	New 300 mm diameter watermain along Main Street and York Durham Line, from Stouffville Well 1&2 to Loretta Crescent. Potential issues with groundwater during construction based on historical construction in this area	2019	Stouffville	A+	300 mm	483	Class 4	High	Rural	325,000	-	107,000	249,000	12,000	\$ 703,000
W07	York Durham Line #2	New 200 mm diameter watermain along York Durham Line, between Bethesda Side Road and Main Street	2020-2022	Stouffville	A+	200 mm	446	Class 4	High	Rural	234,000	30,000	87,000	202,000	9,000	\$ 570,000
W08	Bethesda Side Road #4	New 300 mm diameter watermain along Bethesda Side Road from W01 to Hwy 48	2023	Stouffville	A+	300 mm	267	Class 4	Low	Rural	179,000	-	40,000	83,000	5,000	\$ 320,000
W09	Future Road #2	New 300 mm diameter watermain along future road connecting Baker Hill Boulevard to Bethesda Side Road	2019-2021	Stouffville	A+	300 mm	591	Class 4	Low	Rural	397,000	-	86,000	177,000	11,000	\$ 682,000
W10	Future Road #3	New 300 mm diameter watermain along future road connecting Baker Hill Boulevard to Bethesda Side Road	2019-2021	Stouffville	A+	300 mm	437	Class 4	Low	Rural	294,000	-	64,000	133,000	8,000	\$ 510,000
W11	Future Road #4	New 300 mm diameter watermain along Baker Hill Boulevard	2019	Stouffville	A+	300 mm	390	Class 4	High	Rural	262,000	-	87,000	203,000	9,000	\$ 574,000
W12	Future Road #5	New 300 mm diameter watermain along future road in southeast corner of Stouffville, south of Mantle Avenue. Connecting Byers Pond Way and W15. One creek crossing	2019	Stouffville	A+	300 mm	1210	Class 4	Low	Rural	813,000	37,000	183,000	378,000	24,000	\$ 1,458,000
W13	Future Road #6	New 300 mm diameter watermain along future road in southeast corner of Stouffville, south of Mantle Avenue. Extension of existing watermain on Tenth Line	2019	Stouffville	A+	300 mm	286	Class 4	Low	Rural	192,000	-	43,000	88,000	6,000	\$ 339,000
W14	Future Road #7	New 300 mm diameter watermain along future road in southeast corner of Stouffville, south of Mantle Avenue. Extension of existing watermain on Sunnyridge Avenue	2020	Stouffville	A+	300 mm	243	Class 4	Low	Rural	163,000	-	37,000	76,000	5,000	\$ 291,000
W15	Future Road #8	New 300 mm diameter watermain in southeast corner of Stouffville, south of Mantle Avenue	2020	Stouffville	A+	300 mm	245	Class 4	Low	Rural	165,000	-	37,000	76,000	5,000	\$ 294,000
W16	Future Road #9	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W37 to Bethesda Side Road	2020-2022	Stouffville	A+	300 mm	868	Class 4	Med	Rural	584,000	-	158,000	321,000	18,000	\$ 1,090,000
W17	Future Road #10	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W19 to W16	2020-2022	Stouffville	A+	300 mm	455	Class 4	Med	Rural	306,000	-	84,000	171,000	10,000	\$ 582,000
W18	Future Road #11	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W19 to W16	2020-2022	Stouffville	A+	300 mm	580	Class 4	Med	Rural	390,000	-	106,000	216,000	12,000	\$ 735,000
W19	Future Road #12	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W17 and W18	2020-2022	Stouffville	A+	300 mm	349	Class 4	Med	Rural	235,000	-	65,000	133,000	7,000	\$ 451,000
W20	Future Road #13	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W34 to Ninth Line	2019	Stouffville	A+	300 mm	717	Class 4	Med	Rural	482,000	-	131,000	266,000	15,000	\$ 905,000
W21	PRV Future Road	New Zone 1/2 PRV along W20. Exact location to be determined.	2022-2025	Stouffville	A+	0 mm	0	Class 4	Low	Rural	50,000	-	-	18,000	1,000	\$ 69,000
W22	Main Street	300 mm watermain upgrade along Main Street from Ninth Line to Park Drive. One railway and one creek crossing.	2019-2020	Stouffville	A+	300 mm	1105	Class 4	Low	Urban	743,000	126,000	236,000	488,000	31,000	\$ 1,880,000

Table ES4: Water Capital Program

Master Plan ID	Project Name	Project Description	Year in Service	Municipality	Class EA	Size/Capacity	Length (m)	Class Estimate Type	Project Complexity	Area Condition	Base Construction Cost (\$2018)	Crossings (\$2018)	Additional Costs (\$2018)	Soft Costs (\$2018)	Non-Refundable HST (\$2018)	Total Estimated Cost (\$2018)
W23	Second Street	200 mm watermain upgrade along Second Street from Ninth Line to Albert Street.	2019-2024	Stouffville	A+	200 mm	345	Class 4	Low	Urban	181,000	-	50,000	104,000	7,000	\$ 399,000
W24	Commercial Street	150 mm watermain upgrade along Commercial Street from Church Street North to Mill Street	2019-2024	Stouffville	A+	150 mm	144	Class 4	Low	Urban	66,000	-	19,000	38,000	2,000	\$ 148,000
W25	Church Street North	200 mm watermain upgrade along Church Street North from Main Street to Warriner Street	2019-2024	Stouffville	A+	200 mm	276	Class 4	Low	Urban	145,000	-	40,000	84,000	5,000	\$ 321,000
W26	O'Brien Avenue	150 mm watermain upgrade along O'Brien Avenue from Main Street to Burkholder Street	2019-2024	Stouffville	A+	150 mm	231	Class 4	Low	Urban	105,000	-	29,000	61,000	4,000	\$ 235,000
W27	Lloyd Street	150 mm watermain upgrade along Lloyd Street from Main Street to Rose Avenue	2019-2024	Stouffville	A+	150 mm	375	Class 4	Low	Urban	171,000	-	47,000	98,000	6,000	\$ 377,000
W28	Orchard Park Boulevard	200 mm watermain upgrade along Orchard Park Boulevard from Main Street to Sunset Boulevard	2019-2024	Stouffville	A+	200 mm	197	Class 4	Low	Urban	103,000	-	29,000	60,000	4,000	\$ 231,000
W29	PRV Millard Street	New Zone 1/2 PRV along Millard Street. Exact location to be determined.	2019	Stouffville	A+	0 mm	0	Class 4	Low	Suburban	50,000	-	-	18,000	1,000	\$ 69,000
W30	Future Road #14	New 200 mm diameter watermain along a future road from W16 to Cam Fella Boulevard	2019	Stouffville	A+	200 mm	309	Class 4	Med	Rural	162,000	30,000	53,000	108,000	6,000	\$ 367,000
W31	Mill Street	200 mm watermain upgrade along Mill Street from Main Street to Freel Lane	2019-2024	Stouffville	A+	200 mm	98	Class 4	Low	Urban	51,000	-	15,000	31,000	2,000	\$ 119,000
W32	HWY 48 BPS	Decommissioning of the Highway 48 Booster Pumping Station. Would occur after extension from Ballantrae is complete (W33)	2019-2024	Ballantrae	A+	0 mm	0	Class 4	Low	Rural	50,000	-	-	18,000	1,000	\$ 69,000
W33	HWY 48 #3	New 250 mm diameter watermain along HWY 48 from Spruceview Place to existing dead end.	2019-2024	Ballantrae	A+	250 mm	1173	Class 4	Low	Rural	704,000	-	149,000	308,000	19,000	\$ 1,184,000
W34	Future Road #15	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W19 to W20. One railway crossing and one creek crossing.	2022-2025	Stouffville	Schedule B/Integrated Planning Approach	300 mm	1218	Class 4	Med	Rural	819,000	295,000	304,000	618,000	34,000	\$ 2,104,000
W35	Lakeshore/Ninth	New 300 mm diameter watermain (twinned) along Ninth Line and Lakeshore Road from Musselman's Lake Elevated Tank to Connor Drive	2019-2024	Ballantrae	B	300 mm	2033	Class 4	Low	Suburban	1,367,000	-	347,000	717,000	45,000	\$ 2,760,000
W36	HWY 48 #2	New 300 mm diameter watermain along Hwy 48	2023	Stouffville	A+	300 mm	540	Class 4	High	Rural	363,000	-	120,000	278,000	13,000	\$ 784,000
W37	Future Road #16	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W30 to W16	2020-2022	Stouffville	A+	300 mm	268	Class 4	Med	Rural	180,000	-	51,000	103,000	6,000	\$ 351,000
W38	York Durham Line #3	New 200 mm diameter watermain along York Durham Line, between Bethesda Side Road and Main Street	2020-2022	Stouffville	A+	200 mm	268	Class 4	High	Rural	140,000	-	46,000	108,000	5,000	\$ 304,000
W39	Gormley Fire Protection	New 300 mm diameter fire protection watermain on Stouffville Road from Union Street west (347m)	2022	Gormley	A+	300 mm	347	Class 4	Low	Suburban	233,000	-	61,000	126,000	8,000	\$ 486,000
W40	Gormley Fire Protection	New 300 mm diameter fire protection watermain on Union Street from Stouffville Street south (453 m)	2022	Gormley	A+	300 mm	453	Class 4	Low	Suburban	305,000	-	79,000	163,000	10,000	\$ 630,000
W41	Future Road #4	New 300 mm diameter watermain along Baker Hill Boulevard - Creek Crossing	2019	Stouffville	A+	300 mm	180	Class 4	High	Rural	-	-	-	193,000	9,000	\$ 544,000
W42	Master Plan	Water Master Plan	2023		A+											\$ 250,000
W43	Future Study	Future Service Areas Study - Water	2019-2021		B											\$ 250,000
Total Program - 2041																\$28,060,000

1.6 Wastewater Servicing Strategy

1.6.1 Overall Wastewater Servicing Strategy Summary

Several separate wastewater servicing strategies are recommended throughout the Town of Whitchurch-Stouffville that collectively form the overall preferred wastewater strategy to service the projected growth to 2041. The preferred servicing strategy was developed to ensure that the extension of the existing wastewater collection system is aligned with existing planning policies, designated residential and employment growth areas, can support intensification, and that the Master Plan follows an integrated approach with the Town's state of good repair program.

The primary objective of the wastewater servicing strategy is to build off the configuration of the existing system within the Town of Whitchurch-Stouffville. Since only the Community of Stouffville has municipal wastewater services, the wastewater strategy focuses on this key area. However, the Master Plan recommends that a separate study be carried out to evaluate the potential for municipal water and wastewater services in the current unserved communities within the Town of Whitchurch-Stouffville including Vandorf-Preston and Gormley. The study should be undertaken through the coordination and collaboration at the municipal, regional and provincial level in order to provide a comprehensive review of servicing solutions for these areas.

In general, the wastewater servicing strategy for the Community of Stouffville consists of the following:

- Intensification along the Main Street corridor will be serviced by existing infrastructure.
- Flows from new southeast growth areas will be conveyed west to the York Durham Sanitary System (YDSS) trunk sewer by gravity through the new subtrunk 2.
- Flows from new southwest growth areas will be conveyed east to the YDSS trunk sewer by a combination of pumping and gravity.
- Flows from new growth areas in the north will be conveyed south to the YDSS trunk sewer through subtrunk 10 (north-west), subtrunk 1 (east) and subtrunk 3 (central).
- Design and construction of subtrunk 1 will enable the potential decommissioning of the private Northern Gate Sanitary Pumping Station (SPS) and Eastern Gate SPS if required.

Key capital projects required to achieve this strategy include the following:

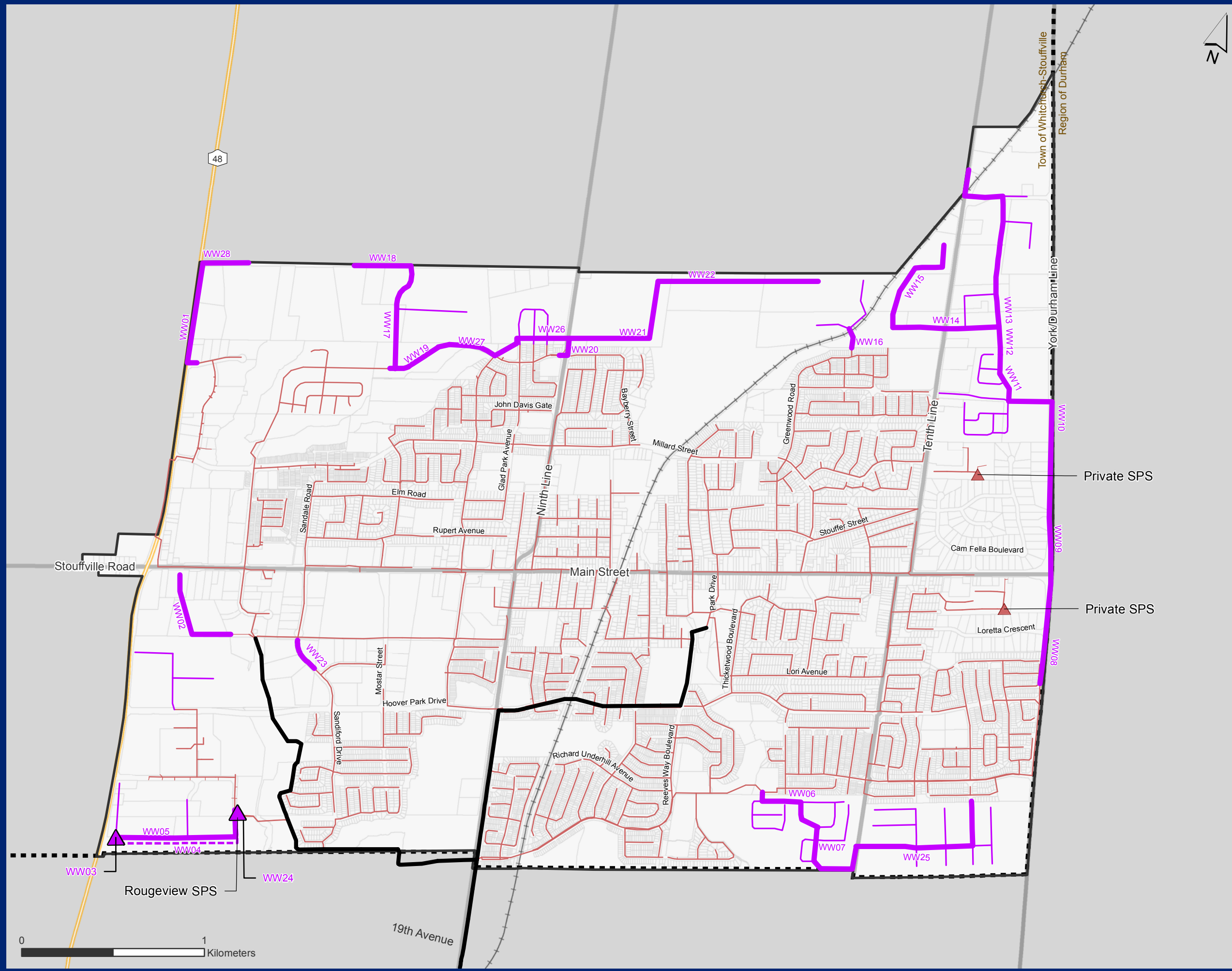
- New subtrunk 2 and connection to subtrunk 1 to service southeast growth areas
- Subtrunk 1 extension up to Tenth Line to service northeast growth areas
- New subtrunk 15 and connection to subtrunk 1

- Subtrunk 10 extension east of Ninth Line to service the north growth areas
- Extension of subtrunk 9 and new SPS/forcemain to service southwest growth areas
- Decommissioning of the Rougeview SPS.

In addition to the key capital projects, several other projects and upgrades are included within the wastewater servicing strategy to address existing and future capacity needs within the collection system. The complete Preferred Wastewater Strategy can be seen in **Figure ES4**. Each capital project is listed along with its respective estimated capital cost in **Table ES5**.

1.6.2 Wastewater Capital Program

A summary of the wastewater servicing strategy capital program is provided in **Table ES5**. The capital program table contains project descriptions, dimensions, proposed timing, and estimated total project cost.



**Town of Whitchurch-Stouffville
Water and Wastewater Master Plan**

**Recommended Strategy
Wastewater System
Community of Whitchurch-Stouffville**
Figure ES4

- Proposed Wastewater System**
-  MP Capital Project - Sanitary Pumping Station
 -  MP Capital Project - Forcemain
 -  MP Capital Project - Gravity
 -  Future Local Collection
- Existing Wastewater System**
-  Sanitary Pumping Station (SPS)
 -  Gravity Main (Municipal)
 -  Gravity Main (Regional - YDSS)
- General Features**
-  Study Area
 -  Municipal Boundary
 -  Freeways and Provincial Highways
 -  Proposed Roads
 -  Railway

Table ES4: Wastewater Capital Program

Master Plan ID	Project Name	Project Description	Year in Service	Class EA	Size/Capacity	Length (m)	Class Estimate Type	Project Complexity	Area Condition	Base Construction Cost (\$2018)	Crossings (\$2018)	Additional Costs (\$2018)	Soft Costs (\$2018)	Non-Refundable HST (\$2018)	Total Estimated Cost (\$2018)
WW01	Subtrunk 13 Extension	200mm sewer on Highway 48 from Norman Jones Place to Bethesda Road	2023-2026	A+	200 mm	600	Class 4	High	Rural	340,000	-	109,000	252,000	12,000	\$ 713,000
WW02	Subtrunk 11 Extension	250/300mm sewer on future road south of Main Street to YDSS West Trunk Sewer	2022-2026	Schedule B/Integrated Planning Approach	300 mm	545	Class 4	High	Rural	343,000	470,000	260,000	603,000	28,000	\$ 1,704,000
WW03	New SW Sanitary Pumping Station	40 L/s New SPS south of Sam’s Way to existing Rougeview SPS forcemain	2022-2026	Schedule B/Integrated Planning Approach	40 L/s		Class 4	Med	Rural	920,000		244,000	495,000	28,000	\$ 1,687,000
WW04	New SW Forcemain	250mm forcemain from New SPS south of Sam’s Way to existing Rougeview SPS forcemain	2022-2026	Schedule B/Integrated Planning Approach	250 mm	800	Class 4	Low	Rural	480,000	-	101,000	209,000	13,000	\$ 803,000
WW05	Subtrunk 9 Extension	375mm sewer on future road from the existing Rougeview SPS to the new SPS south of Sam’s Way	2022-2026	A+	375 mm	800	Class 4	Low	Rural	537,000	-	113,000	233,000	15,000	\$ 896,000
WW06	Subtrunk 2 (Part 1 of 2)	450mm sewer of future road (Subtrunk 2)	2019	Schedule B/Integrated Planning Approach	450 mm	525	Class 4	Low	Rural	383,000	392,000	163,000	336,000	21,000	\$ 1,294,000
WW07	Subtrunk 2 (Part 2 of 2)	375mm sewer of future road (Subtrunk 2) up to Tenth Line	2019	A+	375 mm	350	Class 4	Low	Rural	235,000	-	49,000	102,000	6,000	\$ 392,000
WW08	Subtrunk 1 Extension (Part 1 of 6)	600mm sewer on York/Durham Line from the existing subtrunk 1 sewer north of Hoover Park Drive to Main Street	2019	Schedule B Completed	600 mm	700	Class 4	High	Suburban	2,345,000	-	750,000	1,741,000	81,000	\$ 4,917,000
WW09	Subtrunk 1 Extension (Part 2 of 6)	450mm sewer on York/Durham Line from Main Street to the norht limit of CamFella development	2019	Schedule B Completed	450 mm	720	Class 4	High	Suburban	1,394,000	-	446,000	1,035,000	48,000	\$ 2,923,000
WW10	Subtrunk 1 Extension (Part 3 of 6)	450mm sewer on York/Durham Line from the norht limit of CamFella development to Forsyth Farm Drive	2018-2021	Schedule B Completed	450 mm	205	Class 4	High	Suburban	397,000	-	152,000	354,000	16,000	\$ 1,000,000
WW11	Subtrunk 1 Extension (Part 4 of 6)	450mm sewer on Forsyth Farm Drive from York/Durham Line to Keeler Avenue	2018-2021	Schedule B Completed	450 mm	510	Class 4	High	Rural	1,432,000	196,000	521,000	1,209,000	56,000	\$ 3,414,000
WW12	Subtrunk 1 Extension (Part 5 of 6)	450mm sewer on Keeler Avenue from Forsyth Farm Drive to the connection to subtrunk 15 on future road to the north	2019-2021	Schedule B Completed	450 mm	150	Class 4	Med	Rural	421,000	-	112,000	227,000	13,000	\$ 773,000
WW13	Subtrunk 1 Extension (Part 6 of 6)	375mm sewer on future road east of Tenth Line from the connection to subtrunk 15 to Bethesda Road	2020-2022	Schedule B Completed	375 mm	1110	Class 4	Med	Rural	745,000	418,000	308,000	627,000	35,000	\$ 2,133,000
WW14	Subtrunk 15 (Part 1 of 2)	300mm on future road from the connection to subtrunk 1 to the west crossing Tenth Line	2020-2022	A+	300 mm	580	Class 4	Med	Rural	365,000	118,000	128,000	261,000	15,000	\$ 886,000
WW15	Subtrunk 15 (Part 2 of 2)	300mm on future road west of Tenth Line and south of the Go Transit Railway	2020-2022	A+	300 mm	610	Class 4	Med	Rural	384,000	-	102,000	207,000	12,000	\$ 703,000
WW16	Subtrunk 3 Extension	300mm sewer from the existing subtrunk 3 sewer north of Greenwood Road to the north side of the Go Transit Railway	2020-2022	Schedule B/Integrated Planning Approach	250 mm	160	Class 4	High	Rural	411,000	118,000	169,000	393,000	18,000	\$ 1,109,000
WW17	Subtrunk 18	300mm sewer on future road from Baker Hill Boulevard to Bethesda Road (Subtrunk 18)	2019-2021	A+	300 mm	590	Class 4	Low	Rural	371,000	-	78,000	161,000	10,000	\$ 620,000
WW18	Subtrunk 18	300mm sewer on Bethesda Road from future sewer to the west of the creek (Subtrunk 18)	2023	A+	200 mm	310	Class 4	Low	Rural	176,000	235,000	86,000	178,000	11,000	\$ 686,000
WW19	Subtrunk 10 Extension	450mm sewer onm Baker Hill Road from the existing subtrunk 10 sewer on Baker Hill Road to West Lawn Crescent	2019	A+	450 mm	430	Class 4	Med	Rural	313,000	-	83,000	169,000	9,000	\$ 576,000

Table ES4: Wastewater Capital Program

Master Plan ID	Project Name	Project Description	Year in Service	Class EA	Size/Capacity	Length (m)	Class Estimate Type	Project Complexity	Area Condition	Base Construction Cost (\$2018)	Crossings (\$2018)	Additional Costs (\$2018)	Soft Costs (\$2018)	Non-Refundable HST (\$2018)	Total Estimated Cost (\$2018)
WW20	Subtrunk 10 Extension	450mm sewer on Ninth Line from Baker Hill Road to future road south of Bethesda Road	2019	A+	450 mm	140	Class 4	High	Suburban	102,000	896,000	326,000	756,000	35,000	\$ 2,135,000
WW21	Subtrunk 10 Extension	450mm sewer on future road south of Bethesda Road east of Ninth Line	2019	A+	450 mm	750	Class 4	Med	Rural	547,000	-	145,000	295,000	16,000	\$ 1,004,000
WW22	Subtrunk 10 Extension	375mm sewer on future road south of Bethesda Road east of Ninth Line	2022-2025	Schedule B/Integrated Planning Approach	375 mm	980	Class 4	Med	Rural	657,000	985,000	435,000	886,000	49,000	\$ 3,013,000
WW23	Sandiford Drive Sewer	200mm sewer on Sandiford Drive from	2019	A+	200 mm	190	Class 4	Low	Suburban	108,000	-	27,000	56,000	4,000	\$ 215,000
WW24	Rougeview SPS Decommission	Rougeview Sanitary Pumping Station Decommission	2022-2026	A+		0	Class 4	Med	Rural	-	-	-	-	-	\$ 50,000
WW25	Subtrunk 2 (Part 2 of 2)	300mm sewer of future road (Subtrunk 2) up to Tenth Line	2019	A+	300 mm	970	Class 4	Low	Rural	610,000	118,000	153,000	316,000	20,000	\$ 1,217,000
WW26	Baker Hill Boulevard By-Pass	300mm sewer of future road from Ninth Line to the connection to Subtrunk 10 on Baker Hill Boulevard	2019	A+	300 mm	455	Class 4	Med	Rural	286,000	-	76,000	154,000	9,000	\$ 525,000
WW27	Subtrunk 10 Extension	450mm sewer on Baker Hill Road - Creek Crossing	2019	A+	450 mm	200	Class 4	Med	Rural	146,000	-	39,000	172,000	10,000	\$ 587,000
WW28	Subtrunk 13 Extension	200mm sewer on Bethesda Road to Highway 48	2023-2026	A+	200 mm	255	Class 4	High	Rural	144,000	-	46,000	108,000	5,000	\$ 304,000
WW29	Master Plan	Wastewater Master Plan	2023	A+											\$ 250,000
WW30	Future Study	Future Service Areas Study - Wastewater	2019-2021	B											\$ 250,000
WW31	Flow Monitoring	Flow Monitoring Program (5 years)	2019-2023												\$ 500,000
Total Program - 2041															
\$37,279,000															



Town of Whitchurch-Stouffville Water and Wastewater Master Plan

Prepared
by GM BluePlan for:

Town of Whitchurch-
Stouffville

Project No. 717022

November 2018

MASTER PLAN REPORT



GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA

ROYAL CENTRE, 3300 HIGHWAY No. 7, SUITE 402, VAUGHAN, ON L4K 4M3
P: 416-703-0667 WWW.GMBLUEPLAN.CA

Version Updates

The following is a record of the changes/updates that have occurred on this document.

Revision No.	Changes/Updates	Revised By	Date
1	Working Draft	GM BluePlan	May 25, 2018
2	First Draft	GM BluePlan	June 27, 2018
3	Final Draft for Town Review	GM BluePlan	November 12, 2018
4	Finalized Report for Project Filing	GM BluePlan	November 19, 2018

Glossary of Terms and Acronyms

The following table provides a summary of terms and acronyms that are commonly used throughout the report.

Term or Acronym	Definition
ADD	Average Day Demand
ADWF	Average Dry Weather Flow
Ballantrae-Musselman's Lake	Refers to the servicing area
DC	Development Charges
d/D	Standard Surcharge State
DWF	Dry Weather Flow
EA	Environmental Assessment
EAA	Environmental Assessment Act
FF	Fire Flow
FPSS	Public Fire Protection Survey Services
FUS	Fire Underwriters Survey
GGH	Greater Golden Horseshoe
HGL	Hydraulic Grade Line
I/I	Inflow and Infiltration
IPZ	Intake Protection Zone
LSRCA	Lake Simcoe Region Conservation Authority
LOS	Level of Service
MDD	Maximum Day Demand
MEA	Municipal Engineers Association
MNRF	Ministry of Natural Resources and Forestry
MECP	Ministry of the Environment, Conservation and Parks
ORMCP	Oak Ridges Moraine Conservation Plan
PTTW	Permit to Take Water
PHD	Peak Hour Demand
PIC	Public Information Centre
PRV	Pressure Reducing Valve
PWWF	Peak Wet Weather Flow
SOGR	State of Good Repair
SPS	Sanitary Pumping Station
TRCA	Toronto and Region Conservation Authority
WHPA	Wellhead Protection Area
WPCP	Water Pollution Control Plan
WTP	Water Treatment Plant
WWF	Wet Weather Flow
WWTF	Wastewater Treatment Facility
YDSS	York Durham Sanitary System
YWS	York Water System

Table of Contents

1	Background and Planning Framework	1
1.1	Introduction	1
1.2	Master Plan Objectives	2
1.3	Master Plan Outline	3
1.4	Master Planning Process	4
1.5	Public Consultation	10
1.6	Relevant Studies and Background Information	11
1.7	Problem and Opportunity Statement.....	20
1.8	Study Area	20
1.9	Planning Context	21
1.10	Environment Existing Conditions	56
1.11	Principles and Policies	65
1.12	Planning and Growth Projections.....	66
1.13	Hamlet Water and Wastewater Servicing Polices	68
1.14	Water and Wastewater Master Plan Servicing Polices and Design Guidelines.....	72
1.15	Design Criteria and Level of Service Objectives	75
2	Water Master Plan	77
2.1	Water System Policy and Criteria	77
2.2	Existing Water Distribution System	80
2.3	Water Hydraulic Model.....	89
2.4	York Region Water and Wastewater Master Plan Linkage	90
2.5	Assessment of Existing and Future Water Infrastructure	92
2.6	Water Servicing Strategy	98
2.7	Capital Program.....	112
3	Wastewater Master Plan.....	116
3.1	Wastewater System Policy and Criteria	116
3.2	Existing Wastewater Collection Systems	118
3.3	Wastewater Hydraulic Model	125
3.4	York Region Water and Wastewater Master Plan Linkage	126
3.5	Assessment of Existing and Future Wastewater Infrastructure.....	128
3.6	Wastewater Servicing Strategy.....	131
3.7	Capital Program.....	141
4	Further Considerations	145

4.1	Permits and Approvals.....	145
4.2	Impacts and Mitigation Measures	147
5	Public Consultation.....	151
5.1	Communication and Consultation Summary.....	151
5.2	Contact List.....	152
5.3	Notice of Commencement	152
5.4	Public Information Centres.....	152
5.5	Comments Received.....	153
5.6	Notice of Completion.....	158
5.7	Aboriginal and First Nations Consultation	159

List of Figures

Figure 1: Municipal Class EA Planning and Design Process	9
Figure 2: Study Area	21
Figure 3: Town of Whitchurch-Stouffville Land Use Planning Policies Greenbelt Plan .	31
Figure 4: Town of Whitchurch-Stouffville Oak Ridges Moraine Land Use Designation .	35
Figure 5: Town of Whitchurch-Stouffville– Greenlands System	36
Figure 6: Town of Whitchurch-Stouffville Land Use and Transportation Plan	37
Figure 7: Town of Whitchurch-Stouffville Wellhead Protection Areas	42
Figure 8: Gormley Land Use Map	48
Figure 9: Vandorf-Preston Lake Land Use and Transportation Plan Map	49
Figure 10: Ballantrae-Musselman Lake Land Use Map.....	50
Figure 11: Community of Stouffville Core Area Land Use Map	51
Figure 12: Community of Stouffville Land Use and Transportation Map	52
Figure 13: Community of Stouffville Western Approach Land Use Map.....	53
Figure 14: Significant Environmental Area Designation	60
Figure 15: Town of Whitchurch-Stouffville Existing Water System.....	81
Figure 16: Existing Stouffville Water Distribution System.....	85
Figure 17: Existing Ballantrae-Musselman’s Lake Water Distribution System	88
Figure 18: Water Hydraulic Model	90
Figure 19: Regional Preferred Water Strategy	91
Figure 20: Stouffville Water System Opportunities and Constraints	96
Figure 21: Ballantrae-Musselman’s Lake Water System Opportunities and Constraints	97
Figure 22: Existing Community of Stouffville Water System Looping.....	99
Figure 23: Future Looping Proposed in Previous Master Plan (red)	99
Figure 24: Spine Network Alternative	100
Figure 25: Proposed Capital Projects to Align with SOGR Program	101
Figure 26: Northeast and Northwest Quadrant Looping	102
Figure 27: Alternate Zone 3 Supply.....	103
Figure 28: Supplement Zone 2 from Zone 1 via Two New PRVs	104

Figure 29: Ballantrae-Musselman's Lake Servicing Alternatives	105
Figure 30: Highway 48 Servicing Alternatives	106
Figure 31: Community of Stouffville Preferred Water Servicing Strategy	110
Figure 32: Community of Ballantrae-Musselman's Lake Preferred Water Servicing Strategy	111
Figure 33: Town of Whitchurch-Stouffville Existing Wastewater System.....	120
Figure 34: Existing Stouffville Wastewater System	124
Figure 35: Wastewater Hydraulic Model.....	125
Figure 36: Regional Preferred Wastewater Strategy	127
Figure 37: Stouffville Wastewater System Opportunities and Constraints.....	130
Figure 38: Southeast Growth Wastewater Servicing Alternative	132
Figure 39: West-Central Growth Wastewater Servicing Alternative	133
Figure 40: Southwest Growth Wastewater Servicing Alternatives.....	134
Figure 41: Northeast Growth (Part A) Wastewater Servicing Alternatives.....	136
Figure 42: Northeast Growth (Part B) Wastewater Servicing Alternatives.....	138
Figure 43: Community of Stouffville Preferred Wastewater Servicing Strategy	140

List of Tables

Table 1: York Region Population and Employment Forecasts	24
Table 2: Town of Whitchurch-Stouffville Land Use Designation	32
Table 3: List of Significant Wetlands within the Town of Whitchurch-Stouffville	61
Table 4: List of ANSIs within the Town of Whitchurch-Stouffville	62
Table 5: Population and Employment Estimates to 2041	67
Table 6: Projected Population to 2041	67
Table 7: Projected Employment to 2041	68
Table 8: Relevant Policies for Countryside, Rural Settlements and Natural Linkage Areas	69
Table 9: General Servicing Policies	72
Table 10: Water Servicing Policies.....	73
Table 11: Wastewater Servicing Policies	74
Table 12: Water Demand Criteria.....	78

Table 13: Water Demand Projections.....	79
Table 14: Existing Facilities within the Community of Stouffville Water System.....	82
Table 15: Daily Well Withdrawal – Community of Stouffville	83
Table 16: Annual Well Withdrawal – Community of Stouffville	83
Table 17: Community of Stouffville Water Pumping Stations	84
Table 18: Community of Stouffville Water Storage Facilities.....	84
Table 19: Daily Well Withdrawal – Ballantrae-Musselman’s Lake	86
Table 20: Annual Well Withdrawal – Ballantrae-Musselman’s Lake Community.....	86
Table 21: Ballantrae-Musselman’s Lake Elevated Tank.....	87
Table 22: Regional Water Strategy Recommendations for the Town.....	90
Table 23: Evaluation of System Wide Servicing Alternatives	100
Table 24: Comparison of Servicing Alternatives for the Ballantrae-Musselman’s Lake System	105
Table 25: Comparison of Servicing Alternatives for Highway 48 Area	107
Table 26: Water Capital Program	114
Table 27: Wastewater Flow Criteria	117
Table 28: Wastewater Flow Projections	118
Table 29: Stouffville Subtrunk Sewers.....	121
Table 30: Community of Stouffville Existing Pumping Stations	123
Table 31: Regional Wastewater Strategy Recommendations for the Town	126
Table 32: Wastewater Capital Program.....	143
Table 33: Public Information Centre No. 1	153
Table 34: Public Information Centre No. 2	153
Table 35: Consultation Comments Summary.....	153

List of Appendices

Appendix A	Natural Environment Report
Appendix B	Hydrogeological Report
Appendix C	Archaeological Assessment
Appendix D	Cultural Heritage Screening Report
Appendix E	Drinking Water Source Protection Policies
Appendix F	Servicing Principles and Policies Paper
Appendix G	Design Criteria Review
Appendix H	Cost Estimating Paper
Appendix I	Public Consultation

1 Background and Planning Framework

1.1 Introduction

1.1.1 Background

The Town of Whitchurch-Stouffville is located in Southern Ontario, bordering the City of Markham, Town of Newmarket, Town of Aurora, Town of Richmond Hill, the Town of East Gwillimbury and Durham Region. The Town of Whitchurch-Stouffville is comprised of several communities including Stouffville, Ballantrae, Bloomington, Musselman's Lake, Vandorf-Preston Lake and Gormley.

The Town of Whitchurch-Stouffville water and wastewater servicing is operated under a two-tiered system. York Region is responsible for water supply, transmission mains, storage facilities and booster pumping stations; as well as wastewater treatment and trunk sewers. The Town is responsible for the operation and maintenance of the local water distribution system and local sewer collection systems.

The Town of Whitchurch-Stouffville is part of the Greater Golden Horseshoe (GGH) area situated around the southern end of Lake Ontario that continues to be one of the fastest growing regions in North America. The Government of Ontario's legislative growth plan, *Places to Grow Act 2005*, and recent amendments, identifies substantial population and employment growth for the GGH to the year 2041.

Readily available and accessible public infrastructure is essential to the viability of existing and growing communities. Infrastructure planning, land use planning and infrastructure investment require close integration to ensure efficient, safe and economically achievable solutions to provide the required water and wastewater infrastructure. To balance the needs of growth with the protection and preservation of natural, environmental and heritage resources, the Town of Whitchurch-Stouffville initiated an integrated process to complete a new Water and Wastewater Master Plan.

The Town of Whitchurch-Stouffville retained GM BluePlan Engineering Limited (GM BluePlan) to complete the Water and Wastewater Master Plan which provides the review and development of water and wastewater servicing strategies for servicing within the Town. The Master Plan uses population and employment growth forecasts based on a 2041 planning horizon.

The Study Area for the Master Plan focuses on the existing service areas within the Communities of Stouffville, Ballantrae-Musselman's Lake, but also provides comment on municipal water and sanitary servicing potential for the Town's communities that don't currently have municipal servicing. **Figure 2** provides a map of the study area.

The 2018 Master Plan builds on previous work undertaken as part of the 2013 Functional Servicing Study and the 2013 Development Charges Background Study Report – Water and Wastewater Servicing. The 2018 Master Plan is a critical component in the Town's

planning for growth and will provide the framework and vision for the water and wastewater servicing needs to year 2041.

1.2 Master Plan Objectives

The Master Plan comprehensively documents the development of the preferred water and wastewater servicing strategies for the Town of Whitchurch-Stouffville to meet the servicing needs of existing users and future development to 2041.

The Master Plan evaluates the ability of existing and planned water and wastewater infrastructure within the Town of Whitchurch-Stouffville to efficiently and effectively service the Town's existing population, service the forecasted growth, and evaluate/develop recommended servicing strategies.

The Master Plan comprehensively documents the development of the preferred water and wastewater servicing strategies for the Town of Whitchurch-Stouffville to meet the servicing needs of existing users and future development to 2041.

The key objectives of the Master Plan are as follows:

- Review planning forecasts to 2041 and determine the impacts on servicing needs for the Town's water and wastewater infrastructure;
- Evaluate the ability of existing and planned water and wastewater infrastructure to efficiently and effectively service the Town's existing users and anticipated growth;
- Undertake a comprehensive review and analysis for both water and wastewater servicing requirements;
- Address key servicing considerations as part of the development and evaluation of water and wastewater servicing strategies including:
 - Level of service to existing users and anticipated future growth to 2041 estimated by the Town
 - Operational flexibility and system security and reliability
 - Mitigation of impacts to natural, social and economic environments
 - Opportunity to meet policy, policy statements, regulations and technical criteria
 - Opportunity to optimize existing infrastructure and servicing strategies
 - Ensuring the strategies are cost effective.
- Utilize new calibrated water and wastewater hydraulic models for the analysis of servicing alternatives;
- Establish a complete and implementable water and wastewater capital program;
- Provide extensive consultation with the public and stakeholders; and

- Complete the Master Plan in accordance with the Municipal Engineers Association (MEA) Class Environmental Assessment (EA) process for Master Plans.

This study was originally planned in accordance with Approach #2 of the Master Planning process as set out in the MEA Class EA (October 2000, as amended in 2007, 2011 & 2015) but was later changed to Approach #1 as outlined in Section A.2.7 (Approach 1 in Appendix 4) of the MEA Class EA based on the strategic level study input. This approach involves the preparation of a Master Plan document at the conclusion of Phase 1 and 2 of the Class EA process. The Master Plan was prepared at a broad level assessment and recognizes that further detailed assessment will be required through separate study or Integrated Planning Approach to satisfy project specific fulfillment of the MEA Class EA requirements for the specific schedule B projects identified within the Master Plan.

1.3 Master Plan Outline

The Master Plan is the documentation placed on public record for the prescribed review period. The documentation, in its entirety, describes all required phases of the planning phases of the planning process and incorporates the procedure considered essential for compliance with the *Environmental Assessment Act*.

The Master Plan documentation is organized into six sections:

Executive Summary

The Executive Summary provides a brief overview of the Water and Wastewater Master Plan. It summarizes the information contained in Sections 1, 2, 3, 4, and 5 including problem statement, purpose of the study, significant planning, environmental and technical considerations, description of the analysis performance and final solutions and recommendations.

Section 1 – Background and Planning Framework

Section 1 details the master planning process including the Master Plan Class EA process, related studies, legislative and policy planning context, water and wastewater servicing principles and policies, population and employment growth forecasts, existing environmental conditions, principles and policies and design criteria and level of service.

Section 2 – Water Master Plan

Section 2 consists of the approach, methodologies, technical analyses, development and selection of the preferred water servicing strategy. This section outlines the water policies, design criteria and level of service needed to be achieved by the water network. In addition, this section identifies the existing water systems and describes the hydraulic modelling tool used for analysis. Furthermore, this section details the development and selection of the preferred servicing strategy and associated capital program.

Section 3 – Wastewater Master Plan

Section 3 consists of the approach, methodologies, technical analyses, development and selection of the preferred wastewater servicing strategy. This section outlines the wastewater policies, design criteria and level of service needed to be achieved by the wastewater network. In addition, this section identifies the existing wastewater system and describes the hydraulic modelling tool used for analysis. Furthermore, this section details the development and selection of the preferred servicing strategy and associated capital program.

Section 4 – Further Considerations

Section 4 provides an overview of further considerations that may be required in advance of construction activities and which will be further explored during the detailed design phase. These considerations include permits and approvals and, impacts and mitigation measures.

Section 5 – Public Consultation

Section 5 contains all relevant documentation of the public and agency consultation process including notices, comments and responses, and distribution information. Presentation materials from the Public Information Centres (PIC) held during the process are included. Other presentation material and discussion information from workshops held with relevant agencies, approval bodies and other stakeholders are also included in **Appendix I**.

Appendices

Appendices contain all additional documentation and mapping related to the master plan. The Appendices include the following:

- Appendix A** Natural Environment Report
- Appendix B** Hydrogeological Report
- Appendix C** Archaeological Assessment
- Appendix D** Cultural Heritage Screening Report
- Appendix E** Drinking Water Source Protection Policies
- Appendix F** Servicing Principles and Policies Paper
- Appendix G** Design Criteria Review
- Appendix H** Cost Estimating Paper
- Appendix I** Public Consultation

1.4 Master Planning Process

The Municipal Class EA process clearly defines approaches for completion of Master Plans within the Class EA context. The Town of Whitchurch-Stouffville Master Plan is based on Approach 1 of the Class EA process, which involves preparing a master plan document at the conclusion of Phases 1 and 2 of the Class EA Process.

This section describes the class environmental assessment process and the specific requirements for the preparation of master plans.

1.4.1 Class Environmental Assessment Process

Ontario's Environmental Assessment Act (EAA) was passed in 1975 and was proclaimed in 1976. The EAA requires proponents to examine and document the environmental effects that could result from major projects or activities and their alternatives. Municipal undertakings became subject to the EAA in 1981.

The EAA's comprehensive definition of the environment is:

- Air, land or water;
- Plant and animal life, including human life;
- The social, economic and cultural conditions that influence the life of humans or a community;
- Any building, structure, machine or other device or thing made by humans;
- Any solid, liquid, gas, odour, heat, sound, vibration, or radiation resulting directly or indirectly from human activities; and,
- Any part of a combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.

The purpose of the EAA is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management of the environment in Ontario (RSO1990, c.18, s.2). It is the objective of EAA proponents to ensure that decisions result from a rational, objective, transparent, replicable, and impartial planning process.

As set out in Section 6.1(2) of the EAA, an EA document must include the following:

- A description of the purpose of the undertaking;
- A description of and a statement of the rationale for,
 - The undertaking;
 - The alternative methods of carrying out the undertaking; and,
 - Alternatives to the undertaking.

The EA document must also include a description of:

- The environment that will be affected or that might reasonably be expected to be affected, directly or indirectly, by the undertaking or alternatives to the undertaking;
- The effects that will be caused or that might reasonably be expected to be caused to the environment by the undertaking or alternatives to the undertaking;

- The actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment by the undertaking or alternatives to the undertaking;
- An evaluation of the advantages and disadvantages to the environment of the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking (RSO1990, c.18, s.2); and,
- A description of any consultation about the undertaking by the proponent and the results of the consultation.

1.4.2 The Principles of Environmental Planning

The EAA sets a framework for a systematic, rationale and replicable environmental planning process that is based on five key principles, as follows:

- Consultation with affected parties. Consultation with the public and government review agencies is an integral part of the planning process. Consultation allows the proponent to identify and address concerns cooperatively before final decisions are made. Consultation should begin as early as possible in the planning process.
- Consideration of a reasonable range of alternatives. Alternatives include functionally different solutions, “alternatives to” the proposed undertaking and “alternative methods” of implementing the preferred solution. The “Do Nothing” alternative must also be considered.
- Identification and consideration of the effects of each alternative on all aspects of the environment. This includes the natural, social, cultural, technical, and economic environments.
- Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects. The evaluation shall increase in the level of detail as the study moves from the evaluation of “alternatives to” to the evaluation of “alternative methods”.
- Provision of clean and complete documentation of the planning process followed, to allow “traceability” of decision-making with respect to the project. The planning process must be documented in such a way that it may be repeated with similar results.

1.4.3 Class Environmental Assessment

“Class” Environmental Assessments (Class EAs) were approved by the Minister of the Environment in 1987 for municipal projects having predictable and mitigable impacts. The Municipal Class EA process was revised and updated in 1993, 2000, 2007, 2011 and 2015. The Class EA approach streamlines the planning and approvals process for municipal projects that are:

- Recurring;
- Similar in nature;
- Usually limited in scale;
- Predictable in the range of environmental impacts; and,
- Responsive to mitigation.

The Municipal Class Environmental Assessment, prepared by the Municipal Engineers Association (October 2000, as amended in 2007, 2011 and 2015), outlines the procedures to be followed to satisfy Class EA requirements for water, wastewater, stormwater management and road projects. The process includes five phases:

- Phase 1: Identification of the Problem or Opportunity;
- Phase 2: Identification and Evaluation of Alternative Solutions to determine a Preferred Solution while taking input from the public and other stakeholders into consideration;
- Phase 3: Examination of Alternative Methods of implementation of the Preferred Solution based on the existing conditions and anticipated environmental effects, while taking input from the public and other stakeholders into consideration;
- Phase 4: Documentation of the Class EA process in the form of an Environmental Study Report (ESR) for public review; and,
- Phase 5: Implementation and Monitoring.

Projects subject to the Class EA process are classified into the following four “schedules” depending on the degree of the expected impacts.

Schedule A projects are minor or emergency operational and maintenance activities and are approved without the need for further assessment. These projects are typically smaller in scale and do not have a significant environmental effect.

Schedule A+ projects are also pre-approved; however, the public is to be advised prior to the project implementation. Projects of this class do not usually have the potential for adverse environmental impacts. Typical projects that fall in this category are within existing road allowance, and utility corridors.

Schedule B projects require a screening of alternatives for their environmental impacts and Phases 1 and 2 of the planning process must be completed. The proponent is required to consult with the affected public and relevant review agencies. Provided that no significant impacts are identified and no requests for a Part II Order to a Schedule C or Individual Environmental Assessment are received, Schedule B projects are approved and may proceed directly to implementation.

Schedule C projects must satisfy all five phases of the Class EA process. These projects have the potential for greater environmental impacts. Phase 3 involves the assessment of alternative methods of carrying out the project, as well as public consultation on the preferred conceptual design. Phase 4 normally includes the preparation of an Environmental Study Report (ESR) that is filed for public review. Provided no significant impacts are identified and no requests for Part II Order or “bump-up” to an Individual Environmental Assessment are received, Schedule C projects are then approved and may proceed directly to implementation.

Figure 1 illustrates the Municipal Class EA planning and design process with the phases required for each schedule.

