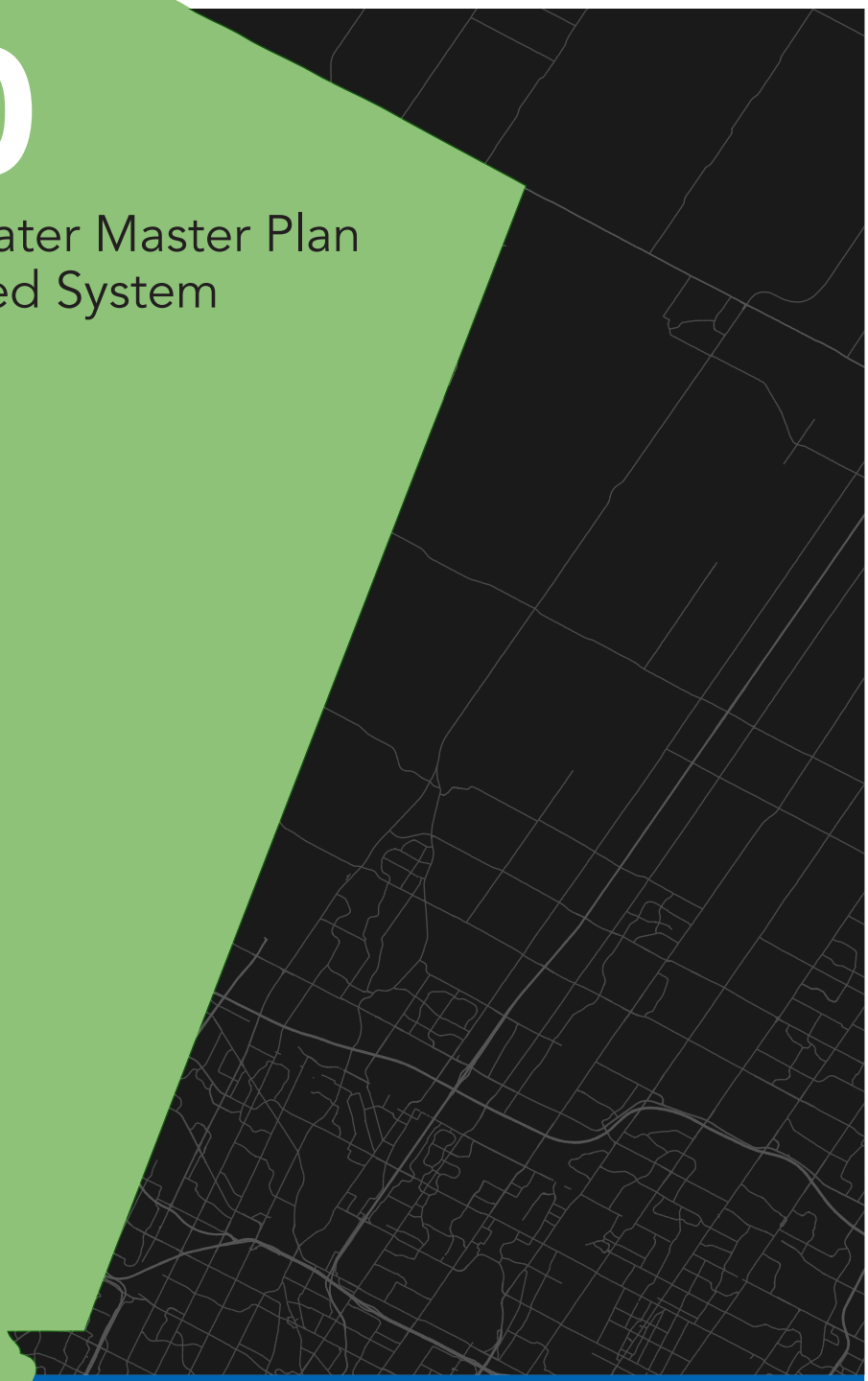
Region of Peel
working with you

2020

Water & Wastewater Master Plan for the Lake-Based System



VOLUME 2

Background & Planning Context

Prepared by: BluePlan ENGINEERING

2020 Water and Wastewater Master Plan for the Lake-Based Systems Class Environmental Assessment Study Report Outline

The report for the 2020 Water and Wastewater Master Plan for the Lake-based Systems ("2020 Master Plan") is a comprehensive document that describes the planning, evaluation, and decision-making process for developing the long-term water and wastewater strategies in the Region of Peel. The master plan documentation is compliant with the requirements of the *Environmental Assessment Act* and is being placed on public record for the prescribed review period.

The 2020 Master Plan Report is organized into five volumes:

Volume 1 – Executive Summary

Provides a brief overview of the 2020 Master Plan. It summarizes the information contained in Volumes 2, 3, 4 and 5, including problem statement, purpose of the study, planning, policy and technical considerations, and description of the preferred water and wastewater servicing strategies, including depiction of the projects and capital programs.

Volume 2 – Background and Planning Context

Details the master planning process including the Class EA process for Master Plans, related studies and background information, legislative and policy planning context, water and wastewater servicing principles and policies, population and employment growth forecasts, existing environmental and servicing conditions and future considerations.

Volume 3 – Water Master Plan

Provides the comprehensive documentation for the water system and details the study objectives, approach, methodologies, technical analyses, evaluation and selection of the preferred water servicing strategy. This volume contains baseline water system data and performance information. This volume documents the water servicing strategy development, with detailed information on the projects and capital program associated with the preferred water servicing strategy.

Volume 4 – Wastewater Master Plan

Provides the comprehensive documentation for the wastewater system and details the study objectives, approach, methodologies, technical analyses, evaluation and selection of the preferred wastewater servicing strategy. This volume contains baseline wastewater system data and performance information. This volume documents the wastewater servicing strategy development, with detailed information on the projects and capital program associated with the preferred wastewater servicing strategy.

Volume 5 – Public and Agency Consultation

Contains all relevant documentation of the public consultation process including notices, comments and responses, and distribution information. Presentation material from all public information centres (PICs) held during the process is included. Additional presentation materials and discussion information from workshops held with relevant agencies, approval bodies and other stakeholders are also included.

The following sections present Volume 2 which is one of five volumes that make up the complete 2020 Master Plan Report and should be read in conjunction with the other volumes.

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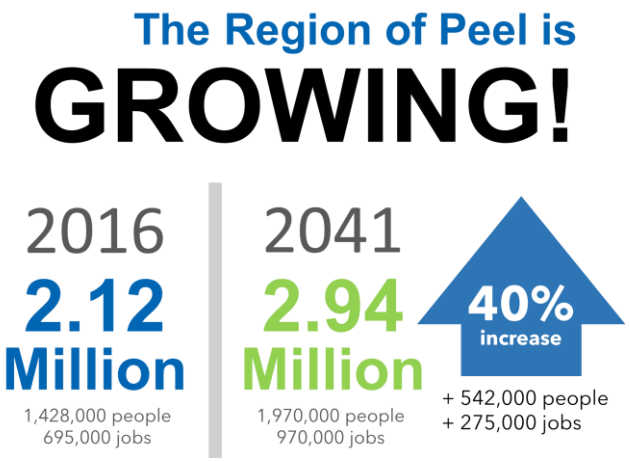
1.0 Introduction

1.0 Introduction

1.1 Background

The Region of Peel is made up of three local municipalities: the City of Mississauga, the City of Brampton, and the Town of Caledon. Located in southern Ontario, the Region of Peel is part of the Greater Golden Horseshoe area, one of the most dynamic and fast-growing regions in Canada and North America.

The Region of Peel is responsible for water treatment, transmission and distribution mains, storage facilities and pumping stations, as well as wastewater treatment, sanitary sewers, force mains and sewage pumping stations. The Region builds and maintains infrastructure to treat, deliver and move water and wastewater across the Region.



As one of the fastest growing municipalities in Ontario, the Region of Peel and its Public Works department recognizes that readily available and accessible public water and wastewater infrastructure is essential to the viability of existing and growing communities across the Region. The *Places to Grow Act* and supporting documentation has identified the 2041 residential and employment projection for the Region of Peel. The Region of Peel's population is expected to grow to almost 2 million people by 2041[1]. This means that by 2041, the Region needs to accommodate water and wastewater servicing for over 542,000 new residents and 275,000 additional jobs.

To balance the needs of growth with the protection and preservation of natural, environmental and heritage resources, the Region of Peel initiated an update of its water and wastewater master plan.

The 2020 Water and Wastewater Master Plan for the Lake-Based Systems ("2020 Master Plan") is a study intended to address the increasing demands on the Region's water and wastewater infrastructure. The study provides a review, evaluation, and development of water and wastewater servicing strategies for all servicing needs within the lake-based systems in the cities of Mississauga and Brampton and parts of the Town of Caledon. The 2020 Master Plan does not examine the groundwater-based systems or communal wastewater systems in Caledon as they are addressed separately by the Region.

The 2020 Master Plan builds on previous work undertaken as part of the 1999 Master Plan, the 2002 Master Plan Addendum, the 2007 Master Plan, and the 2013 Master Plan. The master plan is a critical component of the Region's growth management strategy and will provide the framework and vision for the water and wastewater servicing needs for the lake-based service areas of the Region to 2041 and beyond. In addition, the 2020 Master Plan serves as the basis for short-term and long-term infrastructure programming and capital budgeting. The 2020 Master Plan is the foundation for the water and wastewater program as part of the Region of Peel's Development Charges (DC) Background Study and By-law update.

1.2 Water and Wastewater Master Plan Objectives

The 2020 Master Plan comprehensively documents the development, evaluation and selection of the preferred water and wastewater servicing strategies to meet the servicing needs of existing and future development to 2041.

The key objectives of the 2020 Water and Wastewater Master Plan are as follows:

- Identify a preferred lake-based water and wastewater servicing strategy to support existing servicing needs and projected growth.
- Coordinate with the Regional Official Plan Amendment (ROPA), which guides provincially mandated growth within the Region to 2041.
- Emphasis on intensification impacts, consideration of post-2041 growth and alignment with the Regional Strategic Plan.
- Provide the need, timing and cost of servicing and infrastructure.
- Follow the Municipal Class Environmental Assessment process for master plans.

The 2020 Master Plan study incorporates the latest planning information, modelling tools, historical flow and demand data, and servicing studies to complete a full review and update of the servicing strategies. The study also reviews the Region's capital plan to meet the current servicing agreements with York Region and the City of Toronto.

This study follows Approach 1 of the Class Environmental Assessment (EA) process for master plans. The approach involves preparing a master plan document at the conclusion of Phase 1 and 2 of the Class EA process. This approach allows for Schedule A, A+ identified in the master plan to move forward to implementation and become the basis for future investigations for specific Schedule B and C projects.

1.3 Problem Opportunity Statement

The problem or opportunity statement defines the principal starting point in the undertaking of the Class EA study and assists in defining the scope of the project. The problem or opportunity statement for the 2020 Master Plan for the Lake-Based Systems is defined as follows:

The Region of Peel has completed several updates to the water and wastewater master plan, completing the most recent update in 2013.

With an updated planning horizon to 2041, the Master Plan needs to be updated to determine how the Region's water and wastewater infrastructure will support growth in a sustainable and financially responsible manner.

The Master Plan will develop a long-term servicing strategy and capital forecast to ensure level of service for existing residents and businesses, to support future growth in the community through 2041, and to consider potential impacts post-2041.