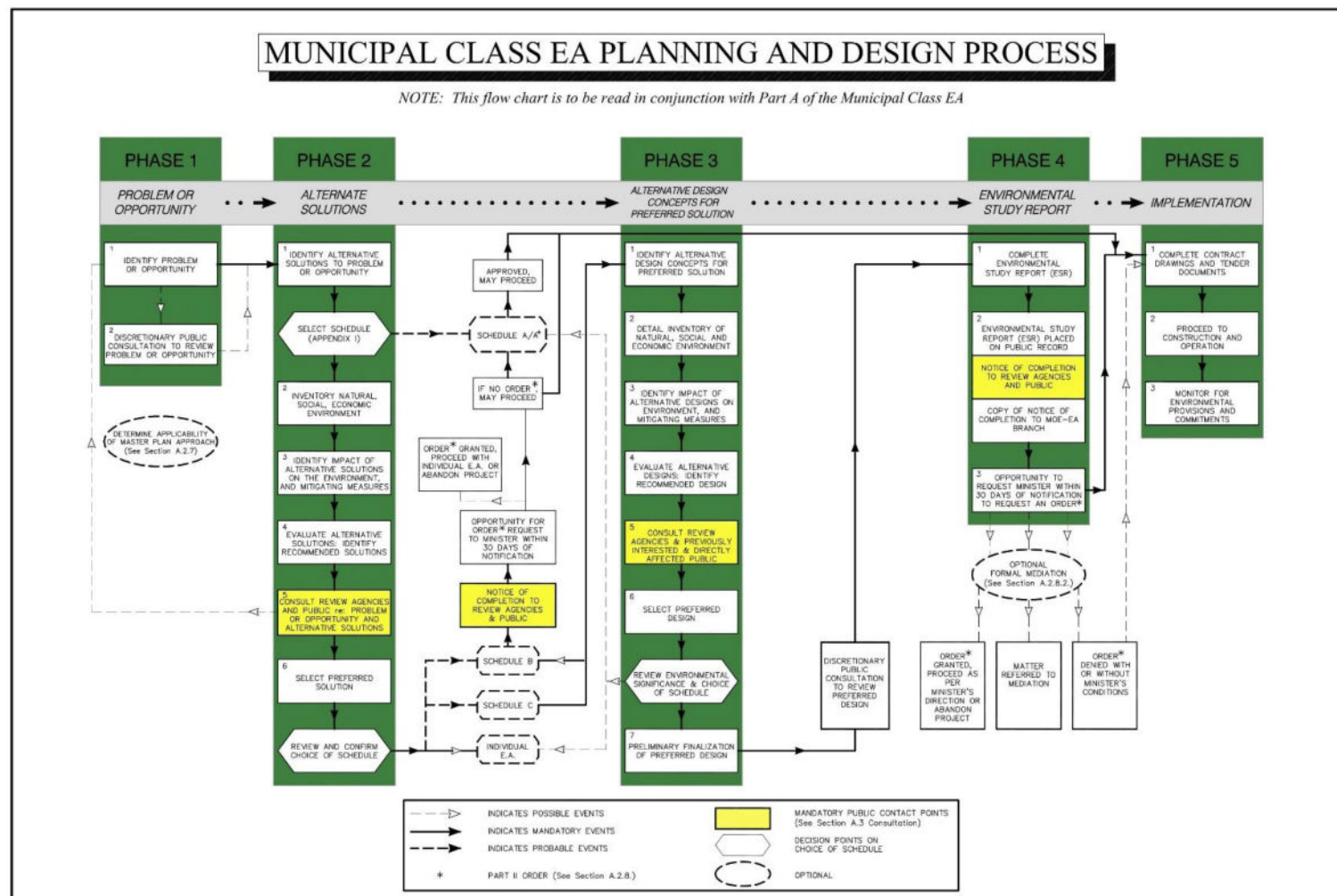


Figure 1: Municipal Class EA Planning and Design Process

1.4.4 Master Planning Process

Municipalities recognize the benefits of comprehensive, long-range planning exercises that examine problems and solutions for an overall system of municipal services. The Municipal Class EA for Water and Wastewater Projects recognizes the importance of master plans as the basis for sound environmental planning. The Class EA defines master plans as:

“Long range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. These plans examine an infrastructure system(s) or group of related projects in order to outline a framework for planning for subsequent projects and/or developments.”

Master plans have distinguishing features that set them apart from project specific studies. These features include the following:

- Master plans are broad in scope and focus on the analysis of a system for the purpose of outlining a framework for the provision of future works and developments.
- Specific projects recommended in a master plan are part of a larger management system and are distributed geographically throughout the study area. The implementation of specific projects may occur over an extended time frame.

In accordance with the MEA Class EA document, a Master Plan must at least satisfy the requirements of Phases 1 and 2 of the Class EA process and incorporate the five key principles of environmental planning. The Master Plan must document public and agency consultation at each phase of the process and a reasonable range of alternative solutions must be identified and systematically evaluated.

The approach for the Master Plan is to confirm existing planned projects and where applicable, evaluate and develop any new components. This approach would also be scrutinized through a public and agency consultation process and be fully documented.

This study follows Approach 1 of the approved master planning Class EA process. Under this approach, the Master Plan document is completed through a conceptual and strategic level study where detailed investigations would be required at the project-specific level for individual Schedule B and C projects or developer led requirements identified through the Master Plan.

1.5 Public Consultation

Public and agency consultation are integral to the Class EA planning process. The public consultation process is essential for informing and obtaining input from potentially interested and affected parties during the study process.

Objectives of Phase 1 of the MEA Municipal Class EA process with respect to public consultation are as follows:

- Present clear and concise information to stakeholders at key stages of the study process;
- Solicit community, regulatory and Town staff input;
- Meet Municipal Class EA consultation requirements;
- To fulfill the consultation requirements of the MEA Municipal Class EA document:
 - Build on past communication protocols and consultation plans from previous Class EA and municipal planning initiatives, to ensure consistency and continuity.
 - Meet public and agency notification and consultation requirements for Phases 1 and 2 of the MEA Municipal Class EA; and
 - Complete additional tasks to enhance the proposed consultation program and overall Class EA process.

As part of the current project, a communication and consultation plan was developed. The main objective of the plan was to proactively engage the community, regulatory agencies, Town and Regional staff. More specifically, the plan was designed to:

- Ensure the general public, Regional and Municipal councilors, stakeholders, external agencies (including federal and provincial) and special interest groups had an opportunity to participate in the study process;
- Ensure that factual information was provided to interested and affected stakeholders early and often throughout the study process; and
- Contact external agencies to obtain legislative or regulatory approvals, or to collect pertinent technical information.

The complete Public Consultation process is documented in **Section 5 – Public Consultation**.

1.6 Relevant Studies and Background Information

The following completed Regional and Municipal level studies have been reviewed and considered throughout the master planning process and selection of preferred servicing strategies.

1.6.1 Town of Whitchurch-Stouffville Studies

1.6.1.1 Town of Whitchurch-Stouffville, 2016 Drinking Water Summary Report

In accordance with the requirements outlined in Schedule 22 of the Drinking Water Systems Regulation O.Reg. 17/03., the Town prepared the 2016 annual report reviewing

any incidents of regulatory non-compliance for the year, water quantity supplied and flow rates from Regional Facilities. The report outlines the water systems within Ballantrae-Musselman's Lake and Community of Stouffville. There was one reported occurrence within the Stouffville Distribution System on November 6, 2016 for adverse water quality. There were no reported occurrences of regulatory non-compliance in the above systems.

1.6.1.2 Town of Whitchurch-Stouffville, Transportation Master Plan, February 2017

This study reviews the Town's long-term transportation strategy including active transportation. This study develops an overall vision for the transportation system using the numerous Provincial plans as a basis including the Provincial Policy Statement, Growth Plan for GGH, etc. It also considers Regional/Municipal plans including the York Region Transportation Master Plan (TMP), Town's Official Plan, Ballantrae-Musselman's Lake and Environs Secondary Plan, Town's Functional Servicing Study Update, etc.

The highlighted recommendations based on the master planning evaluation process includes but is not limited to:

- Amendment to the Town's Official Plan (Section 5, Table 1 and Schedule B) Land Use and Transportation with Transportation Master Plan road classification recommendations
- Road jurisdiction transfers

1.6.1.3 Town of Whitchurch-Stouffville, Subtrunk 1 Sanitary Sewer Class Environmental Assessment (Schedule B), May 2014

The Town completed a Class Environmental Assessment for the proposed extension of the sanitary sewer along Regional Road 30 from Hoover Park Drive north to approximately 750m north of Main Street including watermain system extensions where appropriate. The proposed extension will provide municipal water supply and sewage services to currently unserviced lands. The study area was divided into Zone A, south limit of study area, and Zone B, from north of property limit of existing Westfield Estates Subdivision to Transit Tracks north of Bethesda Sideroad.

The preferred alternative for Zone A included the connection of the existing trunk system on the York/Durham line (south of Loretta Crescent) to north along York/Durham Line's Westfield Estates Subdivision. The preferred alternative for Zone B included the connection to Zone A's preferred alternative on York/Durham Line at the north lot line of the existing Westfield Estates Subdivision through to the interior land between Tenth Line and York/Durham Line to Bethesda Sideroad.

1.6.1.4 Town of Whitchurch-Stouffville, Growth Management Strategy – Implementation and Phase 3 Lands, March 2014

This study reviewed the water and wastewater servicing options for the Phase 3 Lands and any connections to existing water and wastewater systems for the Community of

Stouffville. Phase 3 lands objective is to add a mixture of low, medium and high density residential and community and industrial land uses.

The population used in this report was lower than in the Functional Servicing Study (FSS) report which resulted in smaller volumes, eliminating improvements requirements to the existing downstream system. Phase 3 lands can be serviced with 200 mm to 450 mm wastewater sewer pipes and can be connected to the existing/proposed systems identified in the Town's FSS.

Water demands were based on the Town's design guidelines and MECP recommendations. The water demands used in this report were higher than the demands used in the FSS, which resulted in higher water demands. The proposed pipes based on the population and demand is between 150 mm to 400 mm.

1.6.1.5 Town of Whitchurch-Stouffville, Growth Management Strategy – Implementation and Phase 3 Lands – Background and Future Directions Report, November 2013

The report summarizes the key findings of the Growth Management Strategy – Step 2 Secondary Plan Amendment process including the background analysis and effects on the Phase 3 lands. The study area of the Phase 3 lands focused on the remaining undeveloped greenfield lands in the northern portion of the Stouffville Secondary Plan, with a total of 194 ha of land. Draft Official Plan amendments for Phase 3 lands were recommended including:

- Removing the Rural Area designation for Phase 3 lands, replacing with residential designations and policies (High Density Residential Area, Major Transit Station Area)
- Greenland System boundary changes
- Recognizing an increase in density for low density residential land uses by adding a Special Provision to Residential Area
- Addition of two (2) subareas for the Phase 3 lands.

There were some development constraints identified for Phase 3 lands in this report: Phase 3 lands had wastewater capacity constraints with the existing wastewater subtrunk west of Tenth Line. Servicing the eastern portion of this area would require a by-pass sewer for Subtrunk 1, the east/west arterial road system is disconnected from the Phase 3 lands and parcels development is not continuous and would constrain future development.

1.6.1.6 Town of Whitchurch-Stouffville, 2013 Fiscal Impact Study Update, November 2013

The Fiscal Impact Study (FIS) reviews the proposed DC Capital Plan on the Town's tax base and capacity limits of the Town's annual debt. The fiscal impact model was updated

and was compared to the results of the last fiscal impact study undertaken by the Town in 2010. It was updated to reflect the Town's 2013 Operating Budget as well as the 2013 10-Year Capital Plan and the 2013 Development Charged Background Study.

Using the updated model, the recommended approach involved the addition to financial contributions from future Stouffville Phase 2 development lands as well as additional contributions to capital reserves to non-DC supported capital.

1.6.1.7 Town of Whitchurch-Stouffville, 2013 Development Charges Study Background Study, November 2013

Using the Town's Growth Management Strategy, this study reviewed the residential and non-residential growth forecasts. This study projected the population and employment numbers of the Town to be 58,300 and 17,400, respectively, by 2031. In accordance with the requirements of the Development Charges Act, 1997, this study presented the growth-related net capital costs for expected future development from 2013-2031.

As part of the DC study, the report also presented costs and implementation of water and wastewater projects required to service future growth based on the servicing strategies developed through the Functional Servicing Strategy (FSS). Population and Employment growth for the water and wastewater service area was also based on the values presented in the FSS.

1.6.1.8 Town of Whitchurch-Stouffville, Functional Servicing Study Update, May 2013

This study provides servicing updates for road networks, water, wastewater and stormwater systems in the Town of Whitchurch-Stouffville. Recommended sanitary capital projects included:

- Construct a permanent pumping station to replace the temporary pumping station currently servicing subtrunk 9. This construction includes a new forcemain from the new pumping station to existing forcemain.
- New sanitary sewers within subtrunk 1, 2, 3, 10 and 15 and abandoning existing sewers no longer required at Memorial Park and Subtrunk 7.

The water system's recommended Capital Projects included:

- Creation of new boundaries in Stouffville
- Addition of new watermains outside subdivisions and upgrades to existing watermains outside subdivisions
- Oversizing watermains within subdivisions above 300 mm diameter.

1.6.1.9 Town of Whitchurch-Stouffville, Fire Master Plan Minor Update, December 2012

This study defines the direction and development of fire and emergency services within the Town. Two sources for water supply for fire protection within the Town; municipal water supply (hydrant, pressurized) and rural water supply (non-hydrant, unpressurized). York Region is responsible for supplying water with adequate flows to meet firefighting needs. The Town is responsible for the distribution of hydrants throughout the water system. Rural water supply depends on water tankers and trained personnel. Hydrant testing was completed, and results showed that the majority of hydrants in both Stouffville and Ballantrae-Musselman's Lake can achieve Nation Fire Protection Association (NFPA) standards.

1.6.1.10 Town of Whitchurch-Stouffville, Ballantrae-Musselman's Lake and Environ, Secondary Plan/Highway 48 Corridor Review Final Report, November 2012

This report reviews the findings of the Ballantrae-Musselman's Lake and Environs area background analyses and public input. Ballantrae-Musselman's Lake is currently serviced by a municipal communal water system.

Public concerns centred on the growth potential constraint by the settlement boundaries due to the Oak Ridges Moraine Conservation Plan policies. Ballantrae-Musselman's Lake is serviced by private septic systems; therefore, the preferred alternative is using existing sewage capacity surplus in the treatment plants (serving the Ballantrae Golf and Country Club) to service the new developments along Highway 48/Aurora Road. This alternative is preferred due to the potential utilization of existing surplus sewage capacity of the treatment plan to account for long term growth. If issues cannot be resolved between the Town and the Owner, then private on-site systems is preferred. The wells will have adequate water supply to 2031 therefore it was found that no other strategy is required at this time. The impact assessments of the preferred alternative on the neighbouring properties and aquifers in its vicinity were underway during this study.

1.6.1.11 Town of Whitchurch-Stouffville, Standard Guidelines and Drawings, June 18, 2008

The Town prepared a design standards guideline for the design and construction of roads, sanitary sewage, storm drainage, water distribution, street lighting, and landscaping. These design criteria were developed to guide developing engineers, architects, developers and Town staff on new developments and subdivisions and to ensure a consistent minimum standard. Each section includes design requirements and required calculations/reports as well as standard drawings and standard drawing requirements, based on Ontario Provincial Standard Drawings (OPSD).

1.6.2 York Region Studies

1.6.2.1 York Region, Water and Wastewater Master Plan Update, November 2016

This study's objective was to develop a cost effective and resilient infrastructure plan to serve York Region communities to 2041 and beyond and develop a long-term strategy to provide sustainable water services utilizing a One Water approach.

According to the Master Plan, the Town of Whitchurch-Stouffville population and employment growth forecasts to 2041 are 64,500 and 23,000, respectively. Based on these growth forecasts, additional lake-based supply capacity will be required. The York-Durham Sewage System that currently services Whitchurch-Stouffville was recently expanded and can therefore meet the servicing need to 2041, if the outfall constraints are addressed.

Through the Master Plan, the following projects are to be completed for the Town of Whitchurch-Stouffville:

- Stouffville Zone 2 Capacity Increase (Phase 1) – installation of pressure reducing valves (PRV) to connect Zone 1 and Zone 2 (0-5 years)
- Stouffville Zone 2 Capacity Increase (Phase 2) – new elevated tank to provide additional storage (capacity of 4 ML and 1.5 km of watermain) (15-20 years)
- Stouffville Zone 2 Booster Pumping Station Pump Addition – new pump to support growth (capacity of 290 L/s) (20-25 years)
- Additional lake-based supply capacity will be required to service the growth in Stouffville to the year 2041.

The MECP has raised concerns to York Region regarding the potential shallow groundwater rise in the Community of Ballantrae. In response, York Region has submitted a proposed monitoring and mitigation plan to the MECP for review to address their concerns. Future environmental assessment projects in the Community of Ballantrae will depend on the outcome of this study.

1.6.2.2 York Region, Ballantrae-Musselman's Lake Water Supply Environmental Assessment, 2017

The Region has recently completed an environmental assessment to determine water supply alternatives for the projected growth within the Ballantrae-Musselman's Lake area proposed in the Official Plan Amendment (OPA) 136. This study considered the provincial, regional and municipal policies and strategies provided in the *Places to Grow Act*, Oak Ridges Moraine Conservation Plan, the Town's OPA 136 and the Region's 2016 Water and Wastewater Master Plan Update. Through a thorough evaluation and ranking process in addition to public consultation, the study identified the preferred solution to expand the existing well sites, from 4580 m³/day to approximately 5420 m³/day.

1.6.2.3 York Region, Transportation Master Plan, November 2016

This study reviews the Region's transportation system and provides recommendations on infrastructure to address transportation needs to 2041 including transit, road networks, active transportation and movement of goods. Key recommendations included maximizing potential of employment areas, improving transportation demand management policies and programs and accessibility to alternative modes of transportation.

1.6.2.4 York Region, Inflow and Infiltration Reduction Strategy, March 2016

This report reviews the inflow and infiltration reduction program which began in March 2011. The report reviews the 2015 program accomplishments including:

- Approximately 1.18 megalitres per day (MLD) reduction (3% of total I/I reduction target)
- 35 km of Region sewer and 420 km local municipality sewer inspected by CCTV – 9.4 km of mainline inspected within the Town of Whitchurch-Stouffville
- Removal of 68 downspout connections to sanitary sewers
- 829 m of local municipality sewer relined.
- Region spent \$5.1 M on I/I reduction activities
- Local municipalities spent \$3.5 M on I/I activities
- Ongoing data collection for 248 flow monitors and 70 York Region rainfall monitors.

1.6.2.5 York Region Water Conservation Initiatives

York Region, in collaboration with the Town of Whitchurch-Stouffville, have taken several actions to promote water conservation and water use efficiency including:

- Summer Water Restriction Programs.
- One Water Action Plan: an action plan with the objective to change people's water usage and create innovative strategies for water conservation within York Region.
- Long Term Water Conservation and Water Reuse: includes several water conservation programs for the Region of York (York Region Water and Wastewater Master Plan Update, Section 4.3.1).

1.6.3 Conservation Authority Studies

1.6.3.1 Toronto and Region Conservation Authority and Rouge River Watershed Plan Towards a Healthy and Sustainable Future

The Watershed Plan's objective is to guide governments (municipal, provincial and federal), conservation authorities, non-governmental organizations and private landowners on the environmental protection policies within the Rouge Park watershed.

The watershed evaluation led to three key findings:

- The watershed is an important resource due to its location and its limited development.
- Urban development has significantly changed natural communities including water balance and quality, percent of natural cover, air quality, cultural heritage and the diversity of aquatic and terrestrial communities.
- Current conditions will not be able to be maintained with projected future development, especially with current approaches to urban design, stormwater management and climate change.

1.6.3.2 Toronto and Region Conservation Authority, A Watershed Plan for Dufferin Creek and Carruthers Creek, August 2013

The Watershed Plan reviews the existing conditions of the watershed, identifies opportunities and issues and prepares management strategies to be adopted. The plan identified integral management actions including:

- Protection of existing natural and sensitive features including wetlands and streams
- Restoration of areas within enhanced natural heritage system
- Stormwater management controls and stringent erosion and sediment controls
- Land use and water management and eliminate pollution source points
- Remove/mitigate human built barriers for fish and sediment and maintain fish and wildlife population
- Raise awareness of human influences.

1.6.4 Ongoing Studies

1.6.4.1 York Region, Ballantrae Long Term Water Supply Class Environmental Assessment (Schedule B), Ongoing

Amendment 136 of the Town of Whitchurch-Stouffville's Official Plan indicated that the population of the Ballantrae-Musselman's Lake settlement areas are projected to increase to 6,230 persons. As a result, water capacity needs to support the increase in population required upgrading. Through the evaluation process, the recommended

preferred strategy indicated an expansion of the existing well sites. The following minor upgrades were recommended:

- Increase of the combined firm pumping and treatment capacity of the three (3) wells from 5,236 m³/day to 5,420 m³/day
- Increase of the existing Permit to Take Water maximum limit from 4,580 m³/day to 5,420 m³/day.

Currently, additional work is required to address the MECP concerns related to this project.

1.6.4.2 York Region, Stouffville Long-Term Water Supply and Servicing Class Environmental Assessment (Schedule B) - 2017 to Ongoing

As a result of the recommendations made in the 2016 York Region Water and Wastewater Master Plan Update, it was found that additional water storage infrastructure and water supply capacity was required to support the projected population growth in the Community of Stouffville. The study area is bounded by Vandorf Sideroad to the north, Kennedy Road to the west, 19th Avenue to the south and the York/Durham Line to the east. This study will review the potential alternative strategies for water supply and servicing within the Community of Stouffville and through evaluation and consultation, identify the recommended preferred strategy.

1.6.4.3 Town of Whitchurch-Stouffville, Design Guidelines and Standard Drawings

These guidelines are being prepared for the design of roads and services for all land development within the Town of Whitchurch-Stouffville. These guidelines will include design specifications specific to the Town's objectives and will be supplemented with the Ontario Provincial Standard Drawings and Specifications.

1.6.5 Other Studies

The following studies have also been considered during the Master Plan:

1. Community of Stouffville, Trail System & Parks Concept Plan, October 2016,
2. Town of Whitchurch-Stouffville, Leisure Facilities Strategy Update, May 2013,
3. Town of Whitchurch-Stouffville, Leisure and Community Services Master Plan, June 2011
4. Community of Stouffville, Residential Intensification Urban Design Guidelines, November 23, 2009
5. Town of Whitchurch-Stouffville, Community of Stouffville Urban Design Guidelines, December 2002

1.7 Problem and Opportunity Statement

The Water and Wastewater Master Plan has been initiated to identify servicing requirements for existing service areas and growth areas to 2041 including a review of municipal servicing potential for the Town's communities of Ballantrae-Musselman's Lake, Gormley, Vandorf, and Bloomington.

The Regional Municipality of York is responsible for the planning of the Regional system for water supply, storage and pumping, and wastewater collection and treatment. The Town of Whitchurch-Stouffville is reliant on the Region to provide adequate water supply and wastewater collection for the Community of Stouffville (water supply and wastewater collection) and Ballantrae-Musselman's Lake (water supply).

The Town of Whitchurch-Stouffville Water and Wastewater Master Plan has been prepared on the basis that the Region will meet its legislative requirements to provide Regional Municipal water and wastewater servicing to meet existing need and approved growth within the Town.

1.8 Study Area

The Town of Whitchurch-Stouffville is located in the Regional Municipality of York, in the southern region of Ontario. The Town is situated in the eastern portion of the Greater Golden Horseshoe (GGH) and has a total area of approximately 220 km² with a population of 45,800 persons and employment of 15,200 jobs in 2016. The majority of the population and employment reside within the Community of Stouffville with an approximate population and employment of 31,300 and 7,750 respectively in 2016.

The study area, provided in **Figure 2**, covers the entire municipality of the Town of Whitchurch-Stouffville. The servicing study has primarily focused on the urban water and wastewater service areas within the Community of Stouffville and the water service area of Ballantrae-Musselman's Lake. The Master Plan has also within the context of existing Provincial Planning Policy considered the potential of future municipal service expansion to the rural settlement areas of Ballantrae-Musselman's Lake, Vandorf-Preston Lake, Bloomington and Gormley.

The majority of the Town's land is agricultural. Approximately 80% of the Town is located within the Oak Ridges Moraine Conservation Plan (ORMCP) jurisdiction. Development within the ORMCP jurisdiction is controlled to ensure the conservation and protection of significant ecological and hydrological features. The Town's southern area is located within the Rouge River watershed.

The Town resides in two (2) conservation authority jurisdictions; Ballantrae, Musselman's Lake, Vandorf-Preston Lake, and parts of Bloomington are located within the Lake Simcoe Region Conservation Authority (LSRCA) jurisdiction. The Community of Stouffville, Gormley and the rest of Bloomington are located within the Toronto and Region Conservation Authority (TRCA) jurisdiction. The Conservation Authorities Act

provides for regulations that restrict development in areas adjacent to wetlands, watercourses, and hazard lands.

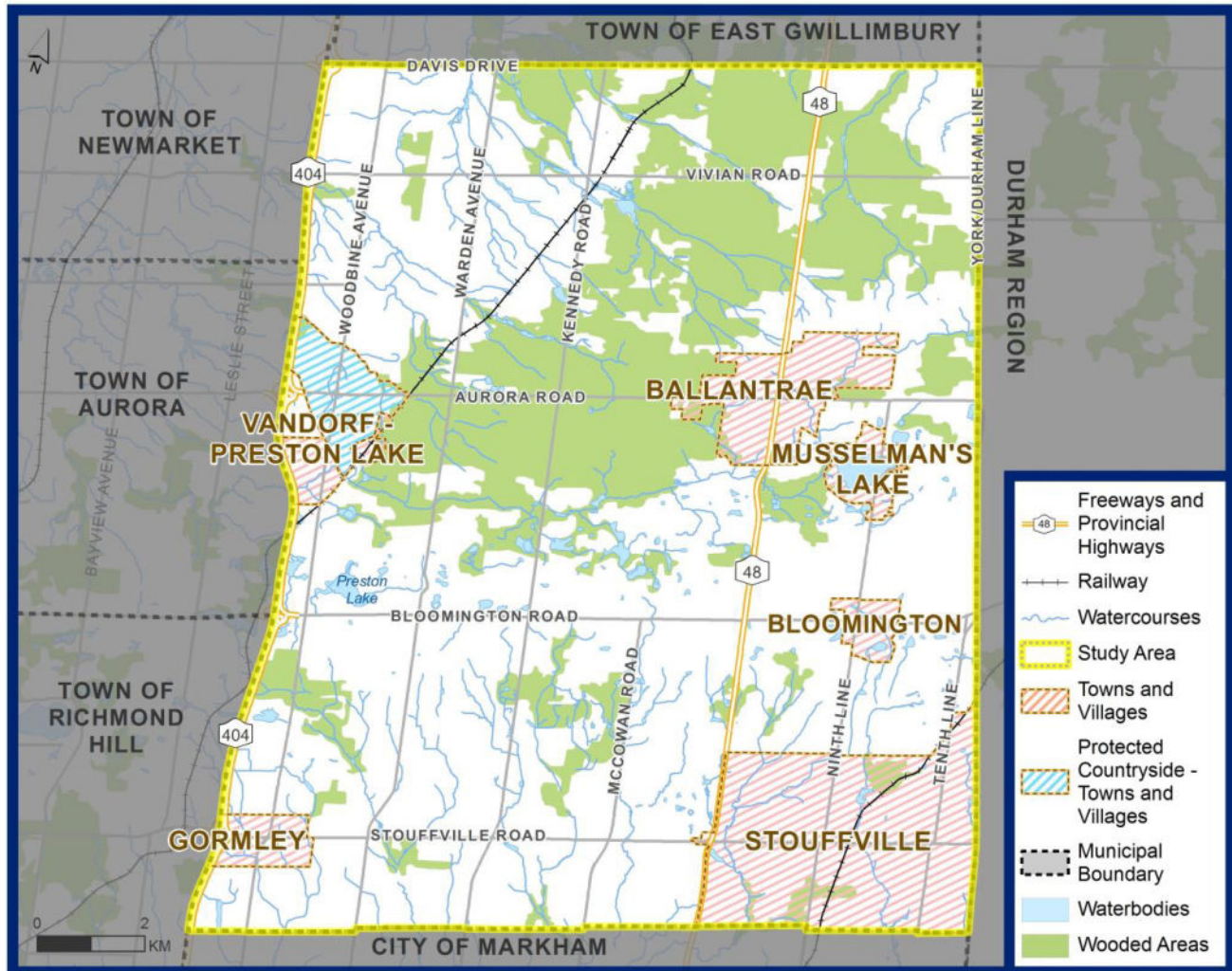


Figure 2: Study Area

1.9 Planning Context

1.9.1 Provincial and Federal Legislation and Policy Context

1.9.1.1 Provincial Policy Statement

The Provincial Policy Statement, 2014 is issued under Section 3 of the Planning Act. The latest Provincial Policy Statement came into effect on April 30, 2014 and supersedes the 2005 Provincial Policy Statement (PPS). It provides policy direction on matters of provincial interest related to land use planning and development. As a key part of Ontario's policy-led planning system, the PPS sets the policy foundation for regulating the development and use of land (Ministry of Municipal Affairs and Housing, MMAH, 2014).

The policies of the PPS may be complemented by provincial plans or by locally-generated policies regarding matters of interest.

Key policies relevant to planning for water and wastewater services include:

Policy 1.6.1

Infrastructure, electricity generation facilities and transmission and distribution systems, and public service facilities shall be provided in a coordinated, efficient and cost-effective manner that considers impacts from climate change while accommodating projected needs.

Planning for infrastructure, electricity generation facilities and transmission and distribution systems, and public service facilities shall be coordinated and integrated with land use planning so that they are:

- a. financially viable over their life cycle, which may be demonstrated through asset management planning; and,
- b. available to meet current and projected needs.

Policy 1.6.3

Before consideration is given to developing new infrastructure and public service facilities:

- a. the use of existing infrastructure and public service facilities should be optimized; and,
- b. opportunities for adaptive re-use should be considered, wherever feasible.

Policy 1.6.6.1

Planning for sewage and water services shall:

- a. Direct and accommodate expected growth or development in a manner that promotes the efficient use and optimization of existing:
 1. municipal sewage services and municipal water services; and
 2. private communal sewage services and private communal water services, where municipal sewage and water services are not available;
- b. Ensure that these systems are provided in a manner that:
 1. can be sustained by the water resources upon which such services rely
 2. is feasible, financially viable and complies with all regulatory requirements; and
 3. protects human health and the natural environment;
- c. Promote water conservation and water use efficiency;

- d. Integrate servicing and land use considerations at all stages of the planning process; and,
- e. Be in accordance with the servicing hierarchy outlined through policies 1.6.6.2, 1.6.6.3, 1.6.6.4 and 1.6.6.5.

Key policies relevant to planning for the Town of Whitchurch-Stouffville water and wastewater infrastructure include:

Policy 1.1.3.1

Settlement areas shall be the focus of growth and development, and their vitality and regeneration shall be promoted.

Policy 1.1.3.8

Planning authorities shall identify appropriate locations and promote opportunities for intensification and redevelopment where this can be accommodated taking into account existing building stock or areas, including *brownfields sites*, and the availability of suitable existing or planned *infrastructure* and *public service facilities* required to accommodate projected needs.

Policy 1.1.4.2

In *rural areas*, rural *settlement areas* shall be the focus of growth and development, and their vitality and regeneration shall be promoted.

Policy 1.1.4.3

When directing development in rural settlement areas in accordance with policy 1.1.3, planning authorities shall give consideration to rural characteristics, the scale of development and the provision of appropriate service levels.

1.9.1.2 2017 Growth Plan for the Greater Golden Horseshoe

The 2005 Places to Grow Act was implemented via the Growth Plan for the Greater Golden Horseshoe (GGH). The most recent Growth Plan came into effect on July 1, 2017 replacing the 2006 Growth Plan prepared by the Ministry of Municipal Affairs and Housing.

The Growth Plan is a long-term plan that works together with the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan and the Niagara Escarpment Plan to manage growth, build complete communities, curb sprawl and protect the natural environment.

To support these goals, the Growth Plan for the Greater Golden Horseshoe works to:

- Support the achievement of complete communities that offer more options for living, working, learning, shopping and playing.
- Reduce traffic gridlock by improving access to a greater range of transportation options.

- Provide housing options to meet the needs of people at any age.
- Revitalize downtowns to become more vibrant and to provide convenient access to an appropriate mix of jobs, local services, public service facilities and a full range of housing.
- Curb sprawl and protect farmland and green spaces.
- Promote long-term economic growth.

Like other provincial plans, the Growth Plan builds upon the policy foundation provided by the Provincial Policy Statement (PPS) and provides additional and more specific land use planning policies to address issues facing specific geographic areas in Ontario. While the 2014 PPS provides for a time horizon of up to 20 years for making sufficient land available to meet projected needs, Policy 1.1.2 of the 2014 PPS suggests that a provincial plan may provide an alternate time horizon for specific areas of the province. The 2017 Growth Plan provides that the applicable time horizon for land use planning is 2041. Policy 1.1.2 of the PPS allows the Town's 2041 population and employment anticipated growth forecasts estimates to be used in this document.

A key change from the 2006 Growth Plan relevant to York Region – which includes the Town of Whitchurch-Stouffville – includes revised population and employment forecasts for York Region in 2031, 2036, and 2041 as follows:

Table 1: York Region Population and Employment Forecasts

York Region	2031	2036	2041
Population	1,590,000	1,700,000	1,790,000
Employment	790,000	840,000	900,000

Source: 2017 Growth Plan for the Greater Golden Horseshoe

The 2017 Growth Plan includes increases in intensification (40% to 60%) and Designated Greenfield Area density targets (50 persons and jobs per hectare to 80 persons and jobs per hectare) for York Region.

Section 3.2.6 of the 2017 Growth Plan establishes the water and wastewater system policies to support growth. Those policies relevant to the Whitchurch-Stouffville Water and Wastewater Master Plan include:

1. Municipalities should generate sufficient revenue to recover the full cost of providing and maintaining *municipal water and wastewater systems*.
2. *Municipal water and wastewater systems* and *private communal water and wastewater systems* will be planned, designed, constructed or expanded in accordance with the following (Policy 3.2.6.2):

- a. opportunities for optimization and improved efficiency within existing systems will be prioritized and supported by strategies for energy and water conservation and water demand management;
- b. the system will serve growth in a manner that supports achievement of the minimum intensification and density targets in this Plan;
- c. a comprehensive water or wastewater master plan or equivalent, informed by *watershed planning* has been prepared to:
 - i. demonstrate that the effluent discharges and water takings associated with the system will not negatively impact the *quality and quantity of water*;
 - ii. identify the preferred option for servicing growth and development, subject to the hierarchy of services provided in policies 1.6.6.2, 1.6.6.3, 1.6.6.4 and 1.6.6.5 of the PPS, 2014, which must not exceed the assimilative capacity of the effluent receivers and sustainable water supply for servicing, ecological, and other needs; and
 - iii. identify the full life cycle costs of the system and develop options to pay for these costs over the long-term
- d. in the case of large subsurface sewage disposal systems, the proponent has demonstrated attenuation capacity; and
- e. plans have been considered in the context of applicable inter-provincial, national, bi-national, or state-provincial Great Lakes Basin agreements or provincial legislation or strategies.

An overview of the 2017 Growth Plan and its key differences from its predecessor is provided below:

A. Strategic Growth Areas

The 2017 Growth Plan identifies the term strategic growth areas to replace the original terms intensification areas and intensification corridors. Strategic growth areas refer to areas that can include major transit station areas, urban growth centres and other major opportunities that may comprise infill, redevelopment, brownfield sites, the expansion or conversion of existing buildings or greyfields. The 2017 Growth Plan provides more explicit direction on how density targets are translated into official plans, zoning and other planning decisions and documents.

Unlike its predecessor, the 2017 Growth Plan identifies policies that require the delineation of strategic growth areas, the establishment of density targets and focusing growth to these areas. Additional policies enable planning beyond the Growth Plan horizon for strategic growth areas located in delineated built-up areas (if certain conditions are applied).

The 2017 Growth Plan identifies four (4) specific targets to be used for planning and managing growth: intensification target, designated Greenfield target, urban growth centres density targets and major transit station areas density targets. The latter target is new for 2017.

1. Intensification and Density Targets

Under the 2017 Growth Plan, the vast majority of growth will be directed to settlement areas that:

- (i) have a delineated built boundary;
- (ii) have existing or planned municipal water and wastewater systems; and
- (iii) can support the achievement of complete communities.

By 2031, the intensification target will be increased to 60% of residential development annually directed to delineated built-up areas¹. By the time the next municipal comprehensive review is approved and in effect, and each year until 2031, an interim intensification target of 50% will apply.

2. Designated Greenfield Areas

By 2041, *designated greenfield areas* will be planned to achieve a minimum density target of 80 residents and jobs combined per hectare². Through the next municipal comprehensive review, the minimum density target in Designated Greenfield Areas will be 60 residents and jobs per hectare.

3. Transit Corridors and Major Station Areas

The 2017 Growth Plan requires municipalities to identify priority transit corridors in their official plans and delineate the boundaries of major transit station areas along the priority transit corridors or subway lines in a transit-supportive manner that maximizes the size of the area and number of transit users within walking distance. A new policy also identifies density targets for priority transit corridors and major transit station areas, including:

- 200 residents and jobs combined per hectare for subways;
- 160 residents and jobs combined per hectare for light rail transit or bus rapid transit; and
- 150 residents and jobs combined per hectare for those that are served by GO Transit rail service.

The 2006 Growth Plan comprised policies to support major transit station areas but did not include specific density targets.

¹ The 2006 Growth Plan previously recommended a minimum of 40% of residential development to occur within built up areas.

² The 2006 Growth Plan previously recommended a minimum density target of 50 residents and jobs combined per hectare for Designated Greenfield Areas.

4. Urban Growth Centres

The 2017 Growth Plan continues to recognize the 25-urban growth centres identified in 2006 Growth Plan as regional focal points for accommodating population and employment growth. The Town of Whitchurch-Stouffville is not included in the urban growth centres. The density targets recommended in the 2017 Growth Plan mirror those identified in the 2006 Plan.

B. Supporting Complete Communities

The 2017 Growth Plan clarifies policies to support the achievement of complete communities, which include mixed-use neighborhoods or other areas within cities, towns and settlement areas that offer and support opportunities for people of all ages to conveniently access most of the necessities for daily living. While the 2006 Growth Plan defined complete communities and supporting policies, the new Growth Plan further clarifies how the policies work together to achieve complete communities through such elements as site design and urban design standards. In support of complete communities, the 2017 Growth Plan identified the following new policies:

1. Housing

Under the 2017 Growth Plan, municipalities are required to develop a housing strategy that supports the minimum intensification and density targets that will result in complete communities. In so doing, the housing strategy will consider the use of available tools to require multi-unit residential developments incorporate a mix of unit sizes to accommodate a diverse range of household sizes and incomes. While the 2006 Growth Plan required having a housing strategy which addressed planning for a mix of housing, the 2017 Growth Plan clarifies this strategy to assist municipalities with implementation and alignment.

2. Community Hubs

The 2017 Growth Plan introduces the term community hubs to promote co-locating public service facilities and services within community hubs. The 2006 Growth Plan promoted the co-location of community infrastructure, which was replaced in the 2017 Growth Plan with public service facilities. As a result of this modification, municipalities are now required to collaborate and consult with service planning, funding and delivery sectors to facilitate the coordination and planning of community hubs and other public service facilities.

3. Transportation, Transit and Urban Form

The 2017 Growth Plan identifies new policies that require the adoption of complete streets when designing, refurbishing or reconstructing the existing or planned street network, which highlight the importance of active transportation networks and transit supportive built form. The 2006 Growth Plan spoke broadly about transportation planning but did not fully define the policies to plan for the transportation system.

4. Employment Areas

The 2017 Growth Plan introduces a new "Prime Employment Area" designation for:

"Areas of employment within settlement areas that are designated in an official plan and protected over the long-term for uses that are land extensive or have low employment densities..."

These uses include manufacturing, warehousing, and logistics, and appropriate associated uses and ancillary facilities. If municipalities designate prime employment areas, they are required to be in areas located adjacent to, or near, major goods movement facilities and corridors (including highway interchanges).

1.9.1.2.1 Settlement Areas

According to the 2017 Growth Plan³:

"For settlement areas that are serviced by rivers, inland lakes, or groundwater, municipalities will not be permitted to extend water or wastewater services from a Great Lakes source unless:

- the extension is required for reasons of public health and safety, in which case, the capacity of the water or wastewater services provided in these circumstances will be limited to that required to service the affected settlement area, including capacity for planned development within the approved settlement area boundary
- in the case of an upper- or single-tier municipality with an urban growth centre outside of the Greenbelt Area:
 - the need for the extension has been demonstrated;
 - the increased servicing capacity will only be allocated to settlement areas with urban growth centres; and
 - the municipality has completed the applicable environmental assessment process in accordance with the Ontario Environmental Assessment Act; or
- the extension had all necessary approvals as of July 1, 2017 and is only to service growth within the settlement area boundary delineated in the official plan that is approved and in effect as of that date.

1.9.1.3 Greenbelt Plan

Like the Growth Plan for the Greater Golden Horseshoe, the updated Greenbelt Plan (2017) came into effect on July 1, 2017. As of 2017, the Greenbelt contained over two million acres of land, and was the largest and most protected greenbelt in the world. Ontario's Greenbelt extends 325 km from the eastern end of the Oak Ridges Moraine,

³ Ministry of Municipal Affairs and Housing. 2016. *Growth Plan for the Greater Golden Horseshoe, 2017*. <http://placestogrow.ca/images/pdfs/ggh2017/en/growth%20plan%20%282017%29.pdf>. Accessed March 22, 2017

near Rice Lake, in the east, to the Niagara River in the west. The Greenbelt includes over 800,000 acres of land protected by the Niagara Escarpment Plan and the Oak Ridges Moraine Conservation Plan and over 1.2 million acres of land known as *Protected Countryside* and *Urban River Valley* established by the overarching Greenbelt Plan.

The Greenbelt is a broad band of permanently protected land which supports agriculture as the predominant land use, gives permanent protection to the natural heritage and water resource systems, and provides for a diverse range of economic and social activities⁴. It includes lands within, and builds upon the ecological protections provided by, the Niagara Escarpment Plan (NEP) and the Oak Ridges Moraine Conservation Plan (ORMCP). The Greenbelt Plan was published by the Ministry of Municipal Affairs and Housing in 2005. The Plan identifies where urbanization should not occur in order to provide permanent protection to the agricultural land base and the ecological features and functions occurring on this landscape.

The Oak Ridge's Moraine Conservation Act (2001) and the Greenbelt Act (2005) affect development and water and wastewater infrastructure planning. According to the Oak Ridges Moraine Conservation Plan and Greenbelt Plan, the following restrictions apply:

- Construction or expansion of partial services (where only one of the services, water or wastewater, is provided by a municipality or private communal service) of water or wastewater.
- Extension of municipal or private communal sewage or water services outside of a settlement area boundary.

The Greenbelt Plan, together with the Oak Ridges Moraine Conservation Plan and the Niagara Escarpment Plan, identifies where urbanization should be excluded in order to provide permanent protection to the agricultural land base and the ecological and hydrological features, areas and functions occurring on this landscape.

Relevant changes to the Greenbelt Plan include:

- Introducing the need to address climate change considerations, including incorporating techniques “to reduce greenhouse gas emissions, and increasing the resilience of settlement areas and infrastructure within the Greenbelt”.
- Introducing the need to “identify potential areas to be added to the Protected Countryside of the Greenbelt” as well as urban river valley areas focused on restricting urbanization in these “ecological and hydrological areas of significance”.
- Introducing a new policy in the Greenbelt Plan that speaks to the potential for the province to consider opportunities to grow the Greenbelt. The province will

⁴ Ministry of Municipal Affairs and Housing. 2016. *The Greenbelt Plan*. <http://www.mah.gov.on.ca/Page189.aspx>. Accessed March 21, 2017

undertake a process, including public consultation, to expand the Greenbelt on the outer edge in the near future

- Addition of policies for key hydrologic areas in the Protected Countryside including the allowance for major development within these areas only when “hydrologic functions, including groundwater and surface water quality and quantity, of these areas [are] protected and, where possible, improved or restored...”.
- Addition of general settlement area policies restricting expansion into and within the Greenbelt.
- Additional policies surrounding sewage and water infrastructure in the Protected Countryside are included below:
 - Planning, design and construction of sewage and water infrastructure shall be carried out in accordance with the policies in subsection 3.2.6.2 of the Growth Plan mentioned below.

The study area is within the Oak Ridges Moraine Area of the Greenbelt Plan Area, with exception of the northwest corner and the southern boundary.

Greenbelt Protected Countryside

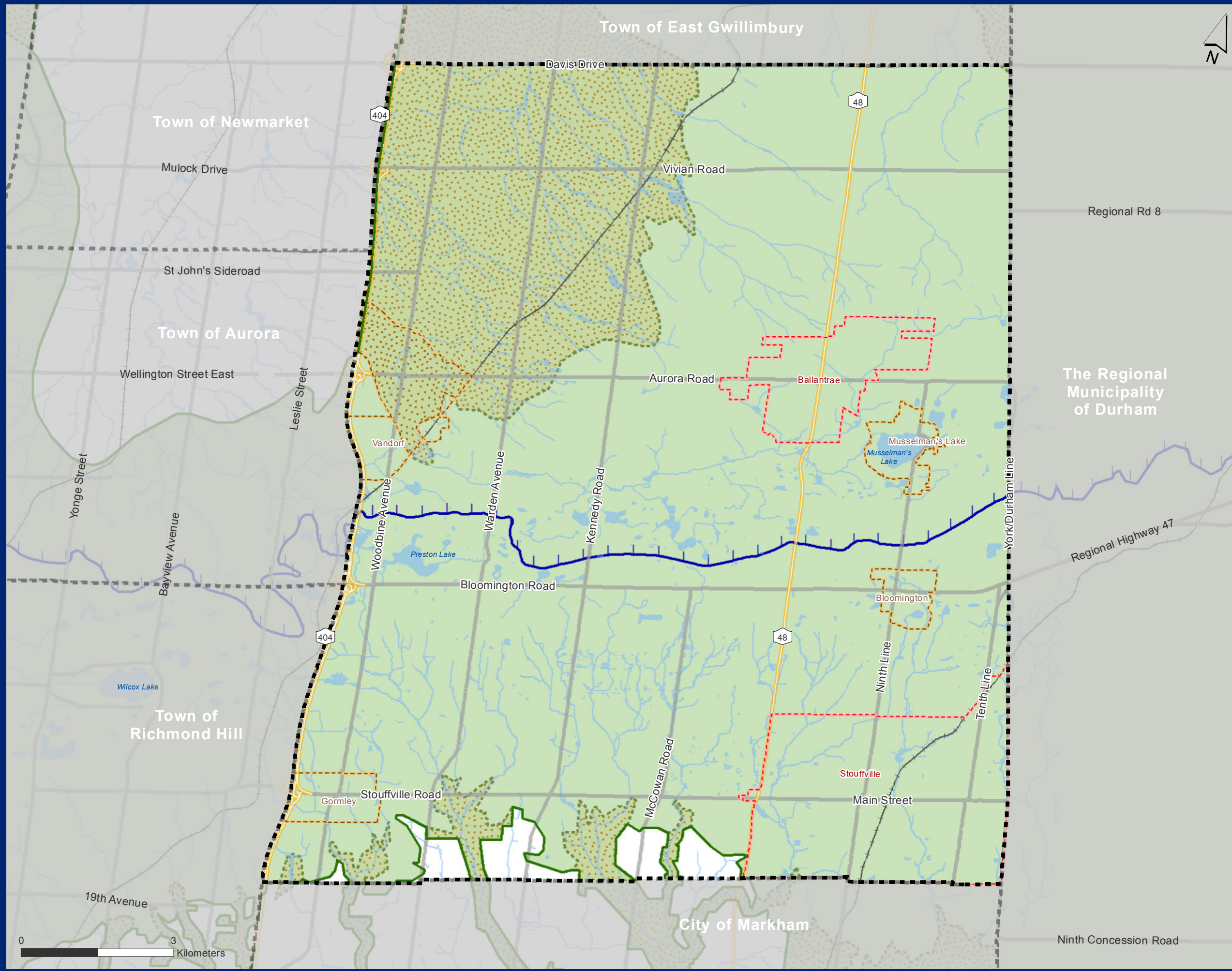
The Greenbelt Protected Countryside covers 20% of the Town of Whitchurch-Stouffville land area.