1.4 Study Area

The Region of Peel is situated in the west-central inner ring of the Greater Golden Horseshoe area. The Region is bounded to the north by Dufferin County and Simcoe County, to the south by Lake Ontario, to the east by the City of Toronto and York Region, and to the west by Halton Region and Wellington County.

The Region of Peel is made up of three local municipalities: the City of Mississauga; the City of Brampton; and the Town of Caledon, as shown in **Figure 1**. The Region includes a diverse mix of urban, suburban, rural, agricultural and natural landscapes including the Oak Ridges Moraine, the Niagara Escarpment and the Greenbelt.

The Region of Peel covers an area of 1,247 square kilometres with a population of approximately 1.4 million people as listed in the 2016 census. The study area covers the existing and future lake-based water and wastewater systems. The groundwater-based systems and communal wastewater system in Caledon are not included in the scope of this study.

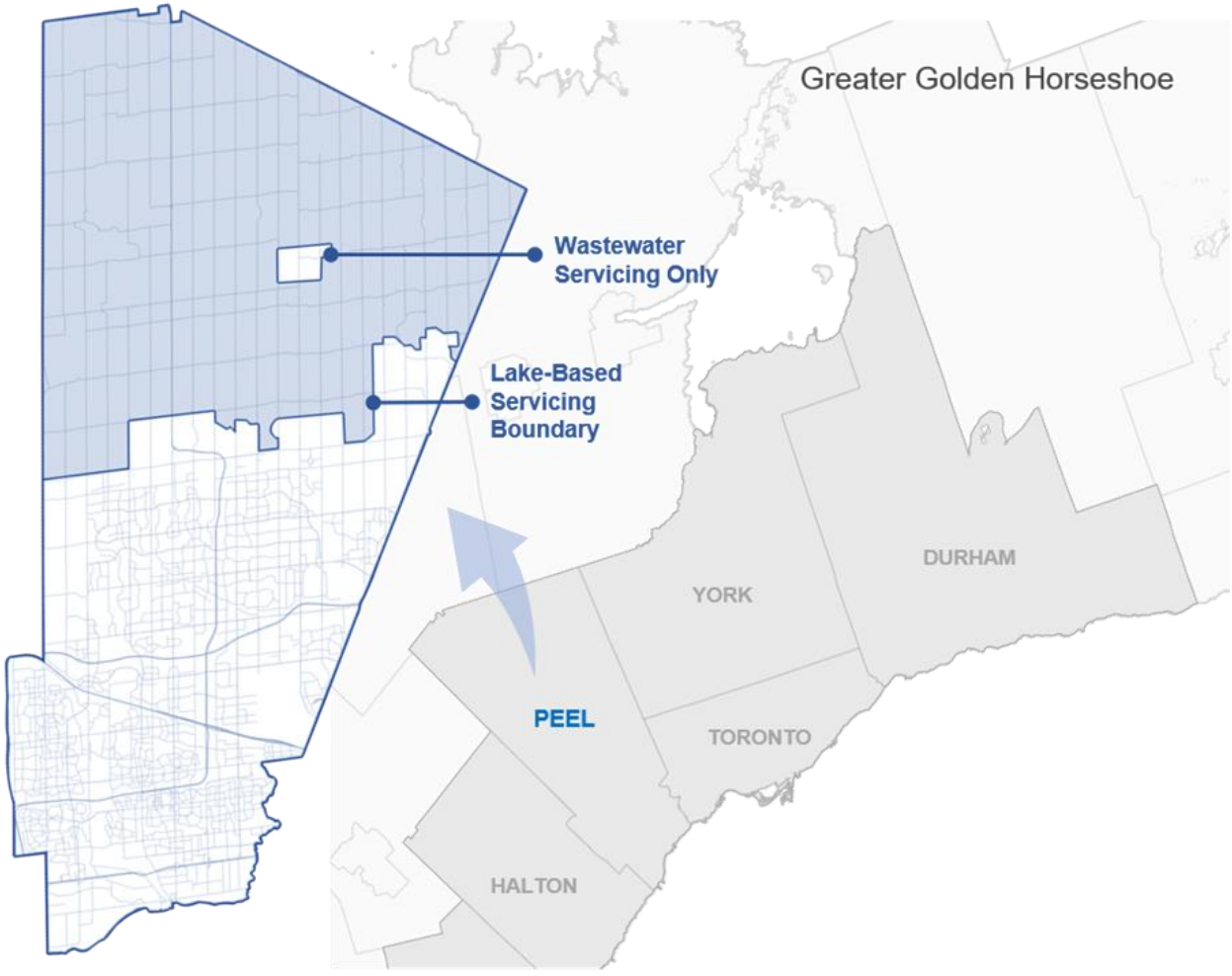


Figure 1– Study area for the 2020 Water and Wastewater Master Plan.

2.0 Master Planning Process

2.1 Class Environmental Assessment Process
2.2 Public Consultation

2.0 Master Planning Process

The Municipal Class EA process clearly defines approaches for completion of Master Plans within the Class EA context. 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."**

The 2020 Master Plan is based on Approach 1 of the Municipal 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 environmental assessment process and the specific requirements for the preparation of master plans.

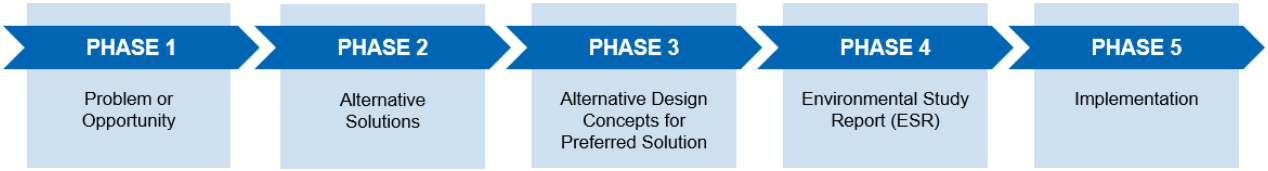


Figure 2 – Municipal Class Environmental Assessment process.

2.1 Class Environmental Assessment Process

2.1.1 Environmental Assessment Act

Ontario's *Environmental Assessment Act (EAA)* defines a planning and design process that proponents must follow to examine and document the environmental effects that could result from major projects or activities.

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 in Ontario of the environment"[2].

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 MEA Municipal Class EA is an approved planning process for municipal infrastructure that can be used to meet the requirements of the *EAA*.

2.1.2 Principles of Environmental Planning

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

1. **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.

2. **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.

3. **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.

4. **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".

5. **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.

2.1.3 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 EA outlines the procedures to be followed to satisfy Class EA requirements for water, wastewater, stormwater management and road projects. **Figure 3** illustrates the Municipal Class EA planning and design process.

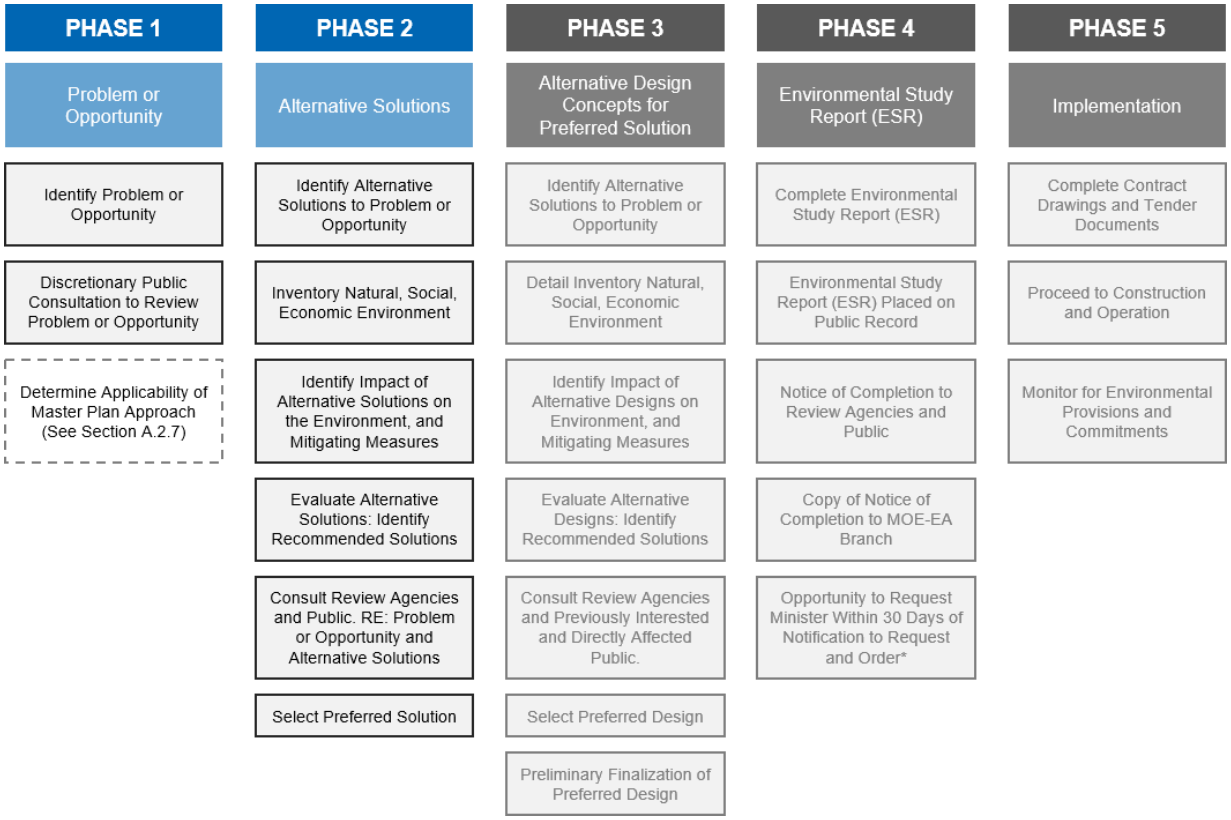


Figure 3 – Municipal Class EA planning and design process.

2.1.4 Project Schedules

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

Schedule A

These 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.

Examples: Repairing watermain breaks, cleaning sanitary sewers.

Schedule A+

These 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 allowances, and utility corridors.

Examples: Resorting a water treatment plant, installing a sanitary sewer in an existing road allowance.

Schedule B

These projects require a screening of alternatives for their environmental impacts and completion of Phases 1 and 2 of the Class EA process. 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.

Examples: Increasing the depth of a municipal well, retiring a wastewater treatment plant.

Schedule C

These 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 to implementation.

Examples: Building a new water treatment plant, expanding an existing wastewater treatment plant beyond its rated capacity.

2.1.6 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.

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.

According to the 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, as identified in Section 2.1.2 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 2020 Master Plan is designed to build on decision-making completed in previous master plans and Development Charges By-law updates and to present a refined overall strategy for all the communities in the study area. The approach for the 2020 Master Plan is to confirm existing servicing strategies and projects and, where applicable, evaluate and develop new ones. This approach was scrutinized through a public and agency consultation process and is fully documented in Volume 5 of the 2020 Master Plan study report.

This study follows Approach 1 of the approved master planning Class EA process. This approach allows for Schedule A, A+ identified in the master plan to move forward to implementation and become the basis for future investigations for specific Schedule B and C projects.

2.2 Public Consultation

The public consultation process is essential for informing the public about the study and obtaining input from interested and affected parties during the study process.

The main objectives of the public consultation process were:

- Present clear and concise information to stakeholders at key stages of the study process.
- Solicit community, regulatory and Regional staff input.
- Meet Municipal Class EA consultation requirements.

To fulfill the consultation requirements of the MEA Municipal Class EA and enhance the overall Class EA process, the Master Plan was designed to:

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

The complete public consultation and communication process is documented in detail in **Volume 5 – Public Consultation.**

3.0 Related Studies and Background Information

3.0 Related Studies and Background Information

The Region of Peel has a history of successful implementation of recommendations from the water and wastewater master plan since the first completed master plan in 1999. Since then, several studies, plans, frameworks, programs and other initiates, have been developed to inform the Region's decision-making and long-term planning process while providing a better understanding of the Region's water and wastewater infrastructure.

The following sections present an overview of the history of the Region's master plans and present relevant background information reviewed and considered throughout the master planning process in the development of the preferred servicing strategies.

3.1 Water and Wastewater Master Plan History

1999

- First Master Plan completed by the Region for the water and wastewater systems.
- Identified servicing strategies for the lake-based water and wastewater systems to 2031.

2000

- Master Plan Addendum to the 1999 Master Plan based on the York-Peel Servicing Agreement.
- Revision of the water and wastewater servicing strategies to accommodate water demands and wastewater flows from York Region.

2007

- Full update of the Master Plan
- Provincial Places to Grow legislation was put in effect
- Water and wastewater servicing strategies were reviewed and updated to support the Region's growth based on the growth plan.

2013

- Population and Employment forecasts were updated in the Region's Official Plan Amendment.
- Emphasis placed on intensification servicing as well as consideration for post-2031 growth.
- Wastewater trunk system model, water model and water schematics provide greater and better analysis tools for refinement of projects and timing.
- Incorporated recent servicing studies into updated strategies.

2020

- Population and Employment forecast updated to 2041, with emphasis on intensification, post-2041 growth and alignment with Region Strategic and Official Plan.
- Enhanced Growth Management Process – proactive collaboration with stakeholders and iterative planning review.
- New wastewater all-pipe model and updated water model and water schematics provide greater accuracy in results and refinement to projects and timing.
- Updates to per capita design criteria and extraneous flow criteria.
- Review of recent historical data to recognize changing consumption.
- Results of detailed servicing studies incorporated into program.
- Program focused on wet weather.
- Climate change considerations incorporated into analysis.
- Integrated Watershed Planning.

3.2 Class Environmental Assessments

The following sections provide an overview of past and current Municipal Class Environmental Assessments (EA) in the Region of Peel that are relevant in the 2020 Master Plan context.

Table 1 – Class Environmental Assessments overview – completed projects.

	Completed Class EA	Description	Status
Completed	Sanitary Sewer and Water Main Improvements for South East Mississauga (Schedule B)	Schedule B Class EA for sanitary sewer and water main improvements near Mattawa Avenue in Mississauga to address long-term servicing needs.	Completed, October 2019
	New Sanitary Sewers – Fair Birch Drive, Birchview Drive, Queen Victoria Avenue and Lorne Park Road (Schedule B)	Schedule B Class EA for sanitary sewer improvements on Fair Birch Drive, Birchview Drive, Queen Victoria Avenue, and Lorne Park Road. These improvements were required to maintain the system connection to the existing sanitary sewer.	Completed, July 2019
	Front Street Sewage Pumping Station Wastewater Diversion (Schedule B)	Schedule B Class EA to address the current Front Street and Richard's Memorial Sewage Pumping Stations and catchment area wastewater flows to align with the Region's long-term sustainable plan to provide wastewater services.	Completed, June 2019
	Water Main Requirements – Castlemore Road to Countryside Drive (Schedule B)	Schedule B Class EA to investigate the need for a water main on McVean Drive from Castlemore Road to Countryside Drive in Brampton.	Completed, January 2019
	Mississauga Sewage Pumping Station Upgrades (Schedule B)	Schedule B Class EA to identify sewage pumping stations that need to be upgraded due to their aging infrastructure: Rosemere Road SPS, Indian Road SPS and Silver Birch Trail SPS.	Completed, August 2018
	Silverthorn Reservoir and Pumping Station Expansion (Schedule B)	Schedule B Class EA to identify and assess the environmental impacts of the expansion and upgrades of the Silverthorn Pumping Station and Reservoir and determine the preferred solution and required upgrades.	Completed, January 2018

	Ongoing Class EA	Description	Status
Completed	East to West Wastewater Diversion Strategy (Schedule C)	Schedule C Class EA to identify, develop and implement a strategy to convey wastewater from the east trunk system to the west trunk system. More details in **Section 3.2.1**	Completed, December 2016
	Burnhamthorpe Road Water Main (Schedule B)	Schedule B Class EA to improve water supply and provide water infrastructure upgrades in response to the need to support growth in the Mississauga City Centre area.	Completed, September 2015
	East Brampton Water Main Municipal (Schedule C)	Schedule C Class EA to select the preferred routes for two new large-diameter municipal water mains in the City of Brampton.	Completed, June 2014
	West Brampton Watermain (Zone 5 Sub-transmission Main) (Schedule C)	Schedule C Class EA for the construction of the West Brampton Watermain within pressure zone 5 that will help meet the long term water supply needs for future approved growth, and provide security and flexibility in delivering water supply between the east and west Brampton water supply systems.	Completed, November 2013
	Zone 6 Reservoir and Feeder Main Class EA (Schedule C)	Schedule C Class EA to identify and select a storage reservoir type and facility and a route for associated feeder mains to service Zone 6 in North Brampton and Caledon (Bolton).	Completed, October 2011

Table 2 – Class Environmental Assessments overview – ongoing projects.

	Ongoing Class EA	Description	Status
Ongoing	Etobicoke Creek Sanitary Trunk Sewer Improvements and Upgrades (Schedule C)	Schedule C Class EA to identify, develop and implement a solution to address future capacity needs and existing sanitary sewer issues in the Etobicoke Creek Sanitary Trunk Sewer, from Kennedy Road to south of Highway 407. More details in **Section 3.2.2**	Ongoing, Commenced June 2019
	Wastewater Capacity Improvements in Central Mississauga (Schedule C)	Schedule C Class EA to expand the capacity of the wastewater system to service increased growth in Central Mississauga over the next 20 years. More details in **Section 3.2.3**	Ongoing, Commenced May 2019
	West Sanitary Trunk Sewer Diversion (Schedule B)	Schedule B Class EA to review alternative flow diversions from the existing Credit Valley Sanitary Trunk Sewer to the newly constructed West Sanitary Trunk Sewer at Erin Mills Parkway. These upgrades are required to service growth and to allow for future rehabilitation of the existing sanitary trunk sewer.	Ongoing, Commenced April 2019
	Water Main Crossing – Goreway Drive – Castlemore Road to Countryside Drive (Schedule B)	Schedule B Class EA to examine two water main and transmission main crossings outside of the road right-of-way on Goreway Drive from Castlemore Road to Countryside Drive in the City of Brampton	Ongoing, Commenced November 2018

3.2.1 East-to-West Wastewater Diversion Strategy Class EA

The Region of Peel completed the East to West Wastewater Diversion Strategy Schedule C Class EA to identify, develop and implement a strategy to convey wastewater from the east trunk system to the west trunk system. The recommended diversion solution consists of an 11 km long deep gravity sewer that will be constructed via tunnel boring machine (TBM) and will run along Derry Road, Old Derry Road, Old Creditview Road and Creditview Road between Spring Creek (east of Bramalea Road) and the Credit River (Highway 401/Creditview Road) in the City of Mississauga.

The East-to-West Wastewater Diversion Strategy was recommended through the 2002, 2007, and 2013 Master Plans and is a key component of the Region's long-term plan to provide wastewater servicing. The need for the strategy was identified to optimize the infrastructure upgrade timings, balance the collection system and facility capacities at the G.E. Booth Wastewater Treatment Plant (WWTP) and the Clarkson WWTP while accommodating growth. The strategy also enables de-rating of the G.E. Booth WWTP to complete future capacity upgrades.

3.2.2 Etobicoke Creek Sanitary Trunk Sewer Improvements and Upgrades Class EA

The Region of Peel is undertaking a Schedule C Municipal Class Environmental Assessment to identify, develop and implement a solution to address future capacity needs and existing sanitary sewer issues in the Etobicoke Creek Sanitary Trunk Sewer, from Kennedy Road to south of Highway 407 in the City of Brampton.

The Etobicoke Creek Sanitary Trunk Sewers service a large area extending north of Mayfield Road, which is projected to grow by 40 percent. The existing sewer consist primarily of twin 1050-mm and 1200-mm diameter pipes, including some sections that have been lined. With the construction of the East-to-West Diversion Sanitary Trunk Sewer, some sewage flows could be transferred from the east trunk system to the west trunk system to continue to provide operational flexibility. This study will ensure reliable wastewater service is provided to existing and future growth in this area.

3.2.3 Wastewater Capacity Improvements in Central Mississauga Class EA

Central Mississauga is expected to experience significant growth over the next 20 years, specifically within core areas including: the Mississauga City Centre, Hurontario Corridor and the Dundas Corridor. It is expected that these areas will grow by over 40 percent by 2041. The current wastewater infrastructure does not have available capacity to service this increased growth.

The Region of Peel is undertaking a Schedule C Municipal Class Environmental Assessment to address these capacity constraints by developing an integrated wastewater strategy for the Central Mississauga system to achieve operational flexibility, which will enable more capacity for growth and potential for wet weather impact consideration.

3.3 Water Efficiency Strategy

The Region of Peel first developed a Water Efficiency Plan (WEP) in 2004 in response to the growing demands on the water supply and wastewater treatment systems at the time. In 2011, the WEP underwent a review to account for technological and marketplace changes since it was originally developed and to align the strategy with the Regional Strategic Plan and Term of Council Priorities. The new strategy, the 2013-2025 Water Efficiency Strategy, accounts for marketplace changes, Regional direction and is in line with current legislation including the 2010 *Ontario Water Opportunities Act* and the *Ontario Water Resources Act*.

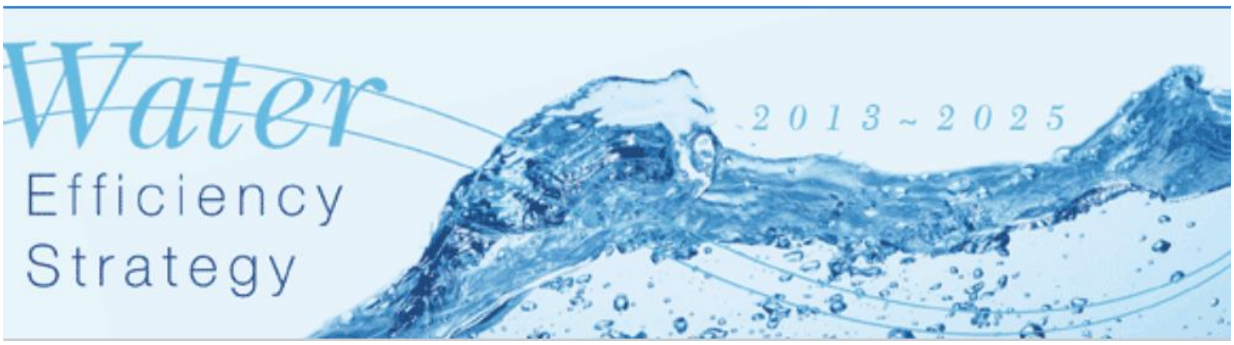
The 2013 Water Efficiency Strategy has five primary objectives:

1. Reduce peak day water demands.
2. Meet legislation requirements and goals for water efficiency.
3. Keep Regional residential per capita water demands in line with other leading GTA municipalities.
4. Help non-residential customers manage their water demands more effectively.
5. Manage system water loss.