All existing, expanded or new infrastructure subject to and approved under the Canadian Environmental Assessment Act, Ontario’s Environmental Assessment Act, the Planning Act, the Aggregate Resource Act or the Telecommunications Act or by the National or Ontario Energy Boards, or which received a similar environmental approval, is permitted within the Protected Countryside, subject to the required policies within the Greenbelt Plan and provided it meets one of the following two (2) objectives:

- Supports agriculture, recreation, and tourism, Towns/Villages and Hamlets resource use or the rural economic activity that exists and is permitted within the Greenbelt; or
- It serves the significant growth and economic development expected in Southern Ontario beyond the Greenbelt by providing for the appropriate infrastructure connections among urban centre and between these centres and Ontario’s borders.

Figure 3 shows the portion of the Greenbelt lands that extends into the Town of Whitchurch-Stouffville’s boundaries, restricting the type of development that occurs in those areas.

Natural environment policies relating to the Greenbelt Plan can be found in the Natural Environment Existing Conditions Report provided in **Appendix A**.



**Town of Whitchurch-Stouffville
Water and Wastewater Master Plan**

**Land Use Planning Policies
Greenbelt Plan**

Figure 3

Greenbelt Plan

-  Greenbelt Plan Area Boundary
-  Protected Countryside
-  Protected Countryside - Hamlet

Other Features

-  Area Subject to the Lake Simcoe Protection Plan
-  Towns and Villages
-  Hamlets
-  Municipal Boundary
-  Creeks, Rivers, and Lakes
-  Freeways and Provincial Highways
-  Railway



1.9.1.4 Oak Ridges Moraine

The Oak Ridges Moraine is an environmentally sensitive landform in south central Ontario which covers approximately 80% of the Town. The Oak Ridges Moraine Conservation Plan provides land use and resource management direction for these sensitive resources within the Moraine. The Moraine has a unique concentration of environmental, geological and hydrological features that make its ecosystem vital to south-central Ontario.

Within the Town, there are 5 Oak Ridges Moraine (ORM) land use designations; natural core area, natural linkage area, countryside area (including rural settlement), and settlement area. One of the objectives of the Oak Ridges Moraine Conservation Plan is to provide for *continued development within existing urban settlement areas and recognizing existing rural settlements*.

ORMCP Land Use Designation Map is provided in **Figure 4**. **Table 2** provides the Town's land use designations.

Table 2: Town of Whitchurch-Stouffville Land Use Designation

Designation Type	Settlement/Hamlet
Countryside Area – Rural Settlement	Musselman's Lake, Gormley, Vandorf, Bloomington
Settlement Area	Stouffville, Ballantrae
Natural Linkage Area	Preston Lake

The 2017 Oak Ridges Moraine Conservation Plan (ORMCP) includes a reproduction of the 2002 regulation (O. Reg. 140/02) as well as new "Introduction" and "Implementation" sections. These new sections provide both an explanation of the Oak Ridges Moraine Conservation Plan and some additional information for users of the Plan that is not found in the 2002 plan.

In order to serve the projected growth of southern Ontario, new and/or expansions of facilities will be required.

Coordination with local land use planning may be required including public highways and transportation, utilities, water, wastewater and stormwater systems and facilities and other municipal infrastructure and right of ways.

Policies related to infrastructure within the ORCMP include:

- *In the Oak Ridges Moraine, new infrastructure corridors or facilities shall only be allowed in the Natural Core Areas and Natural Linkage Areas if they are shown to be necessary and there is no reasonable alternative. They shall also have to meet stringent review and approval standards.*
- *Municipalities shall ensure that the development of new infrastructure or the upgrading or extension of existing infrastructure is supported by the necessary*

studies, assessments and documentation such as infrastructure master plans, asset management plans, land use and financial scenarios, watershed studies and subwatershed plans, environmental assessments and other relevant studies that,

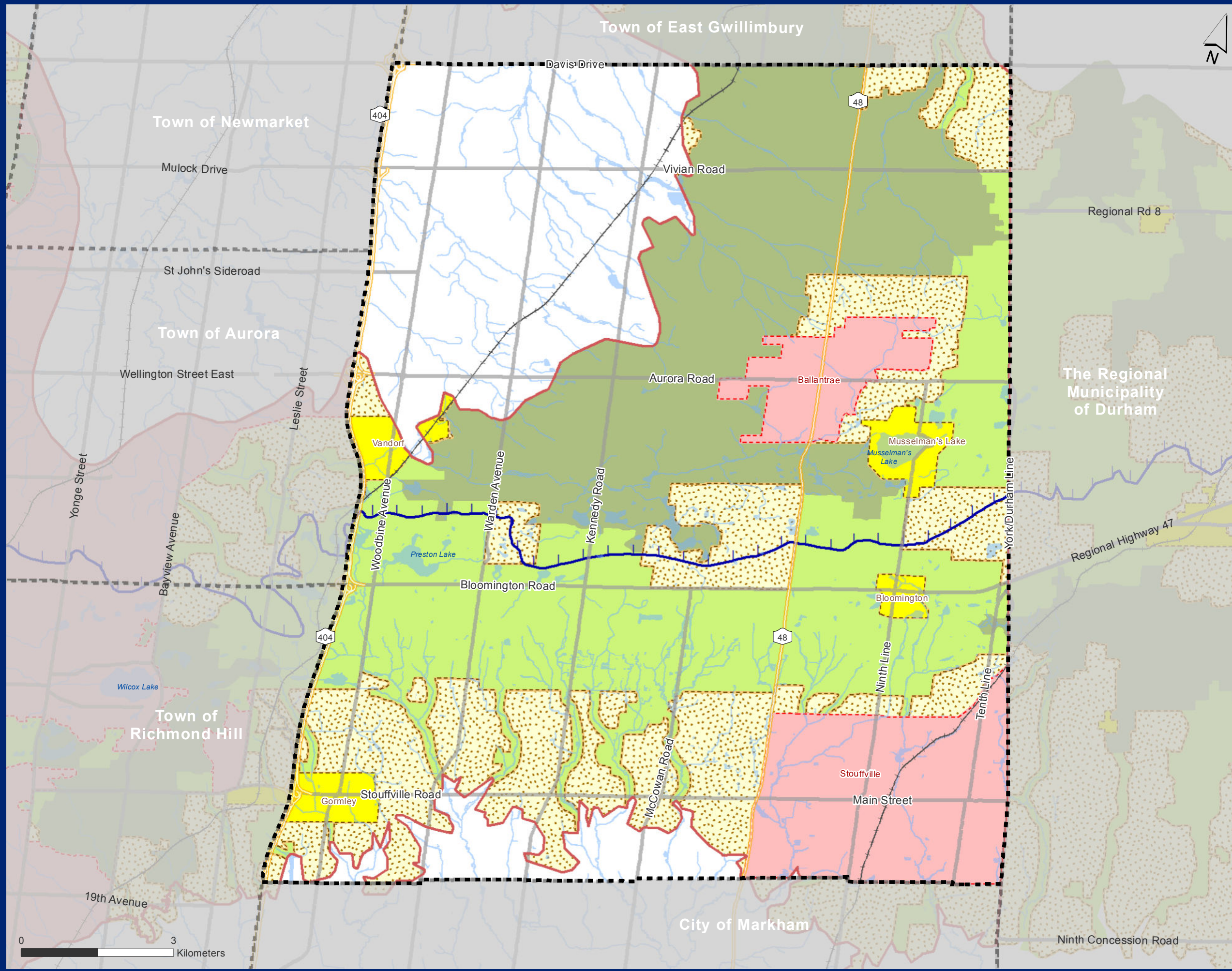
- a) Demonstrate that infrastructure will be financially feasible and sustainable over the long term;*
- b) Demonstrate that an adequate water supply is available for the development, and that there is sufficient assimilative capacity to deal with the sewage from the development, without compromising the ecological integrity of the Plan Area;*
- c) Address stormwater management at appropriate scales throughout the land use planning process;*
- d) Utilise appropriate low impact development techniques and green infrastructure; and*
- e) Assess actions to reduce greenhouse gas emissions and to adapt to climate change impacts.*
- *Service and utility trenches for infrastructure shall be planned, designed and constructed so as to keep disruption of the natural groundwater flow to a minimum.*
- *An application for major development shall be accompanied by a sewage and water system plan that demonstrates,*
 - a) that the ecological integrity of hydrological features and key natural heritage features will be maintained;*
 - b) that the quantity and quality of groundwater and surface water will be maintained;*
 - c) that stream baseflows will be maintained;*
 - d) that the project will comply with any applicable watershed plan, water budget, water conservation plan, water and wastewater master plan or subwatershed plan;*
 - e) that the assimilative capacity of receiving lakes, rivers or streams with respect to sewage from surrounding areas will not be exceeded and the attenuation capacity of groundwater with respect to subsurface sewage service systems will not be exceeded; and*
 - f) that the water use projected for the development will be sustainable*
- *Water and sewer service trenches shall be planned, designed and constructed so as to keep disruption of the natural groundwater flow to a minimum.*

ORCMP policies related to rural settlements include:

- *The Oak Ridges Moraine contains a range of settlements that vary significantly in both size and population, economic activity, diversity/intensity of uses, the type(s) of water and sewage services and the role they play within their municipalities. They are designated as Settlement Areas or identified as Rural Settlements within the Countryside Area of the Plan. Land use patterns within Settlement Areas will support the development of complete communities working towards low-carbon communities, including the long-term goal of net-zero communities. The development of complete communities will, in part, be achieved by facilitating the development of community hubs that involve the co-location of public services to address local community needs to convenient locations that are accessible by active transportation and where available, transit.*

Schedules A, A1, B, B1, E, H, I, J and K of the Official Plan identify the lands in Whitchurch-Stouffville which are located within the Moraine and described as the *Oak Ridges Moraine Plan Area*. The Official Plan provides general policies on infrastructure which apply to all lands in the Oak Ridges Moraine including:

- *Section 3.2.5: Transportation, infrastructure and utilities are to be prohibited in all land use designations on Schedules 'A' (Figure 5) and 'B' (Figure 6) and/or key natural heritage features and hydrologically sensitive features unless the requirements of Section 41 of the Oak Ridges Moraine Conservation Plan have been addressed to the satisfaction of the applicable approval authority, such as the Region of York or the Town of Whitchurch-Stouffville. The Town shall ensure that the Section 41 requirements, including the determination of need and no reasonable alternatives, are met through Environmental Assessment Act, Planning Act, Condominium Act, and Local Improvement Act approval processes or other applicable approval processes.*



Land Use Planning Policies
Oak Ridges Moraine
Conservation Plan
Figure 4

**Oak Ridges Moraine Conservation
Plan Land Designation**

-  ORM Plan Boundary
-  Natural Core Area
-  Natural Linkage Area
-  Countryside Area
-  Rural Settlement
-  Settlement Area

Other Features

-  Area Subject to the Lake Simcoe Protection Plan
-  Municipal Boundary
-  Creeks, Rivers, and Lakes
-  Freeways and Provincial Highways
-  Railway

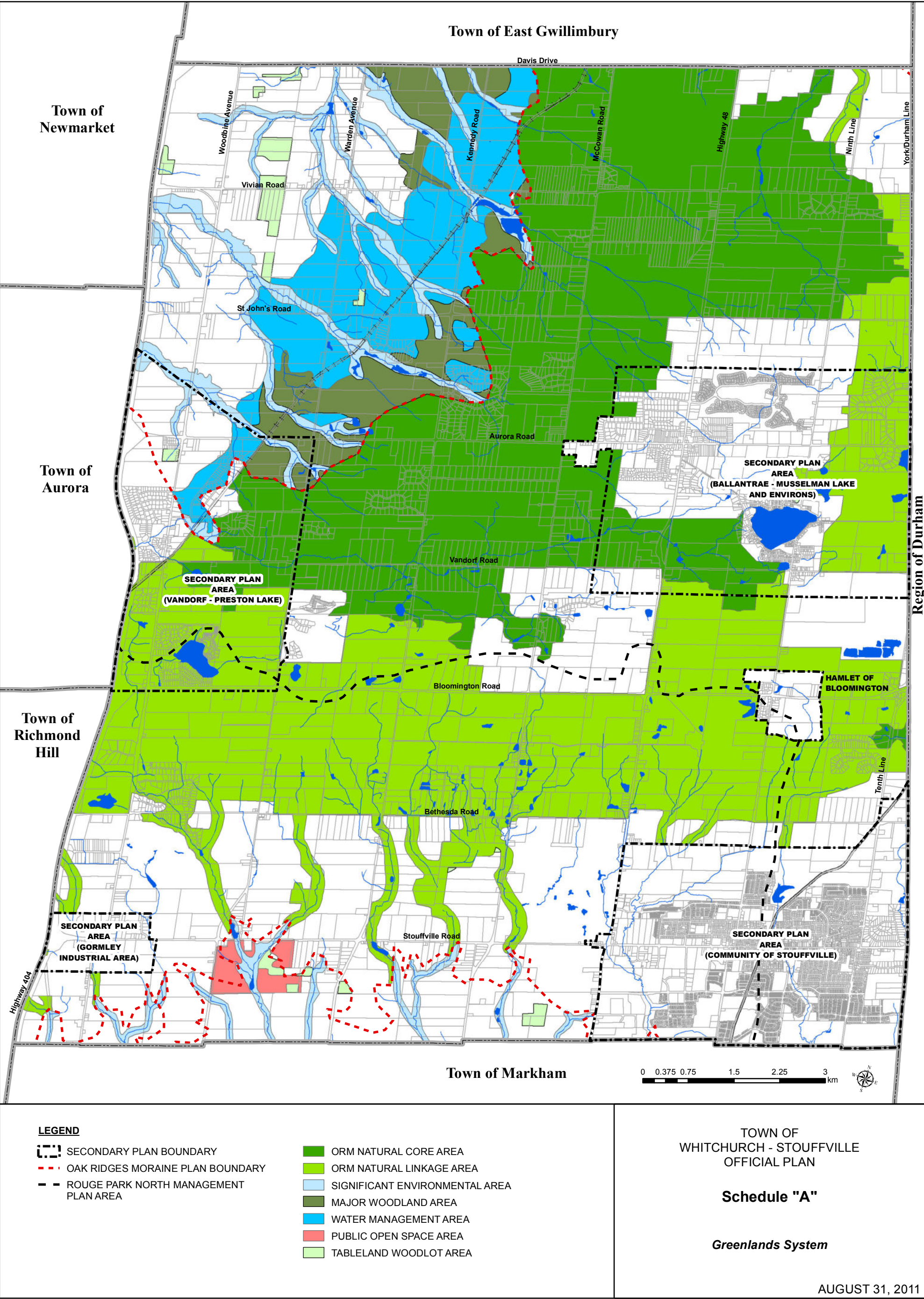


Figure 5: Town of Whitchurch-Stouffville - Greenlands System

1.9.1.5 Planning Reform Act

The Planning Act establishes the rules for land use planning in Ontario. It describes how land uses may be controlled in communities. Changes to the planning system were introduced in 2006 by the *Planning and Conservation Land Statute Law Amendment Act*. Key changes are as follows:

- Municipalities must now update their official plan every five years, followed by an update of the accompanying zoning by-law within three years after the new official plan is in effect
- There are more opportunities for public input before local decisions are made
- Municipalities have enhanced ability to plan for a range and mix of housing types and densities
- Municipalities have additional ability to have the final say on whether designated employment lands can be changed to other uses

1.9.1.6 Bill 13, Sustainable Water and Wastewater Systems Improvement and Maintenance Act, 2010

This Bill enacts the Sustainable Water and Wastewater Systems Improvement and Maintenance Act, 2010 and repeals the Sustainable Water and Sewage Systems Act, 2002. The Bill had its first reading on March 23rd, 2010. Key points of the Bill are as follows:

- Sets out the purposes of the Act, which include ensuring that public ownership of water services and wastewater services is maintained.
- Establishes the Ontario Water Board as an agent of the Crown and sets out the Board's objectives, powers and duties which relate to the regulation of water services and wastewater services.
- Sets out the responsibilities of municipalities or groups of municipalities that are designated as regulated entities by regulation.
- Regulated entities must prepare business plans for the provision of water services or wastewater services. The plan must contain, among other things, an assessment of the full cost of providing water services or wastewater services to the public and a description of how the regulated entity intends to pay this full cost.

1.9.1.7 Water Opportunities and Conservation Act

The Ontario Government passed the Water Opportunities and Conservation Act in 2010. The purposes of the Act are as follows:

- To foster innovative water, wastewater and storm water technologies, services and practices;

- To create opportunities for economic development and clean-technology jobs in Ontario; and
- To conserve and sustain water resources for present and future generations.

To further the purposes of the Act, the Minister of the Environment may establish aspirational targets in respect of the conservation of water and other matters.

The Act requires certain municipalities, persons and entities to prepare, approve and submit to the Minister of the Environment municipal water sustainability plans for municipal water services, municipal wastewater services and municipal storm water services under their jurisdiction. The Minister may establish performance indicators and targets for these services. The Act also authorizes the making of regulations requiring public agencies to prepare water conservation plans, achieve water conservation targets, and consider technologies, services and practices that promote the efficient use of water and reduce negative impacts on Ontario's water resources.

1.9.1.8 Safe Drinking Act

The *Safe Drinking Water Act* was adopted in 2002. The Act provides for the protection of human health and the prevention of drinking water hazards through the control and regulation of drinking water systems and drinking water testing. Key features of the Act include the following:

- Legally binding standards for contaminants in drinking water;
- Requirement to use licensed laboratories for drinking water testing;
- Requirement to report any results that do not meet the standards to the Ministry of the Environment and the local Medical Officer of Health and to undertake corrective action;
- All operators of municipal drinking water systems must be trained and certified;
- Establishment of a licensing regime for drinking water systems; and
- Inspections and enforcement to determine compliance with the Act.

1.9.1.9 Clean Water Act

The Clean Water Act was adopted in 2006 with the objective to protect existing and future sources of drinking water including rivers, lakes, and underground aquifers. The Act requires the following:

- That local communities assess existing and potential threats to their water, and that they set out and implement the actions needed to reduce or eliminate these threats;
- Empowers communities to take action to prevent threats from becoming significant;
- Public participation on every local source protection plan – the planning process for source protection is open to anyone in the community; and

- That all plans and actions be based on sound science.

1.9.1.9.1 Source Water Protection

Under the Clean Water Act, O. Reg. 287/07, on-site sewage systems and sewage works may be considered a threat to drinking water. These activities may be deemed significant under certain conditions. Therefore, the applicable source protection plan policies, provided in **Appendix E**, have been considered throughout this Master Plan.

Source Water Protection (SWP) Plans were prepared for the 19 watershed-based Source Protection Regions (SPR) across Ontario to protect existing and future sources and to identify areas of significant drinking water threats. The Town of Whitchurch-Stouffville falls within two Source Water Protection Regions:

1. Credit Valley, Toronto and Region and Central Lake Ontario (CTC) (occupies the southern half including the Community of Stouffville, Bloomington, Gormley)
2. South Georgian Bay Lake Simcoe (occupies the northern half including Ballantrae, Musselman's Lake, Vandorf, and Preston Lake).

The Source Water Protection Plans identify vulnerable areas that have been delineated under the Clean Water Act including Wellhead Protection Areas (WHPA), Intake Protection Zones (IPZ), Highly Vulnerable Aquifers (HVA), Significant Groundwater Recharge Areas (SGRA), and Vulnerable Scoring Areas for Groundwater and Surface Water (VSA) as well as water quantity vulnerable areas. According to the Source Protection Plan⁵:

- WHPAs are *areas on the land around a municipal well, the size of which is determined by how quickly water travels underground to the well, measured in years.*
- IPZs are the *areas on the water and land surrounding a municipal surface water intake.*
- SGRAs are *areas characterized by porous soils that allow the water to seep easily into the ground and flor to an aquifer.*
- HVAs are *aquifers that can be easily changed or affected by contamination from both human activities and natural processes as a result of (a) its intrinsic susceptibility, as a function of the thickness and permeability of overlaying layers, or (b) by preferential pathways to the aquifer.*

Based on the assessment completed on the MECP's Source Protection Information Atlas web page, the study area is within the Wellhead Protection Area Q1 and Q2 and Intake

⁵ South Georgian Bay Lake Simcoe Source Protection Region, Approved Source Protection Plan, January 26, 2015, p. 34-37; 41; 181

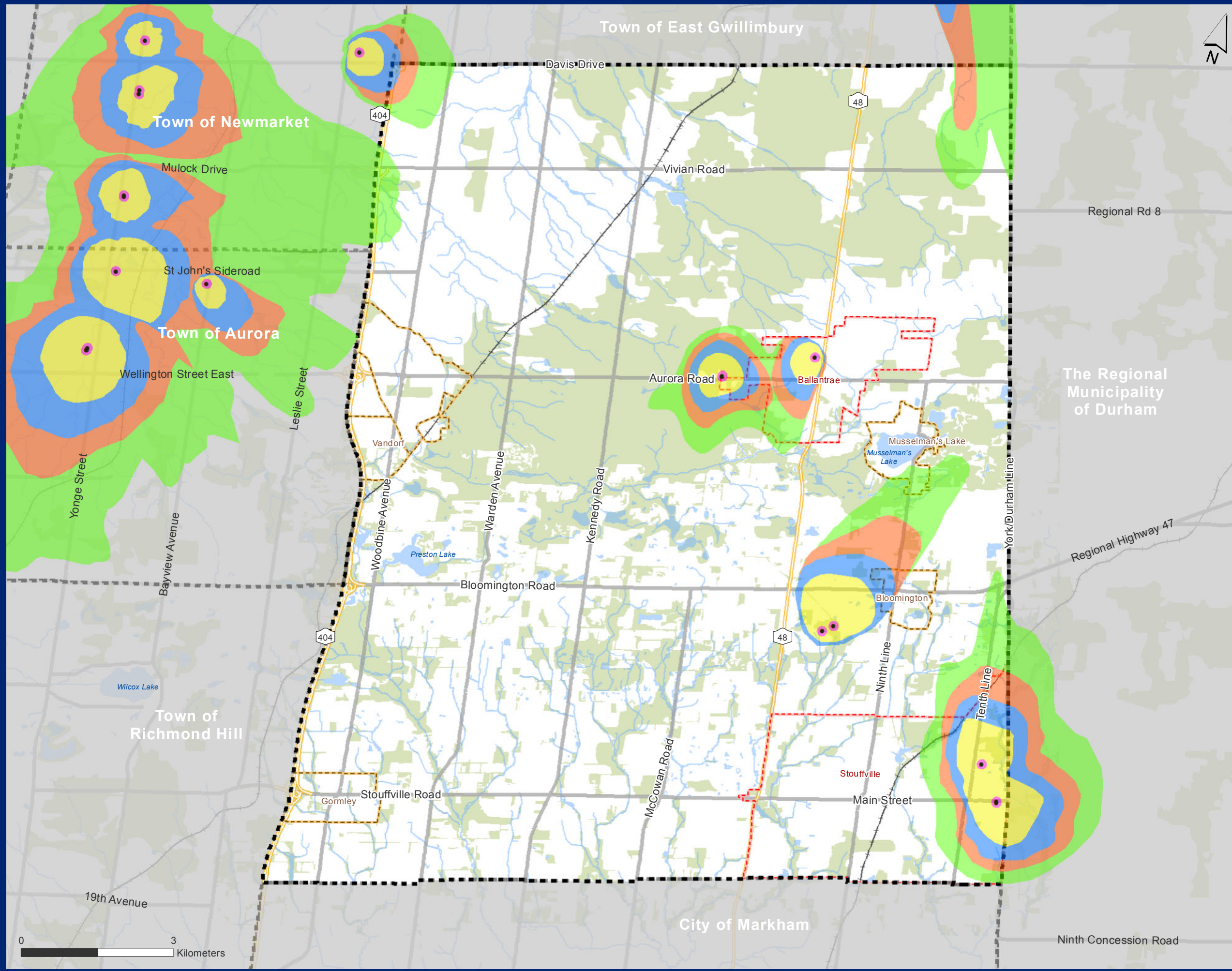
Protection Zone 3. A WHPA-Q1 is an area delineated through a Tier 3 Water Budget and Water Quantity Risk Assessment as being the combined area that is the cone of influence of the well and the whole of the cones of influence of all other wells that intersect that area⁶. A WHPA-Q2 is an area delineated through a Tier 3 Water Budget and Water Quantity Risk Assessment as being the area that includes the WHPA-Q1 and any area where a future reduction in recharge would significantly impact that area⁷. IPZ-3 is an area where activities further away from the intake could still have an impact on water quality⁸.

The study area includes six (6) WHPAs and six (6) Vulnerable Scoring Areas (Groundwater). In addition, the study area contains SGRAs, Vulnerable Scoring Areas (Surface Water) and Highly Vulnerable Aquifers. No IPZ have been identified within the Town. WHPA areas within the Town includes portions of Stouffville, Bloomington, and Ballantrae, Musselman's Lake. The WHPA map is provided in **Figure 7**. Additional vulnerable areas maps can be found in **Appendix B**.

⁶ South Georgian Bay Lake Simcoe Source Protection Region, Approved Source Protection Plan, January 26, 2015, p. 58

⁷ South Georgian Bay Lake Simcoe Source Protection Region, Approved Source Protection Plan, January 26, 2015, p. 58

⁸ South Georgian Bay Lake Simcoe Source Protection Region, Approved Source Protection Plan, January 26, 2015, p. 38

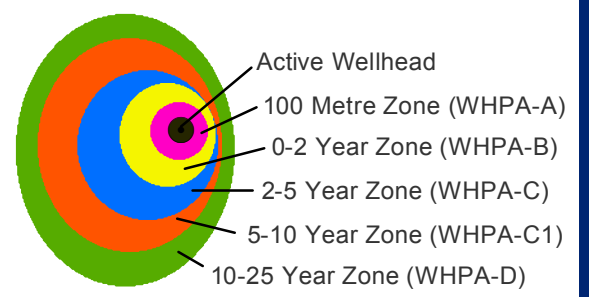


**Town of Whitchurch-Stouffville
Water and Wastewater Master Plan**

**Wellhead Protection Areas of the
Town of Whitchurch-Stouffville**

Figure 7

Wellhead Protection Areas



General Features

-  Towns and Villages
-  Hamlets
-  Municipal Boundary
-  Creeks, Rivers, and Lakes
-  Wooded Areas
-  Freeways and Provincial Highways
-  Railway

1.9.1.10 CCME Strategic Vision for Water

In 2009, the Canadian Council of Ministers of the Environment (CCME) provided a framework for future actions and activities related to water through the development of a vision and action plan, such that Canadians have access to clean, safe and sufficient water to meet their needs in ways that also maintain the integrity of ecosystems. The goals and rationale developed as part of the vision includes the following:

Goal 1: Aquatic ecosystems are protected on a sustainable watershed basis.

Rationale: Enhance understanding and application of Integrated Water Resource Management to improve ecosystem health.

Goal 2: The conservation and wise use of water is promoted.

Rationale: Improve understanding of the full value of water to achieve behavioral change.

Goal 3: Water quality and water quantity management is improved, benefitting human and ecosystem health.

Rationale: Promote nationally consistent approaches to water quality and quantity monitoring, guidelines and multi-jurisdictional public reporting. Encourage research and networks to enhance knowledge and understanding of ground and surface waters.

Goal 4: Climate change impacts are reduced through adaptive strategies.

Rationale: Enhance water quality and quantity monitoring networks to support water and adaptation needs.

Goal 5: Knowledge about Canada's water is developed and shared.

Rationale: Help to spearhead value added information on water quality and quantity by supporting jurisdictional reporting efforts to Canadians in a systematic and consistent fashion.

1.9.1.11 Canada-wide Strategy for the Management of Municipal Wastewater Effluent

This 2009 Strategy was developed by the Canadian Council of Ministers of the Environment (CCME). It requires that all facilities achieve minimum National Performance Standards and develop and manage site-specific Effluent Discharge Objectives. The Strategy requires that overflow frequencies for sanitary sewers not increase due to development or redevelopment. The same applies for combined sewers, unless occurring as part of an approved combined sewer overflow management plan. Neither should occur during dry weather, except during spring thaw and emergencies. Source control of pollutants is recommended, and monitoring and reporting on effluent quality required. The 2014 Progress Report outlined the progress made by signatory federal, provincial and territorial jurisdictions on the commitments made in the 2009 Strategy.

1.9.1.12 CCME Wastewater Systems Effluent Regulations

The proposed CCME Wastewater System Effluent Regulations were published in March 2010, with the final Regulations published on June 29, 2012 and was amended January 2015. These Regulations are the primary instrument that Environment Canada is using to implement the CCME Canada-wide Strategy for the Management of Municipal Wastewater Effluent.

The proposed Regulations apply to any wastewater system that has a capacity to deposit a daily volume of effluent of 100 cubic metres⁹ or more from its final discharge point. The effluent from the applicable wastewater systems would be compared against “national effluent quality standards”, which are as follows¹⁰:

- Average carbonaceous biochemical oxygen demand (CBOD) due to the quantity of BOD matter in the effluent of less than or equal to 25 mg/L;
- Average concentration of suspended solids in the effluent of less than or equal to 25 mg/L;
- Average concentration of total residual chlorine in the effluent of less than or equal to 0.02 mg/L; and
- Maximum concentration of un-ionized ammonia in the effluent of less than 1.25 mg/L, expressed as nitrogen (N), at 15°C ± 1°C.

1.9.1.13 CEPA – Inorganic Chloramines and Chlorinated Wastewater Effluents in Municipal Wastewater Effluent

The Canadian Environmental Protection Act (CEPA) required the elimination of toxic chlorine residuals from municipal wastewater effluent. All owners and operators of wastewater systems with daily volumes greater than 5,000 cubic metres of effluent were required to lower their total residual chlorine (TRC) levels to less than 0.02mg/L or lower by December 15, 2009¹¹.

1.9.1.14 Ministry of the Environment, Conservation and Parks Procedure F-5-1

Procedure F-5-1 outlines the treatment requirements for municipal and private sewage treatment works discharging to surface waters. Effluent requirements are established on a case-by-case basis considering the characteristics of the receiving water body. All sewage treatment works shall provide secondary treatment or equivalent as the “normal” level of treatment, unless individual receiving water assessment studies indicate the need for higher levels of treatment. Existing works not complying with the guideline are required to upgrade as soon as possible. The Procedure stipulates effluent design objectives for

⁹ <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2012-139/FullText.html>, Application 2(1)

¹⁰ <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2012-139/FullText.html>, Authorization to Deposit 6(1)

¹¹ <http://ec.gc.ca/lcpe-cepa/default.asp?lang=En&xml=8EE8F3F3-DE8E-41CD-BC74-BAB1B4F52171>, (2); 4.3.3 – Dec 2009

BOD, suspended solids, total phosphorus and ammonia and provides guidelines for BOD and suspended solids. It is the responsibility of the Region to ensure sewage treatment works are designed according to the guidelines and should be able to meet the objectives on an average annual basis and not exceed the guidelines.

1.9.2 Conservation Authority Regulation and Policy

The legislative mandate of the Conservation Authority, as set out in Section 20 of the Conservation Authorities Act, is to establish and undertake programs designed to further the conservation, restoration, development and management of natural resources.

Conservation Authorities are local agencies that protect and manage water and other natural resources at the watershed level. These agencies have a number of responsibilities and functions in the land use planning and development process.

The study area falls within two Conservation Authority jurisdictions: the Toronto and Region Conservation Authority (TRCA) to the south, including the Community of Stouffville, Gormley and part of Bloomington, and Lake Simcoe Region Conservation Authority (LSRCA) to the north including Vandorf, Preston Lake, Ballantrae, Musselman's Lake and parts of Bloomington.

TRCA and LSRCA are commenting agencies on the development applications under the Planning Act based on regulations approved by their Board of Directors and the province. These Conservation Authorities have agreements with partnering municipalities to provide technical services regarding matters associated with natural heritage protection, hazardous land management and water resources (e.g., stormwater management).

In addition, Conservation Authorities have the delegated responsibility from the Ministries of Natural Resources and Municipal Affairs and Housing to implement Section 3.1 (Natural Hazards) of the Provincial Policy Statement (2014), consistent with the Provincial one-window planning initiative.

TRCA and LSRCA also administer Regulation 166/06 and Regulation 179/06 respectively, under Section 28 of the Conservation Authorities Act. In general, these regulations prohibit altering a watercourse, wetland or shoreline and prohibit development in areas adjacent to river and stream valleys, hazardous lands and wetlands, without the prior written approval from the Conservation Authority (i.e., issuance of a permit). A map indicating the areas within the Town of Whitchurch-Stouffville under the TRCA and LSRCA jurisdictions is provided in **Appendix A**.

1.9.2.1 TRCA, The Living City Policies (LCP) – November 2014

The LCP supersedes the Valley and Stream Corridor Management Program (VSCMP). It is a guidance document for the implementation of the TRCA's advocacy roles and responsibilities in the planning and development approval process. This document is in accordance with the requirements under Section 28 of the Conservation Authorities Act.

1.9.2.2 LSRCA, Guidelines for the Implementation of Ontario Regulation 179/06 – April 2015

This document outlines the guidelines in implementing policies within the LSRCA jurisdiction, under Ontario Regulation 179/06. Specifically, these guidelines review the objectives and implementation of the development, interference with wetlands and alteration to shorelines and Watercourses Regulation program.

1.9.3 Regional and Municipal Legislation and Policy

1.9.3.1 Town of Whitchurch-Stouffville Official Plan

The Town of Whitchurch-Stouffville Official Plan (OP) establishes the land use policies to guide future development and manage growth and describes the Council's policies on land use. Policies on land use include appropriate location of residential, industrial, commercial and institutional properties, location of services (i.e., roads, watermains, sewers, parks and schools), and the order of the Town's growth plan. The majority of the Town is located on the Oak Ridges Moraine (ORM) therefore all applicable ORM policies apply in addition to the policies set out in the OP. Various Secondary Plans form part of the OP, each of which provides specific land use policies and direction for lands within the Town. Secondary Plans include:

- Gormley Industrial Secondary Plan
- Ballantrae-Musselman's Lake and Environs Secondary Plan
- Community of Stouffville Secondary Plan
- Vandorf-Preston Lake Secondary Plan

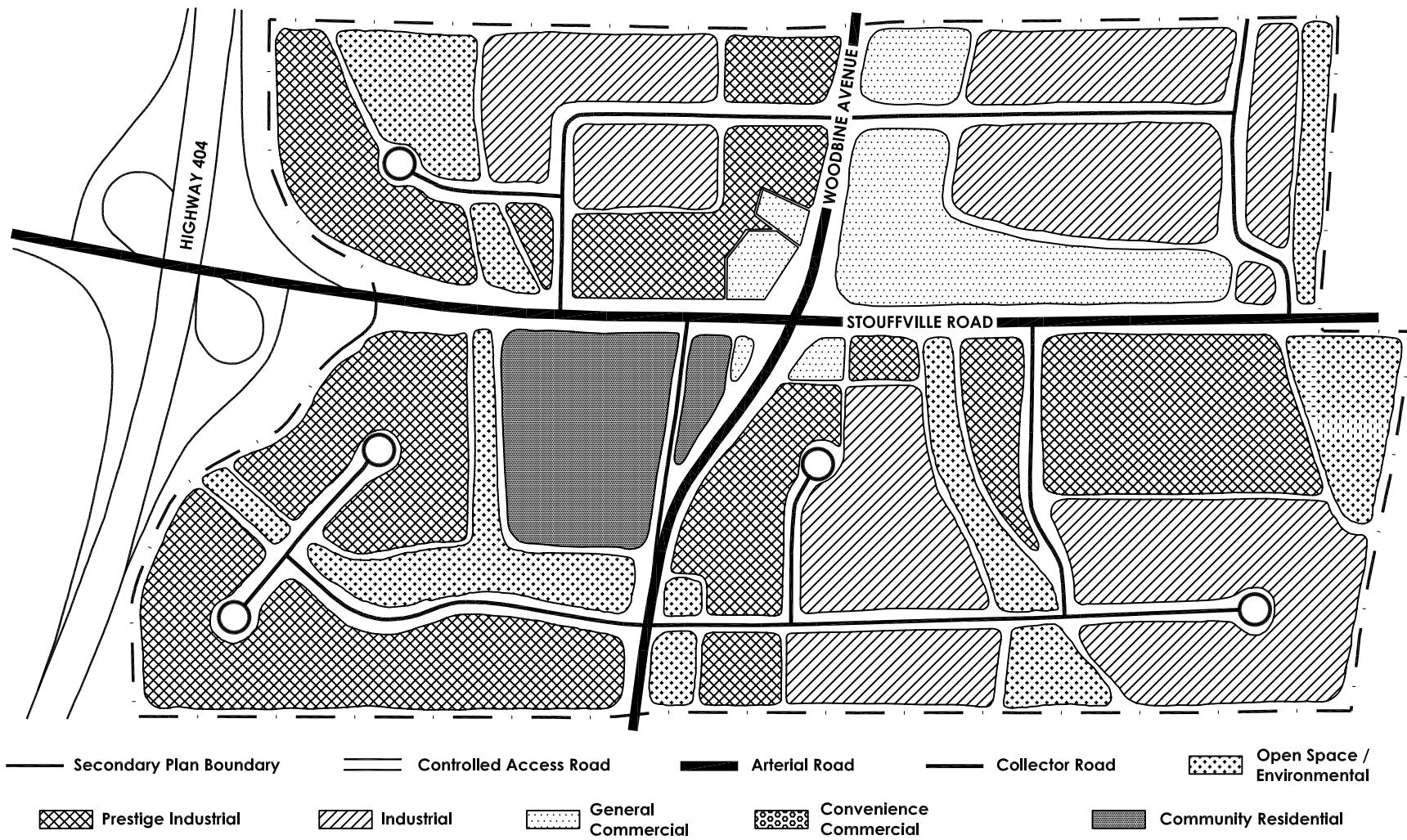
The Official Plan was approved by the Town on September 2000 and amended by Official Plan amendments over time. The OP is based on the projected population growth of the Town from 39,400 in 2011 to 60,600 by 2031 and employment growth from 12,600 in 2011 to 23,000 by 2031, with the focus on the Community of Stouffville. Moderate growth is projected to occur in Ballantrae and Musselman's Lake with additional growth in Gormley Industrial area and areas in Vandorf-Preston Lake.

Gormley and Vandorf-Preston Lake do not have any municipal water supply or municipal wastewater collection. Industrial uses within Gormley will be limited to dry industry – private or communal sewage systems may be permitted conditional on the required studies being conducted. Communal groundwater system is the long-term objective for the Secondary Plan for Gormley. **Figure 8** provides Gormley's land use map from the Gormley Industrial Secondary Plan. The Vandorf-Preston Lake land use map is provided in **Figure 9**.

Ballantrae-Musselman's Lake is serviced by private sewage systems and a municipal water supply and distribution system. The hamlet is located on the Oak Ridges Moraine therefore it is an environmentally sensitive area. Development on these lands is limited

and must adhere to the applicable policies (i.e. Oak Ridges Moraine, etc.). The Ballantrae-Musselman Lake land use map is provided in **Figure 10**.

The current developed area of the Community of Stouffville is serviced by municipal sanitary sewage collection and treatment and a municipal water supply and distribution. Other undeveloped areas within Stouffville are serviced by private sewage disposal services and wells. All new development within the Community will be serviced by municipal water supply and distribution system and by municipal sewage collection and treatment, based on the available capacity at the time of development. Community of Stouffville land use maps are provided in **Figure 11** to **Figure 13**.



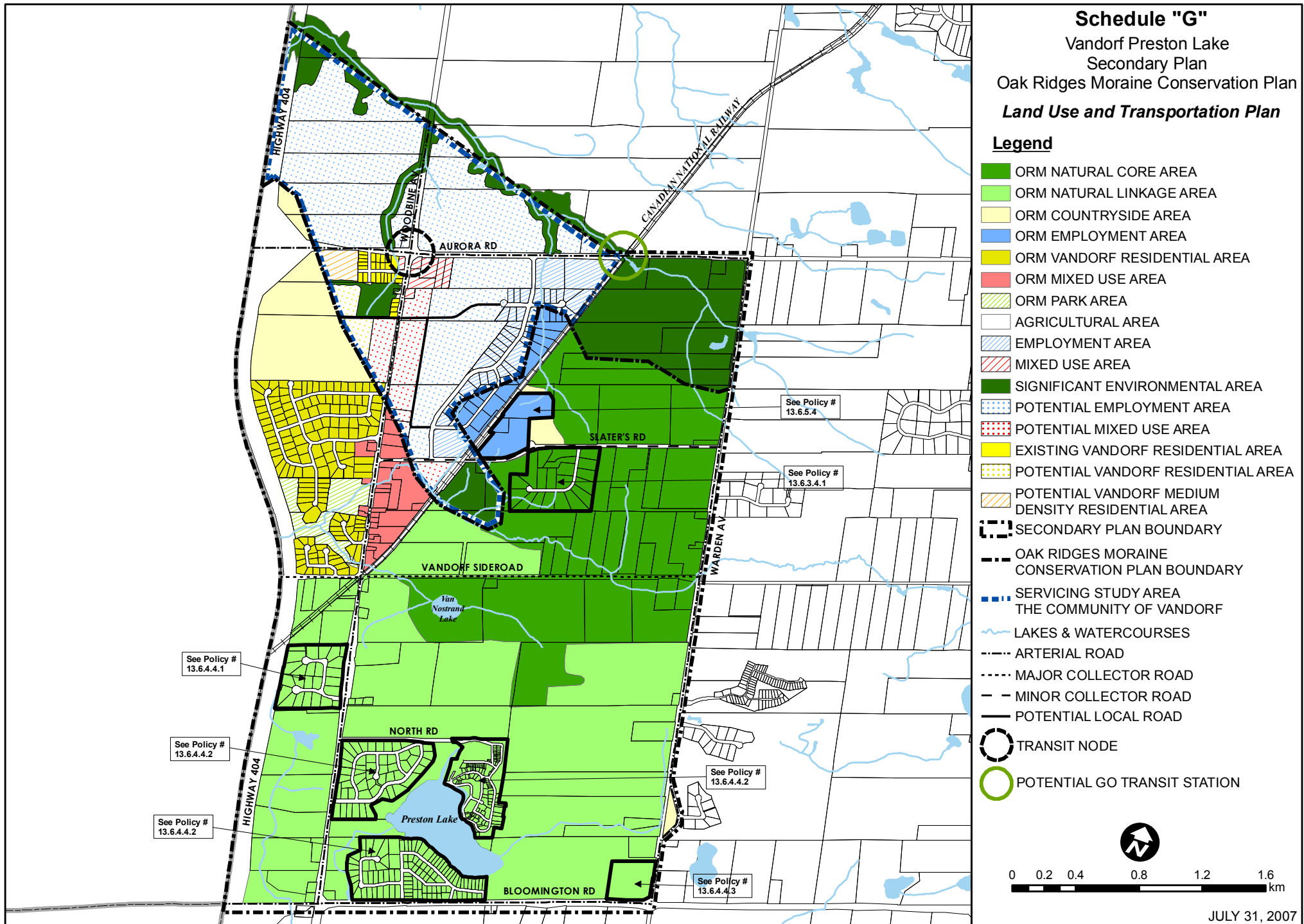
GORMLEY INDUSTRIAL SECONDARY PLAN
 Schedule A
 Land Use and
 Roads Plans



March 5, 2009

Figure 8: Gormley Land Use Map

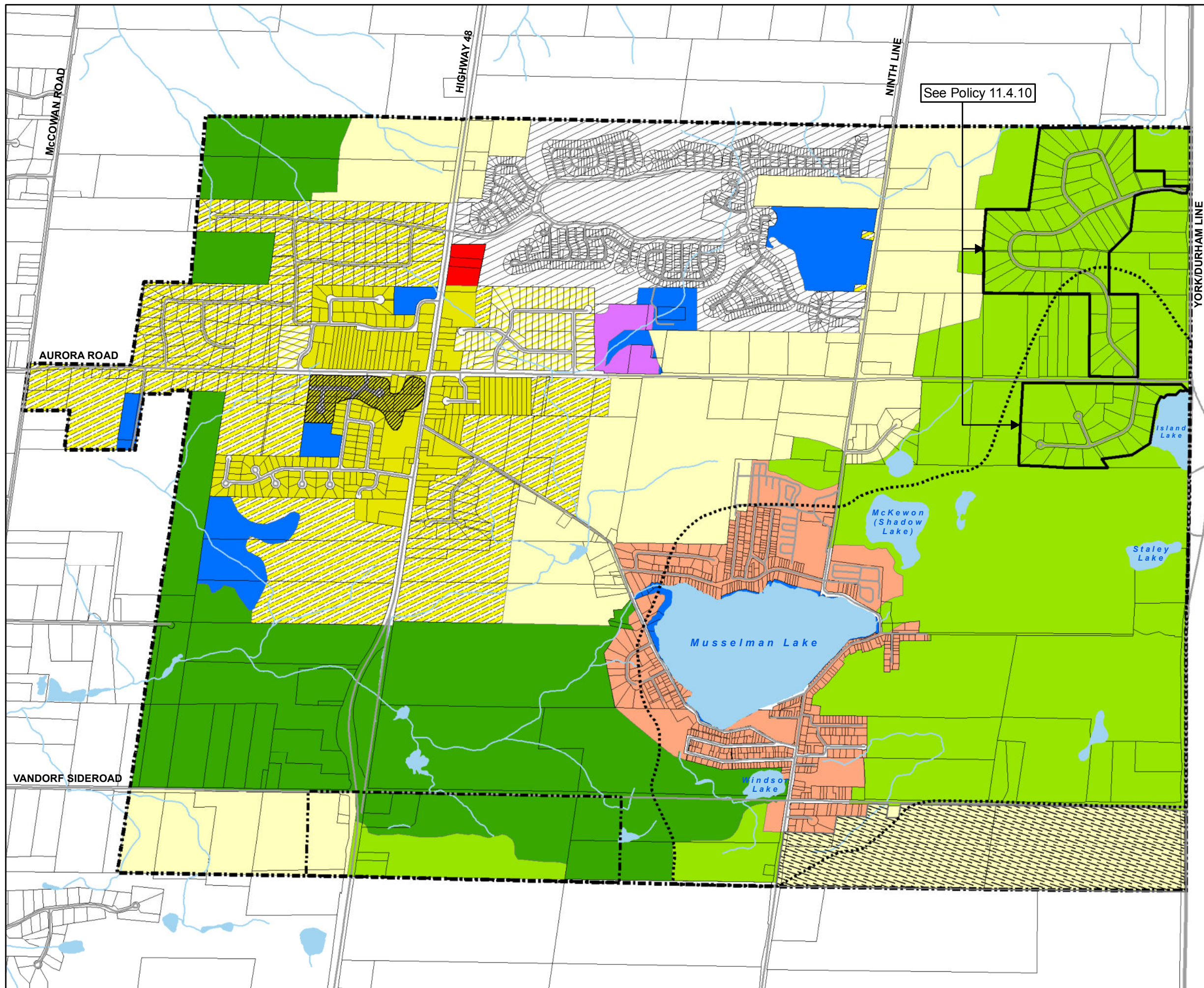
Figure 9: Vandorf-Preston Lake Land Use and Transportation Plan Map



BALLANTRAE-MUSSELMAN LAKE
AND ENVIRONS SECONDARY PLAN
Land Use Plan
Schedule "E"

Legend

-  Secondary Plan Area Boundary
-  Lakes and Watercourses
-  ORM Natural Core Area
-  ORM Natural Linkage Area
-  ORM Countryside Area
-  Natural Feature Conservation Area
-  Underlying Natural Feature Conservation Area
-  Ballantrae Community Area
-  Ballantrae Future Residential Area I
-  Ballantrae Future Residential Area II
-  Ballantrae Residential Golf Course Area
-  Moraine Aggregate Resource Area
-  Musselman Lake Community Area
-  Mixed Use Area
-  Institutional Area
-  Waste Disposal Area of Influence
-  Kettle Lake Drainage Area Boundary