To achieve these primary objectives, the Region established three specific water efficiency targets:

- Maintain an average peak day report of no more than 1.55.
- Reduce single-family indoor water demands to an average of 150 L/cap/d by 2025.
- Maintain a distribution system infrastructure leakage index (ILI) rating of less than 2.0.

Water demands within the Region will continue to be monitored and measured to assess projected savings and verify that targets are met. Reducing water demands through water efficiency will help the Region avoid meeting growth demands by infrastructure expansion alone.



3.4 Climate Change Master Plan

In 2017, Regional Council endorsed a Climate Change Statement of Commitment to ensure concrete action is taken to mitigate and adapt to the effects of climate change, provide tangible benefits for residents today, and ensure future generations will have access to resources that support a healthy, safe, and connected community.

The Statement of Commitment establishes guiding principles and desired outcomes for Council to support transitioning to a low-carbon and resilient future. To achieve these outcomes, the Statement committed the Region to develop a Climate Change Master Plan (CCMP).

The CCMP is a comprehensive ten-year strategy comprised of 20 actions and 66 activities which set forth the direction for how the Region will **lead** by example through the management of Regional assets, Infrastructure, and services in a changing climate over the next decade; and substantiate the **influence** necessary to support the community as it **transforms** in response to climate change.

The CCMP provides details for decision-makers on what solutions should be acted upon to achieve the Region's climate change outcomes. The primary outcomes of the CCMP are to "reduce emissions" and "be prepared". Supporting outcomes will enable success by providing direction to "build capacity," "invest," and "monitor and report". The pursuit of these outcomes is guided by four principles: balance, transparency, collaboration and innovation.[3]

Table 3 – Climate Change Master Plan outcomes.

Outcomes	Description
Reduce Emissions	Corporate greenhouse gas emissions are reduced by 45 percent by 2030, relative to 2010 levels.
Be Prepared	A safe, secure, and connected community is provided by ensuring Regional services and assets are more resilient to extreme weather events and future climate conditions.
Build Capacity	Climate change is considered in all decision-making through organization wide climate literacy, planning, and accountability.
Invest	Innovative and sustainable approaches are used to finance action on climate change.
Monitor and Report	Progress on addressing Regionally funded climate change work is consistently reported, available, and widely understood.

Progress on these outcomes will be measured by the Region's Climate Change Resiliency scorecard which assesses key factors of a climate resilient community.

3.5 Inflow and Infiltration Studies

Inflow and Infiltration (I/I) is a major contributor to surcharging of sanitary sewers especially during extreme weather events. Effects of climate change combined with vulnerabilities such as aging infrastructure results in increased susceptibility to inflow and infiltration. Some of the studies that the Region of Peel has undertaken to identify and address I/I issues in its sanitary system include:

1. Sanitary Sewer Design Enhanced Criteria Standards for Climate Change Impacted Infrastructure[4]
   - Specifically, with regards to I/I, this study aimed to address two business objectives of the 2014-2018 Council: Assess wastewater capacity and to enhance integrity of the wastewater collection system.
   - Based on the analysis undertaken, including a review of industry practices, the study recommended increasing the design criteria from 0.20 L/s/ha to 0.26 L/s/ha.
2. Region of Peel CCTV and I/I Investigation Program[5]
   - Built on previous work undertaken through the Flow Monitoring and Closed-Circuit Television (CCTV) Analysis Project to understand factors that signify infiltration issues.
   - Used "Drainage Catchment Area Level Analysis" to identify priority pipes and maintenance holes that need to be further investigated.
3. Region of Peel Corporate Flow Monitoring Program
   - The Region of Peel maintains a flow monitoring program of over 300 flow monitors and 33 rain gauges currently installed within the Region's lake-based wastewater collection system.
   - Installed flow monitors were appointed program objectives based on their location, including I/I studies and investigations, flow investigations, major trunk sewer monitoring, wastewater model updates, new development studies, and capacity analysis.
   - Catchment areas for each flow monitor were delineated and ongoing dry and wet weather analyses are completed on a quarterly basis.
   - This data is used to support other Regional studies including I/I and CCTV investigations and wastewater operations.
4. Region of Peel Block Area I/I Analysis
   - The Region of Peel currently undertakes periodic dry and wet weather flow analyses on identified block areas known to experience high levels of I/I.
   - Through this analysis, wet weather response is assessed, and recommendations are made on the extent and type of I/I within each block area.
   - Catchments with high I/I are identified as priority areas for future field investigation.
5. Region of Peel Storm Analysis
   - The Region completes detailed review of storm events that cause operational issues and flooding across the Region. Analysis is completed to determine the source of capacity issues as well as any opportunities to enhance the wastewater system to reduce or solve the issues for similar storm events in the future.
6. Region of Peel Inflow and Infiltration, Reduction and Mitigation Strategy
   - In 2017, the Region began developing the I/I Reduction and Mitigation Strategy. The strategy aims to support the reduction of climate change issues such as basement flooding from sewer backups.
   - This strategy will develop a roadmap taking into consideration a triple bottom line approach to I/I management and review existing and future related programs to assist in I/I capital funding and resource allocation.
   - The program will highlight the following areas: 1) Identifying and mitigating issues through field investigations and studies; 2) Diverting and storing overflow through capital improvements; 3) Prevention and resident programs.

3.6 Hydraulic Models and Analysis Tools

The Region of Peel has developed and maintains several analysis tools for its water and wastewater systems. These tools are valuable means to analyze system performance, to determine the impacts of growth, to identify areas with capacity issues, and to assist in the design of proposed infrastructure.

For the 2020 Master Plan, the following tools were used to identify potential capacity constraints in the existing and future water and wastewater systems, as well as supporting the development of servicing strategies and proposed capital projects.

3.6.1 Water Hydraulic Model

The Region maintains an InfoWater hydraulic model of its water distribution system. The all-pipe model has been loaded with asset information for water distribution mains, transmission mains, pumping stations and reservoirs for the water lake-based system. In addition, the model contains existing and future scenarios that were developed and continuously updated based on current water demands and future population projections.

For more information about the water model, please refer to **Volume 3 – Water Master Plan.**

3.6.2 Water Schematics

In addition to the water model, the Region also maintains Excel-based water schematics as supporting analysis tools. The water schematics contains information including but not limited to:

- Historical water production, stating point method and water demand projections.
- Pump Curves and system head curves.
- Schematics for the lake-based water supply system (2019, 2021, 2026, 2031, 2036, 2041, buildout).
- Various tables and charts for treatment, pumping, transmission, storage and standby power.

For more information about the water schematics, please refer to **Volume 3 – Water Master Plan.**

3.6.3 Wastewater Model

The Region maintains an InfoWorks ICM hydraulic model of its lake-based wastewater collection system. The all-pipe model has been loaded with asset information including trunk and local sanitary sewers, force mains, sewage pumping stations and various flow control and flow diversion structures. In addition, the model contains existing and future scenarios that were developed and continuously recalibrated based on flow monitoring data and future population projections.

For more information about the wastewater model, please refer to **Volume 4 – Wastewater Master Plan.**

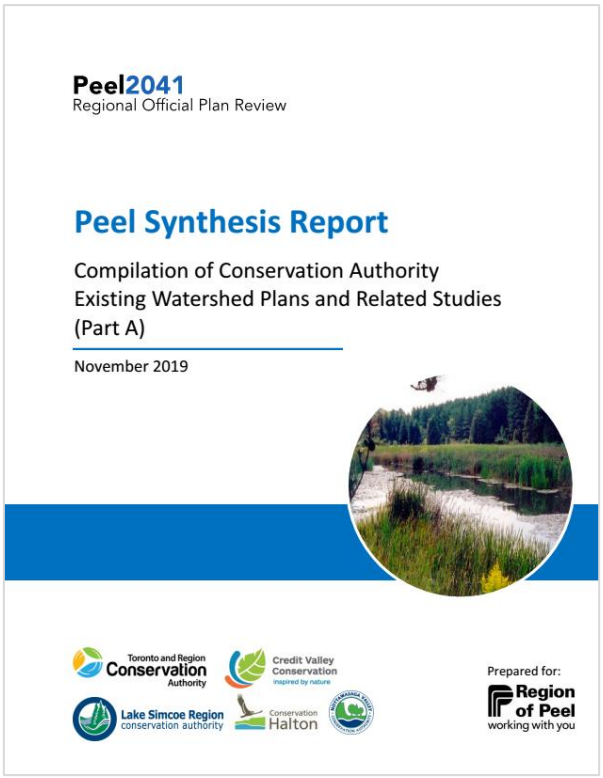
3.7 Peel Synthesis Report

The Region of Peel developed a Synthesis Report[6] in November 2019 that summarizes available information from the Conservation Authorities such as watershed plans and other related studies, that inform Regional land use and infrastructure planning decisions.

The watersheds in the Region of Peel are managed by five conservation authorities: Toronto and Region Conservation Authority, Credit Valley Conservation Authority, Conservation Halton, Lake Simcoe Region Conservation Authority, and Nottawasaga Valley Conservation Authority. Conservation Authorities have been undertaking watershed and subwatershed planning for decades as part of their mandate to study their watersheds under the *Conservation Authorities Act*.

The Synthesis Report is divided into two separate parts:

- Part A summarizes, at a high-level, the key watershed planning documents, strategies and policies that have already been undertaken by Conservation Authorities in the Region.
- Part B includes all relevant appendices listing other detailed information such as subwatershed studies.



The documents in both parts of the report were selected as being representative, or equivalent to components for watershed studies. The purpose of this report is to inform decision making in the Region's current Official Plan Update – Peel 2041: Regional Official Plan Review, and help demonstrate conformity with the Growth Plan, a municipal requirement through official plan updates by 2022.

3.8 Dundas Connects Master Plan

In 2018, the City of Mississauga Council endorsed the Dundas Connects Master Plan[7]. The master plan aims to integrate transportation and land use planning and implement best practices along the Dundas Street corridor to address current and future demand.

Seven focus areas that will require attention were identified at key intersections along the Dundas Street corridor including: Etobicoke Creek, Dixie, Cawthra, Cooksville, Erindale Station, Erin Mills and Winston Churchill. These seven focus areas have the following characteristics:

- Identified in the Mississauga Official Plan as appropriate for intensification.
- Interchange transit areas (i.e., one or more existing or planned higher-order transit stations are located on or near Dundas Street).
- Gateway areas (i.e., areas that border other municipalities).
- Areas with flooding issues.
- Areas with a significant amount of land that is underutilized (i.e., underbuilt relative to in-force zoning).

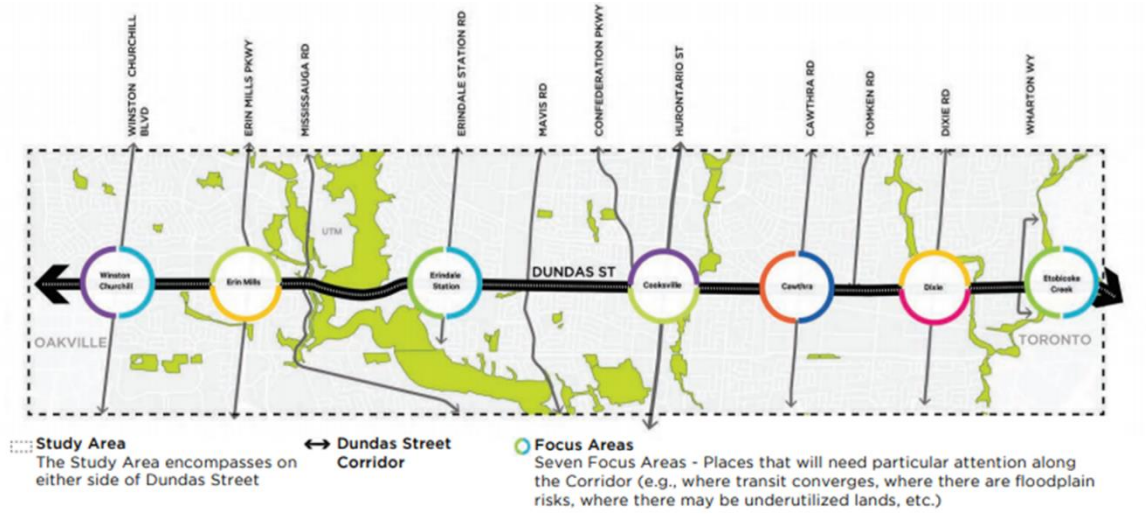


Figure 4 – Dundas Connects Master Plan focus areas.

Some of the key recommendations in the Dundas Connects Master Plan include:

- Implementing Bus Rapid Transit along Dundas Street.
- Encouraging mixed-use development that supports transit.
- Creating more open spaces and community facilities.
- Maintaining existing and supporting new affordable housing.
- Maintaining four traffic lanes along Dundas Street.
- Providing safe cycling infrastructure along the length of the Dundas Street corridor.
- Enhancing pedestrian space and providing street trees.
- Encouraging street-related retail while supporting existing business.

3.9 Brampton Vision 2040

The development of the Brampton Vision 2040 began in 2017 when the City of Brampton recruited several thousands of people to take part in public discussion and contribute specific ideas for the needs of the City of Brampton over the next 20 years.

The vision brings ten transformations to Brampton including the following[8]:

- A heart to draw everyone and shift the balance of local jobs – new Uptown and reset Downtown.
- Jobs within communities – five new Town Centres (Bram West, Heritage Heights, Bramalea GO, Trinity Commons, Bram East).
- Thriving arts scene – Arts Street as a unique maker-place, art hubs in the cores and spontaneously elsewhere.
- Complete living – revitalized existing districts, model new neighbourhoods, refreshed Bramalea, boulevard lifestyle along central Queen street.
- Everything connected – transit network and new core loop, walking and cycling networks, virtual networks, new travel technologies explored.
- Beauty brought back – streets for people, trees everywhere, designed communities, handsome buildings.
- Nature brought back – new Eco-park, sustainable living integrated into everything.
- Social and health harmony – local hands tackling local problems.
- Organizations to act – local forces with resources, networks, and leadership at hand.
- A way to act – five proven tools for success.

For Brampton 2040 Vision to realize its full potential, the Region will need to continue to provide and plan for appropriate water and wastewater servicing.

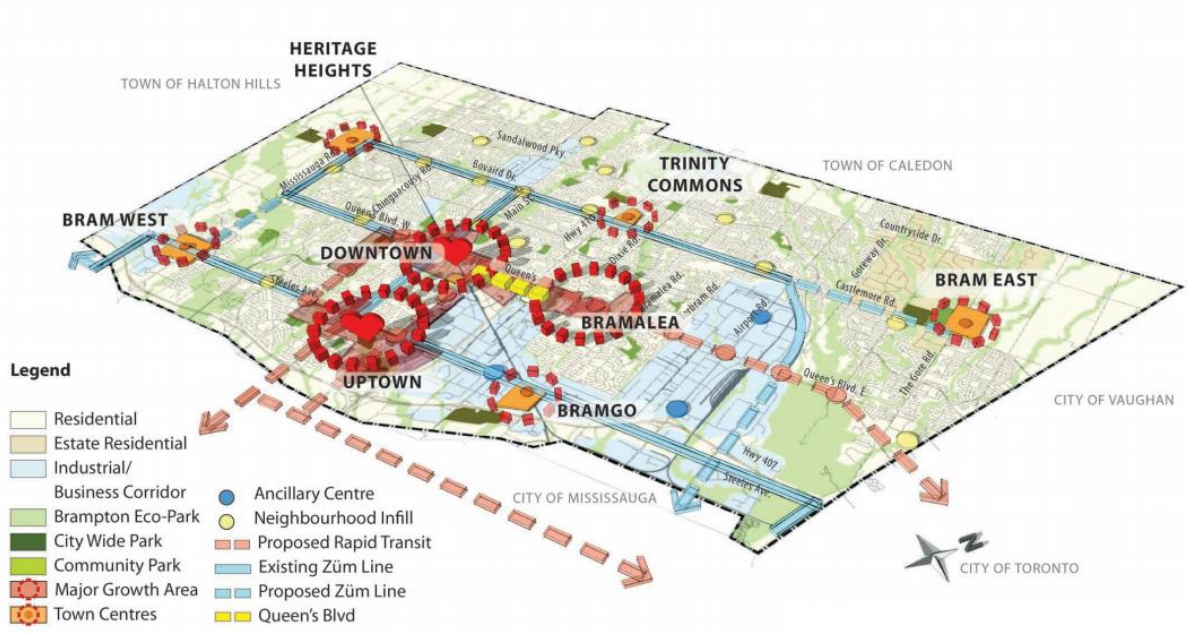


Figure 5 – Brampton Vision 2040 overview.

4.0 Planning Context

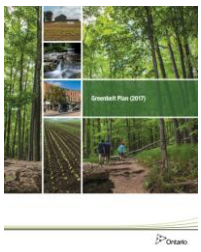
4.0 Planning Context

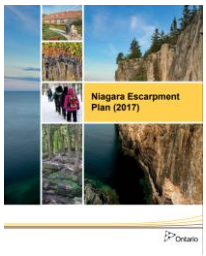
4.1 Provincial and Federal Legislation and Policy

All municipalities in Ontario must operate within the administrative, legislative and financial framework established by senior levels of government. The following sections summarize key provincial and federal initiatives that provide direction and are considered within the master planning process.

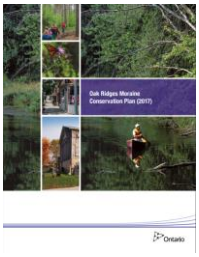
4.1.1 Provincial Policy Statement

The Provincial Policy Statement sets the policy foundation for land use planning and development in Ontario. The Provincial Policy Statement provides guidance and support for appropriate land use planning and development while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment.





The Provincial Policy Statement applies to land use planning decisions made under the *Planning Act* by provincial ministers, municipal councils, local boards and planning boards, among other approval authorities. All municipal decisions affecting planning matters shall be consistent with the policies outlined in the Provincial Policy Statement.



The Provincial Policy Statement contains policies relevant to water and wastewater infrastructure planning including, but not limited to:

- Requirement that infrastructure be provided in a coordinated, efficient and cost-effective manner with considerations to climate change.
- Planning for infrastructure should be financially viable over their lifecycle and available to meet current and projected needs.
- Optimization of the use of existing infrastructure and public service facilities before developing new infrastructure.

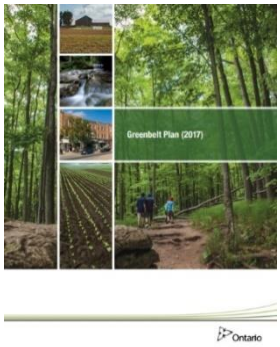
More specifically, the Provincial Policy Statement recommends that water and wastewater services should:

- Direct and accommodate expected growth in a manner that promotes the efficient use and optimization of existing municipal water and wastewater services.
- Ensure that these systems are provided in a manner that:
  - can be sustained by the water resources upon which such services rely;
  - is feasible, financially viable and complies with all regulatory requirements; and
  - protects human health and the natural environment.
- Promote water conservation and water-use efficiency.
- Integrate servicing and land use considerations at all stages of the planning process.

The Greenbelt Plan, the Niagara Escarpment Plan, and the Oak Ridges Moraine Conservation Plan work within the framework set out by the Growth Plan for the Greater Golden Horseshoe for where and how future population and employment growth should be accommodated.

Together, all four provincial plans build on the Provincial Policy Statement to establish a land use planning framework for the Greater Golden Horseshoe and the Greenbelt Plan Area that supports a thriving economy, a clean and healthy environment and social equity.

4.1.2 Greenbelt Plan

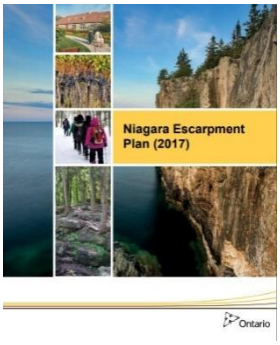


The Greenbelt Plan (2017)[9] builds upon the existing policy framework established in the Provincial Policy Statement. The purpose of the plan is to inform the decision-making process to protect agricultural lands, natural heritage and water resource systems, and to provide for a diverse range of economic and social activities related to rural communities, agriculture, tourism, recreation and resource uses.

The Greenbelt Plan includes lands within the Niagara Escarpment and the Oak Ridges Moraine and builds upon the ecological protections provided by the Niagara Escarpment Plan (NEP) and the Oak Ridges Moraine Conservation Plan (ORMCP). The Protected Countryside lands identified in the Greenbelt Plan are intended to enhance the spatial extent of agriculturally and environmentally protected lands covered by the NEP and the ORMCP while improving linkages between these areas and the surrounding major lake systems and watersheds.

A portion of the Greenbelt lands extend into the Town of Caledon boundaries, restricting the type of development that occurs in those areas.

4.1.3 Niagara Escarpment Plan

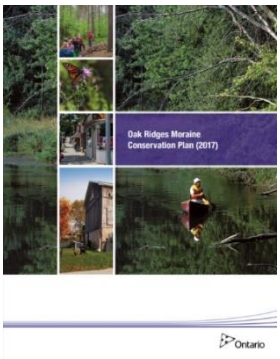


The Niagara Escarpment Plan (2017)[10] builds on the 2011 Plan and has been updated to reflect new legislations and to coordinate with the Greenbelt Plan and other provincial land use planning policy documents. The plan serves as a framework of objectives and policies aimed to balance between development, protection and the enjoyment of the Niagara Escarpment and the resources it supports.

Some of the objectives of the Niagara Escarpment Plan include:

- To protect unique ecologic and historic areas;
- To maintain and enhance the quality and character of natural streams and water supplies;
- To ensure that all new development is compatible with the purpose of the Plan;
- To support municipalities within the Niagara Escarpment Planning Area in their exercise of the planning functions conferred upon them by the *Planning Act*.