**Figure 10: Ballantrae-Musselman
Lake Land Use Map**



0 115 230 460 690 920 m

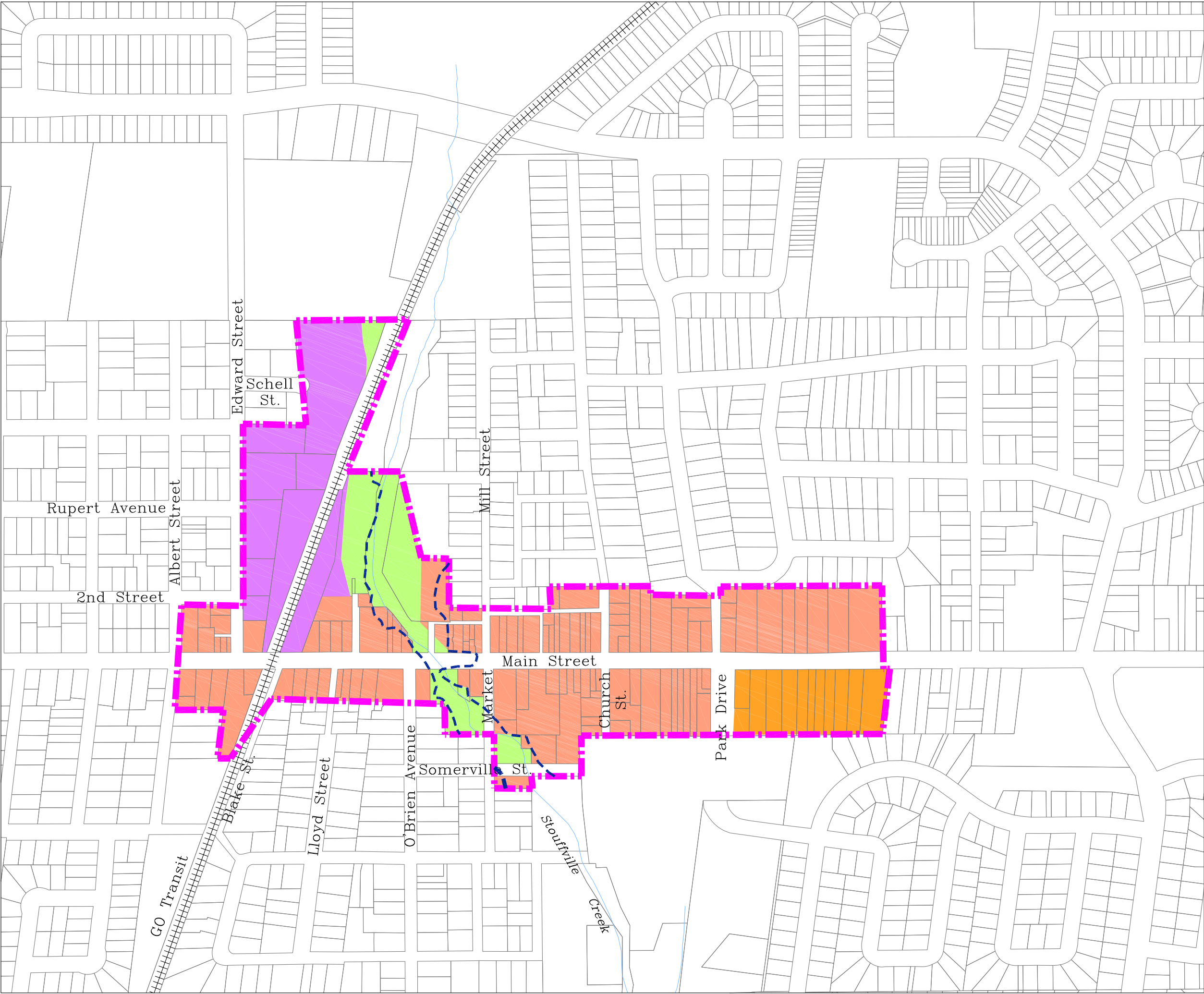
JULY 31, 2007

Figure 11: Community of Stouffville Core Area Land Use Map

- Core Area - Main Street
- Core Area - Mixed Use
- Greenland Area
- Urban Medium Density Residential Area
- Flood Plain Area
- Community Core Area Boundary

Community of Stouffville
Secondary Plan

Schedule F1
Land Use Plan
Community Core Area





Community of Stouffville Secondary Plan

Schedule F

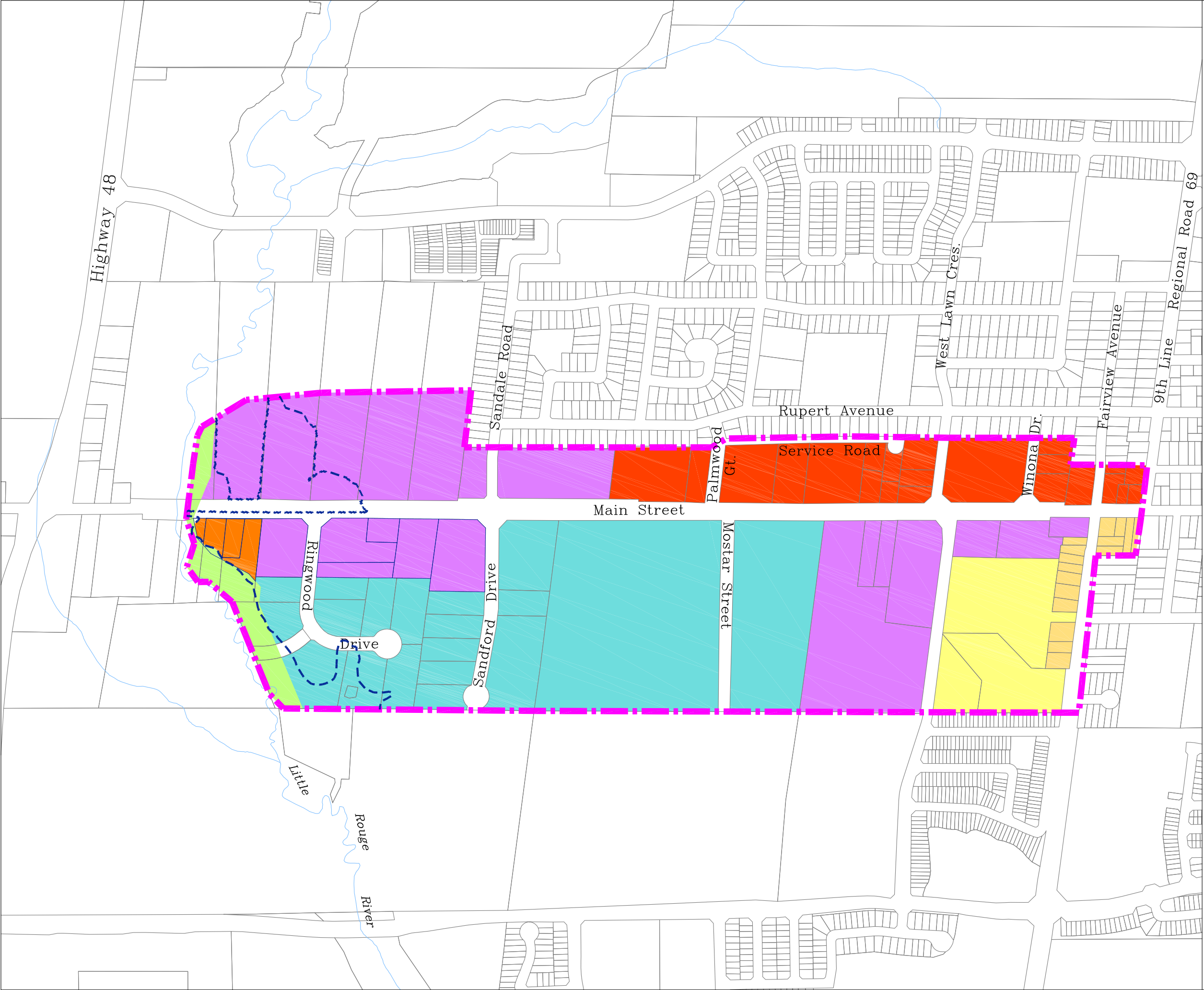
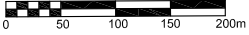
Land Use and Transportation Plan

Figure 13: Community of Stouffville Western Approach Land Use Map

- Existing Residential Area - Special Provision 1
- Existing Residential Area
- Commercial Area
- Mixed Use Area
- Business Park Area
- Greenland Area
- Urban Medium Density Residential Area
- Flood Plain Area
- Western Approach Area Boundary

**Community of Stouffville
Secondary Plan**

Schedule F2
Land Use Plan
Western Approach Area



1.9.3.2 Town of Whitchurch-Stouffville Growth Management Strategy

The Growth Management Strategy formed a critical background document for the Town as it moves forward with the future development of its downtown, existing built-up areas and the remaining designated greenfield areas. The Strategy also provided a forum to update, integrate and co-ordinate key municipal strategies. This study was prepared as a two-step process. This study is the first in a two-step process. Step 1 involved the preparation of a Growth Management Strategy/Land Inventory and Capacity Analysis for the Town. This analysis was undertaken within the framework of provincial planning policy, the Region of York's new Official Plan and the Town of Whitchurch-Stouffville's Official Plan/Secondary Plans. Step 2 was a Secondary Plan Amendment process informed by Step 1 for the Phase 3 lands in the Community of Stouffville. Step 2 proceeded forward once it was determined through Step 1 that there was a demonstrated need for additional residential and non-residential lands within the next 10 years to accommodate growth in the Community of Stouffville.

The Town has experienced substantial growth over recent years with an increase of approximately 4,000 housing units and an increase of 47% in population, with the majority of this increase within the Community of Stouffville. There were four alternative Urban Growth options that were considered to accommodate this projected growth. These options were evaluated based on criteria including urban character/new growth compatibility, urban containment, sustainable and resilient community/urban design, housing choices/affordability, feasibility/market demand, transportation impacts, municipal fiscal impacts, social/health indicators and wastewater impacts.

There were four (4) growth options that were considered:

1. Current trends/low density growth trend scenario (Scenario 1)
2. More compact scenario 1 / more compact greenfield (Scenario 2)
3. Scenario 2 and increased intensification (Scenario 3)
4. Highly compact scenario accommodating all growth within remaining Phase 2 lands without the need for Phase 3 lands

The preferred growth option accommodates growth through moderate intensification, through the utilization of greenfield lands (within Phase 2 and Phase 3 lands only) with compact development and a moderate shift towards higher density housing with a greater share of residential intensification.

The Municipal Comprehensive Review looked at employment lands within the Town. There will not be enough vacant land to accommodate the projected growth to 2031. Options for employment land expansion for the Town are limited due to Oak Ridges Moraine – may have opportunity to expand in Vandorf-Preston Lake (EA to be completed).

1.9.3.3 Town of Whitchurch-Stouffville Corporate Strategic Plan 2011-2014

The Plan sets out a strategy for municipal decision-making for Town Council and Staff and ensures work is planned on time and within budget. Community survey findings identify potential areas for improvement for water and sanitary sewer maintenance, public consultation and communications and environmental protection.

The Town's strategic goals surrounding water and wastewater infrastructure include:

- Delivering new infrastructure and services through new partnerships
- Ensure long term asset and infrastructure management and planning
- Sustainable long term fiscal plan for all infrastructure and buildings
- Increase inter-government relationships and local government support
- Increase revenues while reducing costs

1.9.3.4 York Region Official Plan

The Regional Official Plan (ROP) is a comprehensive document that sets out the policies for development of the municipalities within the York Region to 2031. The ROP is a framework for the development of existing and future land use within the Region to ensure the needs of both residents and businesses are being met. The Plan establishes growth management for urban, agricultural and rural areas and reviews the service needs for transportation, water and wastewater services, waste management and energy and utilities.

York Region is responsible for providing ongoing water and wastewater services to its municipalities including the Town of Whitchurch-Stouffville. The Region is also responsible for ensuring that municipalities within the Region are adhering to the Wellhead Protection Area and Intake Protection Zone policies. The Region identified vulnerable areas within the Town of Whitchurch-Stouffville including eastern Stouffville, Bloomington, Ballantrae and the southern tip of Musselman's Lake.

The ROP identifies Hamlets within the Region including Musselman's Lake, Vandorf, Bloomington and Gormley. Major development within these Hamlets is not permitted. Additional growth and development within the Vandorf Hamlet may be permitted in accordance with the Vandorf-Preston Lake Secondary Plan including proper water and wastewater strategies.

The ROP identified areas within the Town of Whitchurch-Stouffville is located within Rouge Park. Land designations must be in accordance with the Greenbelt Plan and the Rouge North Management Plan.

York Region's Official Plan is a policy document that describes Council's policies on growth management and land use planning. The Official Plan was updated in 2016 to meet Planning Act requirements, maintain conformity with Provincial Plans, and include

growth forecasts to 2041. The OP that recently came into effect supersedes the York Region Official Plan 2010.

The Official Plan recommends new strategies to address future planning and services. Those strategies and elements most relevant to the Town's future water and wastewater needs include supporting:

- A minimum of 40 per cent residential intensification within the built-up area.
- Designs to a higher standard that includes requirements for sustainable buildings, water and energy management, public spaces, mixed-use, compact development, and urban design.
- Updated York Region Master Plans for transportation and transit, water and wastewater, and pedestrian and cycling.
- Progressively higher standards in energy and water efficiency, renewable energy systems and waste reduction.
- Urban development and infrastructure projects that contribute enhancements to the Region Greenlands System.

1.10 Environment Existing Conditions

1.10.1 Natural Environment Policy Context

1.10.1.1 Provincial Policy Statement (PPS)

The PPS was issued under Section 3 of the Planning Act and came into effect on April 30, 2014 and replaces the PPS issued March 1, 2005.

The natural heritage policies of the PPS (MMAH 2014) indicate that:

- Policy 2.1.1 Natural features and areas shall be protected for the long term;
- Policy 2.1.2 The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and groundwater features;
- Policy 2.1.3 Natural heritage systems shall be identified in Ecoregions 6E and 7E, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas and prime agricultural areas;
- Policy 2.1.4 Development and site alteration shall not be permitted in [the following] unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.
 - a. Significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;

- b. Significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
 - c. Significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
 - d. Significant wildlife habitat
 - e. Significant areas of natural and scientific interest; and
 - f. Coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b).
- Policy 2.1.6 Development and Site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements;
 - Policy 2.1.7 Development and Site alteration shall not be permitted in habitat of endangered species and threatened species except in accordance with provincial and federal requirements; and
 - Policy 2.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.3, 2.1.4 and 2.1.5 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

1.10.1.2 Species at Risk Act (SARA)

At a federal level, species at risk designations for species occurring in Canada are initially determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). If approved by the federal Minister of the Environment, species are added to the federal List of Wildlife Species at Risk (Government of Canada 2002). Species that are included on Schedule 1 as endangered or threatened are afforded protection of critical habitat on federal lands under the Species at Risk Act (SARA). On private or provincially-owned lands, only aquatic species listed as endangered, threatened or extirpated and migratory birds are protected under SARA, unless ordered by the Governor in Council.

1.10.1.3 Endangered Species Act (ESA)

Species at risk designation for species in Ontario are initially determined by the Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the provincial Minister of Natural Resources and Forestry, species are added to the provincial Endangered Species Act (ESA), which came into effect June 30, 2008 (Ontario 2007). The legislation prohibits the killing or harming of species identified as endangered or threatened in the various schedules to the Act. The ESA also provides habitat protection to all species listed as threatened or endangered. As of June 30, 2008, the Species at Risk in Ontario (SARO) List is contained in O. Reg. 230/08.

1.10.1.4 Fisheries Act

The purpose of the Fisheries Act is to maintain healthy, sustainable and productive Canadian fisheries through the prevention of pollution, and the protection of fish and their habitat. In 2012, changes were made to the Fisheries Act to enhance Fisheries and Oceans Canada (DFO) ability to manage threats to Canada's commercial, recreational and Aboriginal (CRA) fisheries.

Projects affecting waterbodies supporting Canada's CRA fisheries must comply with the provisions of the Fisheries Act. The proponent is responsible for determining if the project is likely to cause impacts to CRA fish and if these impacts can be avoided or mitigated.

1.10.1.5 Town of Whitchurch-Stouffville Official Plan

Section 3.4.2.1 defines Significant Environmental Areas within the Town of Whitchurch-Stouffville. According to the Official Plan, the Significant Environmental Area designation recognizes:

- i. a variety of features possessing significant attributes or environmental functions, which in many instances have been deemed to be of Provincial Regional or Local Significance, including: Areas of Natural and Scientific Interest (ANSI's), locally and Provincially Significant Wetlands, significant portions of the habitat of threatened and endangered species, Environmentally Significant Areas (ESAs) and significant wildlife habitat. In some cases, these areas consist of a complex unit containing a variety of wetlands that may be separated by forest conditions or relatively open areas; and;
- ii. all valley and stream corridors as defined in Section 9.5 of the Plan that contain streams which flow for most if not all of the year. They are fed by groundwater discharges and are generally considered to support cold water fish species, particularly in their upper reaches.

Section 3.4.2.2 lists the permitted uses of the land designated Significant Environmental Area:

1. The permitted uses of land within the areas designated Significant Environmental Area on Schedules "A" and "B" shall be conservation, enhancement and preservation of the natural environment, and passive recreational uses such as nature viewing and pedestrian trails which will have no negative impact on the natural environment features and ecological functions of the area, including no net loss of this habitat, where applicable.
2. The only exceptions to the provisions of Section 3.4.2.2. i) are the following uses and facilities:
 - a. Development or land disturbance for required stream bank erosion protection and fish, wildlife and conservation management provided that any required reconstruction of a watercourse is completed in a way which

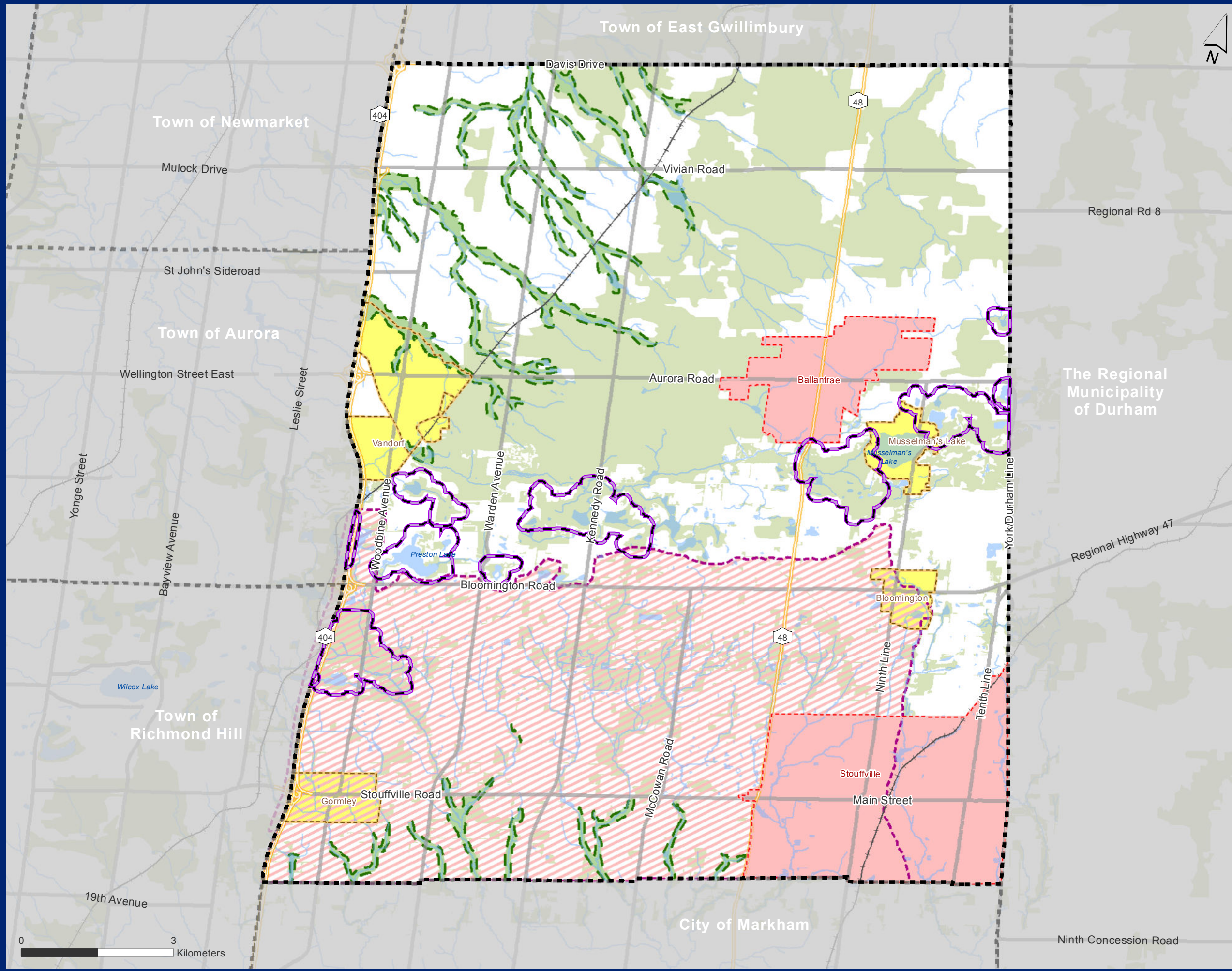
creates a natural appearing stream environment with variable side slopes, landscaping and a meandering channel; and,

- b. Existing roads and related utilities or modifications to such facilities which shall be permitted to cross the Significant Environmental Area designation in the general area of the road designations on Schedule “B”.

However, such uses shall only be permitted by the Town, in consultation with the appropriate Conservation Authority, where they are being carried out by a public agency or provided that prior to approving the location/ construction of such uses, an Environmental Impact Study (EIS) or, where required a Class Environmental Assessment, shall be carried out by qualified consultants, demonstrating:

- a. The need for such a use or facility; and,
 - b. That there is no negative impact on the functions and features of the Significant Environmental Area during both the construction and post-development phases. Where an EIS is required, the Town shall carry out a peer review of the study, at the cost of the applicant, as part of the basis for evaluating conformity with the policies of this Plan.
3. Notwithstanding any other provisions of this section, where historic development and recreation uses, including golf course uses, are located in the Significant Environmental Area designation or buffer areas at the date of adoption of this Plan, such uses shall continue to be permitted. In addition, redevelopment of such lands may be permitted where there is no negative impact on the functions and features of the Significant Environmental Area during the construction and post-development phases, and where the Town is satisfied that the redevelopment restores and enhances environmental features wherever feasible. Further, where an EIS is required, the Town shall carry out a peer review of the study, at the cost of the applicant, as part of the basis for evaluating conformity with the policies of this Plan.

Figure 14 shows the Significant Environmental Area Designation within the Town of Whitchurch-Stouffville.



Environmental Features

-  OP Schedule A - Rouge River Watershed
-  OP Schedule A - Significant Environmental Area
-  OP Schedule H - Areas of Natural and Scientific Interest
-  Creeks, Rivers, and Lakes
-  Wooded Areas

General Features

-  Towns and Villages
-  Hamlets
-  Municipal Boundary
-  Freeways and Provincial Highways
-  Railway

1.10.2 Natural Environment

This section describes the existing environmental conditions within the study area at a more detailed level, by ecological feature or function. The Natural Environment Existing Conditions Report is provided in **Appendix A**. Through the identification and description of features and functions, potential constraints and opportunities are highlighted. The inventory supports the high-level review and evaluation of servicing strategies, alignments, environmental crossings and infrastructure siting.

1.10.2.1 Physiography

The study area consists of five different physiographic regions: Peel Plain, South Slope, Oak Ridges Moraine, Schomberg Clay Plain and Peterborough Drumlin Field. The southern portion of the study area is dominated by fine-textured surficial deposits, primarily glacial.

1.10.2.2 Species at Risk

A Species at Risk Screening was completed as part of this study. This screening considered species listed in the provincial Endangered Species Act (ESA, Ontario 2007) as well as the federal Species at Risk Act (SARA, Canada 2002). Species with overlapping ranges within the study area and recent sighting records within the study area were screened by comparing their habitat requirements to habitat conditions in the study area. Based on the desktop assessment, 18 endangered and threatened species were determined to have potential to occur in the study area, including eight (8) birds, four (4) mammals, one (1) salamander, one (1) turtle, one (1) fish, and three (3) vascular plants.

A complete list of considered species is provided in **Appendix A**.

1.10.2.3 Wetlands

There are eight (8) provincially significant wetlands (PSW) and two (2) non-PSW located within the study area and provided in **Table 3**. There are also unevaluated wetlands across the study area.

Table 3: List of Significant Wetlands within the Town of Whitchurch-Stouffville

Wetland Name	Location within Study Area
Black River Headwater PSW Complex	North-central
Bogart Creek PSW Complex	West-central
White Rose – Preston Lake PSW Complex	West-central and southwest
Vandorf PSW Complex	Centre
East Musselman PSW Complex	East-central

Wetland Name	Location within Study Area
Musselman's Lake PSW	East-central
Goodwood/Glasgow PSW	Northeastern
Bruce and Berczy Creek PSW Complex	Southwest corner
Stouffville Marsh Non-PSW	Southeast
Black River Wetland Complex #4 Non-PSW	Northwest

All development within regulated areas associated with wetlands will require a Development, Interference with Wetland and Alterations to Shorelines and Watercourses permit from LSRCA or TRCA, depending on the site's conservation authority jurisdiction.

1.10.2.4 Significant Woodlands

There are two (2) major woodland areas located in the northwest corner of the study area:

- East of the rail tracks at Aurora Road/Warden Avenue
- South of Davis Drive between Warden Avenue/Kennedy Road

There are five (5) tableland woodlot areas located in the south of the study area, located south of Stouffville Road and between Bruce Creek and Highway 48

Development within or adjacent to significant woodland areas must adhere to the Oak Ridges Moraine policies as well as the Official Plan for the Town and the Region of York.

1.10.2.5 Life Science ANSIs

Areas of Natural or Scientific Interest (ANSIs), identified by the MNRF, are areas of land/water containing identified natural landscapes or features with life science or earth science value linked with protection, scientific study or education. There are three (3) ANSI's located within the study area:

Table 4: List of ANSIs within the Town of Whitchurch-Stouffville

ANSI	Location within Study Area
Musselman Lake Kettle Complex Life Science ANSI	East-central
Musselman's Lake Kettle Complex Earth Science ANSI	East-central
Vandorf Kettle Life Science ANSI	West-central

1.10.2.6 Provincial Parks

There are no provincial parks located within the study area.

1.10.2.7 Conservation Authorities

The study area falls within two Conservation Authority jurisdictions: the Toronto and Region Conservation Authority (TRCA) to the south, including the Community of Stouffville, Gormley and part of Bloomington, and Lake Simcoe Region Conservation Authority (LSRCA) to the north including Vandorf, Preston Lake, Ballantrae, Musselman's Lake and parts of Bloomington.

1.10.2.8 Fish and Fish Habitat

The study area comprises of numerous surface water features that are either confirmed to be or have high potential of being fish habitat. These water features provide habitat for numerous cold-water species including the brook trout and the redbreasted dace, considered provincially endangered.

1.10.3 Hydrogeological Analysis

A desktop high level Hydrogeological Study was completed to characterize the hydrogeological system within the study area, further detailed assessments may be required to support infrastructure design and any necessary permitting. The general findings from the study are summarized below:

- Dewatering requirements in Ballantrae are generally expected to be minor but areas with coarser soils may require intensive dewatering.
- Dewatering requirements in Musselman's Lake are expected to be minor due to existing soil types and anticipated groundwater levels.
- Dewatering requirements in south west Stouffville is expected to be minimal or perhaps even unnecessary for construction for shallow excavations (< 5 m depth). For deeper excavations, it may require significant dewatering. For areas north east and east recent construction has experienced high groundwater conditions and may require significant dewatering
- In certain parts of northern Stouffville deeper excavations (approaching 8 m or greater) may require significant dewatering due to the artesian conditions that persist there. Dewatering may be required not only to make excavations sufficiently dry for construction, but also to promote excavation stability by reducing pressure in the underlying sand aquifers.

Since the Master Plan wastewater strategies will only be located in Stouffville, the following summary from the Hydrogeological Report focuses on this area in terms of source water protection:

Stouffville

Wellhead Protection Areas categories "A" through "D" lie within the eastern portion of Stouffville, roughly east of Byers Pond Way and Stouffer Street and north and east of Millard Street (see **Figure 7**). These areas indicate a range of vulnerability which may

pose potential drinking water threats. Certain sewage-infrastructure items and activities in these areas may trigger the need for a risk management plan.

The Hydrogeological Report is provided in **Appendix B**.

1.10.4 Archaeological Screening

The archaeological screening undertaken by Golder established that the study area exhibited potential for the recovery of pre-contact Indigenous and historical Euro-Canadian archaeological deposits.

This finding is supported by the study area's proximity to potable water, soils conducive to Aboriginal agriculture, and a large number of previously identified archaeological sites within the study area and the proximity of the study area.

A review of York Region's Archaeological Potential Mapping indicates that the study area exhibits archaeological potential. The report recommends that following the completion of the Master Plan any further studies required to fulfill individual Class EA requirements should undertake a Stage 1 Archaeological Assessment to support preliminary design.

The Archaeological Screening Technical Memorandum can be found in **Appendix C**.

1.10.5 Built/Cultural Heritage Resources

A Cultural Heritage Existing Conditions Brief was prepared by Golder to provide a baseline understanding of the cultural heritage resources in the Town to support the preparation of the Water and Wastewater Master Plan and provide guidance on next step commitments related to cultural heritage for the projects recommended. The Report is provided in **Appendix D**.

The study area contains the following known cultural heritage resources:

1. Protected Heritage Properties Designated under Part IV of the Ontario Heritage Act (within Heritage Area)
 - a. 19 North Civic Avenue, Stouffville (clock Tower, Bylaw 02-169)
 - b. 19 South Civic Avenue, Stouffville (now the Lebovic Centre for Arts & Entertainment since 2009; Bylaw 02-169)
 - c. 6060 Main Street, Stouffville (Residence; Bylaw 02-1470)
 - d. 6528 Main Street, Stouffville (Memorial Christian Church; Bylaw 95-39)
2. Heritage Area
 - a. Heritage area within downtown Stouffville – not designated as a Heritage Conservation District under Part V of the Ontario Heritage Act.
3. Heritage Plaques
 - a. A plaque commemorating the Founding of Stouffville is located on the north side of Main Street in front of Latcham Gallery (6240 Main Street)

- b. Ontario Heritage Foundation Plaque on the grounds of the Pine Orchard Union Church

4. Cemeteries

- a. Baker Hill Baptist Church Cemetery, 13448 Highway 48
- b. Churchill Community Church Cemetery, 15336 Ninth Line
- c. Bloomington Methodist Cemetery, 13659 Ninth Line
- d. Bloomington United Church Cemetery, 6041 Bloomington Road
- e. Lemonville United Church Cemetery, 13523 McCowan Road
- f. Hartman Cemetery, 5829 Davis Drive
- g. Springvale Baptist Church Cemetery, 3885 Stouffville Road
- h. Stouffville Cemetery, 12118 Tenth Line
- i. Pine Orchard Friends' Cemetery, 2684 Vivian Road

The Brief recommended that given the number of known resources and high potential of additional potential cultural heritage resources in the Study Area that future planning for water and wastewater servicing projects:

- Avoid the cemeteries in the Study Area;
- Plan future water and wastewater servicing work in the Stouffville Heritage Area within the existing road rights-of-way;
- Conduct site-specific Heritage Impact Assessment prior to water and/or wastewater servicing work on or adjacent (contiguous) to all properties designated under the Ontario Heritage Act and/or subject to a heritage plaque.

For any other areas in the Town where water and wastewater servicing projects will be subject to Schedule B Municipal Class EAs Golder recommends conducting a Cultural Heritage Assessment Report for each project.

1.11 Principles and Policies

The following sections outlines the principles and policies that guided the Town of Whitchurch-Stouffville Water and Wastewater Master Plan.

1.11.1 Climate Change

Climate change was considered in the development of servicing concepts and strategies, and ultimately helped guide the selection of the preferred servicing strategies that make up the Master Plan. Alternatives that help reduce emissions and created the least impacts on the environment were favoured. The following factors were considered:

- Using gravity sewers versus pumping stations to reduce the amount of greenhouse gas emissions,

- Utilizing existing infrastructure versus building new infrastructure,
- Design wastewater infrastructure for existing and future peak wet weather conditions.
- Ensuring adequate redundancy within the system.

1.11.2 Source Water Protection

The master planning process took into consideration the source water protection policies from the Credit Valley, Toronto and Region, Central Lake Ontario (CTC) and South Georgian Bay – Lake Simcoe Source Water Protection Plans when selecting the preferred servicing strategies. The applicable Source Water Protection Policies can be found in **Appendix E**. The key policies are summarized below:

- The development of a risk management plan may be required when there exists a potential significant adverse effect on drinking water.
- The application for an Environmental Compliance Approval may be required with specific terms and conditions are included to ensure no significant adverse effects to drinking water exist
- New developments that require sanitary sewers with activities that may pose significant adverse effects on drinking water require an approved Environmental Assessment process to ensure that the location of sewers is the preferred alternative and does not impact safe drinking water conditions.

Through the master planning process, the following considerations were made when selecting the preferred strategies:

- Minimizing impacts to drinking water by avoiding WHPAs where possible,
- Utilizing existing wastewater infrastructure instead of building new infrastructure,
- Where preferred strategies are located within WHPAs, recommend the development of a risk management plan,
- Commitment that through design and permitting stages of the recommended projects that Risk Management Plans be prepared for projects considered a threat to well head protection areas.
- Decommission, where possible, private sewage pumping systems that represent significant drinking water threats under the Clean Water Act, 2006.

1.12 Planning and Growth Projections

The Growth Plan for the GGH has had two amendments since its release in June 2006. The first amendment was released in January 2012 and contained new policies, schedules and definitions that apply in the Simcoe Sub-area. The second amendment was released in June 2013 to update and extend the Growth Plan's vision, policies and

population and employment forecasts to 2041 to help communities across the Region better plan for growth and development in a sustainable way. An updated Growth Plan was recently released in May 2017 and came into effect on July 1, 2017, replacing the previous 2006 Growth Plan. The 2017 Growth Plan provides population and employment growth forecasts to 2041, which have not changed from the Amendment 2 Growth Plan 2006 values.

The Regional Municipality of York updated their Water and Wastewater Master Plan in November 2016. The Region used the population and employment forecasts identified in the Amendment 2 to the Growth Plan for the GGH (2013) mentioned above, as well as provided estimates for the Town of Whitchurch-Stouffville to 2041 (**Table 5**).

Table 5: Population and Employment Estimates to 2041

	Population		Employment	
	2015	2041	2015	2041
Whitchurch-Stouffville	44,900	64,500	14,800	23,000
Region of York	1,156,200	1,790,000	577,600	900,000

Source: Regional Municipality of York Water and Wastewater Master Plan Update, 2016

Based on the Town's on-going planning studies, development and pre-submission consultation, growth analysis and targets, the Town updated their population and employment growth forecasts to the year 2041 for use in the Master Plan.

Planning estimates for the Town of Whitchurch-Stouffville, distributed throughout the hamlets of the Community of Stouffville, Ballantrae, Musselman's Lake, Gormley, Preston Lake, Vandorf and Bloomington, were the basis for the water and wastewater demand and flow projections for this Master Plan. **Table 6** and **Table 7** provide an overview of the projected population and employment estimates to 2041. For the purpose of this study, 2016 has been used as the base year.

Table 6: Projected Population to 2041

	2016	2021	2026	2031	2036	2041
Ballantrae	3,357	3,637	3,927	4,006	4,006	4,192
Bloomington	211	313	415	415	415	415
Gormley	124	124	124	124	124	124
Musselman's Lake	1,670	1,679	1,679	1,679	1,679	1,679

	2016	2021	2026	2031	2036	2041
Other	7,685	7,790	7,823	7,823	7,823	7,823
Stouffville	31,312	40,385	46,309	49,490	50,826	51,932
Vandorf-Preston	1,479	1,488	1,488	1,488	1,488	1,488
Total	45,838	55,416	61,765	65,025	66,361	67,653

Note: Town of Whitchurch-Stouffville Water and Wastewater Master Plan population estimates.

Table 7: Projected Employment to 2041

	2016	2021	2026	2031	2036	2041
Ballantrae	253	287	323	332	332	332
Bloomington	171	183	195	195	195	195
Gormley	1,350	1,631	1,931	2,509	2,509	2,509
Musselman's Lake	26	27	27	27	27	27
Other	3,856	3,917	3,921	3,921	4,221	4,448
Stouffville	7,753	9,854	12,021	12,965	13,283	13,490
Vandorf-Preston	1,792	1,796	1,796	1,796	2,338	2,668
Total	15,201	17,695	20,214	21,745	22,905	23,669

Note: Town of Whitchurch-Stouffville Water and Wastewater Master Plan employment estimates.

1.13 Hamlet Water and Wastewater Servicing Policies

Planning estimates for the Town of Whitchurch-Stouffville, distributed throughout the hamlets of the Community of Stouffville, Ballantrae, Musselman's Lake, Gormley, Preston Lake, Vandorf and Bloomington, were the basis for the water and wastewater demand and flow projections for the existing municipal water and wastewater service areas within this Master Plan. Limited growth has been projected for the communities of Gormley and Vandorf which are currently not municipally serviced.

The Town of Whitchurch-Stouffville consider the communities of Gormley and Vandorf as important potential future service areas due to their strategic location next to Highway 404 and the requirements to meet Provincial growth conformity and the Town's limited existing land supply.

Due to their geographic location and existing Provincial policies the introduction of new servicing will be challenging and likely require both Provincial and an inter-municipal solution. The Master Plan does not recommend new infrastructure for these areas but does recommend a separate individual Class EA Study to explore the future opportunities for servicing. The following section is a preliminary review of existing related policies.

Provincial policies including the Growth Plan, Greenbelt, and Oak Ridges Moraine restrict development and water and wastewater system extensions to protect areas classified as natural core heritage and natural linkage areas. There are three areas within the Town of Whitchurch-Stouffville that are affected by these policies: Gormley, Bloomington and Vandorf (Countryside/Rural Settlement area), and Preston Lake (Natural Linkage Area).

Table 8 provides a list of relevant Provincial policies relating to Countryside, rural settlements and natural linkage areas.

Table 8: Relevant Policies for Countryside, Rural Settlements and Natural Linkage Areas

Source	Relevant Sources
Provincial Policy Statement	<i>Planning for sewage and water services shall direct and accommodate expected growth or development in a manner that promotes the efficient use and optimization of existing private communal sewage services and private communal water services, where municipal sewage and water services are not available. (Policy 1.6.6.1)</i>
	<i>In rural areas, rural settlement areas shall be the focus of growth and development, and their vitality and regeneration shall be promoted. (Policy 1.1.4.2)</i>
	<i>When directing development in rural settlement areas in accordance with policy 1.1.3, planning authorities shall give consideration to rural characteristics, the scale of development and the provision of appropriate service levels. (Policy 1.1.4.3)</i>
Greenbelt Plan	<i>The extension of municipal or private communal sewage or water services outside of a settlement area boundary shall only be permitted in the case of health issues or to service existing uses and the expansion thereof adjacent to the settlement area. Notwithstanding the above, where municipal water services exist outside of settlement areas, existing uses within the service area boundary as defined by the environmental assessment may be connected to such a service (Policy 4.2.2.2)</i>
	<i>The location and construction of infrastructure and expansions, extensions, operations and maintenance of infrastructure in the Protected Countryside are subject to the following:</i>

Source	Relevant Sources
	a. <i>Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System and Water Resource System, traversed and/or occupied by such infrastructure;</i> b. <i>Planning, design and construction practices shall minimize, wherever possible, the negative impacts on and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt;</i> c. <i>Where practicable, existing capacity and co-ordination with different infrastructure services shall be optimized so that the rural and existing character of the Protected Countryside and the overall hierarchy of areas where growth will be accommodated in the GGH established by the Greenbelt Plan and the Growth Plan are supported and reinforced;</i> d. <i>New or expanding infrastructure shall avoid key natural heritage features, key hydrologic features or key hydrologic areas unless need has been demonstrated and it has been established that there is no reasonable alternative (Policy 4.2.1.2.d)</i> e. <i>Where infrastructure does cross the Natural Heritage System or intrude into or result in the loss of a key natural heritage feature, key hydrologic feature or key hydrologic areas, including related landform features, planning, design and construction practices shall minimize negative impacts on and disturbance of the features or their related functions and, where reasonable, maintain or improve connectivity</i> f. <i>New or expanding infrastructure shall avoid specialty crop areas and other prime agricultural areas in that order of priority, unless need has been demonstrated and it has been established that there is no reasonable alternative;</i> g. <i>Where infrastructure crosses prime agricultural areas, including specialty crop areas, an agricultural impact assessment or equivalent analysis as part of an environmental assessment shall be undertaken; and</i> <i>New waste disposal sites and facilities, and organic soil conditioning sites are prohibited in key natural heritage features, key hydrologic features and their associated vegetation protection zones. (Policy 4.2.1.2)</i> <i>The purpose of Countryside Areas is to encourage agricultural and other rural uses that support the Plan's objectives by [...] maintaining existing public service facilities and adapting them, where feasible, to meet the needs of the community. (Policy 13.1.e)</i> h. <i>The purpose of Natural Linkage Areas is to maintain, and where possible improve or restore, the ecological integrity of the Plan Area, and to</i>

Source	Relevant Sources
	<i>maintain, and where possible improve or restore, regional-scale open space linkages between Natural Core Areas and along river valleys and stream corridors [...]. (Policy 12.1.1)</i>
Oak Ridges Moraine Conservation Plan	<i>Municipalities shall ensure that the development of new infrastructure or the upgrading or extension of existing infrastructure is supported by the necessary studies, assessments and documentation such as infrastructure master plans, asset management plans, land use and financial scenarios, watershed studies and subwatershed plans, environmental assessments and other relevant studies that,</i> <i>a. demonstrate that infrastructure will be financially feasible and sustainable over the long-term;</i> <i>b. demonstrate that an adequate water supply is available for the development, and that there is sufficient assimilative capacity to deal with the sewage from the development, without compromising the ecological integrity of the Plan Area;</i> <i>c. address stormwater management at appropriate scales throughout the land use planning process;</i> <i>d. utilise appropriate low impact development techniques and green infrastructure; and</i> <i>assess actions to reduce greenhouse gas emissions and to adapt to climate change impacts. (Policy 41.1.2)</i> <i>An application for the development of infrastructure in or on land in a Natural Linkage Area shall not be approved unless,</i> <i>a. the need for the project has been demonstrated and there is no reasonable alternative; and</i> <i>b. the applicant demonstrates that the following requirements will be satisfied, to the extent that is possible while also meeting all applicable safety standards:</i> <i>1. The area of construction disturbance will be kept to a minimum.</i> <i>2. Right of way widths will be kept to the minimum that is consistent with,</i> <i>I. meeting other objectives such as stormwater management and erosion and sediment control, and</i> <i>II. locating as much infrastructure uses within a single corridor as possible.</i> <i>3. The project will allow for wildlife movement.</i> <i>4. Lighting will be focused downwards and away from Natural Core Areas.</i>

Source	Relevant Sources
	<i>The planning, design and construction practices adopted will keep any adverse effects on the ecological integrity of the Plan Area to a minimum. (Policy 41.2)</i>
	<i>Water and sewer service trenches shall be planned, designed and constructed so as to keep disruption of the natural groundwater flow to a minimum. (Policy 43.2)</i>
	<i>The construction or expansion of partial services is prohibited. (Policy 44.1)</i>

1.14 Water and Wastewater Master Plan Servicing Polices and Design Guidelines

Development of water and wastewater principles and policies are integral to providing guidelines and direction to the Master Plan process, as well as to the identification and evaluation of the servicing strategies.

1.14.1 Servicing Principles and Policies

Specific servicing principles and policies have been developed to guide and provide direction for the development of water and wastewater servicing strategies. In general, the Town of Whitchurch-Stouffville is looking to build and maintain efficient, reliable, sustainable and well managed water and wastewater systems that provide high level of service to the public. In order to capture these goals, general, water and wastewater servicing policies have been structured as summarized in **Table 9**, **Table 10**, and **Table 11**, respectively. Further details for each policy are provided in **Appendix F**.

Table 9: General Servicing Policies

G.01 Municipal Servicing	<i>The Town of Whitchurch-Stouffville shall provide adequate municipal servicing for water and wastewater in accordance with the population and employment projections in the time horizon of the Official Plan.</i>
G.02 Environmental Protection	<i>The Town of Whitchurch-Stouffville shall consider, protect and endeavour to minimize impact to the natural, built and cultural environment and heritage of the community.</i>
G.03 Planning Horizon	<i>The Town of Whitchurch-Stouffville shall ensure that the design of water and wastewater infrastructure recognizes the potential for growth beyond the time horizon of the Official Plan.</i>
G.04 Reserve Capacity	<i>The Town of Whitchurch-Stouffville will endeavor to maintain sufficient reserve capacity in its water and wastewater infrastructure</i>

	<i>and facilities to provide operational flexibility and meet potential changes in servicing conditions.</i>
G.05 System Reliability and Security	<i>The Town of Whitchurch-Stouffville shall endeavor to provide reliability, redundancy and security in its water and wastewater systems with attention to high risk and critical areas.</i>
G.06 Location of Municipal Services and Facilities	<i>The Town of Whitchurch-Stouffville shall locate all of its services and facilities on public property or on municipally-owned easements.</i>
G.07 Climate Change	<i>The Town of Whitchurch-Stouffville shall be aware of and consider the potential impact to and from climate change on planning and sizing of infrastructure.</i>
G.08 Energy Efficiency	<i>The Town of Whitchurch-Stouffville shall design water and wastewater facilities with consideration to energy use.</i>
G.09 Integrated Infrastructure Program	<i>The Town of Whitchurch-Stouffville shall coordinate and integrate the Master Plan program with Town and Regional planning, programs and policies where appropriate.</i>
G.10 Level of Service	<i>The Town of Whitchurch-Stouffville shall outline the Level of Service Objectives through the Master Plan and endeavor to meet/exceed the minimum requirements as outlined in the objectives.</i>
G.11 Region and Town Collaboration	<i>The Town of Whitchurch-Stouffville and Region of York will endeavour to maintain consistent criteria, standards and policy with respect to approach and level of service for planning and design the water and wastewater systems to meet growth.</i>
G.12 Sustainability	<i>The Town of Whitchurch-Stouffville will endeavour to undertake sustainable planning, designing, operation and maintenance of the Water and Wastewater Systems.</i>

Table 10: Water Servicing Policies

W.01 Health & Safety	<i>The Town of Whitchurch-Stouffville will promote health, productivity and safety of the community through design, construction and maintenance of the Town's potable water infrastructure.</i>
-------------------------------------	--

W.02 Raw Water Sources	<i>The Town of Whitchurch-Stouffville shall endeavor to enhance, protect and maintain quality, quantity and safety of its raw water sources.</i>
W.03 Treatment & Distribution Water Quality	<i>The Town of Whitchurch-Stouffville shall meet or exceed legislated water quality criteria.</i>
W.04 Water Demand Projections	<i>The Town of Whitchurch-Stouffville shall utilize a water demand projection methodology that recognizes recent water supply data and current consumption trends.</i>
W.05 Distribution Requirements	<i>The Town of Whitchurch-Stouffville shall provide potable water at adequate pressure and flow to its customers.</i>
W.06 Fire Flow Requirements	<i>The Town of Whitchurch-Stouffville shall consider the MECP guidelines and the Fire Underwriters Guidelines for establishing the acceptable level of fire flow.</i>
W.07 Water Efficiency and Consumption Trends	<i>The Town of Whitchurch-Stouffville shall be aware of the impacts water efficiency and conservation has on the water network.</i>
W.08 Water Supply and Distribution Security	<i>The Town of Whitchurch-Stouffville shall plan, design, construct, operate and maintain the water system to balance level of service and security of supply to the customers.</i>

Table 11: Wastewater Servicing Policies

WW.01 Health & Safety	<i>The Town of Whitchurch-Stouffville will promote health, productivity and safety of the community through design, construction and maintenance of the Region's wastewater infrastructure.</i>
WW.02 Receiving Water Bodies	<i>The Town of Whitchurch-Stouffville shall endeavor to enhance, protect and maintain quality, quantity and safety of its receiving water bodies.</i>
WW.03	<i>The Town of Whitchurch-Stouffville shall meet as a minimum the requirements of the Environmental Compliance Approvals set out</i>

Wastewater Treatment and Collection Requirements	<i>by governing bodies and the appropriate legislated treatment and collection criteria.</i>
WW.04 Wastewater Flow Projections	<i>The Town of Whitchurch-Stouffville shall utilize a wastewater flow projection methodology that recognizes recent wastewater flow and treatment data and current consumption trends.</i>
WW.05 Separated Wastewater & Stormwater Systems	<i>The Town of Whitchurch-Stouffville shall plan and maintain separate wastewater and stormwater systems.</i>
WW.06 Wastewater Collection and Pumping Systems	<i>The Town of Whitchurch-Stouffville shall provide adequate reliability and security in wastewater pumping systems.</i>
WW.07 Wet Weather Flow Criteria	<i>The Town of Whitchurch-Stouffville shall utilize current wet weather flow criteria to determine peak wet weather flows and size wastewater infrastructure.</i>

The policies address a wide range of servicing needs. These policies have been developed to address current pressing issues such as climate change, wet weather management, energy management, infrastructure optimization, system security and resiliency.