4.1.4 Oak Ridges Moraine Conservation Plan



The Oak Ridges Moraine Conservation Plan (ORMCP) (2017)[11] is a regulation to the Oak Ridges Moraine Conservation Plan Area. The plan provides land use and resource management direction to provincial ministers, ministries, agencies, municipalities, landowners and other stakeholders on how to protect the ecological and hydrological features and functions of the land and water resources within the Moraine.

Some of the objectives of the ORMCP include:

- Protect the ecological and hydrological integrity of the ORM Area.
- Ensure that only land and resource uses that maintain, improve or restore the ecological and hydrological functions of the ORM Area are permitted.
- Maintain, improve or restore all the elements that contribute to the ecological and hydrological functions of the ORM Area, including the quality and quantity of its water and its other resources.
- Provide for land and resource uses and development that are compatible with the other objectives of the Plan.

4.1.5 A Place to Grow

A Place to Grow[1] is the provincial initiative to plan for growth in Ontario. The most recent growth plan, *A Place to Grow - The Growth Plan for the Greater Golder Horseshoe* (the *Growth Plan*), was first introduced in July 2017 replacing the 2006 Growth Plan, and later amended in May 2019.

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 and development in a way that supports economic prosperity, protects the natural environment, and helps build complete communities that achieve a high quality of life.

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 and provides additional and more specific land use planning policies to address issues facing specific geographic areas in Ontario. While the Provincial Policy Statement provides for a time horizon of up to 20 years to make enough land available to meet projected needs, the Provincial Policy also suggests that a provincial plan may provide an alternate time horizon for specific areas of the province. The 2019 Growth Plan provides that the applicable time horizon for land use planning is 2041.

The 2019 Growth Plan includes revised population and employment forecasts for the Region of Peel as follows:

Table 4 – Distribution of population and employment for the Region of Peel to 2041.

	2031	2036	2041
Population	1,770,000	1,870,000	1,970,000
Employment	880,000	920,000	970,000

Note: Numbers rounded to the nearest 10,000

The 2019 Growth Plan includes the following specific density targets:

- A minimum of 50 percent of all residential development occurring annually within the Region of Peel will be within the delineated built-up area.
- 200 residents and jobs combined per hectare for each of the Downtown Brampton and Downtown Mississauga urban growth centres.
- A minimum density target that is not less than 50 residents and jobs combined per hectare for designated greenfield areas within the Region of Peel.

The Growth Plan also provides for minimum density targets for *Major Transit Station Areas* and *Priority Transit Corridors*, as follows:

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

4.1.6 Sustainable Water and Wastewater Systems Improvement and Maintenance Act

The *Sustainable Water and Wastewater Systems Improvement and Maintenance Act* (Bill 13) [12] aims to sustain and encourage improvement in Ontario's water and wastewater services and to establish the Ontario Water Board. This Bill enacts the *Sustainable Water and Wastewater Systems Improvement and Maintenance Act* (2010) and repeals the *Sustainable Water and Sewage Systems Act (2002)*.

Key points of the Bill are as follows:

- Sets out the purposes of the *Act*, which includes 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.

4.1.7 Water Opportunities and Conservation Act

The *Water Opportunities and Conservation Act*[13] aims to encourage water conservation, strengthen sustainable municipal water planning and make Ontario a leader in developing and selling water technologies and services.

The purposes of the *Act* are as follows:

- Foster innovative water, wastewater and storm water technologies, services and practices.
- Create opportunities for economic development and clean-technology jobs in Ontario.
- Conserve and sustain water resources for present and future generations.

To further the purposes of the *Act*, the Minister of the Environment, Conservation and Parks 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, Conservation and Parks 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.

4.1.8 Safe Drinking Water Act

The *Safe Drinking Water Act* was adopted in 2002[14]. 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, Conservation and Parks 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*.

4.1.9 Clean Water Act and Source Water Protection

The *Clean Water Act* was adopted in 2006[15]. The purpose of the *Act* is to protect existing and future sources of drinking water. 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.
- That all plans and actions be based on sound science.

Under the *Clean Water Act*, *Source Protection Regions* and stand-alone *Source Protection Areas* were established. Source Water Protection Plans were prepared for the 19-watershed based Source Protection Regions across Ontario to protect existing and future sources and to identify areas of significant drinking water threats. The Region of Peel falls within the Credit Valley, Toronto and Region, and Central Lake Ontario Source Water Protection Regions.

The Source Water Protection Plans identifies Wellhead Protection Areas (WHPA), as well as Intake Protection Zones (IPZ). According to the Source Protection Plan, WHPAs are areas on the land around a municipal well. The size of WHPAs is determined by how quickly water travels underground to the well, measured in years. IPZs are areas on the water and land surrounding a municipal surface water intake.

Based on the assessment completed on the MECP's Source Water Protection web page, there are two IPZs within the Region that lie within the City of Mississauga, associated with the A.P. Kennedy and Lorne Park Water Treatment Plants. Several identified Wellhead Protection Zones and a WHPA at the north end of the study area lie within the Greenbelt in Caledon.

4.1.10 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, the CCME look to ensure 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.

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

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

Goal 4: Climate change impacts are reduced through adaptive strategies

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

CCME's current priorities in support of that vision are to [16]:

1. Reduce climate change impacts on water systems and, protect and restore aquatic ecosystems through adaptive strategies.
2. Engage more Canadians in the shared responsibility of protecting aquatic ecosystems and water management.
3. Improve water quality and water quantity management to protect ecosystem health and water uses.

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

The Canada-wide Strategy for the Management of Municipal Wastewater Effluent[17] was developed in 2019 by the Canadian Council of Ministers of the Environment (CCME). The strategy sets out a framework that addresses issues related to governance, wastewater facility performance, effluent quality and quantity and its associated risk and economic considerations in a way that provides consistency and clarity to the wastewater sector across Canada.

The Strategy requires that all facilities achieve minimum National Performance Standards and develop and manage site-specific Effluent Discharge Objectives. The Strategy also outlines risk management activities to be implemented to reduce the risks associated with combined and sanitary sewer overflows. The Strategy requires among other elements 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.

4.1.12 Wastewater Systems Effluent Regulations

The Wastewater System Effluent Regulations[18] (WSER) are the primary instrument that Environment Canada is using to implement the CCME Canada-wide Strategy for the Management of Municipal Wastewater Effluent. The WSER were enacted in June 2012 and amended January 2015. The WSER were implemented by the federal government and became both provincial and federal wastewater standards for compliance.

The proposed Regulations apply to any wastewater system that treats an average daily volume of at least 100 cubic metres per day. The WSER define the following as deleterious substances, and set national standards for their discharge:

Table 5 – WSER National Performance Standards (NPS)[1].

Parameter	Concentration
Carbonaceous Biochemical Oxygen Demand (CBOD)	Average ≤ 25 mg/L
Total Suspended Solids (TSS)	Average ≤ 25 mg/L
Total Residual Chlorine (TRC)	Average ≤ 0.02 mg/L
Un-Ionized Ammonia as N at 15℃ ± 1℃	Maximum < 1.25 mg/L

These performance standards are typically achievable with secondary level of treatment at plants.

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

The Ministry of the Environment, Conservation and Parks works to protect and sustain the quality of Ontario's air, land, and water. The Ministry also coordinates Ontario's actions on climate change in the name of healthier communities, ecological protection and economic prosperity.

Procedure F-5-1[19] outlines 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 biochemical oxygen demand (BOD), suspended solids, total phosphorus and ammonia and provides guidelines for BOD and suspended solids. Sewage treatment works designed according to the guidelines should be able to meet the objectives on an average annual basis and not exceed the guidelines.

These policies were considered in the development of the 2020 Water and Wastewater Master Plan. Key policies relevant to planning for the Region of Peel Water and wastewater infrastructure strategies and projects can be found in greater detail in Appendix 2B.

4.2 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 many responsibilities and functions in the land use planning and development process.

Approximately 98 percent of the total area of the region is managed by either TRCA (54 percent) or CVC (44 percent). The three other authorities, Halton, NVCA and LSRCA, collectively comprise less than 2 percent of the total area of the Region. Conservation Halton manages a small portion of Mississauga. LSRCA and NVCA manage small portions of northern Caledon that do not lie within the Master Plan Study Area.

Conservation Authorities act as commenting agencies on development applications under the *Planning Act* and the *Environmental Assessment 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.

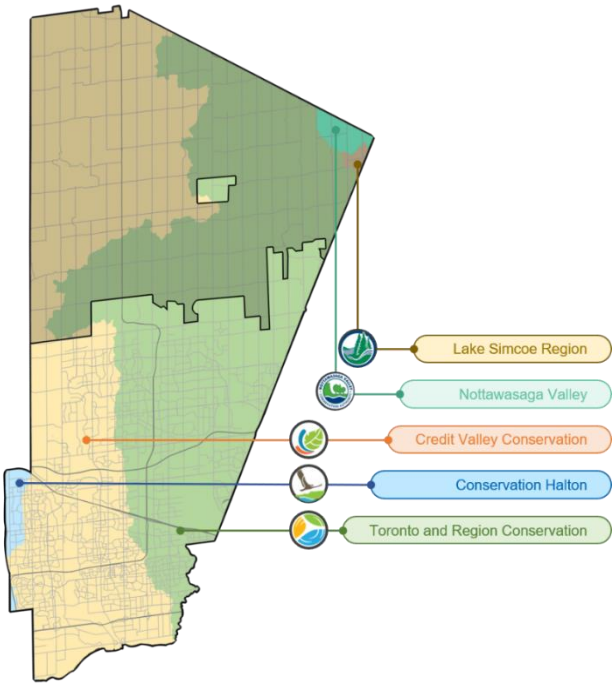


Figure 6 – Conservation Authorities within the Region of Peel.

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, consistent with the Provincial one-window planning initiative.

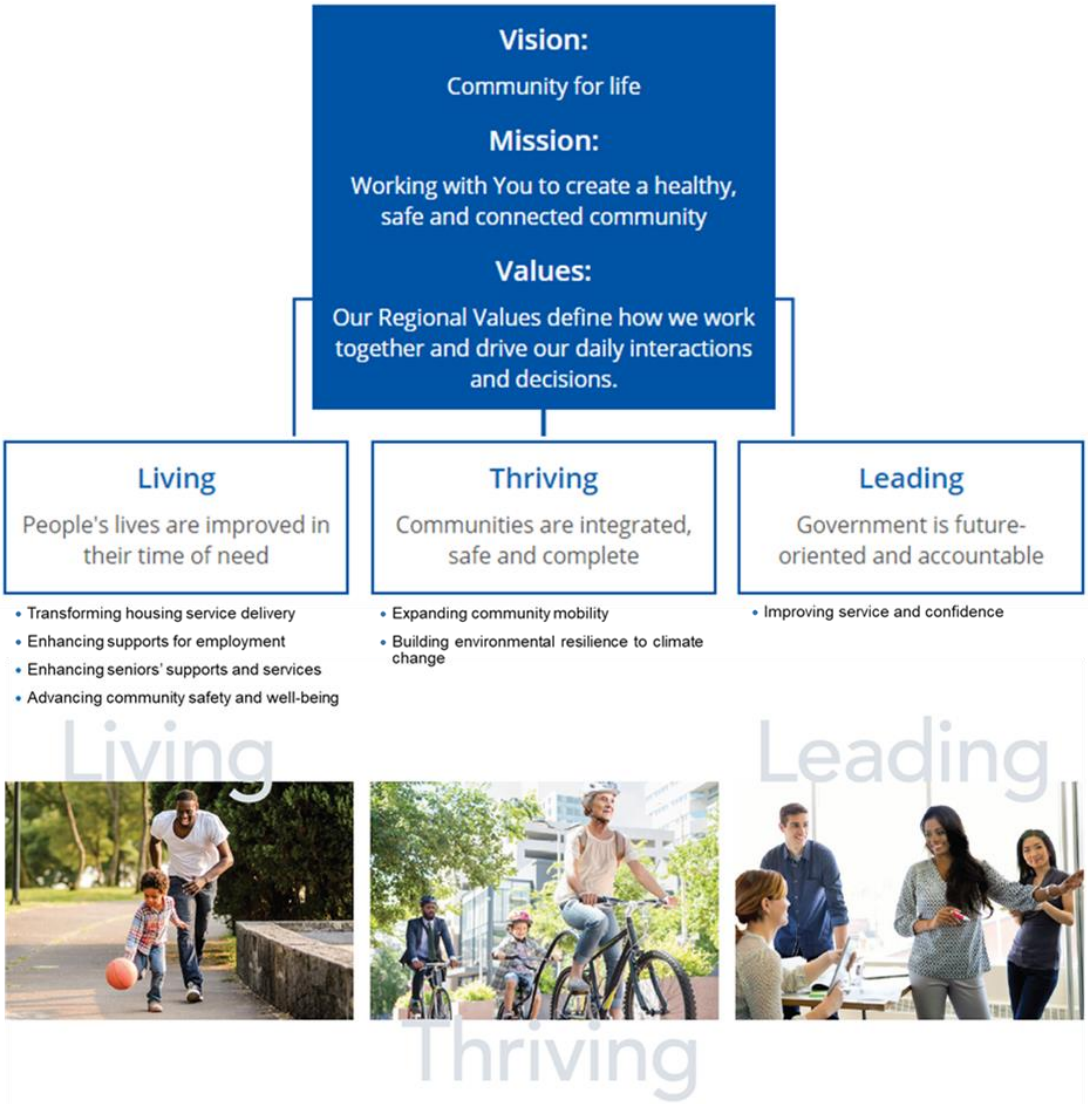
TRCA, CVC and Conservation Halton also administer Ontario Regulations 166/06, 160/06, 162/06, respectively, under Section 28 of the *Conservation Authorities Act*. In general, these regulations prohibit altering a watercourse, wetland or shoreline and prohibit development in areas adjacent to river and stream valleys, hazardous lands and wetlands, without the prior written approval from the Conservation Authority (i.e., issuance of a permit). **Figure 6** depicts the areas within the Region of Peel under these Conservation Authority jurisdictions.

4.3 Regional and Municipal Legislation and Policy

4.3.1 Region of Peel Strategic Plan

The Region is presently working on its first 20-year Strategic Plan for 2015-2035 with the vision to take on more complex challenges and bring bigger ideas to life than is possible over a single term of Council. The 20-year vision for Peel is "Community for Life" which was developed from citizens' feedback to reflect their priorities and hopes for life in the Region of Peel.

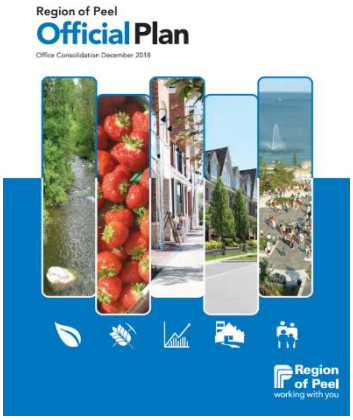
The Strategic Plan has a 20-year outlook and will be fulfilled in stages. This allows the Region to plan across multiple terms of Council and take on bigger challenges. The 2018-2022 Term of Council is focused on seven priorities including four living priorities, two thriving priorities and one leading priority.



The 2020 Master Plan forms the infrastructure foundation for future growth within the Region. The master plan process, recommendations and vision for future servicing supports the Region of Peel's Strategic Plan Vision, Mission, Values and Priorities. Additional 20-year goals and outcomes for year 2035 of the strategic plan that align with these areas of priorities can be found on the Region of Peel website: **https://www.peelregion.ca/strategicplan/**.

4.3.2 Region of Peel Official Plan

The Regional Official Plan[20] is a long-term plan used to assist the Region in managing future growth and development while meeting the needs of existing residents and businesses in the Region. It sets out a policy framework that guides economic, environmental and community planning decisions and set the basis for providing regional services in an efficient and effective manner.



The *Planning Act* requires municipalities to update their official plans every five years. The Region of Peel Official Plan is currently under review to bring the policies in step with provincial requirements.

The Official Plan is key to the Region because:

- It gives Peel Regional Council a policy framework: a set of procedures and goals they can use to make decisions or manage other policies.
- It guides how Peel will grow and develop Peel while protecting the environment, managing resources and setting a structure that efficiently manages Peel's growth.
- It reflects Provincial legislation and policies while keeping Peel's distinct needs first-in-mind.

The Official Plan includes objectives and policies around the natural environment, water resources, and cultural heritage. Key policies relevant to the 2020 Master Plan are as follows:

It is the policy of Regional Council to:

- Require and provide full municipal sewage and water services to accommodate growth in the Urban System to the year 2031, and the three Rural Service Centres to 2021. The provision of full municipal sewage and water services in the Urban System and the three Rural Service Centres will be subject to the Regional financial and physical capabilities (6.4.2.1).
- Ensure that no development requiring additional or new water supply or sanitary sewer services proceeds prior to the finalization of a Servicing Agreement with the Region, confirming the responsibility for, and ability to provide, appropriate facilities for water supply and sewage disposal. In the case of plans of subdivision, confirmation will be required prior to draft approval, that servicing is or will be available (6.4.2.2).
- Pursue, in cooperation with the local municipalities, the public and businesses, water conservation strategies designed to improve the efficiency of the Region's systems (6.4.2.6).
- Ensure that the planning and construction of water and sanitary sewer services protects the environmental systems and natural resources of Peel in a manner consistent with the objectives and policies in this Plan, the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan (6.4.2.7).
- Pursue a water efficiency strategy with a goal to reducing per capita consumption by 10 to 15 percent over the next 20 years (6.4.2.9).

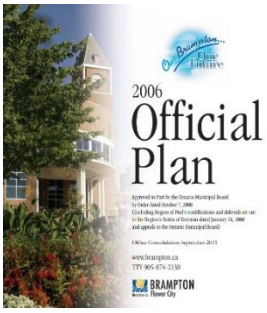
The policies contained in the Regional Official Plan were considered when identifying and assessing water and wastewater servicing alternatives.

4.3.1 City of Mississauga Official Plan

The Mississauga Official Plan (MOP) was adopted by City Council in September of 2010 and partially approved by the Region of Peel in September of 2011. The MOP came into partial effect in November 2012 when the Ontario Municipal Board approved it with some modifications and excluding certain parts of the Plan that were still under appeal. The City of Mississauga is currently reviewing the Official Plan to ensure it reflects the changing needs, opportunities and aspirations of the city. Engagement for the Official Plan Review is underway at **https://yoursay.mississauga.ca/official-plan-review**.

The Mississauga Official Plan provides direction for the next stage of the city's growth and planning policies to guide the city's development to year 2031, as required by provincial legislation. The MOP key policies relevant to the water and wastewater networks were considered in the development of the 2020 Master Plan including ensuring in co-operation with other level of government, appropriate agencies and the private sector, that adequate water and sanitary sewer services are provided.

4.3.2 City of Brampton Official Plan



The City of Brampton Official Plan was adopted by City Council in October 2006 and approved by the Ontario Municipal Board (OMB) in October 2008. The September 2015 Office Consolidation includes the OMB decisions and City Council approved official plan amendments along with updates to conform with the latest provincial Growth Plan. Starting in late 2019, the City of Brampton began development of a new Official Plan. More information on the Official Plan Review can be found at: **https://www.brampton.ca/EN/City-Hall/Official-Plan/Pages/Welcome.aspx**.

The City of Brampton Official Plan provides direction for decision-making on issues related to land use, built form, transportation and the environment within the City to 2031. The purpose of the Official Plan is to give clear direction as to how development and land-use decisions should take place in Brampton to meet the current and future needs of its residents. It is also intended to reflect their collective aims and aspirations, as to the character of the landscape and the quality of life to be preserved and fostered within Brampton. The Plan also provides guidance and assists in the delivery of municipal services and responsibilities.

Key policies relevant to the water and wastewater networks were considered in the development of the 2020 Master Plan including working with the Region of Peel and all utility providers to ensure infrastructure is provided in a timely and efficient manner.

4.3.3 Town of Caledon Official Plan

The Town of Caledon Official Plan (April 2018 Office Consolidation) aims to guide future land use, physical development and change, and the effects on the social, economic, and natural environment within the Town of Caledon to 2031. The Official Plan states that development within the Town will be monitored on a regular basis to ensure that the principles, strategic directions, goals, objectives and policies are being achieved, including such matters as available water and sewer capacity.

The Plan states that the Rural Service Centres of Bolton, Caledon East and Mayfield West are identified as compact, well-integrated rural towns on full piped water and sewer services. The Rural Service Centres are designated as the primary growth areas for the planning period and will be the focus of most new residential and employment growth.

The Town of Caledon is creating a new Official Plan – a road map for the next 20+ years. It will guide development, housing, transportation, employment, facilities and more. Engagement for the Official Plan Review is underway at: **https://future.caledon.ca**.

FUTURE CALEDON
OUR OFFICIAL PLAN

The City of Mississauga, City of Brampton and Town of Caledon Official Plans are currently under review in accordance with Sections 17 and 26 of the *Planning Act* that requires municipalities to update their Official Plan every five years.

4.4 Water and Wastewater Policy Review

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. A principles and policy paper was developed as part of the 2007 Master Plan and updated in the 2013 Master Plan. This policy paper was updated for the 2020 Master Plan to reflect legislation and strategies introduced since the 2013 Master Plan.

In general, the Region's goal is to build and maintain efficient, reliable, sustainable, and well-managed water and wastewater systems that provide a high level of service to the public. In order to capture these goals, the servicing principles and policies have been structured as follows:

General Policies

- G.01: Municipal Servicing
- G.02: Environmental Protection
- G.03: Planning Horizon
- G.04: Reserve Capacity
- G.05: System Reliability and Security
- G.06: Location of Municipal Services and Facilities
- G.07: Climate Change
- G.08: Energy Efficiency
- G.09: Integrated Infrastructure Program
- G.10: Level of Service
- G.11: Inter-Regional Collaboration
- G.12: Sustainability
- G.13: Source Water Protection
- G.14: Term of Council Priorities

Water Policies

- W.01: Health and Safety
- W.02: Raw Water Quality
- W.03: Treatment and Distribution Water Quality
- W.04: Water Demand Projections
- W.05: Distribution Requirements
- W.06: Fire Flow Requirements
- W.07: Water Efficiency and Consumption Trends
- W.08: Water Supply and Distribution Security
- W.09: Design Criteria
- W.10: Costing Criteria
- W.11: Pressure Zone Boundaries

Wastewater Policies

- WW.01: Health and Safety
- WW.02: Receiving Water Bodies
- WW.03: Wastewater Treatment and Collection Requirements
- WW.04: Wastewater Flow Projections
- WW.05: Separated Wastewater and Stormwater Systems
- WW.06: Wastewater Collection and Pumping Systems
- WW.07: Wet Weather Flow Criteria

The complete list of servicing principles and policies can be found in **Appendix 2A**.