1.15 Design Criteria and Level of Service Objectives

This section provides a summary of the water and wastewater design criteria and level of service objectives used under the Master Plan. The design criteria outlines the methodology and values used to estimate growth related demands/flows as well as the decision making rationale related to infrastructure capacity and the trigger for upgrades. Detailed design criteria and level of service is provided in the Water Master Plan and Wastewater Master Plan sections.

1.15.1 Water Demand Design Criteria

The Master Plan has used the following design criteria to project water demands, determine capacity requirements and establish the water infrastructure program:

- Average Day Demand: 350 L/cap/d
- Peaking Factors: highest of SCADA (observed) and MECF criteria
- Fire Flow: Single fire flow demand by land use. Based on the Public Fire Protection Survey Services (FPSS) ranges.

1.15.2 Water Level of Service

- PHD scenario to assess minimum pressures: < 40 psi: below LOS objective
- ADD simulation to assess maximum pressures: > 100 psi: below LOS objective
- MDD+FF simulation to assess available fire flow (must maintain 20 psi across the system): < 80% of fire flow target: below LOS objective

1.15.3 Wastewater Flows Design Criteria

The Master Plan has used the following design criteria to project wastewater flows, determine capacity requirements and establish the wastewater infrastructure program:

- Average Dry Weather Flow: 350 L/cap/d
- I&I Allowance: 0.26 L/s/ha
- Peaking Factor: Harmon (1.5 - 4)

1.15.4 Wastewater Level of Service

- Sewer Capacity: Maintaining the flow in the sewers at less than 85% full under a 5yr design storm conditions.
- Basement Flooding Risk: Ensuring the wastewater HGL does not approach within 1.8 meters of the ground surface under 25yr design storm conditions

2 Water Master Plan

The *Water Master Plan* provides an overall review of the water policies and criteria, existing water distribution system, technical analysis, and development of the preferred water servicing strategy for the Town of Whitchurch-Stouffville. This section has been organized as follows:

- 2.1 Water System Policy and Criteria
- 2.2 Existing Water Distribution System
- 2.3 Water Hydraulic Model
- 2.4 York Region Water and Wastewater Master Plan Linkage
- 2.5 Assessment of Existing and Future Water Infrastructure
- 2.6 Water Servicing Strategy
- 2.7 Capital Program

This section is one of five sections that make up the complete Master Plan Class EA Study Report and should be read in conjunction with the other sections.

2.1 Water System Policy and Criteria

Water policies, design criteria, and level of service requirements were updated as part of this Master Plan to provide guidelines and direction to the master planning process, in addition to ensuring that water demands are adequately representative to support the decision making for sizing and timing of future infrastructure. Refer to **Appendix F** and **Appendix G** for the complete water servicing policies and design criteria review.

2.1.1 Water Servicing Principles and Policies

Specific servicing principles and policies have been developed to guide the development of water servicing strategies. In general, the Town of Whitchurch-Stouffville is looking to build and maintain efficient, reliable, sustainable, and well-managed water systems that provide high level of service to the public. In order to capture these goals, the servicing principles and policies have been structured as outlined in **Section 1.14.1**. Further details on the water policies are provided in **Appendix F**.

2.1.2 Water Design Criteria

A guiding principle of design criteria is to ensure that the demand projections are adequately predicted with an appropriate factor of safety and risk management. This overall principle also ensures that infrastructure has sufficient capacity to meet the growing needs of the Town and does not impede the approved/planned growth.

The water demand criteria updated as part of the Town of Whitchurch-Stouffville Master Plan are summarized in **Table 12**.

Table 12: Water Demand Criteria

Water Demands Projection Methodology				
- Existing flows were established using water billing data. Water billing data was collected and reviewed from 2012-2017. The data was assessed to identify average day demands at each billing address throughout the systems. These demands represent the Baseline demands for the water distribution systems. - Growth flows applied to the Baseline using design criteria.				
Water Demand Criteria for Growth				
Parameter		Design Criteria		
Average Day Demand (ADD)		350 L/cap/d		
Peaking Factors <i>Larger of SCADA, MECP criteria, and Town's Specifications</i>		SCADA ¹²	MECP ¹³	Town's Specifications
Max Day Peaking Factor	Stouffville	1.73	1.80	2.00
	Ballantrae-Musselman's Lake	2.55	2.00	2.00
Peak Hour Peaking Factor	Stouffville	-	2.70	3.00
	Ballantrae-Musselman's Lake	-	3.00	3.00
Landuse		Fire Flow		
Single/Semi Detached		75 L/s		
Townhouse		90 L/s		
Apartment		150 L/s		
Institutional		175 L/s		
Commercial		200 L/s		
Industrial		250 L/s		
Water System Criteria				
Sizing of the water distribution system to accommodate Peak Hour Demands (PHD) and Maximum Day Demands plus Fire Flow (MDD + FF)				

¹² SCADA: Supervisory Control and Data Acquisition generally refers to an industrial control system.

¹³ The MECP criteria is population based and inline with Table 3-1 from the MECP Design Guidelines for Drinking-Water Systems.

2.1.3 Water Level of Service

Industry standards for Level of Service objectives are always changing to meet the demands of growth and reflect more efficient water consumption. The distribution system should be sized for PHD and MDD+FF with considerations for water quality during low demand periods.

The following summarizes the performance indicators that were used to assess the Town's distribution network and ability to meet the LOS objectives:

- PHD scenario to assess minimum pressures:
 - 40-50 psi: flag
 - < 40 psi: below LOS objective
- ADD simulation to assess maximum pressures:
 - 90-100 psi: flag
 - > 100 psi: below LOS objective
- MDD+FF simulation to assess available fire flow (must maintain 20 psi across the system):
 - 80-100% of fire flow target: flag
 - < 80% of fire flow target: below LOS objective
- In addition to pressure and fire flow objectives, the system was reviewed for water mains with high headloss gradients and/or high velocities.

2.1.4 Demand Projections

The population and employment projections outlined in Section 1.12 and the design criteria within Section 2.1.2 were utilized to calculate the average day demand (ADD) and the maximum day demand (MDD). The total projected ADD and MDD are shown in Table 13.

Table 13: Water Demand Projections

Pressure Zone	Total Population & Employment			Projected ADD (L/s)			Project MDD (L/s)		
	2016	2031	2041	2016	2031	2041	2016	2031	2041
Ballantrae-Musselman's Lake	5,306	6,044	6,230	21	24	25	54	61	64
Stouffville	39,065	62,455	65,422	158	253	265	316	506	530

2.1.5 Costing Methodology

The cost estimation methodology for capital projects at a master planning level are typically based on an overall unit cost approach. The unit cost rates used for this Master

Plan are representative in 2018 dollars and take into consideration Southern Ontario prices of labour and availability of materials. The development of these rates were informed by multiple Master Planning Studies and have undergone independent peer reviews in order to further refine and ensure overall accuracy of the cost estimates. They were also favorably compared to costs of recent capital projects completed within the GTA and throughout Southern Ontario. A summary of the unit costs is provided in **Appendix H**.

A capital cost is provided for all projects proposed as part of this Master Plan. For the majority of the water system projects, a base construction cost was obtained using either a unit rate construction cost, based on pipe diameter, or unique project analysis. The base construction cost considers several factors specific to each project such as creek crossings, railway and highway crossings, tunneling requirements, and location of construction (Greenfield, urban, suburban). Design, administration, contingency, and non-recoverable HST costs were added to arrive at a final project cost. Detailed costing sheets were developed to support the financial evaluation for each capital project. The final project costs are provided in the Capital Program, **Section 2.7**.

2.2 Existing Water Distribution System

The Regional Municipality of York uses the York Water System (YWS) to supply water to its nine (9) municipalities, which includes the Town of Whitchurch-Stouffville. The YWS is a lake-based system receiving its water from Lake Simcoe (exclusively for the Town of Georgina) and from Lake Ontario through the City of Toronto and Region of Peel. The YWS is supplemented from eight (8) groundwater protection wells located within the Yonge Street Aquifer and the Whitchurch-Stouffville well system.

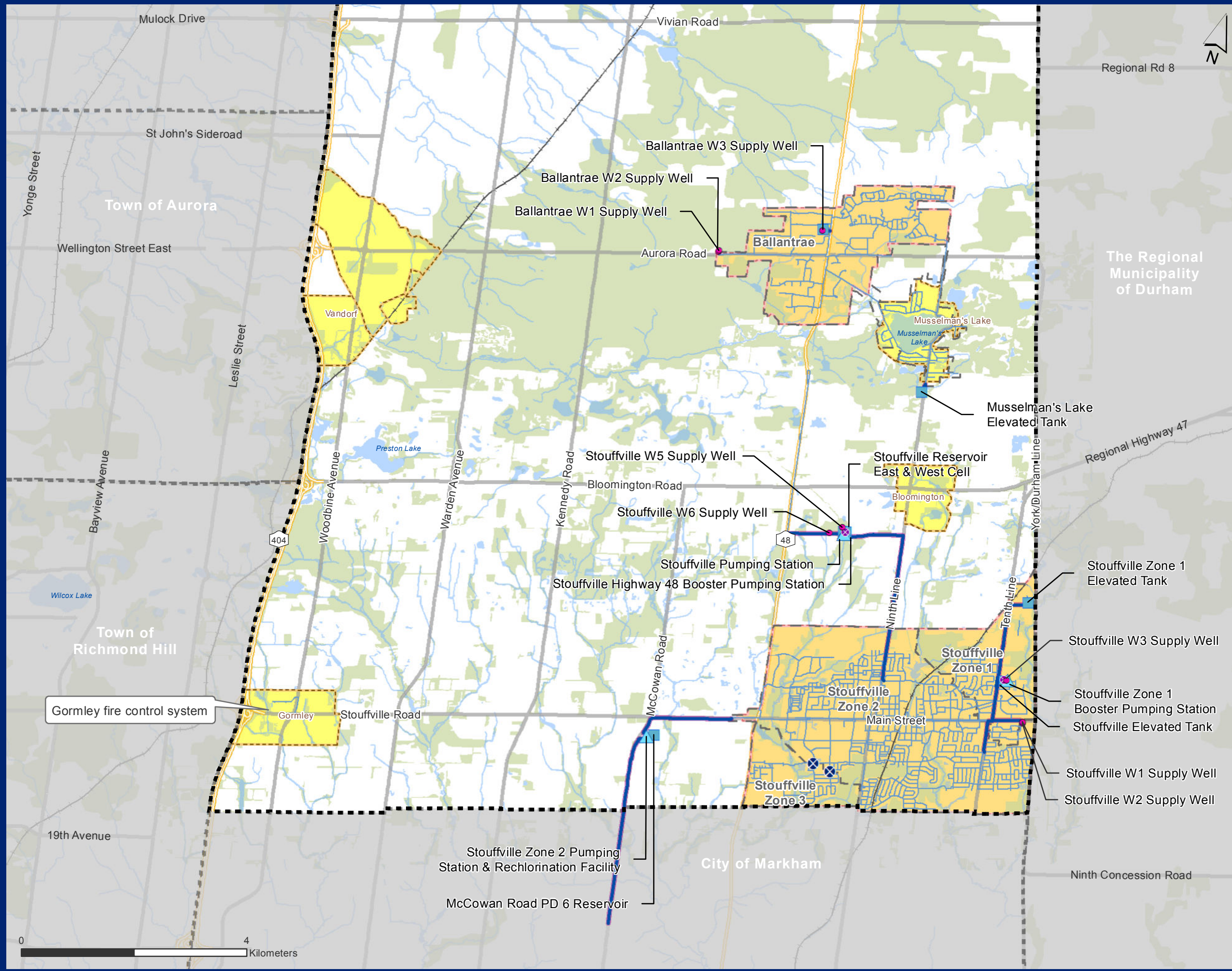
The Regional Municipality of York is a two-tiered system. The Region operates and maintains water facilities and major transmission mains, while the municipalities operate and maintain the distribution system.

The Town of Whitchurch-Stouffville is responsible for the operation and maintenance of watermains, valves, hydrants, service connections, and water meters for following two water distribution systems:

- Stouffville Water Distribution System (Community of Stouffville and Highway 48)
- Ballantrae-Musselman's Lake Water Distribution System.

Currently, the Gormley community does not have municipal potable water service, however does have a fire protection system.

Figure 15 presents the Town of Whitchurch-Stouffville's existing water distribution systems, including the areas that currently do not have municipal water services.



**Town of Whitchurch-Stouffville
Water and Wastewater Master Plan**

**Existing Water System
Town of Whitchurch-Stouffville**

Figure 15

Existing Water System

All pumping stations, water storage, and supply wells are owned by the Region.

Regional Owned		Municipal Owned	
	Pumping Station		Pressure Reducing Valves (PRV)
	Water Storage		Watermains (Municipal)
	Supply Well		Existing Water Pressure
	Pressure Reducing Valves (PRV)		Districts
	Watermains (Regional)		

General Features

-  Towns and Villages
-  Hamlets
-  Municipal Boundary
-  Creeks, Rivers, and Lakes
-  Natural Cover
-  Freeways and Provincial Highways
-  Railway

2.2.1 Stouffville Water Distribution System

The Community of Stouffville water distribution system is comprised of approximately 132 km of various sized watermains, 1440 watermain valves, 1000 hydrants, and 38 sampling stations. In 2016, it serviced approximately 30,250 residents and businesses. The Community of Stouffville water distribution system is divided into three (3) primary water pressure zones:

- Zone 1 (upper) – located in the northeast region of Stouffville
- Zone 2 (middle) – located in the central region of Stouffville
- Zone 3 (lower) – located in the southwest region of Stouffville

In addition to the three primary pressure zones, there is a small boosted zone that distributes potable water to households and businesses located along Highway 48, at Bloomington Road. **Figure 16** presents the existing Stouffville water distribution system.

The facilities that support the distribution system, operated and maintained by the Region, are summarized in **Table 14**. In addition to the facilities, the Region operates and maintains four (4) large transmission watermains along Tenth Line, Main Street, Ninth Line, and Stouffville Road.

Table 14: Existing Facilities within the Community of Stouffville Water System

Name	Location	Zones Supplied
Stouffville Reservoir East/West Cells	Highway 48	Zone 2, Hwy 48
Stouffville Hwy 48 Booster Station	Highway 48	Hwy 48
Stouffville Zone 2 Pumping Station	Near Highway 48	Zone 2
Stouffville Zone 1 Booster Station	East of Tenth Line	Zone 1
Stouffville Zone 1 Elevated Tank	Bethesda Road	Zone 1
Stouffville Wells (#1, #2) – Deep Aquifer	6985 Main Street	Zone 2
Stouffville Well (#3) – Shallow Aquifer	12519 Tenth Line	Zone 2
Stouffville Wells (#5, #6) – Shallow Aquifers, High Lift Reservoir Pumps	13461 Highway 48	Zone 2
Stouffville Zone 2 Pumping Station and Re-chlorination Facility	Stouffville Road (transfer from Markham)	Zone 2
Stouffville Zone 2 Elevated Tank	Bethesda Road	Zone 2
Pressure Reducing Valve (PRV)	Hover Park Dr./Sandiford Dr.	Zone 3

Name	Location	Zones Supplied
Pressure Reducing Valve (PRV)	Mostar St./Clausfarm Gate	Zone 3

2.2.1.1 Community of Stouffville Well Production

Water extraction from the groundwater production wells is regulated by a Permit to Take Water, which is issued by the Ministry of the Environment, Conservation and Parks (MECP). The daily and annual withdrawals for the Community of Stouffville production wells are summarized in **Table 15** and **Table 16**¹⁴.

Wells #3, #5, and #6 are shallow aquifers, therefore concentrations of chloride, sulphate, and sodium are higher when compared to Wells #1 and #2, which are deep aquifers. Chlorine is used to disinfect water from the YWS and is treated for the conversion of chloramine to free chlorine. The groundwater production wells (#1 and #2) are treated with sodium hypochlorite. The other groundwater production wells (#3, #4, and #5) are treated with chlorine gas. Wells #5 and #6 are treated with an ultraviolet light system for primary disinfection with the addition of chlorine to maintain residual levels. To manage iron and manganese within the distribution system, sodium silicate is added.

Table 15: Daily Well Withdrawal – Community of Stouffville

Well	Permitted Daily Withdrawal (L)	Actual Maximum Daily Withdrawal (L)
Well #1	2,946,250	2,831,131 (on July 18, 2016)
Well #2	2,946,250	2,817,348 (on June 26, 2016)
Well #3	2,946,250	2,924,945 (on July 27, 2016)
Well #5	3,110,400	2,878,050 (on June 26, 2016)
Well #6	2,289,600	1,722,680 (August 14, 2016)

Source: Town of Whitchurch-Stouffville 2016 Drinking Water Summary Report

Note: Peak pumping days represents the number of days the wells pump $\geq 80\%$ of the maximum permitted daily withdrawal.

Table 16: Annual Well Withdrawal – Community of Stouffville

Annual Permitted Withdrawal (L)	2016 Annual Withdrawal (L)	Percentage of Permitted Annual Withdrawal (%)
5,197,132,800	1,293,175,576	25%

Source: Town of Whitchurch-Stouffville 2016 Drinking Water Summary Report

¹⁴ Town of Whitchurch-Stouffville. 2016. 2016 Drinking Water Summary Report. Accessed on August 24, 2017.

2.2.1.2 Community of Stouffville Pumping Stations and Storage Facilities

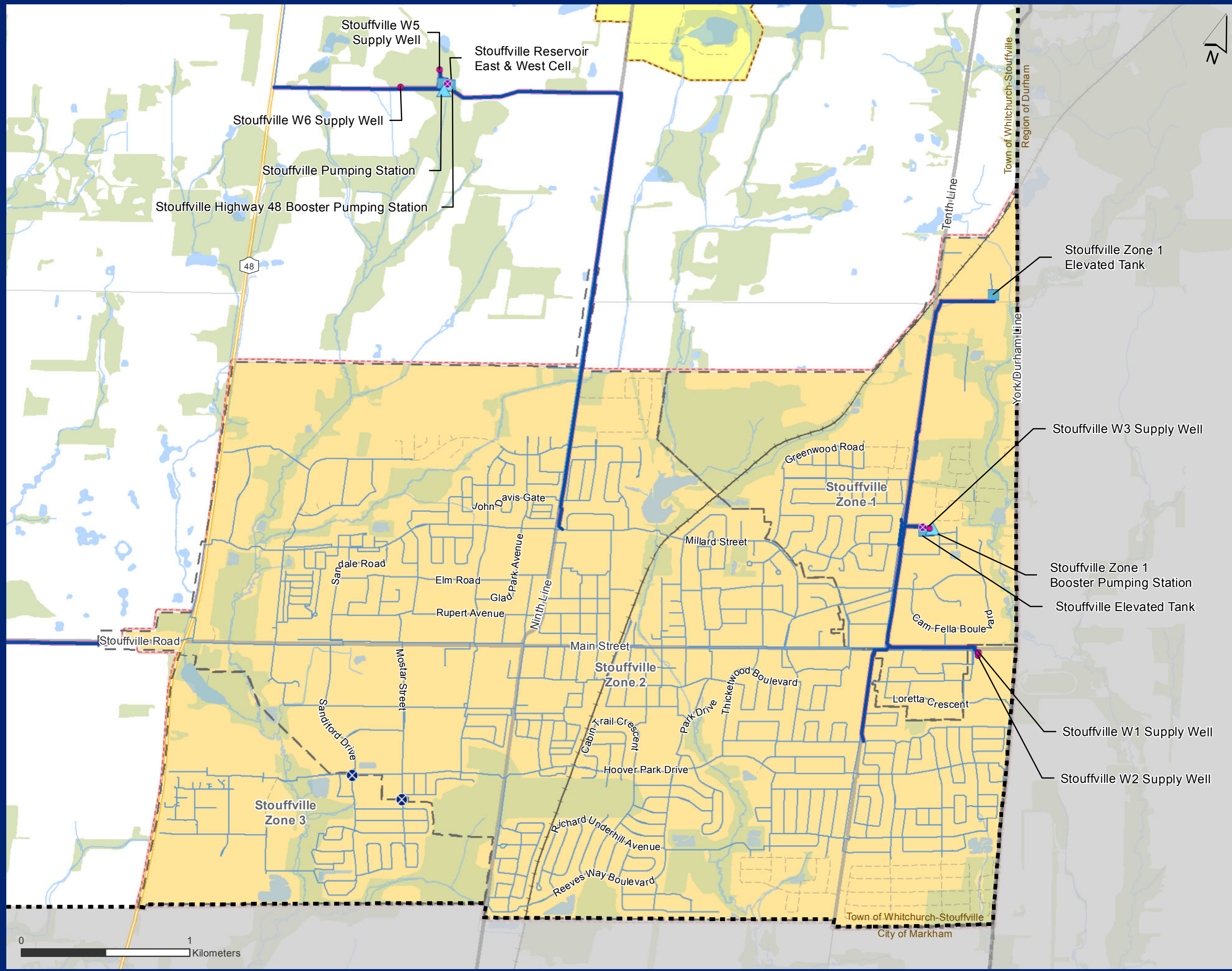
Table 17 and **Table 18** summarize facility specifications for the pumping stations and storage facilities respectively, within the Community of Stouffville.

Table 17: Community of Stouffville Water Pumping Stations

Facility	Pressure Zone	No. of Pumps	Firm Capacity (L/s)
Stouffville Zone 1 Booster Station	Zone 1	2	62.5
Stouffville Hwy 48 Booster Station	Highway 48	2	3.2
Stouffville Zone 2 Pumping Station	Zone 2	2	46
Stouffville Zone 2 Pumping Station and Re-chlorination Facility	Zone 2 (transfer from Markham)	4 (3 + 1 jockey)	176

Table 18: Community of Stouffville Water Storage Facilities

Facility	Pressure Zone	Storage Capacity (m ³)	Top Water Level (masl)
Stouffville Zone 1 Elevated Tank	Zone 1	6,140	349.5
Stouffville Zone 2 Elevated Tank	Zone 2	3,400	323.1
Stouffville Reservoir East/West Cells	Zone 2, Hwy 48	5,132	307.1



**Town of Whitchurch-Stouffville
Water and Wastewater Master Plan**

**Existing Water System
Community of Whitchurch-Stouffville**
Figure 16

Existing Water System
All pumping stations, water storage, and supply wells are owned by the Region.

- | Regional Owned | Municipal Owned |
|--|--|
|  Pumping Station |  Pressure Reducing Valves (PRV) |
|  Water Storage |  Watermains (Municipal) |
|  Supply Well |  Existing Water |
|  Pressure Reducing Valves (PRV) |  Pressure Districts |
|  Watermains (Regional) | |

- General Features**
-  Towns and Villages
 -  Hamlets
 -  Municipal Boundary
 -  Creeks, Rivers, and Lakes
 -  Natural Cover
 -  Freeways and Provincial Highways
 -  Proposed Roads
 -  Railway

2.2.2 Ballantrae-Musselman's Lake Water Distribution System

The Ballantrae-Musselman's Lake community is located in the northeastern part of the Town of Whitchurch-Stouffville and is comprised of approximately 46 km of various sized watermains, 300 watermain valves, 340 hydrants, and 16 sampling stations. In 2016, it serviced approximately 5,900 residents.

The Ballantrae-Musselman's Lake water distribution system is a single water pressure zone. **Figure 17** presents the existing Ballantrae-Musselman's Lake water distribution system.

2.2.2.1 Ballantrae-Musselman's Lake Well Production

Water extraction from the groundwater production wells is regulated by a Permit to Take Water, which is issued by the Ministry of the Environment, Conservation and Parks (MECP). The daily and annual withdrawals for the Ballantrae-Musselman's Lake production wells are summarized in **Table 19** and **Table 20**¹⁵.

The water obtained from these production wells are treated with chlorine for disinfection, and sodium silicate to ensure iron and manganese are kept in suspension.

Table 19: Daily Well Withdrawal – Ballantrae-Musselman's Lake

Well	Permitted Daily Withdrawal (L)	Actual Maximum Daily Withdrawal (L)
Well #1	2,617,920	1,562,758 (on August 27, 2016)
Well #2	2,617,920	1,818,406 (on July 23, 2016)
Well #3	2,617,920	2,046,750 (on June 16, 2016)
Well #1, 2, 3	4,580,000	3,640,000 (on July 23, 2016)

Source: Town of Whitchurch-Stouffville 2016 Drinking Water Summary Report

Note: Peak pumping days represents the number of days the wells pump $\geq 80\%$ of the maximum permitted daily withdrawal.

Table 20: Annual Well Withdrawal – Ballantrae-Musselman's Lake Community

Annual Permitted Withdrawal (L)	2016 Annual Withdrawal (L)	Percentage of Permitted Annual Withdrawal (%)
1,671,700,000	476,731,877	29%

Source: Town of Whitchurch-Stouffville 2016 Drinking Water Summary Report

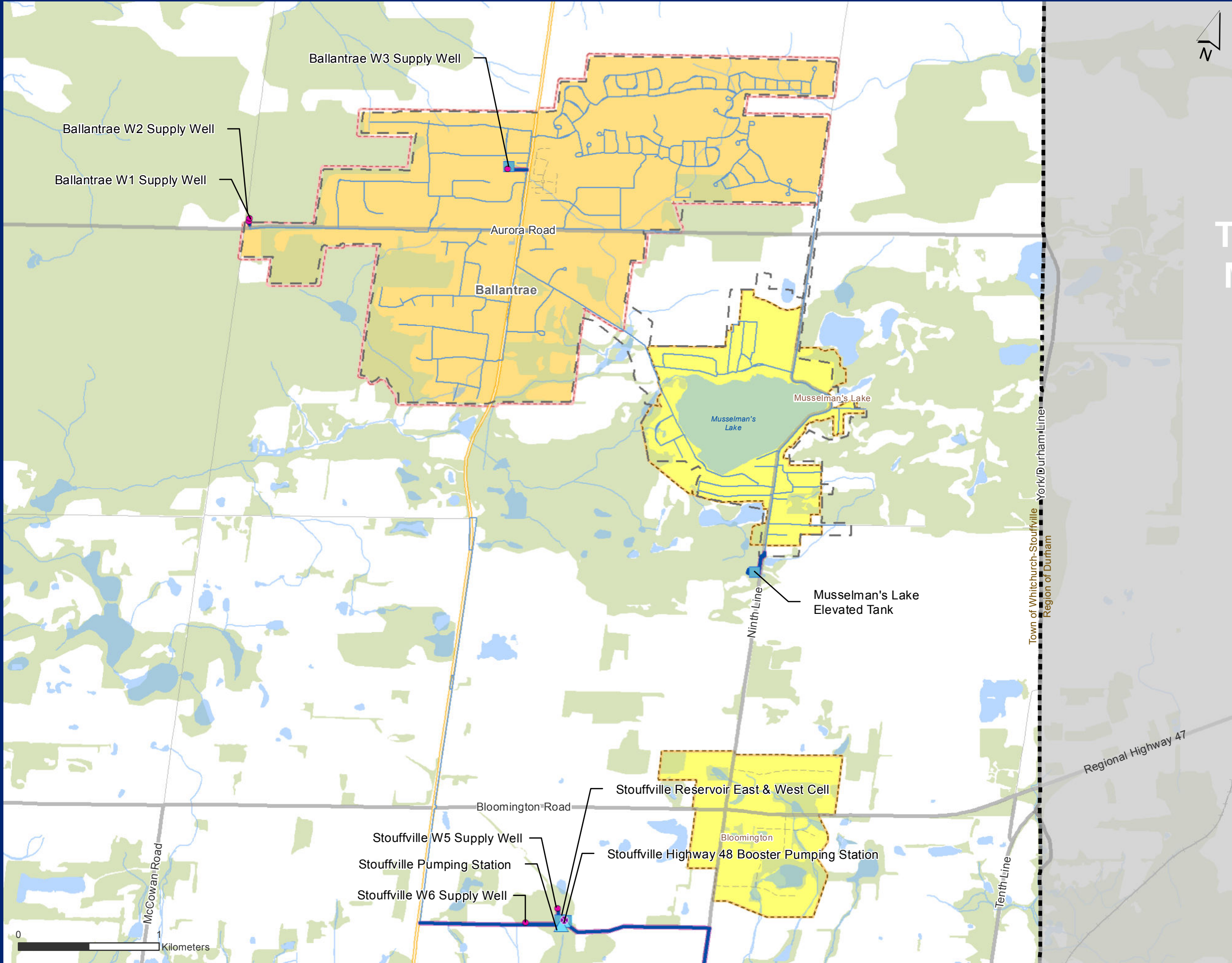
¹⁵ Town of Whitchurch-Stouffville. 2016. 2016 Drinking Water Summary Report. Accessed on August 24, 2017.

2.2.2.2 Ballantrae-Musselman's Lake Storage Facility

The Ballantrae-Musselman's Lake community has one storage facility, the Musselman's Lake Elevated Tank. It is located at the southern tip of the community and provides water storage for the entire system.

Table 21: Ballantrae-Musselman's Lake Elevated Tank

Facility	Storage Capacity (m ³)	Top Water Level (masl)
Musselman's Lake Elevated Tank	2,760	393



Existing Water System
Ballantrae and Musselman's Lake

Figure 17

Existing Water System
All pumping stations, water storage, and supply wells are owned by the Region.

Regional Owned	Municipal Owned
 Pumping Station	 Pressure Reducing Valves (PRV)
 Water Storage	 Watermains (Municipal)
 Supply Well	 Existing Water Pressure Districts
 Pressure Reducing Valves (PRV)	
 Watermains (Regional)	

- General Features**
-  Towns and Villages
 -  Hamlets
 -  Municipal Boundary
 -  Creeks, Rivers, and Lakes
 -  Natural Cover
 -  Freeways and Provincial Highways
 -  Proposed Roads
 -  Railway

2.2.3 Gormley

Gormley is located in the southwestern quadrant of the Town of Whitchurch-Stouffville. Currently, the Gormley community does not have municipal potable water service but does have a fire protection system. The reservoir from which the water is pumped has a capacity of 960 m³ ⁽¹⁶⁾.

2.2.4 Bloomington

Bloomington is located in the eastern part of the Town of Whitchurch-Stouffville, north of the Community of Stouffville. Currently, the Bloomington community does not have municipal potable water service.

2.2.5 Vandorf-Preston Lake

Vandorf-Preston Lake is located in the western part of the Town of Whitchurch-Stouffville, east of the Community of Stouffville. Currently, the Vandorf-Preston Lake community does not have municipal potable water service.

2.3 Water Hydraulic Model

Analysis of the water distribution systems was undertaken using a water hydraulic model. A new water hydraulic model for the communities of Stouffville and Ballantrae-Musselman's Lake was built using Bentley's WaterCAD modelling software. The existing conditions water hydraulic model was calibrated to hydrant testing data and facility SCADA data. The hydrant testing program consisted of 14 capacity tests and 12 C-factor tests.

Population and employment projections were imported into the model to create future growth scenarios. The growth projections were loaded as a separate demand that made it relatively easy to identify the growth portion of the system demands.

¹⁶Whitchurch-Stouffville (Fire and Emergency Services). December 2012. Fire Master Plan Minor Update. Accessed on August 24, 2017

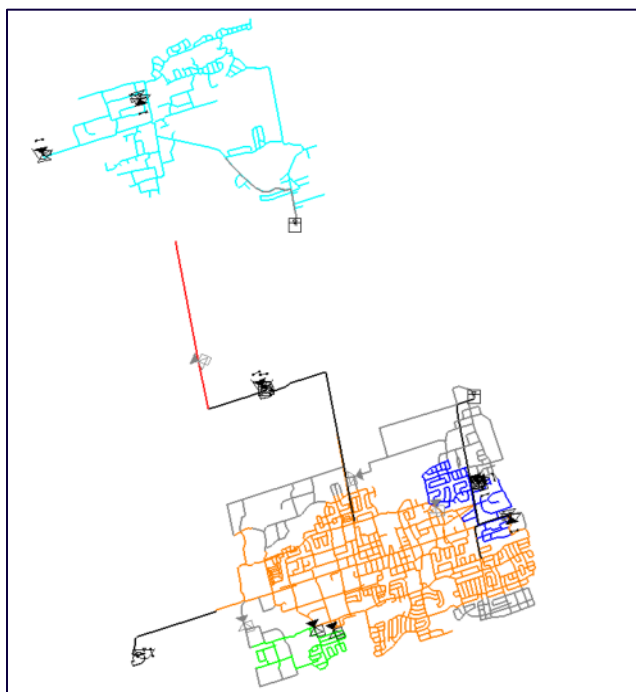


Figure 18: Water Hydraulic Model

2.4 York Region Water and Wastewater Master Plan Linkage

Through the Regional Water and Wastewater Master Plan, the Region recommended a number of water strategies. **Table 22** provides the waster strategies recommended for the Town.

Table 22: Regional Water Strategy Recommendations for the Town

Project Name	Year Completion
Stouffville Zone 2 Capacity Increase – Phase 1: Elevated Tank and Connecting Watermain	2016-2020
Ballantrae Permit to Take Water Increase	2016-2020
Stouffville Zone 2 Booster Pumping Station Pump Addition	2036-2041
Stouffville Zone 2 Capacity Increase – Phase 2	2031-2035

Figure 19 provides an overview of the Region’s preferred water strategy recommended in the York Region 2016 Water and Wastewater Master Plan.

Figure 5.1
Preferred Water
Servicing Strategy

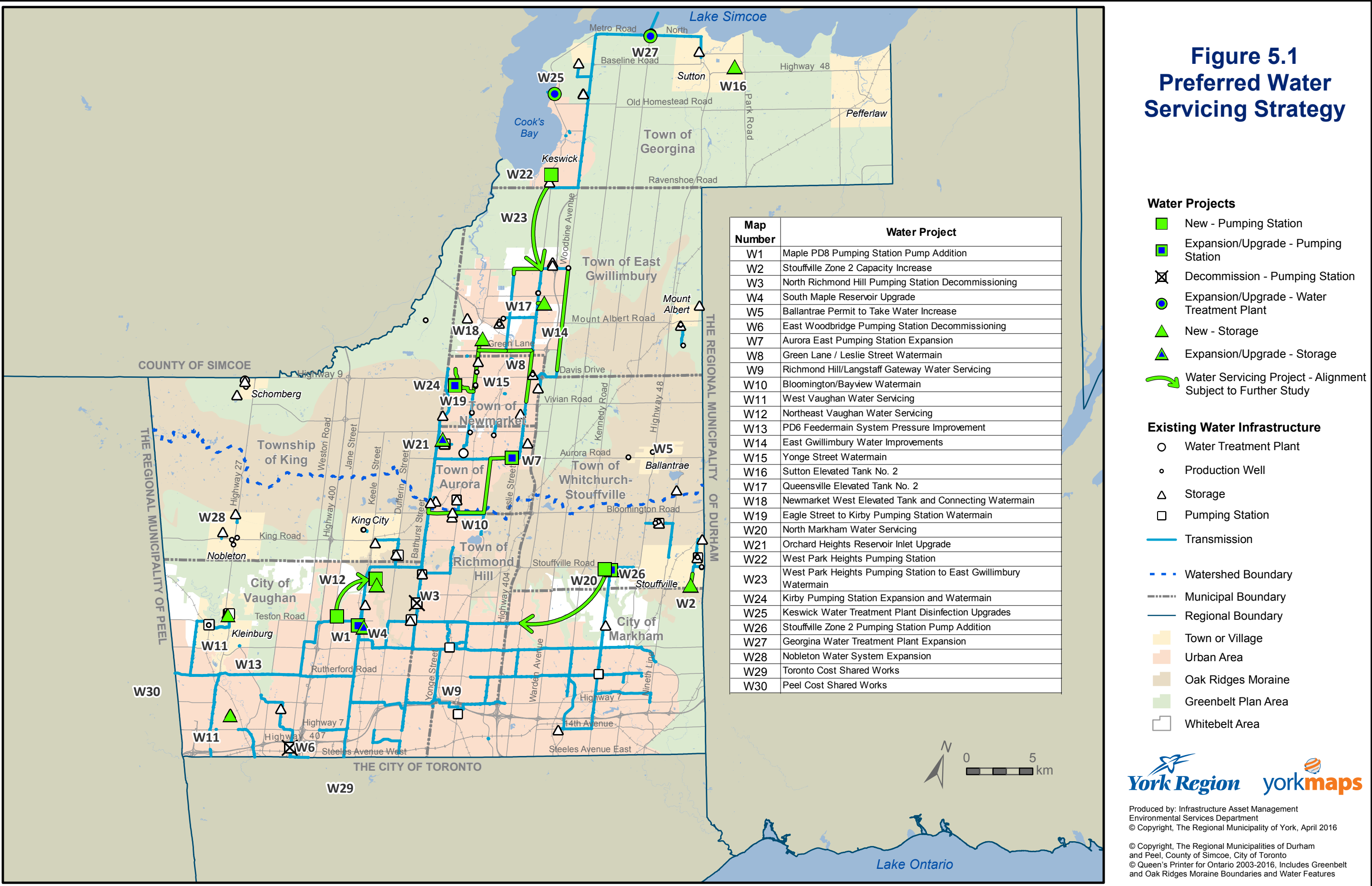


Figure 19: Regional Preferred Water Strategy

2.5 Assessment of Existing and Future Water Infrastructure

A critical step in the Master Planning process is the assessment of the existing infrastructure to establish the water system baseline conditions. These baseline conditions will become the basis of the future recommendations of the Master Plan, therefore it was important to ensure that they were determined through a comprehensive detailed analysis of the system. Once the existing system conditions were established, the potential impacts of the future growth demand on the water distribution system were analyzed to develop and recommend future servicing strategies.

The following sections describe current opportunities and constraints within the existing water system and assess the system's ability to accommodate growth within the 2041 planning horizon, with considerations for post-period growth.

2.5.1 Assumptions

The objective of the Town's Water Master Plan is to assess the performance of the distribution system and its ability to convey potable water from the Regional infrastructure to the consumers. It is assumed that the Regional infrastructure can provide sufficient supply and storage. Although the Regional infrastructure is not part of the Town's Master Plan, the servicing strategy will be developed with system flexibility in mind should any Regional infrastructure fail to meet the needs of the distribution system under extraordinary conditions.

It is assumed that under a fire scenario, the Stouffville Zone 2 Pumping Station from Markham and Ballantrae wells are turned on, which is required to provide fire flow protection in the Stouffville and Ballantrae-Musselman's Lake systems respectively. This assumption was confirmed by the Town.

Sustainability principles will also be considered in the development of the servicing strategy, including:

- Making best use of existing infrastructure
- Minimizing cost of new infrastructure
- Considering operation and maintenance costs to ensure financial sustainability
- Ensuring long-term reliability and security of the water and wastewater system.

The following sections document the logic behind the development of the servicing strategy to provide transparency and ensure that the proposed capital program is defensible.

2.5.2 Opportunities and Constraints

Existing and future water opportunities and constraints were identified through discussions with Town staff, as well as through hydraulic analyses and review of infrastructure data (e.g. GIS, design reports, as-built information, etc.). The WaterCAD hydraulic model for the Community of Stouffville and Ballantrae-Musselman's Lake was

used to analyze the performance of the existing and future system under different demand conditions such as ADD, MDD, PHD, and MDD+FF.

2.5.2.1 Stouffville

In general, the water distribution system for the Community of Stouffville has sufficient capacity to provide adequate pressures under ADD and PHD conditions. The primary issues relate to the system's ability to provide adequate fire flow protection to key areas, such as the downtown core. Figure 20 highlights some of the key opportunities and constraints within the Community of Stouffville's water distribution system.

The key issues and constraints identified by the Town and through the modelling exercise include:

- Low chlorine residuals at dead ends, primarily in Zone 1
- Inability to provide adequate fire flow protection, primarily along Main Street in the downtown core. This is an existing issue that is made worse by growth. There is significant intensification proposed in the downtown area where there are a lot of old and small cast iron watermain.
- Low pressures arise in the northeast corner of Zone 2, east of Ninth Line and north of Main Street, as a result of growth.
- There is an overall conveyance issue from the Zone 2 elevated tank to west side of the system. There is significant headlosses along Tenth Line and Main Street, the primary trunk infrastructure, under PHD or during a fire in Zone 2.

The following lists key opportunities identified by the Town and through the modelling exercise:

- The Town has an ongoing State of Good Repair (SOGR) program that focuses on replacing aging watermain, which lead to frequent watermain breaks and higher leakage due to structural defects. As intensification occurs along Main Street, and new development is underway, there is opportunity to align any upsizing or replacing of aging watermain to provide the additional capacity that is required to accommodate growth. The focus should be on small diameter cast iron and ductile iron watermain.
- The Town has recently installed a new 300mm diameter watermain along Main Street from Tenth Line to Park Drive. Continuing along Main Street to Ninth Line would improve the conveyance from the Zone 2 elevated tank to the west side of the Zone 2 pressure zone.
- There is a surplus of storage in Zone 1. Installing new PRVs between Zone 1 and Zone 2 would provide additional supply to Zone 2 under emergency conditions, increasing the pressures under PHD and available fire flow.
- New infrastructure will be required as new development occurs, especially in the northwest and northeast corners of the serviced area. There are opportunities to

provide addition system looping to help with dead ends and provide greater system flexibility.

2.5.2.2 Ballantrae-Musselman's Lake

In general, the water distribution system for the Ballantrae-Musselman's Lake community has sufficient capacity to provide adequate pressures under ADD and PHD conditions. The primary issues relate to the system's ability to provide adequate fire flow protection. Figure 21 highlights some of the key opportunities and constraints within the Ballantrae-Musselman's Lake water distribution system.

The key issues and constraints identified by the Town and through the modelling exercise include:

- There is no major trunk system from Musselman's Lake elevated tank to the remainder of the system therefore there is significant headloss during a fire scenario.
- There are various dead ends servicing key customers, such as the local school and community centre, making it difficult to provide adequate fire flow protection.

The following lists key opportunities identified by the Town and through the modelling exercise include:

- Additional capacity from the elevated tank to the centre of the network would increase the overall fire flow protection throughout the systems required to increase the fire flow protection.
 - Opportunities to align capital water projects with state-of-good-repair of the road along the lake.
- Looping of dead ends would improve available fire flow.

2.5.2.3 Highway 48 Booster Pumping Station

Potable water servicing was extended from the Community of Stouffville to Highway 48. The boosted system services a few homes, small businesses, and the golf course however does not provide any fire flow protection. Figure 20 and **Figure 21** highlight some of the key opportunities and constraints for the Highway 48 boosted system.

The key issues and constraints identified by the Town and through the modelling exercise include:

- The Highway 48 Booster Pumping Station is nearing the end of its servicing life.
 - There are many operational issues with this station and ongoing maintenance.
- The system is a single watermain with a dead end.
- There have been many customer complaints over the past few years of interrupted service as there are many watermain breaks downstream of the station

- Based on the topography, the servicing along Highway 48 ranges from 40psi to 100psi.

The following lists key opportunities identified by the Town and through the modelling exercise include:

- There is opportunity to improve the performance of the Highway 48 system by connecting the north end to the Ballantrae-Musselman's Lake system.
- There is opportunity to align watermain works with state-of-good repair program.

2.5.2.4 Gormley, Bloomington, Vandorf-Preston Lake

Currently the communities of Gormley and Vandorf-Preston Lake do not have municipal water services. Through the master planning process and consultation with the public, interest was identified for potential extension of municipal water services to these communities.

The following key issues and constraints were identified:

- Currently there is no existing municipal water infrastructure within these communities.
- The communities are located within the Oak Ridges Moraine and Greenbelt Plan Protected Countryside.
- The Oak Ridges Moraine Conservation Plan restrict "partial servicing" of water or wastewater services.
- The Greenbelt Plan restricts the extension of lake-based water and wastewater services.

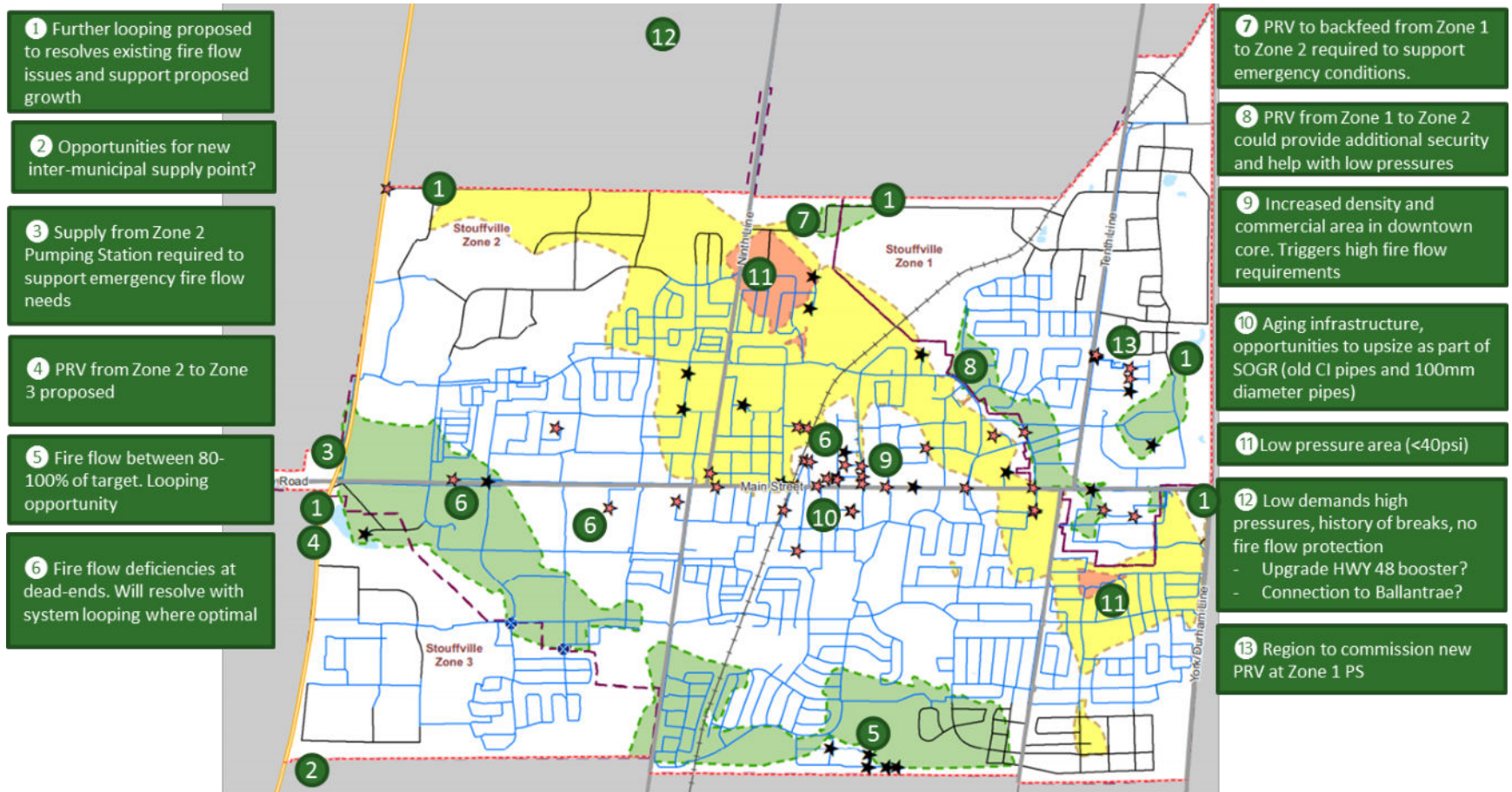


Figure 20: Stouffville Water System Opportunities and Constraints

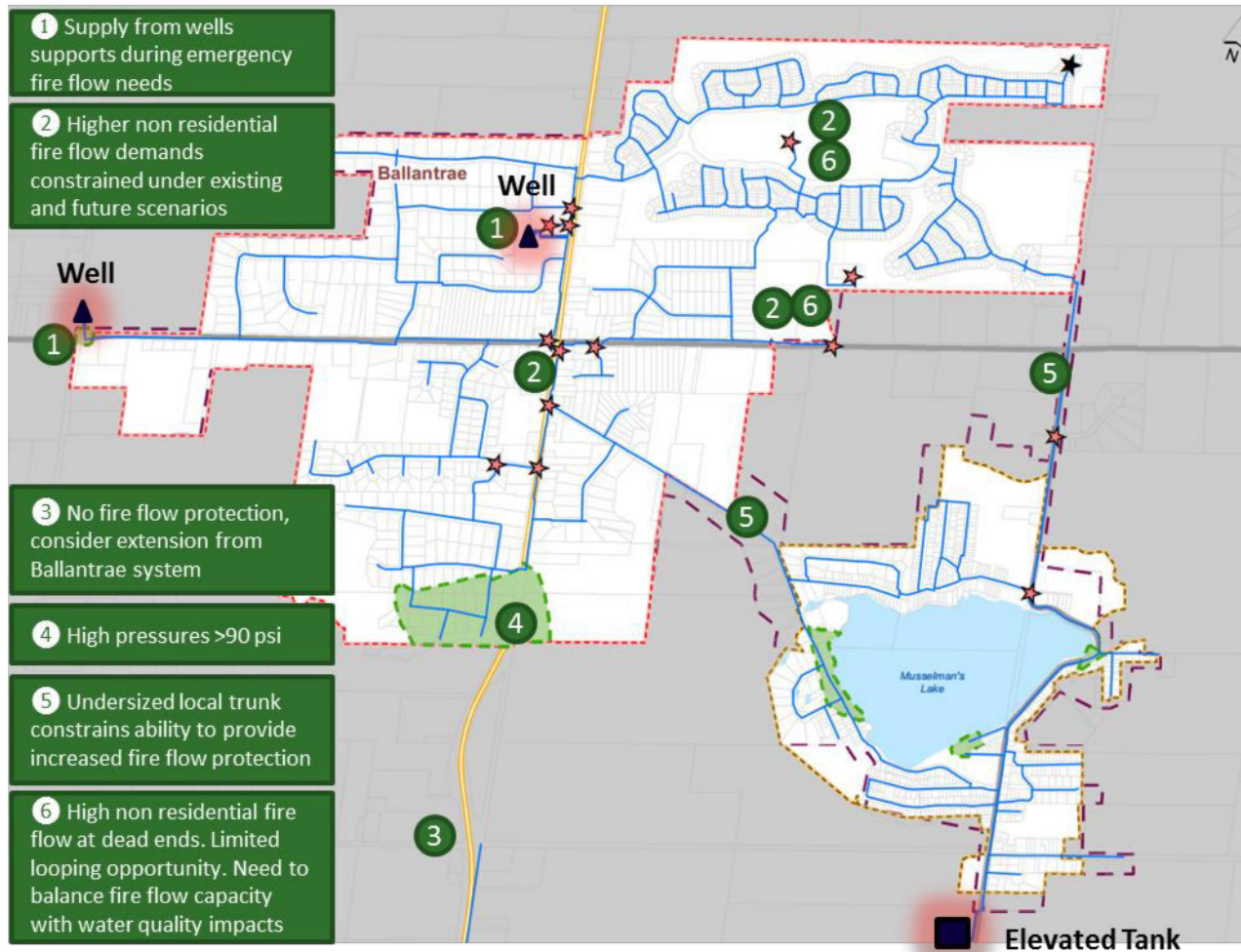


Figure 21: Ballantrae-Musselman's Lake Water System Opportunities and Constraints

2.6 Water Servicing Strategy

The identification and assessment of servicing alternatives is a critical component of the master planning process. It allows for a comprehensive review of various servicing solutions to provide transparency and a recommended strategy that is defensible.

As part of this Master Plan, water alternative servicing strategies were reviewed for existing and future growth areas in order to select the servicing strategies that:

- Make best use of existing infrastructure to avoid new infrastructure where possible
- Minimize cost of new infrastructure
- Consider operation and maintenance costs to ensure financial sustainability
- Ensure long term reliability and security of the water system
- Increase system resilience to climate change
- Avoid/minimize environmental crossings and other disruptions to the environment where possible
- Avoid cemeteries and disruptions to cultural heritage resources
- Plan for future infrastructure within the existing road right-of-way where possible
- Avoid/reduce production of Green House Gas Emissions
- Avoid/minimize impact to areas that could represent a significant drinking water threat

2.6.1 Servicing Strategy Development

Alternative water servicing strategies were identified and reviewed for existing and future growth areas within the Town of Whitchurch-Stouffville in order to select the best servicing solutions for the system. Collectively, all the area specific servicing solutions will form the overall water servicing strategy for the Town.

The following sections summarize the development of the alternative servicing strategies for key growth areas within the Town of Whitchurch-Stouffville.

2.6.1.1 Objectives

The primary objective of the water servicing strategy will be to build off the configuration of the existing systems. The existing Community of Stouffville water system is a sub-trunk looping system without a distinct spine network. **Figure 22** highlights the existing system where the thicker black lines represent the 300-400mm diameter watermains that form various loops throughout the system.

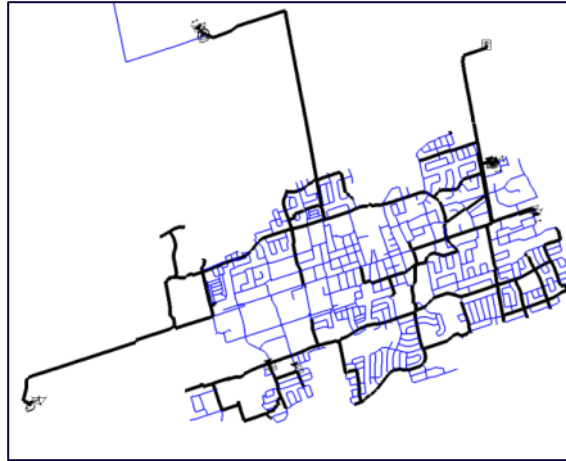


Figure 22: Existing Community of Stouffville Water System Looping

The previous master plan proposed a continuation of the sub-trunk looping approach and applied it to the future infrastructure required to accommodate the proposed Greenfield growth, shown in **Figure 23**. The thick red lines represent the proposed capital projects that close dead ends and create quadrant looping. This strategy strengthens the overall network and provides great system flexibility.

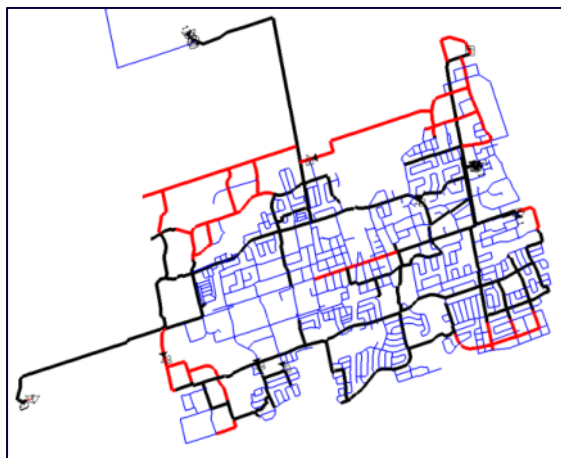


Figure 23: Future Looping Proposed in Previous Master Plan (red)

A second objective for the water servicing strategy is to provide system flexibility to accommodate changes in growth projections and under emergency conditions, should

supply sources be interrupted. Any opportunities for system optimization and improving existing levels of service were incorporated into the development of the water servicing strategy.

The final objectives for the water servicing strategy is to include considerations for climate change and source water protection areas. The ability to reduce energy use through decommissioning of pumping stations, reducing stress on the wells by properly utilizing storage, and minimizing the need for new infrastructure, help reduce contribution to greenhouse gas emissions and impacts on climate change.

As part of this master plan, an alternative servicing strategy was reviewed that includes strengthening of the spine network along Main Street, Ninth Line, and Tenth Line, creating a direct connection between Regional facilities; see **Figure 24**. **Table 23** summarizes the evaluation of the sub-trunk looping system and the spine network alternative.

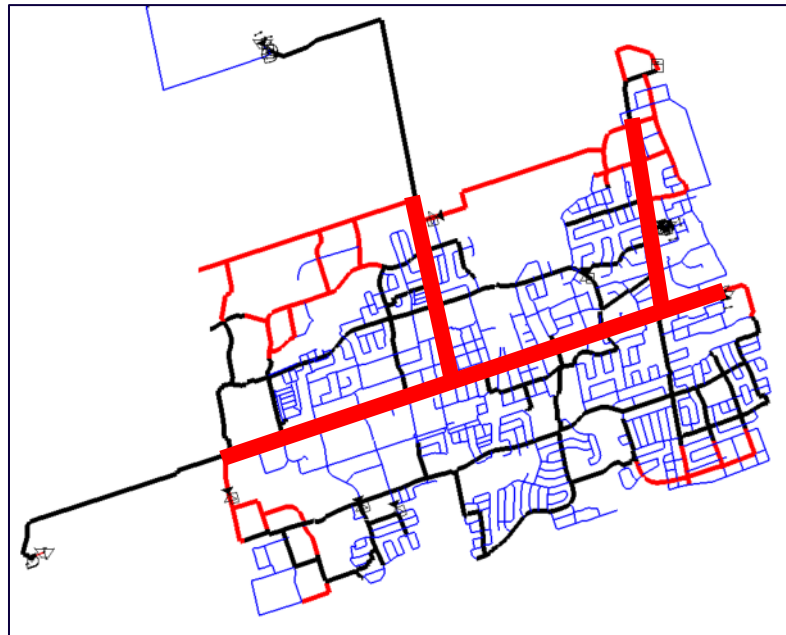


Figure 24: Spine Network Alternative

Table 23: Evaluation of System Wide Servicing Alternatives

Pros/Cons – Sub-trunk Looping	Pros/Cons – New Spine Network
Maximizes use of existing infrastructure	Strengthens conveyance between facilities
Builds off watermain existing upgrades along Main Street	Significant new trunk infrastructure (high cost)

Pros/Cons – Sub-trunk Looping	Pros/Cons – New Spine Network
New sub-trunk watermain required regardless to accommodate new greenfield growth. Can utilize this infrastructure to optimize system.	Greater impacts on the climate (higher greenhouse gas emissions associated with construction of significant new infrastructure)
Avoids major construction and disruption along Main Street	Would require upsizing of recently constructed Main Street watermain
Minimizes construction in close proximity to cultural heritage resources	Major construction in area with cultural heritage resources.

2.6.1.2 Stouffville – SOGR in the Downtown Core

As highlighted in **Section 2.5.2.1**, there are existing fire flow deficiencies in the downtown core, where significant intensification is likely to occur. The downtown core is the oldest part of the Town and contains a lot of old and undersized cast iron and ductile iron watermain, which are limiting the capacity to convey peak hour demands and fire flow protection. The Town has a well-established state of good repair program and has been replacing these watermain over time.

There is a good opportunity to align the intensification strategy with the ongoing SOGR projects. As part of the preferred servicing strategy, it is recommended that the replacement of these old watermain continue, to minimize frequent watermain breaks and high leakage due to structural defects, focusing firstly on the more critical ones that help improve capacity within the proposed intensification pockets; the critical state of good repair watermain have been highlighted in **Figure 25** along the Main Street corridor.

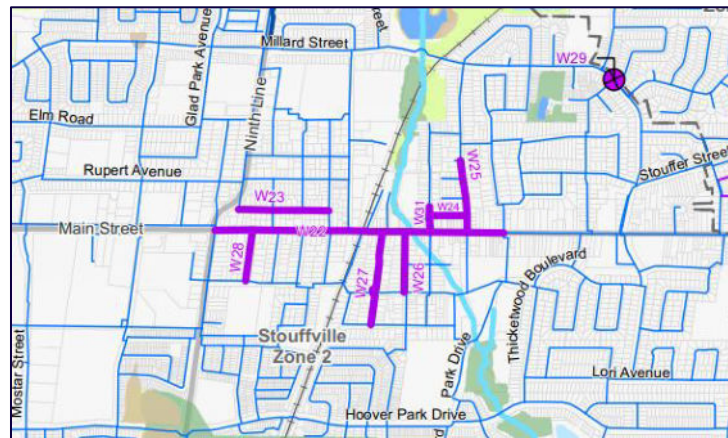


Figure 25: Proposed Capital Projects to Align with SOGR Program

2.6.1.3 Stouffville – Main Street

The most critical capital project in the downtown core is the continuation of the Main Street upgrades (300 mm diameter watermain), from Park Drive to Ninth Line, see **Figure 25**. These upgrades strengthen the conveyance from the Zone 2 elevated tank to the downtown core and west side of the Zone 2 pressure zone. This capital project has

significant impact on available fire flow protection in the area of high intensification. A portion of the Main Street upgrade will have a railway crossing.

2.6.1.4 Stouffville – Quadrant-Looping

Significant Greenfield growth is proposed in the northwest and northeast quadrants of the Stouffville system. It is recommended that the overall strategy of sub-trunk looping be continued in these areas of the Town as development occurs. These additional quadrant-looping networks will strengthen the overall system and provide greater operational flexibility, see **Figure 26**.

The proposed trunk watermain along the northern portion of the servicing boundary, between Tenth Line and Ninth Line, connects Zone 1 and Zone 2. Installing a PRV along this watermain will create a critical system loop that allows Zone 1 to supplement Zone 2 during emergency conditions; this is further discussed in **Section 2.6.2.1**. It is recommended that this watermain be upsized from a 250 mm diameter, which is sufficient for the approved growth, to a 300 mm diameter watermain to provide flexibility for any future expansion of the servicing boundary, to the north. A portion of the Northeast looping will have a railway crossing.

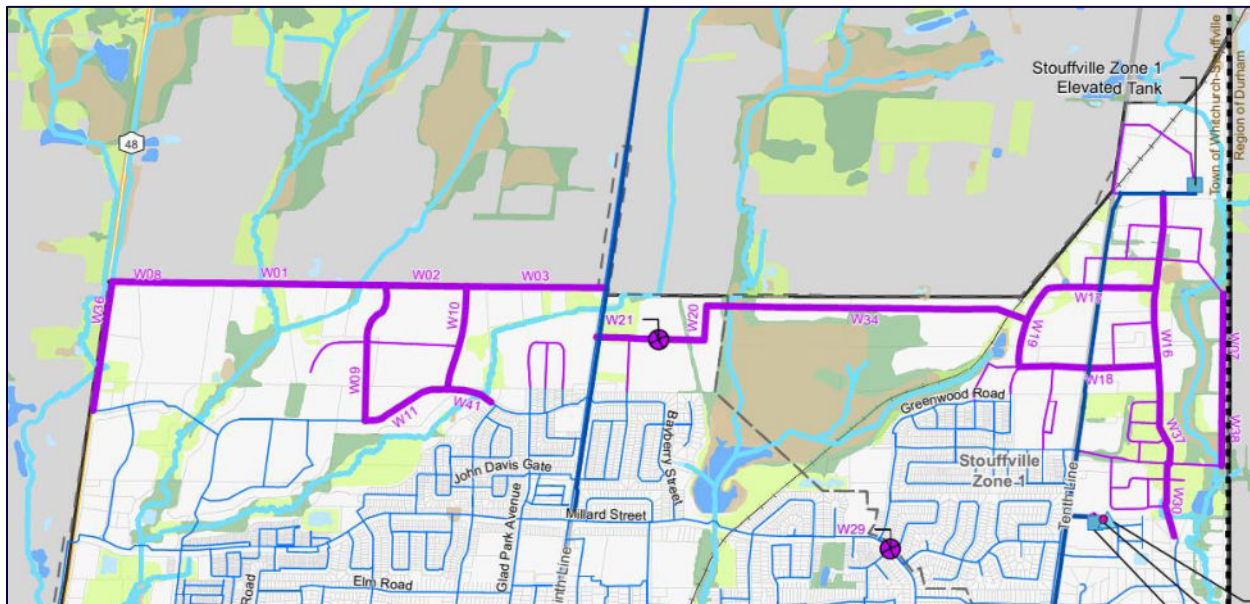


Figure 26: Northeast and Northwest Quadrant Looping

2.6.1.5 Souffville – Alternate Zone 3 Supply

The supply to Zone 3 is sufficient under existing demands, however as growth occurs, a secondary supply from Main Street would provide additional flexibility and security of supply. This new supply point to Zone 3 is also critical for fire flow protection to the proposed industrial area. A PRV is required as it is supplying flow from Zone 2.

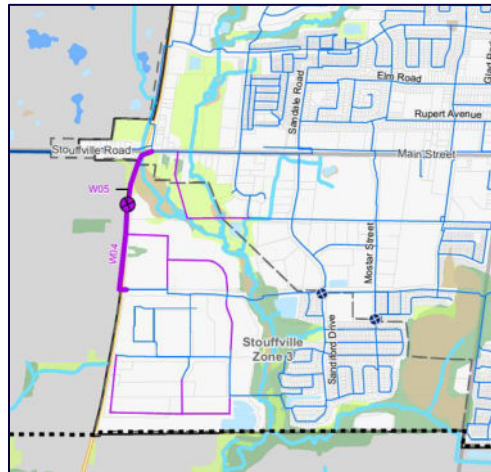


Figure 27: Alternate Zone 3 Supply

2.6.1.6 Stouffville – Regional Storage Strategy

The Region is currently undertaking a storage master plan for the Stouffville system. GM BluePlan met with the Town and the Region to discuss the preliminary findings and collaborate, as both projects are being completed concurrently.

There is currently a small deficit in Zone 2/3 storage and an excess of storage in Zone 1. The Region has adopted a new policy that each individual pressure zone does not have to have sufficient floating storage if it can be supplied by an upper zone via PRVs under peak demand, fire flow, or emergency conditions.

Incorporating the Regional storage strategy into the Town's master plan, Zone 2/3 storage can be supplemented by Zone 1 via two PRVs, **Figure 28**:

1. Along Millard Street, preliminarily proposed by the Region as part of their storage master plan.
2. Along the future watermain between Ninth Line and Tenth Line, at the northern servicing boundary, as outlined in **Section 2.6.1.4**.

These two PRVs would improve the low pressures in the northeast quadrant of Ninth Line and Millard Street, and significantly improve the available fire flow protection within the Zone 2 pressure zone.

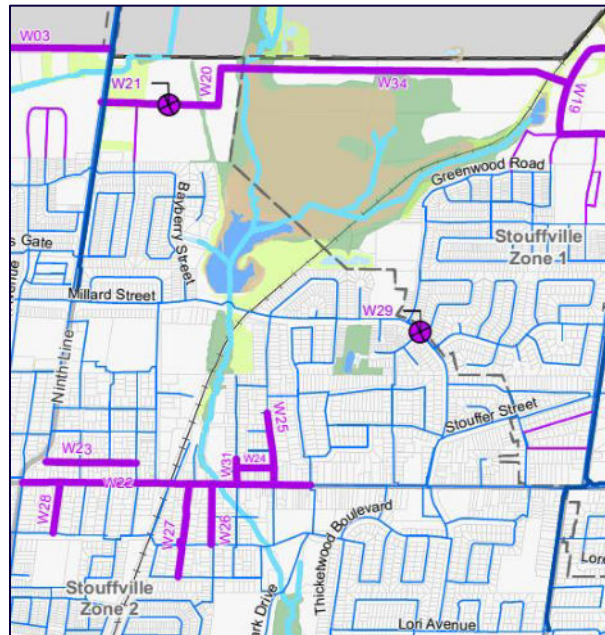


Figure 28: Supplement Zone 2 from Zone 1 via Two New PRVs

2.6.1.7 Ballantrae-Musselman's Lake

The preferred water servicing strategy for Ballantrae-Musselman's Lake is ultimately a system optimization plan. There is relatively small amounts of growth proposed within the existing system and the existing system pressures would not be significantly impacted. The primary objective is to develop a strategy that improves on the existing, and future, fire flow protection.

Three alternatives were considered and **Table 24** summarizes the pros and cons of each:

- Alternative 1: Looping the dead end at the community centre to Ninth Line.
- Alternative 2: Increase capacity from the elevated tank along Lakeshore Road.
- Alternative 3: Increase capacity from the elevated tank along Ninth Line.

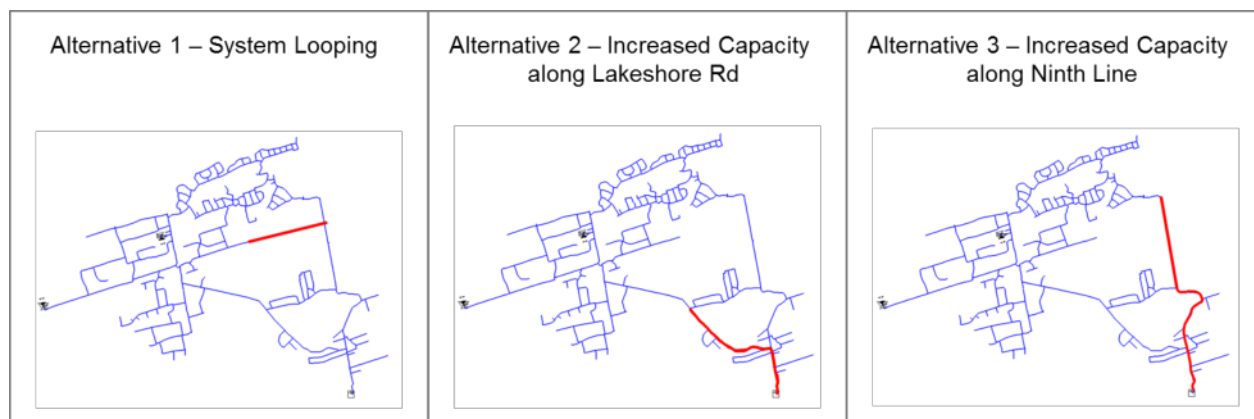


Figure 29: Ballantrae-Musselman's Lake Servicing Alternatives

Table 24: Comparison of Servicing Alternatives for the Ballantrae-Musselman's Lake System

Alternative	Pros	Cons	Cost
1 – System Looping (1 km of 300mm)	Least costly alternative Does not require upgrades along Musselman's Lake	Only small improvement in fire flow protection Does not meet objectives Alignment is outside of servicing boundary	Low
2 – Increased Capacity along Lakeshore (2 km of 300mm)	Significantly improves fire flow protection Improves overall system conveyance to tank Allows for synergy with potential Highway 48 optimization plan Potential to align with Road State of Good Repair projects	Alignment is along water, higher construction risk compared to Alternative 1	Medium
3 – Increased Capacity along Ninth Line (3km of 300mm)	Provides moderate improvement in fire flow protection. Still does not meet LOS objectives.	Most costly alternative Does not meet objectives Alignment is along water, higher construction risk Along Regional road More infrastructure resulting in greater greenhouse gas emissions during construction	High

The preferred servicing strategy for the Ballantrae-Musselman's Lake water distribution system is to increase the capacity of the trunk network from the Musselman's Lake elevated tank to the centre of the system along Lakeshore Road (*Alternative 2*). This is the only alternative that meets the level of service objectives and provides additional opportunities for the implementation of the proposed Highway 48 servicing strategy,

Section 2.6.1.8.

The existing linear infrastructure along Lakeshore Road is likely in good condition as it is relatively new; therefore, the proposed strategy is to twin the watermains from the elevated tank to Connor Drive, which would also minimize disruption to existing services. It is recommended that this project be aligned with any road state of good repair projects along Lakeshore Road, which have been identified by the Town as a need in the near future.

2.6.1.8 Highway 48 Booster

The preferred water servicing strategy for the Highway 48 boosted pressure zone is ultimately a system optimization plan as there is no proposed growth within this serviced area. The primary objective is to improve system pressures, resolve the ongoing operational and maintenance issues associated with the Highway 48 Booster Station, and minimize service disruptions associated with watermain breaks.

Two alternatives were considered and **Table 25** summarizes the pros and cons of each:

- Alternative 1: Upgrades to the Highway 48 Booster Station
- Alternative 2: Extension from Ballantrae-Musselman's Lake system.

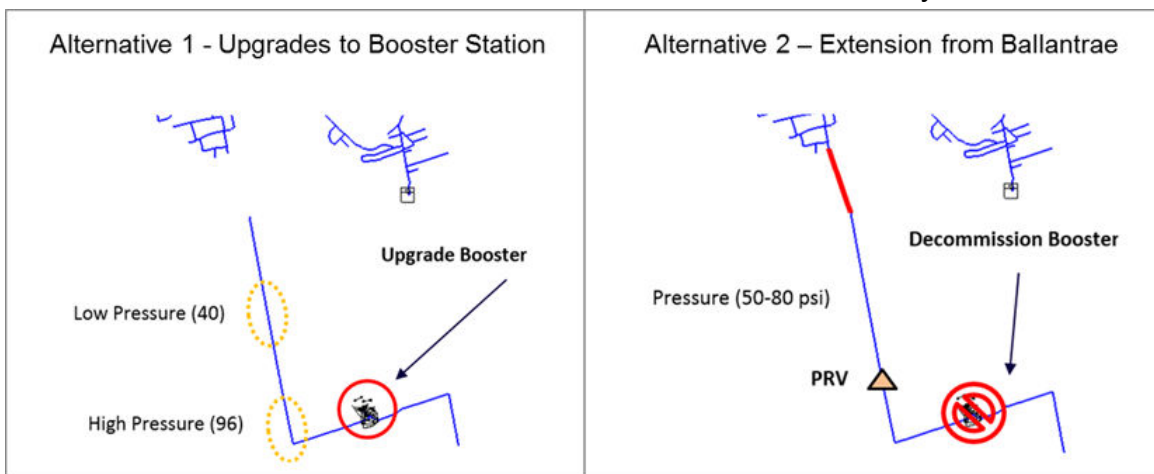


Figure 30: Highway 48 Servicing Alternatives

Table 25: Comparison of Servicing Alternatives for Highway 48 Area

Alternative	Pros	Cons	Cost
1 – Replace booster station	Does not require any new infrastructure outside of servicing boundary Less costly alternative	Does not address pressure issues, continued operational constraints Requires SOGR on discharge watermain from booster to Highway 48 High operation and maintenance costs	Low
2 – Extension from Ballantrae, decommission booster, new PRV	Can maintain adequate pressures along entire main with a PRV No operation and maintenance associated with booster pumping station Opportunity for future fire flow protection by upsizing during SOGR (synergy with proposed Ballantrae servicing strategy) Energy saving and reduced impact to climate change	Requires 850m of new watermain extended from Ballantrae system Costlier alternative	High

The preferred servicing strategy for the Highway 48 area is to extend the dead end watermain and connect to the Ballantrae system so that the existing Highway 48 Booster Station can be decommissioned. This strategy is more costly than Alternative 1 but provides much greater long-term benefits. This strategy would:

- Eliminate the ongoing operation and maintenance issues with the Highway 48 Booster
- Improve overall pressures along Highway 48 (50-80 psi)
- Eliminate lifecycle costs to the Region associated with the booster station
- Provide synergy with the Ballantrae-Musselman's Lake servicing strategy
- Provide opportunities for future fire flow protection. Align upsizing of the watermains along Highway 48 with the SOGR program.

It is recommended that the Region and Town complete a joint study to investigate the opportunity to decommission the Highway 48 Booster Station and service Highway 48 customers from the Ballantrae-Musselman's Lake system.

2.6.2 Preferred Water Servicing Strategy

The recommended water servicing strategy can be broken down into various components that have different aims but each contributing to the overall improvement of the existing system and service the projected growth to 2041.

2.6.2.1 Community of Stouffville

The preferred servicing strategy was developed to ensure that extension of the water distribution system follows the existing sub-trunk looping strategy, that existing infrastructure can support intensification within the downtown core and follows an integrated approach with the Town's state of good repair program.

In general, the water servicing strategy for the Community of Stouffville consists of:

- Aligning the intensification strategy with the ongoing SOGR projects in the downtown core.
- Continuation of the Main Street upgrades. This will significantly improve the available fire flows along the Main Street corridor.
- Build off the existing system configuration of sub-trunk looping. Applying this approach to the proposed Greenfield growth areas will allow for critical looping within each quadrant of the system, along the servicing boundaries. This strengthens the overall system and provides greater operational flexibility.
- Build off the regional storage strategy of supplementing Zone 2 from Zone 1.

Key capital projects required to achieve this strategy includes:

- 3 km of watermain upgrades along Main Street corridor. Primarily replacing of old cast iron watermain.
- New watermain along Highway 48 to connect Main Street to Zone 3. New PRV required.
- New 300 mm diameter watermain along Bethesda Road, at the northern limits of the servicing boundary, to connect Tenth Line to Highway 48.
- Two new Zone 1 to Zone 2 PRVs.

2.6.2.2 Community of Ballantrae-Musselman's Lake

The water servicing strategy for the Community of Ballantrae-Musselman's Lake consists of:

- Strengthen the trunk network from the Musselman's Lake Elevated Tank to the centre of the distribution system.

Key capital projects required to achieve this strategy includes:

- 2 km of new 300 mm diameter watermain along Ninth Line and Lakeshore Road. A twinning of the existing watermain.

2.6.2.3 Servicing of Highway 48

It is recommended that the Region and Town complete a joint study to investigate the opportunity to decommission the Highway 48 Booster Station and service highway 48 customers from the Ballantrae-Musselman's Lake system.

The water servicing strategy for servicing of Highway 48 customers:

- Improve pressures along Highway 48 and eliminate the operational and maintenance challenges associated with the Highway 48 Booster Station by connecting the existing dead end to the Ballantrae-Musselman's Lake system.

Key capital projects required to achieve this strategy includes:

- 1 km of new 250 mm diameter watermain along Highway 48
- New PRV along Highway 48, in proximity of Bloomington Road
- Decommissioning of Highway 48 Booster Station.

In addition to the key capital projects, several other projects and upgrades are included within the water servicing strategy to address existing and future capacity needs within the collection system. The complete Preferred Water Strategy for the Town of Whitchurch-Stouffville is presented in **Figure 31** and **Figure 32**. Each capital project is listed along with its respective estimated capital cost in **Table 26**.

The Master Plan recommends that a separate study be carried out to evaluate the potential for municipal water and wastewater services for the communities of Gormley and Vandorf-Preston.

Town of Whitchurch-Stouffville Water and Wastewater Master Plan

Recommended Strategy - Water System Community of Whitchurch-Stouffville

Figure 31

Proposed Water System

- MP Capital Project - Pressure Reducing Valves (PRV)
- MP Capital Project - Booster Pumping Station (BPS)

- MP Capital Project - Watermain
- Future Local Network

Existing Water System

All pumping stations, water storage, and supply wells are owned by the Region.

Regional Owned

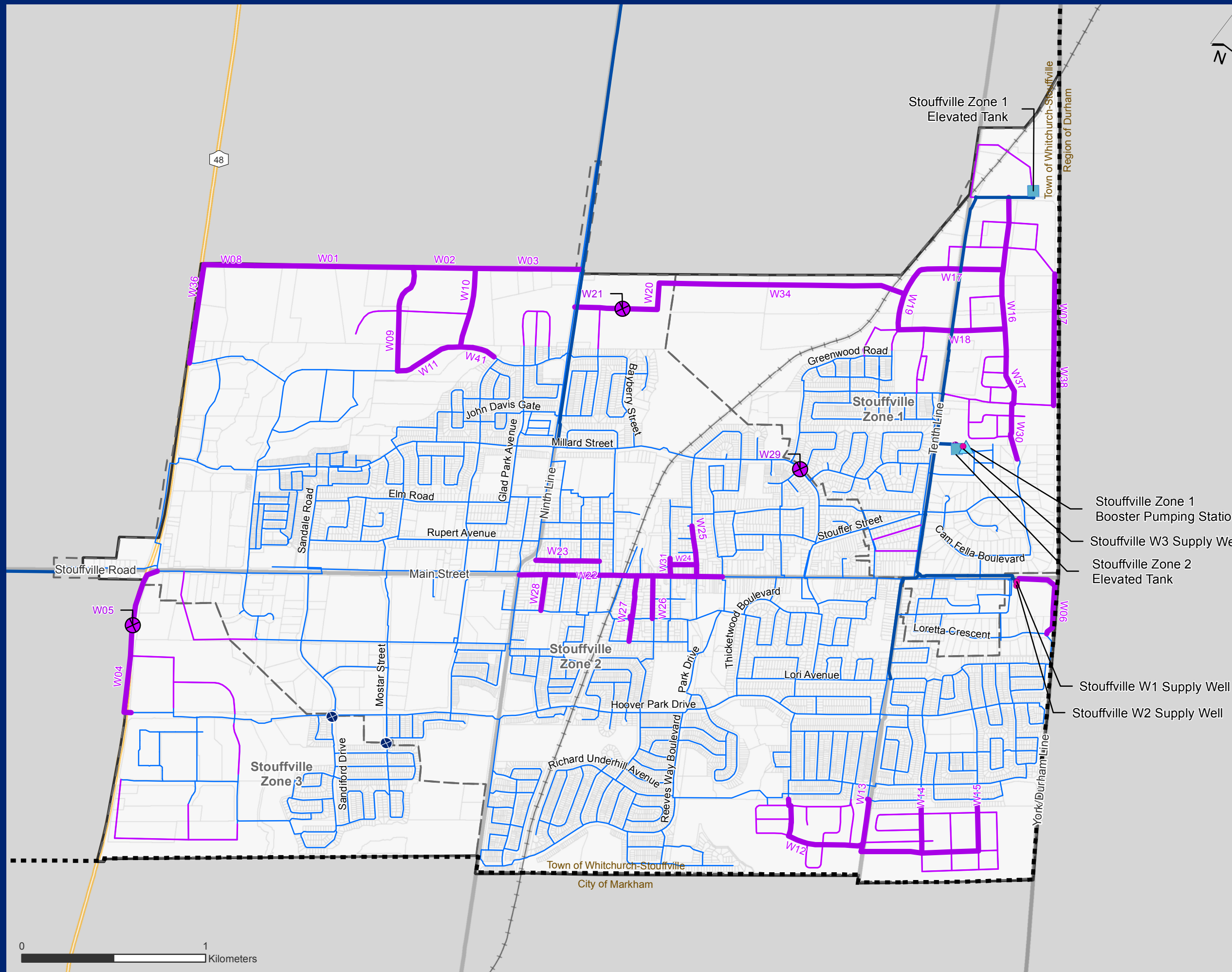
- Pumping Station
- Water Storage
- Supply Well
- Pressure Reducing Valves (PRV)
- Watermains (Regional)

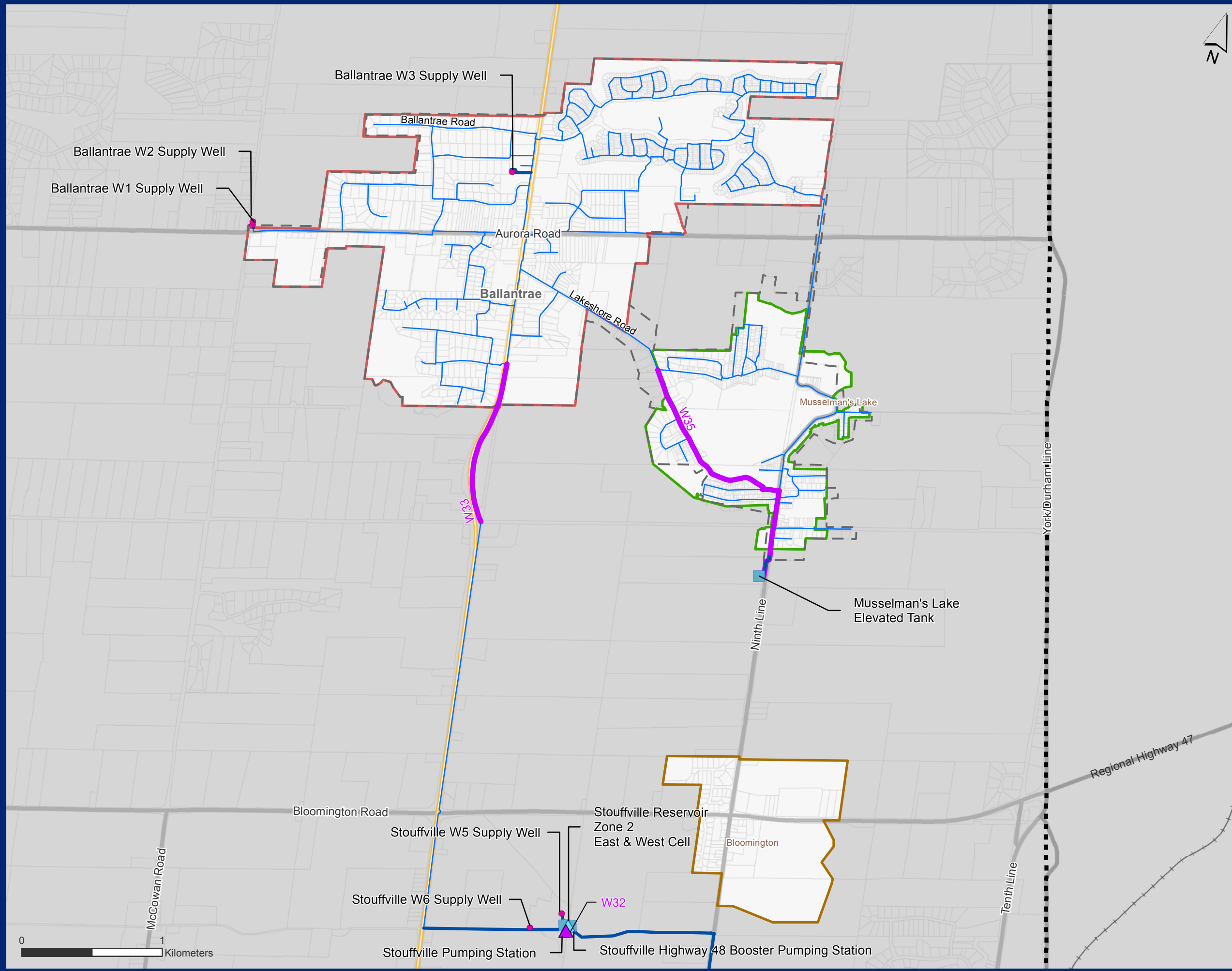
Municipal Owned

- Pressure Reducing Valves (PRV)
- Watermains (Municipal)
- Existing Water
- Pressure Districts

General Features

- Study Area
- Municipal Boundary
- Freeways and Provincial Highways
- Railway





**Town of Whitchurch-Stouffville
Water and Wastewater Master Plan**

**Recommended Strategy - Water System
Ballantrae and Musselman's Lake**

Figure 32

Proposed Water System

-  MP Capital Project - Pressure Reducing Valve (PRV)
-  MP Capital Project - Booster Pumping Station (BPS)
-  MP Capital Project - Watermain
-  Future Local Network

Existing Water System

All pumping stations, water storage, and supply wells are owned by the Region.

Regional Owned

-  Pumping Station
-  Water Storage
-  Supply Well
-  Pressure Reducing Valves (PRV)
-  Watermains (Regional)

Municipal Owned

-  Pressure Reducing Valves (PRV)
-  Watermains (Municipal)
-  Existing Water Pressure Districts

General Features

-  Ballantrae
-  Bloomington
-  Musselman's Lake
-  Municipal Boundary
-  Freeways and Provincial Highways
-  Railway

2.7 Capital Program

As described in the previous sections, the Preferred Water Servicing Strategy has been developed to support the servicing needs of the existing and future growth areas within the Community of Stouffville to 2041. The capital costs for each project of the Preferred Strategy were estimated according to the costing methodology within **Section 2.1.4**. These projects are listed according to their project number and are shown in **Table 26**. The capital program table contains project descriptions, dimensions, proposed timing, and estimated total project cost.

The water capital program will work as a foundation for the Town of Whitchurch-Stouffville Capital Budget. The capital program provides a list and timing of new assets that the Town will have to operate and maintain; and therefore, it is the starting point for the planning of operation and maintenance costs and resources allocation for new water infrastructure.

2.7.1 Implementation Plan

As outlined in **Section 1.4** of this report, the Water and Wastewater Master Plan sets out to satisfy the Class EA Master Plan Approach 1 requirements according to the MEA Class EA document. The Preferred Water Servicing Strategy will support the servicing needs of the Town of Whitchurch-Stouffville's future growth to 2041. This strategy will be implemented in accordance with each project Class EA schedule.

The Class EA requirements for each project have been identified in the Capital Program. Schedule A and A+ projects may move forward to design and construction, with A+ projects requiring public notification prior to implementation. Schedule B or equivalent projects that have been identified within the Preferred Water Servicing Strategy will be part of a developer-led local servicing plan and approved through the Planning Act Municipal development review process or will be satisfied through separate Class EA study prior to design and construction. The Preferred Water Strategy did not identify any Schedule C projects.

Further, any future Water EA project in the Town of Whitchurch-Stouffville should include the results of other Class EAs projects where applicable such as the York Region's Ballantrae Long Term Water Supply Class EA (including York Region's Potential Shallow Groundwater Rise Study), and the Stouffville Long-term Water Supply and Servicing Class EA Study.

During the next steps of the implementation program, primarily during detailed design of the projects, the following requirements should be considered:

- Finalization of property requirements
- Refinement of infrastructure alignment
- Identification of preferred construction methodologies

- Completion of additional supporting investigations as required (e.g. geotechnical, hydrogeological, etc.)
- Review and mitigation of potential construction related impacts
- Satisfying of all provincial, municipal and conservation authority approval requirements

With respect to Town planning and budgeting, this program will be utilized as a high-level baseline estimate for the Town capital budget. These costs will be further developed and refined during the implementation phases as detailed information becomes available.

The anticipated timing of each project within the Preferred Strategy has been established based on the projected population and employment growth within the Town of Whitchurch-Stouffville. The water program's project scheduling has also been cross-referenced with the wastewater program to ensure project coordination along common alignments.

Given the growth-related nature of the servicing strategies, the water capital program forms the foundation for the water component of the Town of Whitchurch-Stouffville Development Charges (DC) By-Law.

Table 26: Water Capital Program

Master Plan ID	Project Name	Project Description	Year in Service	Municipality	Class EA	Size/Capacity	Length (m)	Class Estimate Type	Project Complexity	Area Condition	Base Construction Cost (\$2018)	Crossings (\$2018)	Additional Costs (\$2018)	Soft Costs (\$2018)	Non-Refundable HST (\$2018)	Total Estimated Cost (\$2018)
W01	Bethesda Side Road #1	New 300 mm diameter watermain along Bethesda Side Road from Ninth Line to W10. Two creek crossings.	2023	Stouffville	A+	300 mm	871	Class 4	High	Rural	586,000	243,000	276,000	639,000	30,000	\$ 1,806,000
W02	Bethesda Side Road #2	New 300 mm diameter watermain along Bethesda Side Road from W10 to W09	2023	Stouffville	A+	300 mm	336	Class 4	Low	Rural	226,000	-	50,000	103,000	7,000	\$ 396,000
W03	Bethesda Side Road #3	New 300 mm diameter watermain along Bethesda Side Road from W09 to W08	2023	Stouffville	A+	300 mm	573	Class 4	Low	Rural	385,000	-	83,000	172,000	11,000	\$ 661,000
W04	Hwy 48 #1	New 300 mm diameter watermain along Hwy 48 from Main Street to Hoover Park Drive. One creek crossing	2021-2026	Stouffville	A+	300 mm	862	Class 4	High	Rural	580,000	206,000	258,000	600,000	28,000	\$ 1,693,000
W05	PRV Hwy 48	New Zone 2/3 PRV along Hwy 48, south of Main Street. Exact location to be determined.	2021-2026	Stouffville	A+	0 mm	0	Class 4	Low	Rural	50,000	-	-	18,000	1,000	\$ 69,000
W06	York Durham Line #1	New 300 mm diameter watermain along Main Street and York Durham Line, from Stouffville Well 1&2 to Loretta Crescent. Potential issues with groundwater during construction based on historical construction in this area	2019	Stouffville	A+	300 mm	483	Class 4	High	Rural	325,000	-	107,000	249,000	12,000	\$ 703,000
W07	York Durham Line #2	New 200 mm diameter watermain along York Durham Line, between Bethesda Side Road and Main Street	2020-2022	Stouffville	A+	200 mm	446	Class 4	High	Rural	234,000	30,000	87,000	202,000	9,000	\$ 570,000
W08	Bethesda Side Road #4	New 300 mm diameter watermain along Bethesda Side Road from W01 to Hwy 48	2023	Stouffville	A+	300 mm	267	Class 4	Low	Rural	179,000	-	40,000	83,000	5,000	\$ 320,000
W09	Future Road #2	New 300 mm diameter watermain along future road connecting Baker Hill Boulevard to Bethesda Side Road	2019-2021	Stouffville	A+	300 mm	591	Class 4	Low	Rural	397,000	-	86,000	177,000	11,000	\$ 682,000
W10	Future Road #3	New 300 mm diameter watermain along future road connecting Baker Hill Boulevard to Bethesda Side Road	2019-2021	Stouffville	A+	300 mm	437	Class 4	Low	Rural	294,000	-	64,000	133,000	8,000	\$ 510,000
W11	Future Road #4	New 300 mm diameter watermain along Baker Hill Boulevard	2019	Stouffville	A+	300 mm	390	Class 4	High	Rural	262,000	-	87,000	203,000	9,000	\$ 574,000
W12	Future Road #5	New 300 mm diameter watermain along future road in southeast corner of Stouffville, south of Mantle Avenue. Connecting Byers Pond Way and W15. One creek crossing	2019	Stouffville	A+	300 mm	1210	Class 4	Low	Rural	813,000	37,000	183,000	378,000	24,000	\$ 1,458,000
W13	Future Road #6	New 300 mm diameter watermain along future road in southeast corner of Stouffville, south of Mantle Avenue. Extension of existing watermain on Tenth Line	2019	Stouffville	A+	300 mm	286	Class 4	Low	Rural	192,000	-	43,000	88,000	6,000	\$ 339,000
W14	Future Road #7	New 300 mm diameter watermain along future road in southeast corner of Stouffville, south of Mantle Avenue. Extension of existing watermain on Sunnyridge Avenue	2020	Stouffville	A+	300 mm	243	Class 4	Low	Rural	163,000	-	37,000	76,000	5,000	\$ 291,000
W15	Future Road #8	New 300 mm diameter watermain in southeast corner of Stouffville, south of Mantle Avenue	2020	Stouffville	A+	300 mm	245	Class 4	Low	Rural	165,000	-	37,000	76,000	5,000	\$ 294,000
W16	Future Road #9	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W37 to Bethesda Side Road	2020-2022	Stouffville	A+	300 mm	868	Class 4	Med	Rural	584,000	-	158,000	321,000	18,000	\$ 1,090,000
W17	Future Road #10	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W19 to W16	2020-2022	Stouffville	A+	300 mm	455	Class 4	Med	Rural	306,000	-	84,000	171,000	10,000	\$ 582,000
W18	Future Road #11	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W19 to W16	2020-2022	Stouffville	A+	300 mm	580	Class 4	Med	Rural	390,000	-	106,000	216,000	12,000	\$ 735,000
W19	Future Road #12	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W17 and W18	2020-2022	Stouffville	A+	300 mm	349	Class 4	Med	Rural	235,000	-	65,000	133,000	7,000	\$ 451,000
W20	Future Road #13	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W34 to Ninth Line	2019	Stouffville	A+	300 mm	717	Class 4	Med	Rural	482,000	-	131,000	266,000	15,000	\$ 905,000
W21	PRV Future Road	New Zone 1/2 PRV along W20. Exact location to be determined.	2022-2025	Stouffville	A+	0 mm	0	Class 4	Low	Rural	50,000	-	-	18,000	1,000	\$ 69,000
W22	Main Street	300 mm watermain upgrade along Main Street from Ninth Line to Park Drive. One railway and one creek crossing.	2019-2020	Stouffville	A+	300 mm	1105	Class 4	Low	Urban	743,000	126,000	236,000	488,000	31,000	\$ 1,880,000

Master Plan ID	Project Name	Project Description	Year in Service	Municipality	Class EA	Size/Capacity	Length (m)	Class Estimate Type	Project Complexity	Area Condition	Base Construction Cost (\$2018)	Crossings (\$2018)	Additional Costs (\$2018)	Soft Costs (\$2018)	Non-Refundable HST (\$2018)	Total Estimated Cost (\$2018)	
W23	Second Street	200 mm watermain upgrade along Second Street from Ninth Line to Albert Street.	2019-2024	Stouffville	A+	200 mm	345	Class 4	Low	Urban	181,000	-	50,000	104,000	7,000	\$ 399,000	
W24	Commercial Street	150 mm watermain upgrade along Commercial Street from Church Street North to Mill Street	2019-2024	Stouffville	A+	150 mm	144	Class 4	Low	Urban	66,000	-	19,000	38,000	2,000	\$ 148,000	
W25	Church Street North	200 mm watermain upgrade along Church Street North from Main Street to Warriner Street	2019-2024	Stouffville	A+	200 mm	276	Class 4	Low	Urban	145,000	-	40,000	84,000	5,000	\$ 321,000	
W26	O'Brien Avenue	150 mm watermain upgrade along O'Brien Avenue from Main Street to Burkholder Street	2019-2024	Stouffville	A+	150 mm	231	Class 4	Low	Urban	105,000	-	29,000	61,000	4,000	\$ 235,000	
W27	Lloyd Street	150 mm watermain upgrade along Lloyd Street from Main Street to Rose Avenue	2019-2024	Stouffville	A+	150 mm	375	Class 4	Low	Urban	171,000	-	47,000	98,000	6,000	\$ 377,000	
W28	Orchard Park Boulevard	200 mm watermain upgrade along Orchard Park Boulevard from Main Street to Sunset Boulevard	2019-2024	Stouffville	A+	200 mm	197	Class 4	Low	Urban	103,000	-	29,000	60,000	4,000	\$ 231,000	
W29	PRV Millard Street	New Zone 1/2 PRV along Millard Street. Exact location to be determined.	2019	Stouffville	A+	0 mm	0	Class 4	Low	Suburban	50,000	-	-	18,000	1,000	\$ 69,000	
W30	Future Road #14	New 200 mm diameter watermain along a future road from W16 to Cam Fella Boulevard	2019	Stouffville	A+	200 mm	309	Class 4	Med	Rural	162,000	30,000	53,000	108,000	6,000	\$ 367,000	
W31	Mill Street	200 mm watermain upgrade along Mill Street from Main Street to Freel Lane	2019-2024	Stouffville	A+	200 mm	98	Class 4	Low	Urban	51,000	-	15,000	31,000	2,000	\$ 119,000	
W32	HWY 48 BPS	Decommissioning of the Highway 48 Booster Pumping Station. Would occur after extension from Ballantrae is complete (W33)	2019-2024	Ballantrae	A+	0 mm	0	Class 4	Low	Rural	50,000	-	-	18,000	1,000	\$ 69,000	
W33	HWY 48 #3	New 250 mm diameter watermain along HWY 48 from Spruceview Place to existing dead end.	2019-2024	Ballantrae	A+	250 mm	1173	Class 4	Low	Rural	704,000	-	149,000	308,000	19,000	\$ 1,184,000	
W34	Future Road #15	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W19 to W20. One railway crossing and one creek crossing.	2022-2025	Stouffville	Schedule B/Integrated Planning Approach	300 mm	1218	Class 4	Med	Rural	819,000	295,000	304,000	618,000	34,000	\$ 2,104,000	
W35	Lakeshore/Ninth	New 300 mm diameter watermain (twinned) along Ninth Line and Lakeshore Road from Musselman's Lake Elevated Tank to Connor Drive	2019-2024	Ballantrae	B	300 mm	2033	Class 4	Low	Suburban	1,367,000	-	347,000	717,000	45,000	\$ 2,760,000	
W36	HWY 48 #2	New 300 mm diameter watermain along Hwy 48	2023	Stouffville	A+	300 mm	540	Class 4	High	Rural	363,000	-	120,000	278,000	13,000	\$ 784,000	
W37	Future Road #16	New 300 mm diameter watermain along future road in northeast corner of Stouffville, connecting W30 to W16	2020-2022	Stouffville	A+	300 mm	268	Class 4	Med	Rural	180,000	-	51,000	103,000	6,000	\$ 351,000	
W38	York Durham Line #3	New 200 mm diameter watermain along York Durham Line, between Bethesda Side Road and Main Street	2020-2022	Stouffville	A+	200 mm	268	Class 4	High	Rural	140,000	-	46,000	108,000	5,000	\$ 304,000	
W39	Gormley Fire Protection	New 300 mm diameter fire protection watermain on Stouffville Road from Union Street west (347m)	2022	Gormley	A+	300 mm	347	Class 4	Low	Suburban	233,000	-	61,000	126,000	8,000	\$ 486,000	
W40	Gormley Fire Protection	New 300 mm diameter fire protection watermain on Union Street from Stouffville Street south (453 m)	2022	Gormley	A+	300 mm	453	Class 4	Low	Suburban	305,000	-	79,000	163,000	10,000	\$ 630,000	
W41	Future Road #4	New 300 mm diameter watermain along Baker Hill Boulevard - Creek Crossing	2019	Stouffville	A+	300 mm	180	Class 4	High	Rural	-	-	-	193,000	9,000	\$ 544,000	
W42	Master Plan	Water Master Plan	2023		A+											\$ 250,000	
W43	Future Study	Future Service Areas Study - Water	2019-2021		B											\$ 250,000	
Total Program - 2041																	\$28,060,000

\$28,060,000

3 Wastewater Master Plan

The *Wastewater Master Plan* provides an overall review of the wastewater policies and criteria, existing wastewater collection system, technical analysis, and development of the preferred wastewater servicing strategy for the Town of Whitchurch-Stouffville.

This section has been organized as described below:

- 3.1 Wastewater System Policy and Criteria
- 3.2 Existing Wastewater Collection Systems
- 3.3 Wastewater Hydraulic Model
- 3.4 York Region Water and Wastewater Master Plan Linkage
- 3.5 Assessment of Existing and Future Wastewater Infrastructure
- 3.6 Wastewater Servicing Strategy
- 3.7 Capital Program

This section is one of five sections that make up the complete Master Plan Class EA Study Report and should be read in conjunction with the other sections.

3.1 Wastewater System Policy and Criteria

Wastewater policies, design criteria and level of service requirements were updated as part of this Master Plan to provide guidelines and direction to the master planning process and to ensure that wastewater flows were accurate to support the decision making for the sizing and timing of future infrastructure such as pipes and facilities. Refer to **Appendix F** and **Appendix G** for the complete wastewater servicing policies and design criteria review.

3.1.1 Wastewater Servicing Principles and Policies

Specific servicing principles and policies have been developed to guide and provide direction for the development of wastewater servicing strategies. In general, the Town of Whitchurch-Stouffville is looking to build and maintain efficient, reliable, sustainable and well managed wastewater systems that provide high level of service to the public. In order to capture these goals, the servicing principles and policies have been structured as outlined in **Section 1.14.1**. Further details for the wastewater policies are provided in **Appendix F**.

3.1.2 Wastewater Design Criteria

A guiding principle of design criteria is to ensure that the flow projections are adequately predicted with an appropriate factor of safety and risk management. This overall principle also ensures that infrastructure has sufficient capacity to meet the growing needs of the Town and does not impede the approved/planned growth.

The wastewater flow criteria updated as part of the Town of Whitchurch-Stouffville Master Plan are summarized in **Table 27** below.

Table 27: Wastewater Flow Criteria

Wastewater Flow Projection Methodology	
• Use existing flows for Baseline • Existing flows based on flow monitoring data • Growth flows applied to the Baseline using design criteria	
Wastewater Flow Criteria for Growth	
Parameter	Design Criteria
Average Dry Weather Flow (ADWF)	350 L/cap/d
Inflow & Infiltration Allowance	0.23 L/s/ha
Peaking Factor	Harmon Peaking Factor (1.5 – 4)
Wastewater System Criteria	
• Sizing treatment facilities for Average Day Flows (ADF) (Region Only) • Sizing of trunk sewers, pumping stations and collection system for Peak Wet Weather Flow (PWWF) • Sewage pumping stations firm capacity based on largest pump out of service	

3.1.3 Wastewater Level of Service

Many municipalities use a range of level of service (LOS) requirements to identify when the sanitary system is no longer performing as designed. These level of service requirements can range from depth and flow in the sanitary sewer network, to depth of Hydraulic Grade Line (HGL) to ground level, among others. With regards to LOS, industry standards are adapting to factors such as growth and climate change. Standard surcharge state (d/D) analysis and basement flooding analysis are still suitable for high level assessments such as Master Planning, but more detail is recommended when reviewing the infrastructure to schedule planned improvements to the sanitary network. The Town of Whitchurch-Stouffville Master Plan Level of Service Requirements are as follow:

Sewer Capacity

Maintaining the flow in the sewers at less than 85% full under a 5year design storm conditions.

Basement Flooding Risk

Ensuring the wastewater HGL does not approach within 1.8 meters of the ground surface under 25year design storm conditions.

3.1.4 Flow Projection

The population and employment projections outlined in **Section 1.12** and the design criteria within **Section 3.1.2** were utilized to calculate the average dry weather flow projections (ADWF). The total flows are shown in **Table 28**.

Table 28: Wastewater Flow Projections

	Total Population & Employment			Projected ADWF (L/s)		
	2016	2031	2041	2016	2031	2041
Stouffville	39,065	62,455	65,422	158	253	265

3.1.5 Costing Methodology

The cost estimation methodology for capital projects at a master planning level are typically based on an overall unit cost approach. The unit cost rates used for this Master Plan are representative in 2018 dollars and take into consideration Southern Ontario prices of labour and availability of materials. The development of these rates were informed by multiple Master Planning Studies and have undergone independent peer reviews in order to further refine and ensure overall accuracy of the cost estimates. They were also favorably compared to costs of recent capital projects completed within the GTA and throughout Southern Ontario. A summary of the unit costs is provided in **Appendix H**.

A capital cost is provided for all projects proposed as part of this Master Plan. For the majority of the wastewater system projects, a base construction cost was obtained using either a unit rate construction cost, based on pipe diameter, or unique project analysis. The base construction cost considers several factors specific to each project such as creek crossings, railway and highway crossings, tunneling requirements, and location of construction (Greenfield, urban, suburban). Design, administration, contingency, and non-recoverable HST costs were added to arrive at a final project cost. Detailed costing sheets were developed to support the financial evaluation for each capital project. The final project costs are provided in the Capital Program, **Section 3.7**.

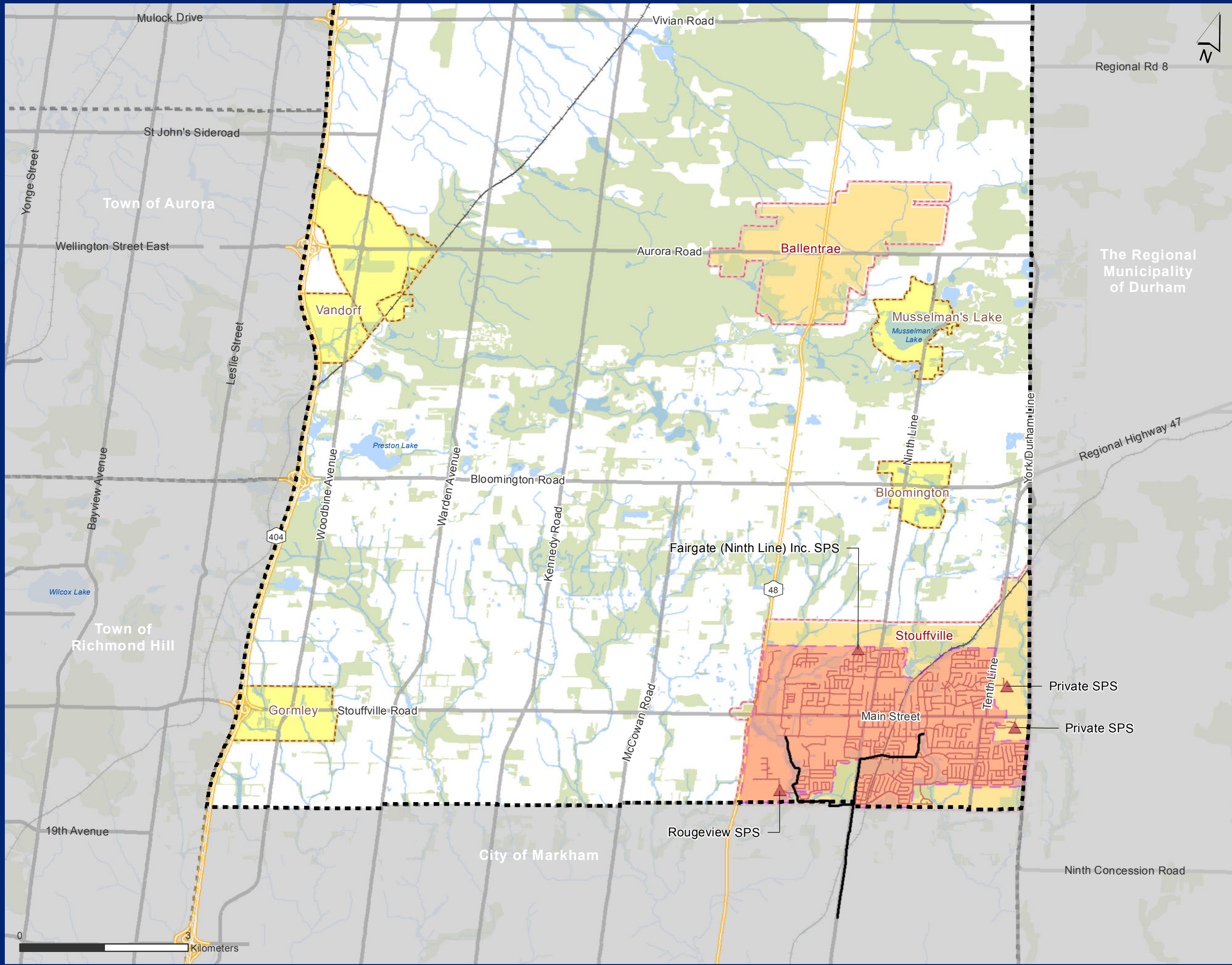
3.2 Existing Wastewater Collection Systems

The Region of York provides wastewater services to its nine (9) municipalities, including the Town of Whitchurch-Stouffville, through multiple components: the York Durham Sewage System (YDSS), the Georgina Wastewater System and some stand-alone facilities.

The Town of Whitchurch-Stouffville provides municipal wastewater services only to the Community of Stouffville. Aside from a small number of lots that are serviced by private systems, wastewater within the community of Stouffville is largely collected by the local municipal sanitary system and then conveyed to the YDSS. The YDSS is jointly owned and operated by York and Durham Regions. Once collected, wastewater is treated at the Duffin Creek Water Pollution Control Plant (WPCP) located in the City of Pickering and subsequently discharged to Lake Ontario.

Currently, the communities of Ballantrae-Musselman's Lake, Gormley, Bloomington, Vandorf and Preston Lake do not have municipal wastewater services. However, the Master Plan incorporates a review of municipal wastewater servicing potential for these communities.

Figure 33 shows the extent of the existing wastewater system in the Town of Whitchurch-Stouffville, including the areas that currently do not have municipal wastewater services.



Existing Wastewater System

- Sanitary Pumping Station (SPS)
- Sanitary Service Area
- Gravity Main (Municipal)
- Gravity Main (Regional - YDSS)

General Features

- Towns and Villages
- Hamlets
- Municipal Boundary
- Creeks, Rivers, and Lakes
- Natural Cover
- Freeways and Provincial Highways
- Railway

3.2.1 Stouffville Wastewater Collection System

The Community of Stouffville municipal wastewater collection system consists of small local sewers, approximately 66km total sewer length, which connect to a number of larger subtrunk sewers conveying flows generally in a southerly direction to the main trunk sewers that are part of the YDSS.

Figure 34 shows the existing Community of Stouffville wastewater system.

The three (3) YDSS trunk sewers servicing the Community of Stouffville are as follows:

- YDSS West Branch: Little Rouge Creek
- YDSS East Branch: Mantle Ave. and Reeves Way Blvd.
- YDSS Main Branch: Ninth Line

There are currently sixteen (16) subtrunks that collect and convey flows to the above YDSS trunk sewers. **Table 29** shows descriptions of the existing subtrunks sewers within the Community of Stouffville.

Table 29: Stouffville Subtrunk Sewers

#	Subtrunk Name	Description
1	Southeast	• Will be the largest subtrunk in Stouffville • Located on Reeves Way Boulevard, Mantle Avenue and Regional Road 30 • Outlet to subtrunk 5
3	Central	• Located north and east from the YDSS East Branch up to Greenwood Road
4	East Central	• Located at the east central region of the Town, south of Main Street, north of subtrunk 5 • Connects to subtrunk 3 approximately 100 meters upstream of the connection to the YDSS East Branch
5	Hoover Park Drive	• Located on Hoover Park Drive at the southeast region of the Town, south of subtrunk 4 • Connects to subtrunk 1 south of James Ratcliff Avenue
6	West Central	• Located at the central region of the Town. The north section is located on Ninth Line • Connects to the YDSS Main at Hoover Park Drive • Outlet to subtrunks 16 and 19
7	West By-Pass	• Located south of Main Street and west of Ninth Line. • Flow diversion for subtrunk 8 to the YDSS West • Outlet to subtrunk 17

#	Subtrunk Name	Description
8	Weldon Rd / West Lawn Blvd	• Located along West Lawn Boulevard and Weldon Road • Connects to subtrunk 7 north of Dougherty Crescent • The southern portion connects to the YDSS at Ninth Line and Hoover Park Drive
9	Hoover Park Town Centre	• Located within employment lands in the SW corner of Stouffville • Flows are pumped through the Rougeview temporary pumping station and forcemain to YDSS West
10	Baker Hill Blvd	• Located along Baker Hill Boulevard • Connection to YDSS West south of Ringwood Drive
12	Winlane Dr	• Located on Winlane Drive from Elm Road south to Main Street • Connects to subtrunk 17 at Sandale Road
13	Northwest Industrial	• Located on Automall Boulevard/Highway 48 from Norman Jones Place to Main Street • Connects to subtrunk 10 at Main Road
14	Edward St / Albert St	• Located on Edward Street from south of Millard St to Main Street, and on Albert Street from Main Street to Sunset Boulevard • Connects to subtrunk 6 at Sunset Boulevard
16	Ninth Line East	• Located in the northern/central region on Ninth Line from Millard Street to Main Street, and south through local roads west of the railway to Hoover Park Drive. • The southern portion connects to the YDSS at Ninth Line and Hoover Park Drive
17	Sandiford Drive	• Located in the west/central region on Sandiford Drive/Sandale Road and north through local roads to Edgevalley Road • Connects to subtrunk 7 at Sandale Road
19	Millard/ Bayberry	• Located on Bayberry Street and Millard Street to Ninth Line • Connects to subtrunks 6 & 16 at Ninth Line and Millard Street
20	O'Brien	• Located on the east side of the railway from Main Street/O'Brien Avenue to Rose Avenue • Connects to the YDSS East on the west side of the Stouffville Creek crossing

There are currently two (2) municipal sanitary pumping stations (SPS) within the Community of Stouffville service area: Rougeview Sewage Pumping Station and Fairgate (Ninth Line) Inc. Sanitary Pumping Station. Both SPS are considered temporary stations.

Rougeview SPS is currently servicing subtrunk 9 and is located in the employment lands at the southwestern part of the Community of Stouffville at Rougeview Avenue.

Fairgate SPS is located at the interception of Baker Hill Boulevard and West Lawn Crescent. With the construction of the sanitary sewer for the Fairgate West subdivision, the pumping station will no longer be needed, therefore the Fairgate is planned to be decommissioned by 2018-2019.

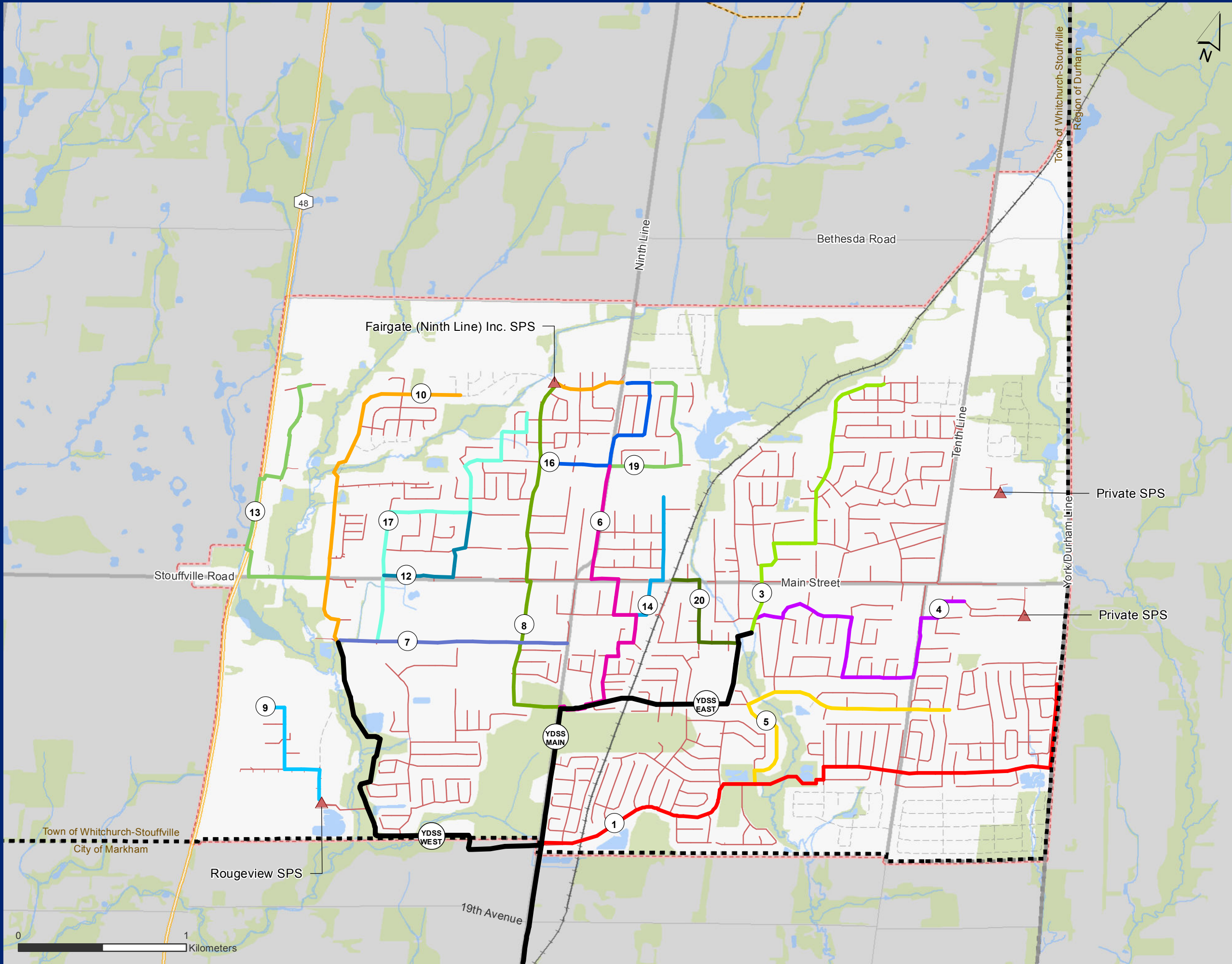
There are also two (2) private SPS in the Community of Stouffville. The Eastern Gate SPS is a private SPS located south of Main Street. This SPS is located on the Eastern Gate Retirement Community. The Northern Gate SPS is located east of Tenth Line and north of Aintree Drive. This SPS is located on the Northern Gate Retirement Community.

Table 30 provides details on the existing sanitary pumping stations within the Community of Stouffville.

Table 30: Community of Stouffville Existing Pumping Stations

Pumping Station	No. of Pumps	Installed Capacity (L/s)	Firm Capacity (L/s)	Ownership
Rougeview SPS			80.8*	Whitchurch-Stouffville
Fairgate (Ninth Line) Inc. SPS	1	20.0	20.0	Whitchurch-Stouffville
Eastern Gate SPS	2	8.7	4.35*	Private
Northern Gate SPS	2	24.0	12.0	Private

*Design Flow



Existing Wastewater System
Community of Whitchurch-Stouffville

Figure 34

Existing Wastewater System

Municipal Owned	Subtrunks	
Sanitary	1	10
Pumping Station (SPS)	3	12
Gravity Main (Municipal)	4	13
Gravity Main (Regional - YDSS)	5	14
	6	16
	7	17
	8	19
	9	20

General Features

-  Towns and Villages
-  Hamlets
-  Municipal Boundary
-  Creeks, Rivers, and Lakes
-  Natural Cover
-  Freeways and Provincial Highways
-  Proposed Roads
-  Railway

3.3 Wastewater Hydraulic Model

Analysis of the existing and future wastewater collection system within the Town of Whitchurch-Stouffville was undertaken using a wastewater hydraulic model. As part of this Master Plan, a new all-pipe wastewater hydraulic model was built specifically for the Community of Stouffville, which is the only community within the Town of Whitchurch-Stouffville with existing municipal wastewater services.

The wastewater hydraulic model, as seen in **Figure 35**, was developed using InfoWorks ICM hydraulic modelling software and calibrated to flow monitoring data to create the baseline/existing scenario. The flow monitoring program consisted of:

- 6 weeks of continuous flow monitoring (August – October)
- 19 flow monitors
- 4 rain gauges

Population and employment projections were also imported into the model to create future growth scenarios. The growth projections were imported as separate layer of subcatchments that made it easy to identify the growth portion of the population in terms of “Intensification Growth” when growth is projected to happen in built areas, and “Greenfield Growth” when growth is projected to happen in current undeveloped areas.

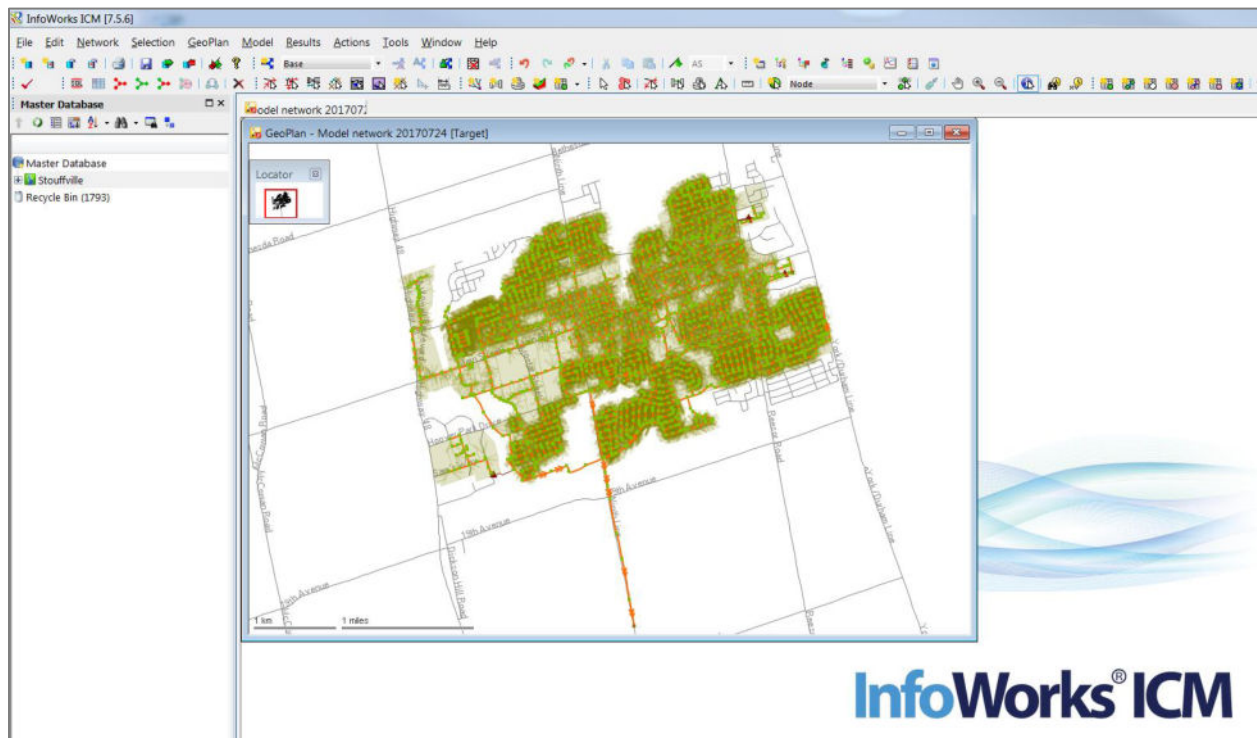


Figure 35: Wastewater Hydraulic Model

3.4 York Region Water and Wastewater Master Plan Linkage

Through the Regional Water and Wastewater Master Plan, the Region recommended a number of wastewater strategies.

Table 24 provides the recommendations relating to the Town's wastewater system.

Table 31: Regional Wastewater Strategy Recommendations for the Town

Project Name	Year Completion
York-Durham Sewage System – increase capacity of Duffin Creek Water Pollution Control Plant to 630 million litres/day to accommodate projected 2041 flows.	2016-2035
Duffin Creek Water Pollution Control Plant Stage 1 and 2 Chlorine Chamber Expansion	2026-2035
The Primary trunk sewer requires a second conduit before 2031	2016-2035

Figure 36 provides an overview of the Region's preferred water strategy recommended in the York Region 2016 Water and Wastewater Master Plan.

Wastewater Projects

- ## Existing Wastewater Infrastructure

-  Sewage Pumping Station
-  Water Resource Recovery Facility
-  Equalization Tank
-  Conveyance
-  Watershed Boundary
-  Municipal Boundary
-  Regional Boundary
-  Town or Village
-  Urban Area
-  Oak Ridges Moraine
-  Greenbelt Plan Area
-  Whitebelt Area

Produced by: Infrastructure Asset Management
Environmental Services Department
© Copyright, The Regional Municipality of York, April, 2016

© Copyright, The Regional Municipalities of Durham
and Peel, County of Simcoe, City of Toronto
© Queen's Printer for Ontario 2003-2016, Includes Greenbelt
and Oak Ridges Moraine Boundaries and Water Features



3.5 Assessment of Existing and Future Wastewater Infrastructure

A critical initial step in the Master Planning process was the assessment of the existing infrastructure to establish the wastewater system baseline conditions. These baseline conditions became the basis of the future recommendations of the Master Plan and therefore it was important to ensure that they were determined through a comprehensive detailed analysis of the system. Once the existing system conditions were established, the potential impacts of the future growth flows on the wastewater collection system were analyzed to develop and recommend future servicing strategies.

The following sections describe current opportunities and constraints in the existing wastewater system and assess the capacity deficiencies in the wastewater collection system within the 2041 planning horizon with some post-period considerations.

3.5.1 Opportunities and Constraints

Existing and future wastewater opportunities and constraints were identified through discussions with Town staff, as well as through hydraulic analyses and review of infrastructure data (e.g. GIS, design reports, as-built information, etc.). The InfoWorks ICM all-pipe hydraulic model for the Community of Stouffville was used to analyze the performance of the existing and future system under dry weather and wet weather flow conditions.

3.5.1.1 Stouffville

In general, the wastewater collection system of the Community of Stouffville has adequate capacity to convey existing and future peak wet weather flows. **Figure 37** highlight some of the key opportunities and constraints in the Community of Stouffville.

The following key issues and constraints were identified:

- Aging sewers in the Downtown Core along the Main Street corridor. The majority of the aging pipes are made of clay with sizes of 300mm and smaller.
- New infrastructure required to extend wastewater servicing to new development areas (Greenfield growth).
- Certain localized small areas show surcharge issues under 25yr design storm conditions. Field investigations are required for better assessment of the infrastructure in these areas.
- Existing sewers on Sandiford Drive do not have sufficient surplus capacity to support the proposed change in land use around the Sandiford Drive area south of Main Street.
- Eastern Gate Private SPS is the most significant risk in terms of source water protection because of its proximity to groundwater well #3 and aquifer.

The following opportunities were identified:

- Coordination with the state of good repair (SOGR) program to maximize the use of existing infrastructure along the Main Street corridor to support intensification in the Downtown Core.
- Opportunity to extend servicing to existing unserved areas south of Bethesda Road and east of Highway 48.
- Rougeview SPS and Fairgate SPS can be decommissioned by implementing the planned extension of subtrunks 9 and 10 respectively.
- There is opportunity to decommission the existing private pumping stations (Northern Gate SPS and Eastern Gate SPS) by gravity connections to the future extension of subtrunk 1.

Additionally, the following considerations for Post-Period Growth were also identified:

- Opportunity to upsize strategic infrastructure to account for potential post-period growth in the Community of Stouffville.
- Opportunity to balance future post-period growth flows in the north areas, by splitting flows between the future extensions of subtrunks 1 & 10.
- Potential to reach capacity in the YDSS West Trunk Sewer if potential growth above the approved planning numbers occur. Opportunity to reduce risk with implementation of inflow and infiltration mitigation measures, by refining the flow split/diversion strategy at the confluence of Subtrunks 7 & 8, among other measures.

3.5.1.2 Gormley, Vandorf-Preston Lake and Ballantrae-Musselman's Lake

Currently the communities of Gormley, Vandorf-Preston Lake and Ballantrae-Musselman's Lake do not have municipal wastewater services. Through the master planning process and consultation with the public, interest was identified for potential extension of municipal wastewater services to these communities.

The following key issues and constraints were identified:

- Currently there is no existing municipal wastewater infrastructure within these communities.
- The communities are located within the Oak Ridges Moraine and Greenbelt Plan Protected Countryside.
- The Oak Ridges Moraine Conservation Plan restrict "partial servicing" of water or wastewater services.
- The Greenbelt Plan restricts the extension of lake-based water and wastewater services.

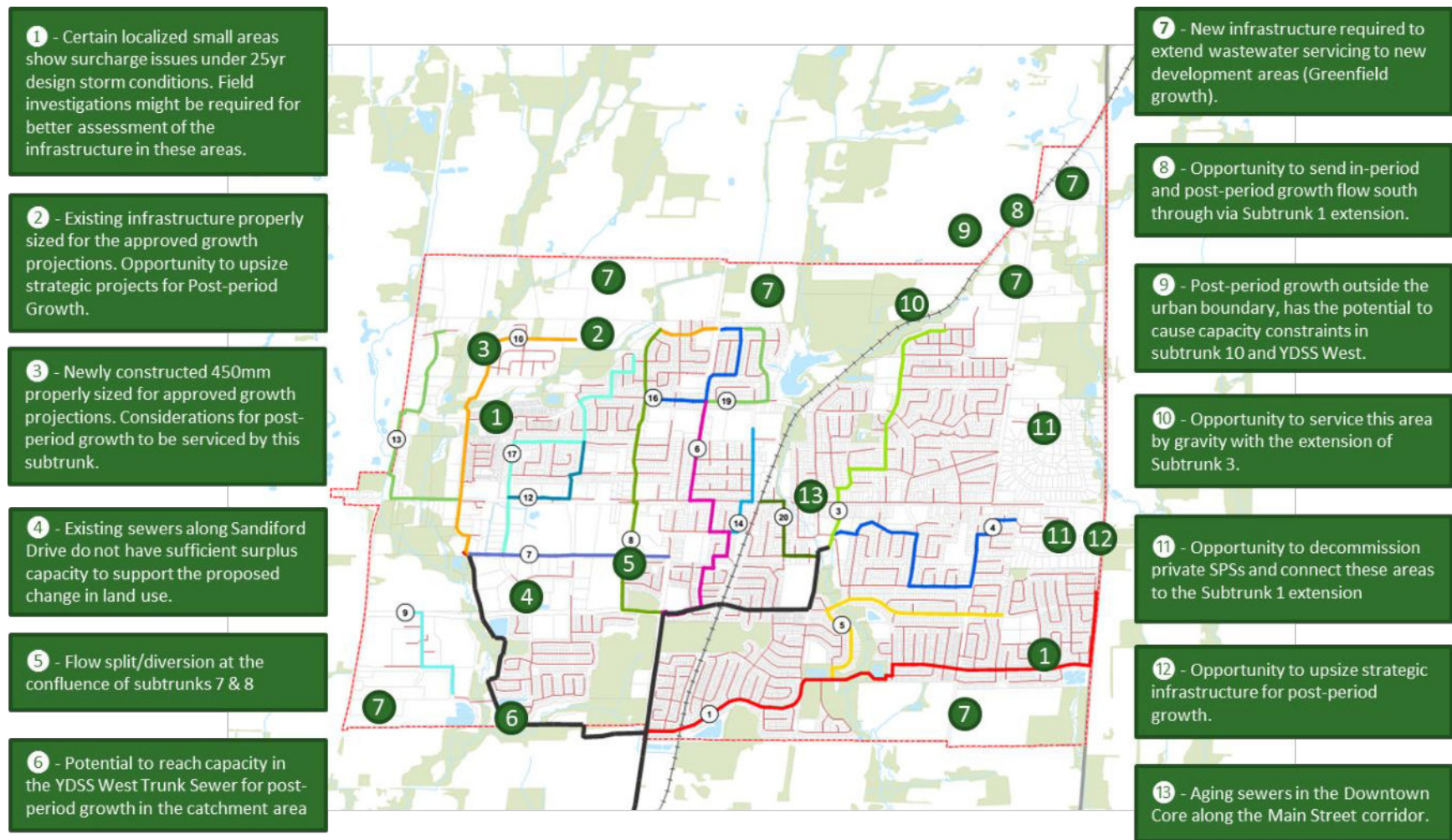


Figure 37: Stouffville Wastewater System Opportunities and Constraints

3.6 Wastewater Servicing Strategy

The identification and assessment of servicing alternatives is a critical component of the master planning process. It enables a comprehensive review of various servicing solutions and should be documented to ensure the process has been carried out in a transparent and defensible manner.

As part of this Master Plan, wastewater alternative servicing strategies were reviewed for existing and future growth areas in order to select the servicing strategies that:

- Make best use of existing infrastructure to avoid new infrastructure where possible
- Minimize cost of new infrastructure
- Consider operation and maintenance costs to ensure financial sustainability
- Ensure long term reliability and security of the wastewater system
- Increase system resilience to climate change
- Avoid/minimize environmental crossings and other disruptions to the environment where possible
- Avoid cemeteries and disruptions to cultural heritage resources
- Plan for future infrastructure within the existing road right-of-way where possible
- Avoid/reduce production of Green House Gas Emissions
- Avoid/minimize impact to areas that could represent a significant drinking water threat

3.6.1 Servicing Strategy Development

Wastewater alternative servicing strategies were identified and reviewed for existing and future growth areas within the Community of Stouffville in order to select the best servicing solution for each area. Collectively, all these area specific servicing solutions will form the overall wastewater servicing strategy for the Town of Whitchurch-Stouffville. The following section summarizes the alternative servicing strategies development for key growth areas within the Community of Stouffville.

3.6.1.1 Southeast Growth

The southeast growth area is a designated Greenfield Area and part of the Phase 2 developable areas in the Community of Stouffville. This area is projected to be mainly residential with some allocation for employment growth. Currently there is no wastewater service in this area and new infrastructure will be required to provide service for future growth. As part of the Master Plan, the following alternative was considered

Alternative 1 – Gravity solution via new subtrunk 2 to extend servicing to new developable areas and connect to exiting subtrunk 1.

Pros	Cons
Support the development of new growth in the area. Proposed new subtrunk sewer will follow future road alignment and will be coordinated with proposed future watermain in the same area.	Disruption to the environment. Requires crossings of environmental feature (Stouffville Creek).

Additional reasonable alternative servicing strategies were not identified for this area, and Alternative 1 was carried forward.

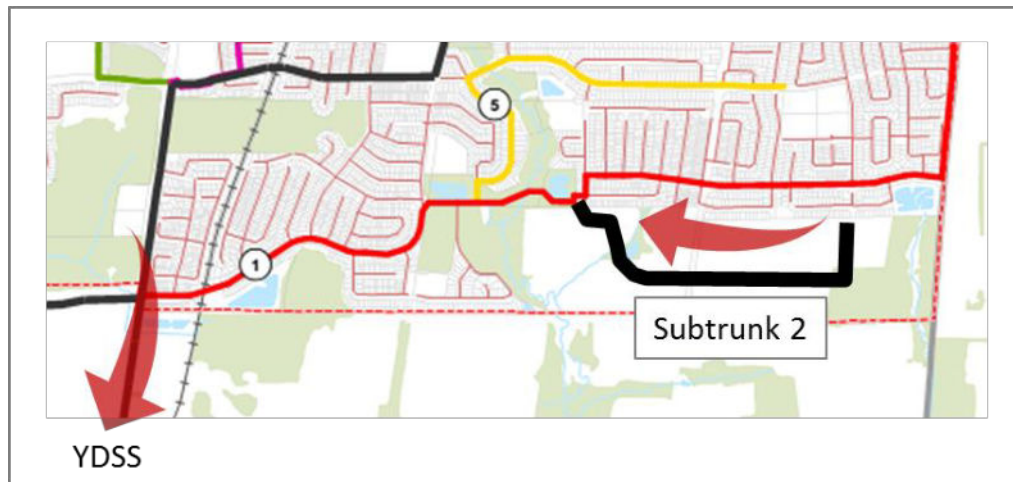


Figure 38: Southeast Growth Wastewater Servicing Alternative

3.6.1.2 West-Central Growth

The West-Central growth areas are generally located south of Main Street and east of Highway 48. They comprise designated Built-up and Greenfield Areas with projected intensification and employment growth respectively. The area is a wetland evaluated by the Ministry of Natural Resources and Forestry (MNRF) in 2017 that is to be a Provincially Significant Wetland (PSW) and is also identified as a wetland in the Oak Ridges Moraine Conservation Plan (ORMCP). In addition, the Little Rouge Creek which runs through the area is a Redside Dace habitat. The topography of the area makes it difficult to drain by gravity to the existing sewers along Main Street. Therefore, the following alternative was considered:

Alternative 1 – Gravity solution via new subtrunk 11 to extend servicing to planned growth and connect to existing YDSS West trunk sewer.

Pros	Cons
Enables servicing of new growth in the area. Topography of the area allows for a gravity solution and connection to the YDSS trunk sewer.	Growth in environmental sensitive area. Disruption to the environment. Requires crossing of environmental feature (Little Rouge Creek). If the sewer is not on a future road alignment, the project will need a separate Schedule B Class EA or be satisfied through the development application and planning process.

The Town of Whitchurch-Stouffville undertook a land use planning study for the lands at the intersection of Highway 48 and Main Street which are designated as the “Gateway Mixed Use Area” in the Community of Stouffville Secondary Plan. This study evaluated in greater detail the policies, environmental issues and servicing for this area. For the purpose of the Master Plan, additional alternative servicing strategies were not assessed for this area, and Alternative 1 was carried forward.

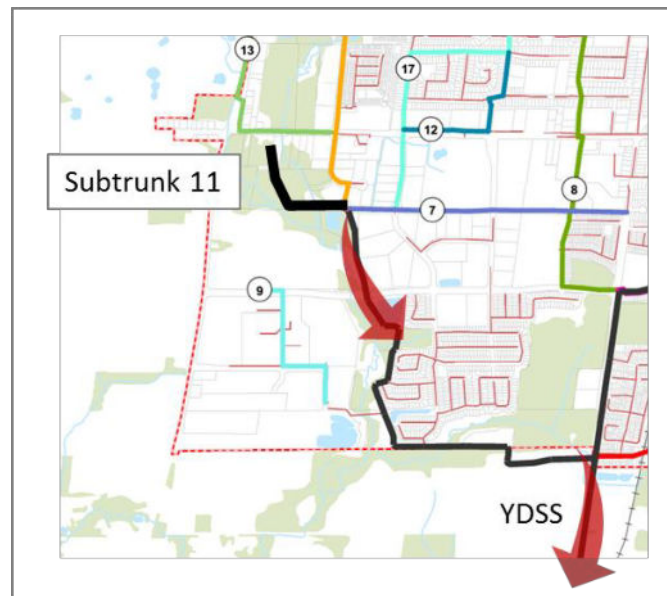


Figure 39: West-Central Growth Wastewater Servicing Alternative

3.6.1.3 Southwest Growth

The southwest growth area is a designated Greenfield Area with project employment growth. The existing area is currently being serviced by gravity sewers that convey flows to the Rougeview SPS. From there, the flows are pumped across the Little Rouge Creek to the connection to the YDSS West trunk sewer. As part of the Master Plan, the following alternative to service the area were considered:

Alternative 1 – Gravity solution to convey flows from the existing and proposed employment area to the YDSS trunk sewer.

Pros	Cons
Avoids the construction of new SPS/FM. Allows for the decommission of existing SPS, which eliminates operations and maintenance costs. Gravity solution does not require use of energy and production of Green House Gas Emissions by SPS. Minimize the potential for emergency overflows and potential discharges to the environment associated with SPS.	Not feasible within Town's Urban Boundary. It would require property acquisition in another municipality (City of Markham). Requires new crossings of environmental features (Little Rouge Creek) and farm lands (great disruption to the environment). Unreasonable high costs to implement.

Alternative 2 – New Sewage Pumping Station and Forcemain to convey flows from the existing and proposed employment area to the YDSS trunk sewer.

Pros	Cons
Less disruption to the environment. Avoids new environmental crossing (Little Rouge Creek). Avoids the need for land acquisition outside the Town's urban boundary. Forcemain alignment will follow future road. Small SPS internal to development. Significantly lower implementation costs.	Higher operations and maintenance costs and production of Green House Gas Emissions in comparison to a gravity only solution. Potential risk for emergency overflows and discharges to the environment associated with SPS.

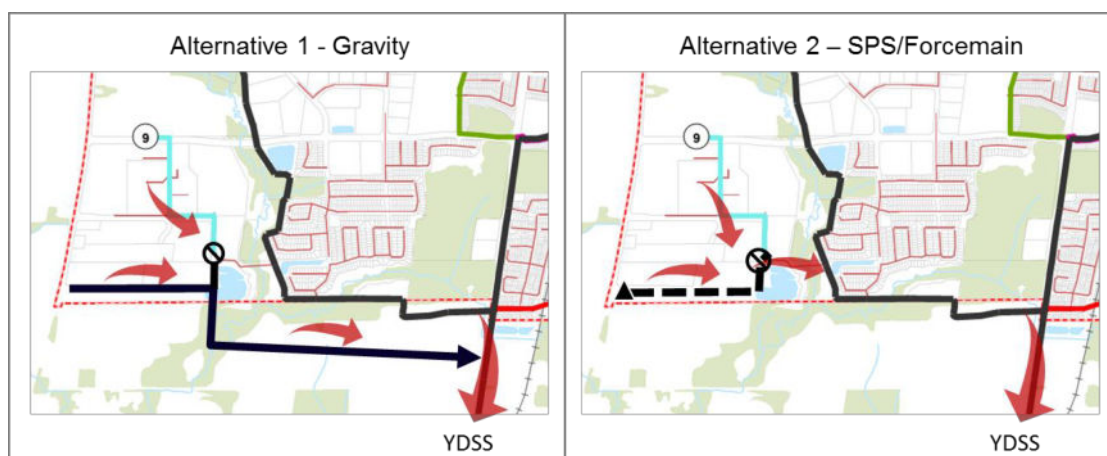


Figure 40: Southwest Growth Wastewater Servicing Alternatives

Alternative 1 was not identified as a feasible solution because of the challenges presented in the land acquisition, inter-municipal coordination, unreasonable implementation costs

and also due to the negative effects to the environment. Alternative 2 is in line with the proposed strategy in previous studies and provided the most effective and feasible solution for the area. Alternative 2 was carried forward.

3.6.1.4 Northeast Growth – Part A

The northeast growth area encompasses designated Greenfield Areas that are part of the Phase 3 developable areas in the Community of Stouffville. This area is projected to be mainly residential with some allocation for employment growth. Currently there is no wastewater service in this area and new infrastructure will be required to provide service for future growth. This section outlines alternative servicing strategies to service growth in the northeast areas within the urban boundary of the Community of Stouffville, as well as potential post-period growth outside the existing urban boundary to the north.

Alternative 1 – All wastewater flows conveyed through subtrunk 10.

Pros	Cons
Reduces flows to subtrunk 1 avoiding potential upsizing of sections of sewer of the subtrunk 1 extension.	Conveys more flows through subtrunk 10 which might experience potential capacity constraints in already built areas for post-period growth. Would require upsizing of subtrunk 10, including section of existing sewers.

Alternative 2 – Split wastewater flows between subtrunk 1 and subtrunk 10.

Pros	Cons
Better balance of flows between subtrunks 1 and 10. Topography generally allows for splitting flows. Provides flexibility for phasing of the infrastructure to support growth.	Requires upsizing of sections of sewer of the subtrunk 1 extension.

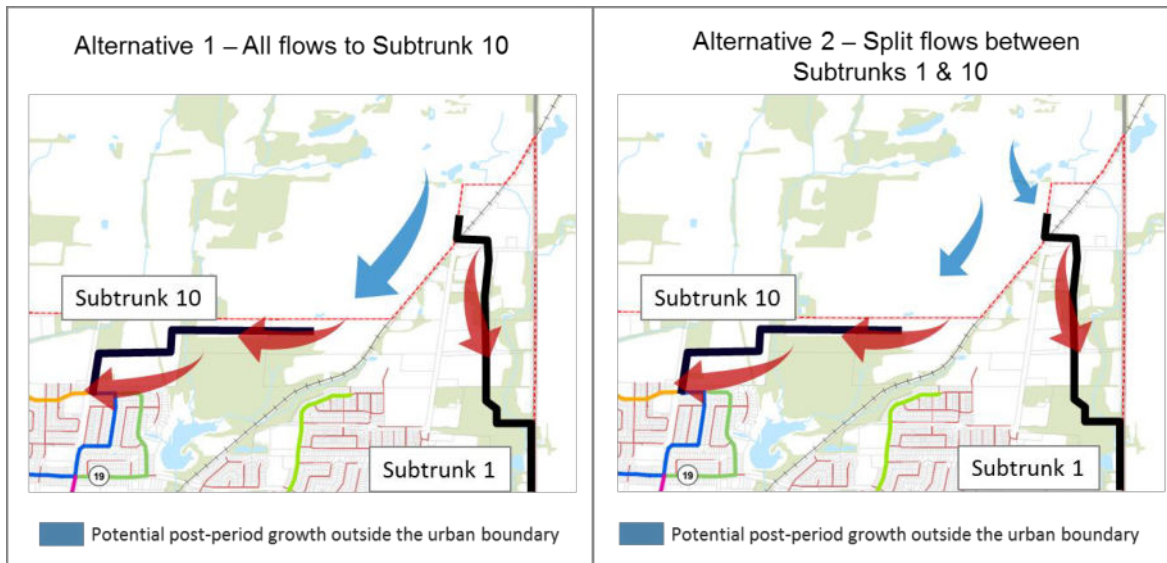


Figure 41: Northeast Growth (Part A) Wastewater Servicing Alternatives

Alternative 2 provides the best balance of flows and minimize the amount of infrastructure that could potentially require upsizing; therefore, Alternative 2 was carried forward.

3.6.1.5 Northeast Growth – Part B

The northeast growth area encompasses designated Greenfield Areas that are part of the Phase 3 developable areas in the Community of Stouffville. This area is projected to be mainly residential with some allocation for employment growth. Currently there is no wastewater service in this area and new infrastructure will be required to provide service for future growth.

This section outlines alternative servicing strategies to service growth in a small northeast area west of the GO Transit railway that lies within the existing urban boundary of the Community of Stouffville. This area is bounded by significant environmental features to the west and the Go Transit railway to the east and south. Additionally, the natural topography of the area drains southwest away from the existing and proposed infrastructure in the vicinity. As part of the Master Plan, the following alternatives to service the area were considered:

Alternative 1 – Gravity solution to subtrunk 3

Pros	Cons
Gravity solution avoids needs for new SPS and forcemain. Less operation and maintenance costs. Gravity solution does not require use of energy and production of Green House Gas Emissions by SPS.	Requires environmental features (disruption to the environment) and railway crossings that are not on future road alignment. Some sections >5m depth. Sewers will most likely not be on a future road alignment. Project will need a separate Schedule B

Pros	Cons
Minimize the potential for emergency overflows and potential discharges to the environment associated with SPS. Maximizes use of existing subtrunk 3, which has been sized and constructed to take the additional flows. Easy implementation. Requires only extension of a short section of subtrunk 3. Reduces flows to subtrunks 1 and 10.	Class EA or be satisfied through the development application and planning process.

Alternative 2 – Sewage pumping station and forcemain to subtrunk 15

Pros	Cons
Maximizes use of future subtrunk 15 and extension of subtrunk 1. Reduces flows to subtrunk 10. Avoids extension of subtrunk 3.	Higher operations and maintenance costs and production of Green House Gas Emissions in comparison to a gravity only solution. Requires environmental features (disruption to the environment) and railway crossings. Potential for emergency overflows and discharges to the environment associated with SPS. Some sections >5m depth. Requires subtrunk 1 & 15 to be constructed.

Alternative 3 – Sewage pumping station and forcemain to subtrunk 10

Pros	Cons
Avoids railway crossing. Avoids crossing of environmental features (disruption to the environment). Avoids extension of subtrunk 3.	Higher operations and maintenance costs and production of Green House Gas Emissions in comparison to a gravity only solution. Potential risk for emergency overflows and discharges to the environment associated with SPS. Conveys more flows through subtrunk 10 which might experience potential capacity constraints in already built areas for post-period growth. Requires subtrunk 10 to be constructed.

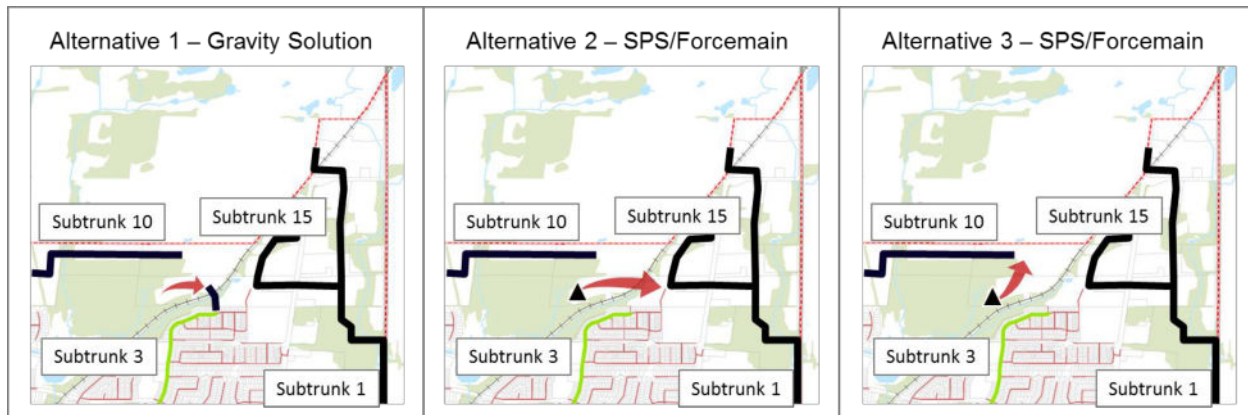


Figure 42: Northeast Growth (Part B) Wastewater Servicing Alternatives

The gravity solution was preferred among the SPS and force mains alternatives. This alternative is in line with the Town's current vision to service the area. The existing subtrunk 3 sewer has been sized to accommodate the additional flows and has been constructed with the provisions for the connection of the extension of the sewer. The Master Plan carried forward with Alternative 1.

3.6.2 Preferred Wastewater Servicing Strategy

Several separate wastewater servicing strategies are recommended throughout the Town of Whitchurch-Stouffville that collectively form the overall preferred wastewater strategy to service the projected growth to 2041. The preferred servicing strategy was developed to ensure that the extension of the existing wastewater collection system is aligned with existing planning policies, designates residential and employment growth areas, can support intensification, and that the Master Plan follows an integrated approach with the Town's State of Good Repair program.

The primary objective of the wastewater servicing strategy is to build off the configuration of the existing system within the Town of Whitchurch-Stouffville. Since only the Community of Stouffville has municipal wastewater services, the wastewater strategy focuses on this key area.

The Master Plan recommends that a separate study be carried out to evaluate the potential for municipal water and wastewater services for the communities of Gormley, Vandorf-Preston and Ballantrae-Musselman's Lake.

In general, the wastewater servicing strategy for the Community of Stouffville consists of the following:

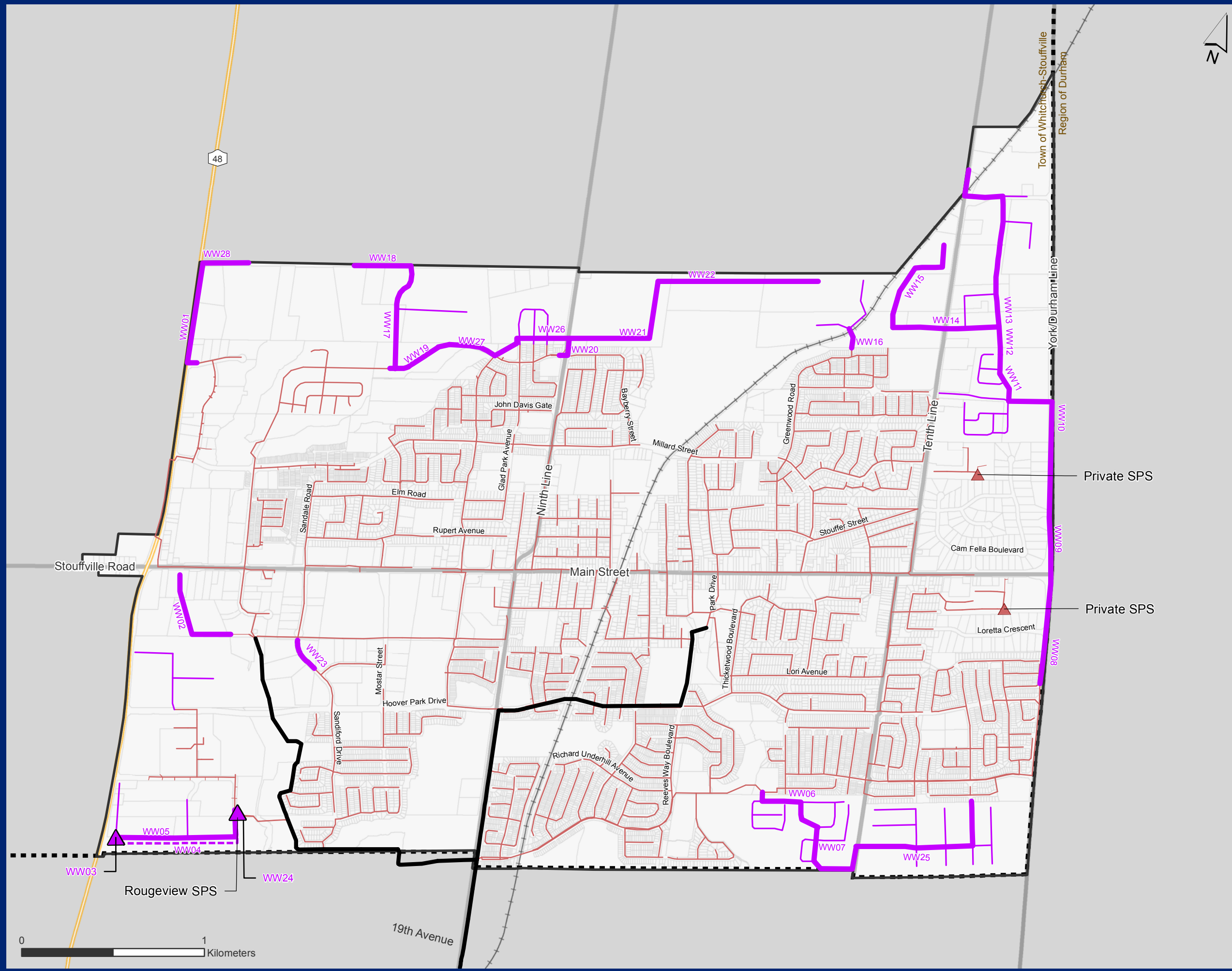
- Intensification along the Main St corridor will be serviced by existing infrastructure.
- Flows from new growth southeast will be conveyed west to the YDSS trunk sewer by gravity through the new subtrunk 2.

- Flows from new growth southwest will be conveyed east to the YDSS trunk sewer by a combination of pumping and gravity.
- Flows from new growth areas in the north will be conveyed south to the YDSS trunk sewer through subtrunk 10 (north-west), subtrunk 1 (east) and subtrunk 3 (central).
- Design and construction of subtrunk 1 will allow for the potential decommissioning of the private Northern Gate SPS and Eastern Gate SPS if required.

Key capital projects required to achieve this strategy include the following:

- New subtrunk 2 and connection to subtrunk 1 to service southeast growth areas
- Subtrunk 1 extension up to Tenth Line to service northeast growth areas
- New subtrunk 15 and connection to subtrunk 1
- Subtrunk 10 extension east of Ninth Line to service the north growth areas
- Extension of subtrunk 9 and new SPS/forcemain to service southwest growth areas
- Decommissioning of the Rougeview SPS

In addition to the key capital projects, several other projects and upgrades are included within the wastewater servicing strategy to address existing and future capacity needs within the collection system. The complete Preferred Wastewater Strategy can be seen in **Figure 43**. Each capital project is listed along with its respective estimated capital cost in **Section 3.7**.



**Town of Whitchurch-Stouffville
Water and Wastewater Master Plan**

**Recommended Strategy
Wastewater System
Community of Whitchurch-Stouffville**
Figure 43

- Proposed Wastewater System**
-  MP Capital Project - Sanitary Pumping Station
 -  MP Capital Project - Forcemain
 -  MP Capital Project - Gravity
 -  Future Local Collection
- Existing Wastewater System**
-  Sanitary Pumping Station (SPS)
 -  Gravity Main (Municipal)
 -  Gravity Main (Regional - YDSS)
- General Features**
-  Study Area
 -  Municipal Boundary
 -  Freeways and Provincial Highways
 -  Proposed Roads
 -  Railway

3.7 Capital Program

As described in the previous sections, the Preferred Wastewater Servicing Strategy has been developed to support the servicing needs of the existing and future growth areas within the Community of Stouffville to 2041. The capital costs for each project of the Preferred Strategy were estimated according to the costing methodology within **Section 3.1.5**. These projects are listed according to their project number and are shown in **Table 32**. The capital program table contains project descriptions, dimensions, proposed timing, and estimated total project cost.

The wastewater capital program will work as a foundation for the Town of Whitchurch-Stouffville Capital Budget. The capital program provides a list and timing of new assets that the Town will have to operate and maintain; and therefore, it is the starting point for the planning of operation and maintenance costs and resources allocation for new wastewater infrastructure.

3.7.1 Implementation Plan

As outlined in **Section 3.4** of this report, the Water and Wastewater Master Plan sets out to satisfy the EA Approach 1 requirements according to the MEA Class EA document. The Preferred Wastewater Servicing will support the servicing needs of the Town of Whitchurch-Stouffville's future growth to 2041. This strategy will be implemented in accordance with each project Class EA schedule.

The Class EA requirements for each project have been identified in the Capital Program. Schedule A and A+ projects may move forward to design and construction, with A+ projects requiring public notification prior to implementation. Schedule B or equivalent projects that have been identified within the Preferred Wastewater Servicing Strategy will be part of a developer-led local servicing plan and approved through the Planning Act Municipal development review process or will be satisfied through separate Class EA study prior to design and construction. The Preferred Wastewater Strategy did not identify any Schedule C projects.

During the next steps of the implementation program, primarily during detailed design of the projects, the following requirements should be considered:

- Finalization of property requirements
- Refinement of infrastructure alignment
- Identification of preferred construction methodologies
- Completion of additional supporting investigations as required (e.g. geotechnical, hydrogeological, etc.)
- Review and mitigation of potential construction related impacts
- Satisfying of all provincial, municipal and conservation authority approval requirements

With respect to Town planning and budgeting, this program will be utilized as high level baseline estimate for the Town capital budget. These costs will be further developed and refined during the implementation phases as more detailed information becomes available.

The anticipated timing of each project within the Preferred Strategy has been established based on the projected population and employment growth within the Town of Whitchurch-Stouffville. The wastewater program's project scheduling has also been cross referenced with the water program to ensure project coordination along common alignments.

Given the growth-related nature of the servicing strategies, the wastewater capital program forms the foundation for the wastewater component of the Town of Whitchurch-Stouffville Development Charges (DC) By-Law.

Table 32: Wastewater Capital Program

Master Plan ID	Project Name	Project Description	Year in Service	Class EA	Size/Capacity	Length (m)	Class Estimate Type	Project Complexity	Area Condition	Base Construction Cost (\$2018)	Crossings (\$2018)	Additional Costs (\$2018)	Soft Costs (\$2018)	Non-Refundable HST (\$2018)	Total Estimated Cost (\$2018)
WW01	Subtrunk 13 Extension	200mm sewer on Highway 48 from Norman Jones Place to Bethesda Road	2023-2026	A+	200 mm	600	Class 4	High	Rural	340,000	-	109,000	252,000	12,000	\$ 713,000
WW02	Subtrunk 11 Extension	250/300mm sewer on future road south of Main Street to YDSS West Trunk Sewer	2022-2026	Schedule B/Integrated Planning Approach	300 mm	545	Class 4	High	Rural	343,000	470,000	260,000	603,000	28,000	\$ 1,704,000
WW03	New SW Sanitary Pumping Station	40 L/s New SPS south of Sam's Way to existing Rougeview SPS forcemain	2022-2026	Schedule B/Integrated Planning Approach	40 L/s		Class 4	Med	Rural	920,000		244,000	495,000	28,000	\$ 1,687,000
WW04	New SW Forcemain	250mm forcemain from New SPS south of Sam's Way to existing Rougeview SPS forcemain	2022-2026	Schedule B/Integrated Planning Approach	250 mm	800	Class 4	Low	Rural	480,000	-	101,000	209,000	13,000	\$ 803,000
WW05	Subtrunk 9 Extension	375mm sewer on future road from the existing Rougeview SPS to the new SPS south of Sam's Way	2022-2026	A+	375 mm	800	Class 4	Low	Rural	537,000	-	113,000	233,000	15,000	\$ 896,000
WW06	Subtrunk 2 (Part 1 of 2)	450mm sewer of future road (Subtrunk 2)	2019	Schedule B/Integrated Planning Approach	450 mm	525	Class 4	Low	Rural	383,000	392,000	163,000	336,000	21,000	\$ 1,294,000
WW07	Subtrunk 2 (Part 2 of 2)	375mm sewer of future road (Subtrunk 2) up to Tenth Line	2019	A+	375 mm	350	Class 4	Low	Rural	235,000	-	49,000	102,000	6,000	\$ 392,000
WW08	Subtrunk 1 Extension (Part 1 of 6)	600mm sewer on York/Durham Line from the existing subtrunk 1 sewer north of Hoover Park Drive to Main Street	2019	Schedule B Completed	600 mm	700	Class 4	High	Suburban	2,345,000	-	750,000	1,741,000	81,000	\$ 4,917,000
WW09	Subtrunk 1 Extension (Part 2 of 6)	450mm sewer on York/Durham Line from Main Street to the norht limit of CamFella development	2019	Schedule B Completed	450 mm	720	Class 4	High	Suburban	1,394,000	-	446,000	1,035,000	48,000	\$ 2,923,000
WW10	Subtrunk 1 Extension (Part 3 of 6)	450mm sewer on York/Durham Line from the norht limit of CamFella development to Forsyth Farm Drive	2018-2021	Schedule B Completed	450 mm	205	Class 4	High	Suburban	397,000	-	152,000	354,000	16,000	\$ 1,000,000
WW11	Subtrunk 1 Extension (Part 4 of 6)	450mm sewer on Forsyth Farm Drive from York/Durham Line to Keeler Avenue	2018-2021	Schedule B Completed	450 mm	510	Class 4	High	Rural	1,432,000	196,000	521,000	1,209,000	56,000	\$ 3,414,000
WW12	Subtrunk 1 Extension (Part 5 of 6)	450mm sewer on Keeler Avenue from Forsyth Farm Drive to the connection to subtrunk 15 on future road to the north	2019-2021	Schedule B Completed	450 mm	150	Class 4	Med	Rural	421,000	-	112,000	227,000	13,000	\$ 773,000
WW13	Subtrunk 1 Extension (Part 6 of 6)	375mm sewer on future road east of Tenth Line from the connection to subtrunk 15 to Bethesda Road	2020-2022	Schedule B Completed	375 mm	1110	Class 4	Med	Rural	745,000	418,000	308,000	627,000	35,000	\$ 2,133,000
WW14	Subtrunk 15 (Part 1 of 2)	300mm on future road from the connection to subtrunk 1 to the west crossing Tenth Line	2020-2022	A+	300 mm	580	Class 4	Med	Rural	365,000	118,000	128,000	261,000	15,000	\$ 886,000
WW15	Subtrunk 15 (Part 2 of 2)	300mm on future road west of Tenth Line and south of the Go Transit Railway	2020-2022	A+	300 mm	610	Class 4	Med	Rural	384,000	-	102,000	207,000	12,000	\$ 703,000
WW16	Subtrunk 3 Extension	300mm sewer from the existing subtrunk 3 sewer north of Greenwood Road to the north side of the Go Transit Railway	2020-2022	Schedule B/Integrated Planning Approach	250 mm	160	Class 4	High	Rural	411,000	118,000	169,000	393,000	18,000	\$ 1,109,000
WW17	Subtrunk 18	300mm sewer on future road from Baker Hill Boulevard to Bethesda Road (Subtrunk 18)	2019-2021	A+	300 mm	590	Class 4	Low	Rural	371,000	-	78,000	161,000	10,000	\$ 620,000
WW18	Subtrunk 18	300mm sewer on Bethesda Road from future sewer to the west of the creek (Subtrunk 18)	2023	A+	200 mm	310	Class 4	Low	Rural	176,000	235,000	86,000	178,000	11,000	\$ 686,000
WW19	Subtrunk 10 Extension	450mm sewer onm Baker Hill Road from the existing subtrunk 10 sewer on Baker Hill Road to West Lawn Crescent	2019	A+	450 mm	430	Class 4	Med	Rural	313,000	-	83,000	169,000	9,000	\$ 576,000

Table 32: Wastewater Capital Program

Master Plan ID	Project Name	Project Description	Year in Service	Class EA	Size/Capacity	Length (m)	Class Estimate Type	Project Complexity	Area Condition	Base Construction Cost (\$2018)	Crossings (\$2018)	Additional Costs (\$2018)	Soft Costs (\$2018)	Non-Refundable HST (\$2018)	Total Estimated Cost (\$2018)
WW20	Subtrunk 10 Extension	450mm sewer on Ninth Line from Baker Hill Road to future road south of Bethesda Road	2019	A+	450 mm	140	Class 4	High	Suburban	102,000	896,000	326,000	756,000	35,000	\$ 2,135,000
WW21	Subtrunk 10 Extension	450mm sewer on future road south of Bethesda Road east of Ninth Line	2019	A+	450 mm	750	Class 4	Med	Rural	547,000	-	145,000	295,000	16,000	\$ 1,004,000
WW22	Subtrunk 10 Extension	375mm sewer on future road south of Bethesda Road east of Ninth Line	2022-2025	Schedule B/Integrated Planning Approach	375 mm	980	Class 4	Med	Rural	657,000	985,000	435,000	886,000	49,000	\$ 3,013,000
WW23	Sandiford Drive Sewer	200mm sewer on Sandiford Drive from	2019	A+	200 mm	190	Class 4	Low	Suburban	108,000	-	27,000	56,000	4,000	\$ 215,000
WW24	Rougeview SPS Decommission	Rougeview Sanitary Pumping Station Decommission	2022-2026	A+		0	Class 4	Med	Rural	-	-	-	-	-	\$ 50,000
WW25	Subtrunk 2 (Part 2 of 2)	300mm sewer of future road (Subtrunk 2) up to Tenth Line	2019	A+	300 mm	970	Class 4	Low	Rural	610,000	118,000	153,000	316,000	20,000	\$ 1,217,000
WW26	Baker Hill Boulevard By-Pass	300mm sewer of future road from Ninth Line to the connection to Subtrunk 10 on Baker Hill Boulevard	2019	A+	300 mm	455	Class 4	Med	Rural	286,000	-	76,000	154,000	9,000	\$ 525,000
WW27	Subtrunk 10 Extension	450mm sewer on Baker Hill Road - Creek Crossing	2019	A+	450 mm	200	Class 4	Med	Rural	146,000	-	39,000	172,000	10,000	\$ 587,000
WW28	Subtrunk 13 Extension	200mm sewer on Bethesda Road to Highway 48	2023-2026	A+	200 mm	255	Class 4	High	Rural	144,000	-	46,000	108,000	5,000	\$ 304,000
WW29	Master Plan	Wastewater Master Plan	2023	A+											\$ 250,000
WW30	Future Study	Future Service Areas Study - Wastewater	2019-2021	B											\$ 250,000
WW31	Flow Monitoring	Flow Monitoring Program (5 years)	2019-2023												\$ 500,000
Total Program - 2041															
\$37,279,000															

4 Further Considerations

The *Further Considerations* section provides an overall review of the permits and approvals, and mitigation measures that may be required for the preferred water and wastewater servicing strategy for the Town of Whitchurch-Stouffville.

This section has been organized as described below:

4.1 Permits and Approvals

4.2 Impacts and Mitigation Measures

This section is one of five sections that make up the complete Master Plan Class EA Study Report and should be read in conjunction with the other sections.

4.1 Permits and Approvals

This section provides an overview of the key permits and approvals that may be required in advance of the construction activities, and which will be further explored during detailed design.

4.1.1 Fisheries and Oceans Canada

A Fisheries Act self-screening may be required. A project review or authorizations may apply if impacts to fish and aquatic habitat cannot be avoided or mitigated during design and construction.

4.1.2 Ministry of the Environment, Conservation and Parks

4.1.2.1 Permit to Take Water

A Permit to Take Water (PTTW) is required for any water takings over 50,000 L/day. For a taking of greater than 50,000 L/day, but less than 400,000 L/day, the water taking shall be registered in the Environmental Activity and Sector Registry.

In the event that groundwater is present within the range of excavation depth, there is potential for dewatering requirements to exceed 400,000 L/d: this would require MECP approval through the PTTW application process. Prior to submitting any PTTW applications, ensure all that of the other related necessary approvals are obtained first.

4.1.2.2 Environmental Activity and Sector Registry

Any activities that discharge air contaminants at the facility will be registered in the Environmental Activity and Sector Registry as prescribed by O. Reg. 1/17.

4.1.2.3 Environmental Compliance Approval

Environmental Compliance Approval(s) are required for all sewage works.

4.1.2.4 Ministry of Natural Resources and Forestry

Wildlife relocation permits may be required if wildlife removals are needed during construction. Similarly, fish relocation permits may be required if fish salvage or

relocations are needed during construction. Permits or other authorization may be required to conduct an activity that could impact an endangered or threatened plant or animal or its habitat.

4.1.3 Ministry of Tourism, Culture and Sport

The MTCS must approve of the fieldwork and reporting completed as part of an archaeological assessment and must deem it compliant with the Ministry's 2011 Standards and Guidelines for Consultant Archaeologists.

Additional surveys may be required contingent on the MTCS review of a Stage 1 Study Report.

4.1.4 Conservation Authorities

Construction plans and supporting technical studies will be required to assess impacts, and to implement strategies to minimize and mitigate impacts, to regulated natural features and hazards. The Town of Whitchurch-Stouffville requires permits under O. Reg 166/06 and O. Reg 179/06, from TRCA and LSRCA, respectively, for interference or alteration to wetlands or watercourses, or for development within regulated areas.

4.1.5 Town of Whitchurch-Stouffville

Tree removal will be conducted in order to comply with the Town and Region's By-law as required.

4.1.6 Drinking Water Source Protection

The Clean Water Act (2006) and the Source Protection Plans that follow under it provide guidance and requirements in land use planning for the protection of Ontario's water resources. In some circumstances, sewage infrastructure may be considered an activity that poses a "significant" risk to drinking water quality.

The Town lies on the divide between two Source Protection Areas:

1. Lakes Simcoe and Couchiching/Black River Source Protection Area, which occupies approximately the northern half of Town
2. Toronto Source Protection Area: which occupies the remaining southern portion of the Town.

Within the Town boundaries, there are no identified surface water Intake Protection Zones but there are several Wellhead Protection Areas (WHPAs, see **Appendix B, Figure 4**). These WHPAs are associated with the municipal wells serving the Town of Whitchurch-Stouffville, as well as a few wells that lie in the neighbouring towns (e.g. Newmarket, East Gwillimbury).

One of the objectives of York Region's source protection program is to work with Conservation Authorities, local municipalities and other Regional departments to ensure new development considers source protection vulnerable areas.

The Master Plan recommends a number of infrastructure projects to support development proposals in potentially vulnerable areas. The Town of Whitchurch-Stouffville in collaboration with York Region will determine the need for any new Risk Management Plans and continue to complete best practice education for sites within vulnerable areas that do not require a Risk Management Plan. The Town's vulnerable areas are provided in **Figure 7**.

4.2 Impacts and Mitigation Measures

During the Municipal Class EA, the Town of Whitchurch-Stouffville worked closely with key stakeholders to address and resolve key issues or challenges associated with this study. However, not all issues can be addressed within the context of this Municipal Class EA process. As a result, the potential effects associated with the preferred strategies are provided below, as are the proposed mitigation measures developed to avoid or minimize those impacts.

4.2.1 Archaeological and Built/Cultural Resources

A Stage 1 archaeological assessment is recommended once a conceptual or preliminary design for the Water and Wastewater strategies are prepared for projects outside of existing and future road right of ways and previously undisturbed areas. The Stage 1 assessment will improve on this current assessment and will confirm the archeological potential of the area.

As part of the cultural heritage existing conditions brief, the following mitigation measures are recommended within the study area:

- Avoid the cemeteries in the Study Area;
- Plan future water and wastewater servicing work in the Stouffville Heritage Area within the existing road right-of-ways;
- Conduct site-specific Heritage Impact Assessment prior to water and/or wastewater servicing work on or adjacent (contiguous) to all properties designated under the Ontario Heritage Act and/or subject to a heritage plaque.
- For any other areas in the Town where water and wastewater servicing projects will be subject to Schedule B Municipal Class EAs Golder recommends conducting a Cultural Heritage Assessment Report for each project

4.2.2 Air Quality, Dust and Noise

The recommended servicing strategies are located within the Community of Stouffville and Ballantae-Musselman's Lake area. These areas are composed of agriculture, recreational, residential and limited commercial/industrial developments. The majority of construction will take place in existing and future road rights-of-ways which may be adjacent to potential sensitive receptors such as residential and business properties. Specific air quality, dust and noise mitigation measures should be prepared during the design stages. This will help to minimize the impact of odour problems and generation of sulfides and other odorous compounds which may be generated by the construction and

operation of the recommended strategies. However, in general the Town of Whitchurch-Stouffville will:

- Ensure Odour Control Plan (OCP) is delivered during construction and operation of recommended SPS project. During the design stage of implementation, as required by the Town, the proponent will provide a noise, odour and/or dust mitigation plan including direction submitting complaints.
- Employ a noise and dust control strategy to reduce emissions during construction of the recommended projects.
- Obtain an Environmental Compliance Approval for Air and Noise during detailed design where required.
- Develop a construction-staging plan to minimize community disruption where required.
- Use low noise equipment during construction, where possible.
- Restrict working hours for construction, in accordance with the Town of Whitchurch-Stouffville's Noise Control By-law.
- During implementation of the design stage, as required by the Town, the proponent should provide noise, odour and/or dust mitigation plan including direction on how to submit complaints.
- As recommended by the MECP, non-chloride dust suppressants will be used during the construction phase.

4.2.3 Species at Risk

Any work that may impact the habitat of threatened or endangered species shall meet all associated regulations, including registration and permitting, as well as comply with all regulations within the Endangered Species Act (ESA).

To minimize any harm to wildlife and wildlife habitat, the following mitigation measures should be implemented during the construction process:

- Any vegetation clearing that must occur during construction shall not occur during the breeding bird season (April 15 to August 15). If this is not possible, prior to vegetation clearing, a qualified biologist must complete a nest search.
- Measures must be implemented to protect trees from direct and indirect physical damage.
- Once the construction has been completed, all disturbed areas shall be rehabilitated, stabilized and revegetated to ensure the project site is restored to pre-construction conditions.
- Installation of exclusion fencing surrounding the active construction area.

4.2.4 Significant Natural Environment Features

It is recommended that future planning avoid any significant natural environment features including environmental significant areas, significant wetlands, woodlands, ANSIs and valleylands. If preferred alternatives cannot avoid these area, additional studies are

recommended to conform to applicable policies of the Greenbelt, ORMCP, Town and Regional Official Plans.

Works in or surrounding significant wetlands, and fish habitat will require a *Development, Interference with Wetland and Alterations to Shorelines and Watercourses* permit from either the LSRCA or TRCA, depending on the area's conservation authority jurisdiction.

4.2.5 Surface and Groundwater

The surface water features associated with the creeks and lakes are considered to be sensitive receptors. As shallow groundwater is understood to discharge to these watercourses, they are considered to be susceptible to impacts from changes in groundwater quantity and/or quality. Mitigation of potential impacts to surface water and groundwater should include the following:

- Appropriate selection of construction methods to minimize dewatering near creeks
- Appropriate selection of linear sewer route and construction methods to minimize potential disruption of current state of interaction between groundwater and surface water
- Employing clay collars as necessary to reduce preferential seepage along the proposed alignment, especially where it is proposed to slope towards and/or cross any creeks.
- Development of an erosion and sediment control plan to ensure dewatering discharge does not impact surface water while protecting the watercourse from sediment laden runoff.
- Development and implementation of a spills response plan in the event of a fuel spill or sediment release.

In order to protect surface and groundwater features, the design of the municipal service corridors should include trench barrier mechanism to prevent the horizontal and vertical transport of potential contaminants through the disturbed soil and materials around the municipal services, especially in areas currently with no municipal sanitary sewer services. This methodology will be considered during design and permits and approvals stage in consultation with the Town.

For any development occurring within a Wellhead Protection Area, the development of a Source Water Impact Assessment and Mitigation Plan may be required.

A geotechnical evaluation for ground settlement, excavation basal heaving and the selection of an appropriate dewatering mechanism should be performed by a geotechnical engineer for the phases of the project that will require a PTTW or where groundwater is under artesian conditions. In addition, a hydrogeological impact assessment should be performed for these projects.

4.2.6 Contaminated Areas

It is recommended that a Phase One Environmental Site Assessment be performed to identify potential contaminating activities and provide an assessment of the risk of contaminated groundwater and soils to support the design phases of planned works.

If soils are contaminated, they will be disposed of consistent with Part XV.1 of the Environmental Protection Act and Ontario Regulations 153/04, Records of Site Condition. The MECP's York-Durham District Office will be contacted for future consultation if contaminated sites are present.

Activities involving the management of excess soil will be completed in accordance with the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014) available online (<http://www.ontario.ca/document/management-excess-soil-guide-best-management-practices>). All waste generated during construction will be disposed of in accordance with provincial requirements. The areas of construction disturbance will be kept to a minimum.

4.2.7 Traffic Management

During detailed design of the recommended projects the proponent will prepare a traffic management plan. This plan will need to consider required signage, traffic control measures to aid the safe ingress and egress of trucks to and from the site, and mitigation of impacts to vehicular traffic in addition to other pedestrian and cycling movements.

4.2.8 Utilities

During detailed design of the recommended projects, the proponent will need to contact the relevant utility firms to confirm and ensure impacts to utilities are minimized or avoided during construction and operations.

5 Public Consultation

The *Public Consultation* section provides a compilation of all the relevant documentation related to the public, stakeholder and agency consultation. This section also provides the background support for satisfying the Public Consultation for the Class EA Process.

This section has been organized as described below:

5.1 Communication and Consultation Summary

5.2 Contact List

5.3 Notice of Commencement

5.4 Public Information Centres

5.5 Comments Received

5.6 Notice of Completion

5.7 Aboriginal and First Nations Consultation

This section is one of five sections that make up the complete Master Plan Class EA Study Report and should be read in conjunction with the other sections.

5.1 Communication and Consultation Summary

Public consultation is an integral component of the Class EA process, enabling the Town to inform the public about the study while eliciting input from potentially interested and affected parties during the study process.

The primary goals of the public consultation process are to:

- Present clear and concise information to stakeholders at key stages of the study process
- Solicit community, regulatory and Town staff input
- Undertake comprehensive consultation to complete the duty to consult with Aboriginal people in Ontario
- Consider stakeholder comments when evaluating alternative solutions and in recommending the technical feasible solution; and,
- Comply with Municipal Class EA consultation requirements

At the outset of the public consultation process, the Town of Whitchurch-Stouffville developed a Communication and Consultation Plan tailored to this study. The primary objective of the plan was to encourage two-way communication with the community, regulatory agencies and Town staff. More specifically, the plan was designed to:

- Build on past communication protocols and consultation plans from previous Class EAs and municipal planning initiatives - to ensure consistency and continuity

- Ensure the general public, local councilors, stakeholders, external agencies (including federal, provincial and regional) and special interest groups had an opportunity to participate in the study process
- Ensure that relevant information was provided to interested and affected stakeholders early and often throughout the planning process
- Make contact with external agencies to obtain legislative or regulatory approvals, and to collect pertinent technical information

In order to comply with the Municipal Class EA process, the Town hosted a Public Information Centre to elicit input on the study process and the preliminary preferred servicing solution and infrastructure projects. Complete documentation of the consultation and communication program is provided in **Appendix I**.

5.2 Contact List

A list of stakeholders, review agencies and other interested parties was developed at the outset of the study to invite participation in the planning process. The contact list was updated throughout the study as more individuals became aware of the study or provided feedback.

5.3 Notice of Commencement

The combined Notice of Commencement and PIC #1 was published and distributed on September 18, 2017. The notice was made public by the following means:

- Mailed/ e-mailed to the stakeholders listed in the contact list,
- Advertised in the Whitchurch-Stouffville “On the Road”, a monthly newspaper, and the “Stouffville Sun” (Sun Tribune), a weekly newspaper.

5.4 Public Information Centres

The study’s PIC was intended to elicit input on the Class EA process, servicing constraints and opportunities, alternative concepts and strategies to address the servicing challenges and opportunities, and the technically feasible solution. The study included two PICs.

5.4.1 Public Information Centre No. 1

PIC No. 1 was held during Phase 1 of the Class EA study process to introduce the project and receive feedback regarding the Problem and Opportunity Statement, Study Background and Class EA Process.

PIC No. 1 was held at the location and date provided in **Table 33**:

Table 33: Public Information Centre No. 1

Date	Location
Wednesday, September 27, 2017 5:30 p.m. to 7:30 p.m.	Town Hall, 111 Sandford Drive, Stouffville

Details on the attendance, comments received, and display panels presented during PIC No. 1 are provided in **Appendix I**.

5.4.2 Public Information Centre No. 2

The Notice of PIC #2 was distributed to the individuals listed in the master contact list as well as being posted in two newspapers; On the Road (February 2018 Edition) and Sun Tribune (February 15 & February 22, 2018).

PIC No. 2 was held during Phase 2 of the Class EA study process to present the systems opportunities and constraints, present preliminary preferred servicing strategies and received public input.

PIC No. 2 was held at the location and date provided in **Table 34**:

Table 34: Public Information Centre No. 2

Date	Location
Thursday, March 1, 2018 5:30 p.m. to 7:30 p.m.	Town Hall, 111 Sandford Drive, Stouffville

Details on the attendance, comments received, and display panels presented during PIC No. 2 are provided in **Appendix I**.

5.5 Comments Received

Through the public consultation process, comments were received from stakeholders. These comments were filed and addressed accordingly. **Table 35** provides a summary of comments received during this study. **Appendix I** provides the detailed list of comments received throughout the study.

Table 35: Consultation Comments Summary

Stakeholder	Date	Summary of Comments	Action
Ontario Power Generation	18-Sep-17	OPG advised that the project is not near the vicinity of OPG's operations. No further consultation required.	1. Comment filed. 2. Contact removed from contact list.
Hydro One	21-Sep-17	Acknowledgement of notice receipt.	1. Comment filed.

Stakeholder	Date	Summary of Comments	Action
		Hydro One advised of the location of a Hydro One high voltage transmission corridor within the study area. Zone 3A scheduling may require consultation when project moves into design phase.	2. Transmission corridor outside of servicing study area. Future consideration for future potential servicing in Gormley.
Resident	27-Sep-17	Resident requested to be added to contact list.	1. Comment filed. 2. Resident added to the contact list.
Resident	27-Sep-17	Resident requested to be added to contact list.	1. Comment filed. 2. Resident added to the contact list.
Metrolinx	27-Sep-17	Acknowledgement of notice receipt.	1. Comment filed.
MECP	28-Sep-17	MECP provided list of Aboriginal Communities to be included in Consultation Plan as well as supplemental information regarding "Areas of Interest".	1. Comment noted and filed. 2. Aboriginal community contacts added to the contact list 3. Areas of Interest included in Project File.
MTCS	18-Oct-17	Acknowledgement of notice receipt. MTCS provided screening and evaluation criteria for Archaeological, Built Heritage and Cultural landscapes.	1. Comment filed. 2. Cultural Heritage Screening Report and Stage 1 Archaeological Report completed.
TRCA	25-Oct-17	TRCA provided the "Areas of Interest" to be considered within the study area and submission guidelines for TRCA master plan review. Contacts requested to be added to the contact list.	1. Comment noted and filed. 2. Contact updated in the contact list. 3. Areas of Interest included in Project File.
Chippewas of Rama First Nation	25-Oct-17	Acknowledgement of notice receipt. Letter forwarded to Council and Karry Sandy McKenzie, Williams Treaties First Nation.	1. Comment filed. 2. Contact already included on contact list.
Infrastructure Ontario	31-Oct-17	Acknowledgement of notice receipt. Request to confirm with MOI in writing of any MOI lands that are proposed to use for the project.	1. Comment filed. 2. Study located on municipal land therefore no further action required.

Stakeholder	Date	Summary of Comments	Action
Town of Whitchurch-Stouffville	8-Nov-17	The Town provided the Notice of Study Commencement for an ongoing municipal class environmental assessment being conducted by York Region within the Community of Stouffville; York Water System in the Community of Stouffville.	1. Comment noted and filed. 2. Comment considered through EA Study.
CN	24-Jan-18	CN advised of properties within the study area and request to remain on the contact list.	1. Comment filed. 2. Comment considered through EA Study.
Hydro One	26-Feb-18	Acknowledgement of notice receipt. Advised of the location of a Hydro One high voltage transmission line and distribution lines and stations within the study area. Zone 3A Scheduling may require consultation when project moves into design phase.	1. Comment filed. 2. Transmission corridor outside of servicing study area. Future consideration for future potential servicing in Gormley.
Resident	1-Mar-18	Resident requested to be added to contact list.	1. Comment filed. 2. Resident added to the contact list.
Resident	1-Mar-18	Resident requested to be added to contact list. Resident suggested extending sewage network to Ballantrae-Musselman's Lake as well as combining both communities into one community.	1. Comment filed. 2. Resident added to the contact list. 3. Resident advised that this study has not recommended wastewater servicing for Ballantrae-Musselman's Lake due to provincial policy restrictions. Resident also advised that integrating the two communities is outside the scope of this study.
Resident	1-Mar-18	Resident requested to be added to contact list. Resident suggested extending services to Gormley.	1. Comment filed. 2. Resident added to the contact list. 3. Resident advised that this study focused on existing and planned growth within urban boundary. In addition, the study has not recommended water servicing for

Stakeholder	Date	Summary of Comments	Action
			Gormley due to provincial policy restrictions.
Resident	1-Mar-18	Resident requested to be added to contact list. Resident suggested extending sewer north on York Durham Town line as well as adding potable water in Gormley southwest corner (fire hydrants).	1. Comment filed. 2. Resident added to the contact list. 3. Resident advised that this study has not recommended water servicing for Gormley due to provincial policy restrictions though the Town recognizes the need for further required studies
Chippewas of Rama First Nation	1-Mar-18	Acknowledgement of notice receipt. Letter forwarded to Council and Karry Sandy McKenzie, Williams Treaties First Nation.	1. Comment filed. 2. Contact already included in contact list.
MECP	2-Mar-18	Acknowledgement of notice receipt. MECP provided additional information on Source Water Protection and Climate Change policies to be considered throughout the study MECP requested email receipt acknowledgement.	1. Comment filed. 2. Confirmed with MECP receipt of email. 3. Areas within study area are within Source Water Protection Zones (within the Community of Stouffville and Ballantrae-Musselman's Lake). Source Water Protection policies and maps included in Project File.
TRCA	6-Mar-18	Meeting with TRCA to review project understanding, present preliminary water and wastewater servicing strategy and the next steps in the project. TRCA identified areas to avoid/minimize impact for both water and wastewater strategies (i.e. environmental features, source water protections zones).	1. Meeting minutes filed. 2. Comments considered through EA study.
Illustrate Inc.	12-Mar-18	Requested copy of comment form.	1. Comment filed. 2. Comment form template forwarded to contact.
Hydro One	13-Mar-18	Hydro One requests the addition of Enza Cancilla, Real Estate Management to contact list to	1. Comment filed. 2. Added Enza Cancilla to contact list.

Stakeholder	Date	Summary of Comments	Action
		ensure no impact on all Hydro One assets. No further consultation with Hydro One Networks is required if there are no changes made to current information.	3. Hydro One Networks removed from contact list.
J+B Engineering Inc.	15-Mar-18	Requested to be added to mailing list J+B Engineering are currently working on 12637 Tenth Line Requested coordination with subdivision engineer and Town regarding site servicing stubs and connections (SAN, STM, water) Inquiry into the quantity and quality treatment of the stormwater pond in relation to their site.	1. Comment filed. 2. Stakeholder added to the contact list. 3. Advised that this study is a strategic level study therefore the site-specific suggestions are outside the scope of the study. 4. 12637 Tenth Line comments forwarded to the Town's Development Engineer.
Fieldgate Development	19-Mar-18	Requested to be added to mailing list For the water system, resident suggested securing agreements with existing industrial in northwest prior to discounting 48/Bethesda alignment; Resident suggested additional technical studies required to evaluate alternatives, approval complexities, land holdings, and costs. Resident suggested area may be better served by an A.S.D.C.	1. Comment filed. 2. Developer added to the contact list. 3. Advised that this study is a strategic level study therefore the suggestions are outside the scope of the study. 4. Comments forwarded to the Town's Financial and Planning Department.
Hydro One	23-Mar-18	Hydro One provided contact information details to replace current Hydro One contact.	1. Comment filed. 2. Contact updated in contact list.
TRCA	29-Mar-18	"TRCA provided information related to source water protection policy documentation. Requested to be added to TRCA contact list for report final review"	1. Comment filed and noted. 2. Added Jennifer Stephens to contact list.
LSRCA	3-Apr-18	LSRCA advised that the agency only gets involved when there is a change in municipal well/intake	1. Comment filed and noted.

Stakeholder	Date	Summary of Comments	Action
		therefore if no changes are proposed to the municipal drinking water system, no further comment is required from LSRCA.	2. Added Bill Thompson to contact list.
LSRCA	6-Apr-18	LSRCA provided a document indicating that no further LSRCA requirements are needed for this study, unless servicing strategies change.	1. Comment filed.
LSRCA	5-Jul-18	Copy of draft project file and appendices sent to York Region for review.	1. Comment filed. 2. Contact list updated with new LSRCA representative. 3. No comments received from LSRCA"
SCS Consulting Group	2-Aug-18	Stakeholder requested to be notified of any future study activities regarding this project	1. Comment filed 2. Request added to project file
MECP	7-Aug-18	MECP completed a review of the draft project file and provided formal comments.	1. Comment filed. 2. Receipt of comments acknowledged 3. MECP comments incorporated into Master Plan project file
TRCA	15-Aug-18	TRCA completed a review of the draft project file and provided formal comments.	1. Comment filed. 2. TRCA comments incorporated into Master Plan project file

5.6 Notice of Completion

The Notice of Completion was published and distributed on November 21, 2018. The notice was made public by the following means:

- Mailed/ e-mailed to the stakeholders listed in the contact list,
- Advertised in the Whitchurch-Stouffville "On the Road", a monthly newspaper, and the "Stouffville Sun" (Sun Tribune), a weekly newspaper.

5.7 Aboriginal and First Nations Consultation

Following the notice of commencement and PIC #1, the MECP provided GM BluePlan with a list of Aboriginal and First Nation's communities who may potentially be affected by the Town's Master Plan. The identified communities include:

- Chippewas of Georgina Island First Nation,
- Rama First Nation,
- Beausoleil First Nation,
- Alderville First Nation,
- Curve Lake First Nation,
- Hiawatha First Nation,
- Mississaugas of Scugog Island First Nation, and
- Kary Sandy-Mckenzie, Williams Treaty Claims Coordinator

These communities were added to the project contact list and received all project notices throughout the project's timeline.