4.5 Growth Management Strategy

The Growth Management Strategy is a collaborative and integrated approach to plan and manage forecasted growth in the Region. As part of the growth management exercise, innovative strategies, including substantial engagement of key stakeholders, have been developed to support the planning, servicing and financing of growth to 2041. This new integrated approach has resulted in a comprehensive framework that includes Official Plan updates, Transportation Master Plan updates, Water and Wastewater Master Plan updates, and Financial Planning updates.

The Region's Growth Management Committee, comprised of members from the Planning, Development Services, Water and Wastewater, Transportation and Corporate Finance divisions, have been working to "achieve a financially sustainable complete community, where the location and servicing of growth is optimized."

This outcome will be achieved through delivery of four key strategies:

1. Internal and External Collaborations
   - Continued collaboration with local municipal partners through inter-municipal working group (IMWG) and the development industry working group (DIWG)
2. Plan and Manage Location and Servicing of Growth
   - Continued integration of financing and servicing into planning decisions early in the process
3. Manage Revenues and Expenditures
   - Continued use of a risk-based financing lens into growth related decisions
4. Leverage Business Intelligence
   - Establish a business intelligence framework to make evidence-informed decisions around the location and servicing of growth

The 2020 Master Plan is one component of the Region's Growth Management Strategy that is being coordinated and implemented as part of the integrated approach. This integrated process will provide policy, servicing and financial capital inputs to the next Development Charges By-law update.

The enhanced consultation process under the Growth Management Strategy has included meetings with key stakeholders including the local municipalities and representatives of the Building Industry and Land Development Association (BILD). The local municipalities and BILD have been involved and consulted on key items including: location and rate of development, infrastructure needs, infrastructure planning principles, financial impacts and Development Charges (DC) impacts.

The 2020 Master Plan is developed based on the growth allocations endorsed for capital planning purposes and developed through the Growth Management Strategy to date.

4.6 Population and Employment Planning Forecasts

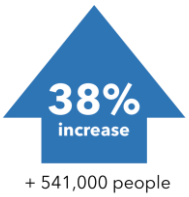
As part of the Integrated Growth Management Strategy, a draft Growth Management Regional Official Plan Amendment (ROPA) was prepared. The ROPA implements the growth management policies of the Provincial Growth Plan and provides a framework for further implementation work. The ROPA allocates the Province's 2041 growth projections to the local municipalities taking in consideration their input. The Growth Management ROPA is one focus area of the overall Peel 2041 Official Plan review process.

The growth allocation incorporated into the draft ROPA reflects the integrated master planning process associated with the Growth Management Strategy Program.

The following tables present planning forecasts included in the Draft ROPA for Scenario 16 (Council endorsed growth scenario for capital planning purposes) with the distribution of population and employment growth among the local municipalities.

Table 6 – Forecasted residential population for the Region of Peel to 2041.

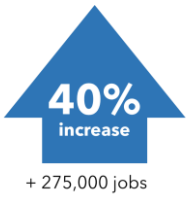
Municipality	2016	2021	2026	2031	2036	2041
Brampton	614,000	683,000	750,000	812,000	854,000	890,000
Caledon	69,000	81,000	99,000	116,000	138,000	160,000
Mississauga	746,000	778,000	805,000	842,000	880,000	920,000
Total	**1,429,000**	**1,542,000**	**1,654,000**	**1,770,000**	**1,872,000**	**1,970,000**



Forecasts include the total Region of Peel residential population and include both serviced and un-serviced population. The serviced residential population of the lake-based water and wastewater systems is less than the above numbers.

Table 7 – Forecasted employment force for the Region of Peel to 2041.

Municipality	2016	2021	2026	2031	2036	2041
Brampton	191,000	231,000	260,000	285,000	303,000	325,000
Caledon	27,000	36,000	44,000	51,000	64,000	80,000
Mississauga	477,000	502,000	520,000	534,000	547,000	565,000
Total	**695,000**	**769,000**	**824,000**	**870,000**	**914,000**	**970,000**



Forecasts include the total Region of Peel employment force and include both serviced and un-serviced employment. The serviced employment force of the lake-based water and wastewater systems is less than the above numbers. Total employment includes work from home (WFH) and no fixed place of work (NFPOW) categories.

More details on the Growth Management Strategy and draft ROPA can be found at:
https://www.peelregion.ca/planning/officialplan/growth-management-strategy.htm.

4.7 Inter-Regional Servicing

Readily available and accessible public infrastructure is essential to the viability of existing and growing communities. In some cases, the most efficient provision of infrastructure services relies on cooperation between neighbouring municipalities to share the use of infrastructure. In these cases, inter-municipal agreements between the respective parties are typically used to guide the sharing of infrastructure services. An inter-municipal agreement is a voluntary but formal agreement between two or more municipal governments.

The following are current agreements the Region of Peel has with the City of Toronto and York Region, as described below. There has been no consideration of other servicing agreements with other neighbouring municipalities as part of the 2020 Master Plan.

4.7.1 York-Peel Inter-Regional Agreement

The Regions of York and Peel currently participate cooperatively to manage many aspects of the infrastructure program within the Peel boundaries required to treat and supply water to York and collect and treat wastewater from York.

The York-Peel Water and Wastewater Agreements set out the committed servicing requirements to York Region from the Region of Peel.

Committed water supply capacity to a maximum day demand of 331.2 ML/d in 2031 and beyond is factored into the development of the Peel water servicing strategy.

Committed wastewater treatment capacity to an average day wastewater flow of 53.2 ML/d in 2031 and beyond is factored into the development of the Peel wastewater servicing strategy. This flow is pumped from the Humber Sewage Pumping Station in York Region to the east trunk system in Peel and is treated at the G.E. Booth WWTP.

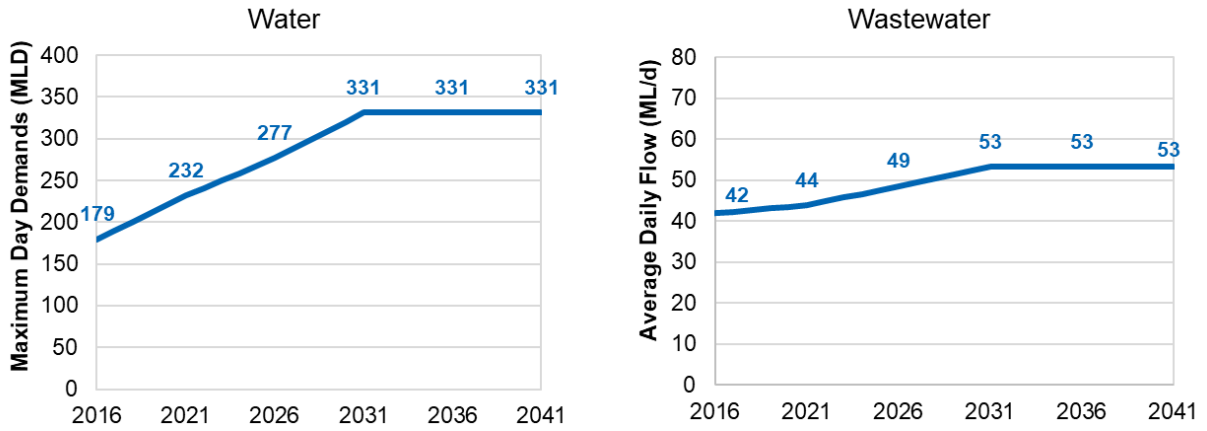


Figure 7 – Water demands and wastewater flows as per the York-Peel Inter-Regional Agreement.

4.7.2 Peel-Toronto Inter-Regional Servicing Agreement

The Toronto-Peel Wastewater Servicing Agreement allows for the provision of treatment services to parts of the City of Toronto's and the Region of Peel's respective sanitary sewersheds that would otherwise require significant additional infrastructure to intercept and convey sewage flows back to the municipalities' respective wastewater treatment plants. The agreement effectively eliminates the need for both municipalities to construct and maintain additional pumping stations and force mains.

The agreement states that there are several locations where sewage flows across the municipal boundary line between Peel and Toronto, as listed in **Table 8**.

Table 8 – Locations of sewage flows between the Peel and Toronto Inter-Regional Servicing Agreement.

Direction of Flow	Interconnection Point	Receiving System	Receiving Facility
Toronto to Peel	Rakely Court and Eglinton Avenue East	Peel East Sanitary Trunk Sewer	G.E. Booth WWTP
Toronto to Peel	41st Street and Lakeshore Road East	Peel East Sanitary Trunk Sewer	G.E. Booth WWTP
Peel to Toronto	Disco Road and Highway 427	Toronto	Humber Bay WWTP
Peel to Toronto	Dundas Street East to Dundas Street W Transition on the East side of Etobicoke Creek	Toronto	Humber Bay WWTP

The agreement states that each municipality will receive the flow from the other at the designated interconnection points and treat it at the designated treatment facility. It also specifies a rate per cubic meter to be charged on a net flow basis. The four locations identified in **Table 8** are equipped with flow monitors for the purposes of quantifying the wastewater flows that are being conveyed from each municipality to the other. Recent analysis of historic flows shows that flows from Toronto to Peel exceed the flows from the Region of Peel to Toronto, meaning that there is a net flow from Toronto to the Region of Peel.

5.0 Existing Conditions

5.0 Existing Conditions

The natural, socio-economic and cultural environments have been reviewed to illustrate which components or features may be affected by the 2020 Master Plan. The following sections summarize existing conditions in the study area, as well as the existing water and wastewater systems.

5.1 Natural Environment

The natural areas and major landscaped features located in Peel include the Greenbelt, the Niagara Escarpment, Lake Ontario, the Oak Ridges Moraine, numerous streams, creeks and rivers, and other identified areas of natural significance. This section provides an overview of the existing environmental conditions within the study area. A more detailed baseline environmental overview is provided in **Appendix 2B**.

5.1.1 Watersheds

Watersheds are portions of land drained by a river system. Some of the major watersheds in the Region of Peel include the Credit River, Humber River, Etobicoke Creek, Mimico Creek and their tributaries. The watersheds of the Region fall under the jurisdiction of three conservation authorities: the Toronto and Region Conservation Authority (TRCA), Credit Valley Conservation (CVC), and Conservation Halton. The conservation authorities are local watershed management agencies that protect and manage water and other natural resources in partnership with government, landowners and other organizations.

The 2020 Master Plan recognizes the importance of watershed management and the planning challenges associated with increasing pressure generated by the large population and job growth projected for the Region. To minimize impacts to watersheds, where necessary the Master Plan project team ensured that open communication and feedback was gathered about servicing strategies and proposed projects with the relevant conservation authorities.

Appendix 2C presents a figure outlining the Watershed Boundaries as per the Region of Peel Official Plan.

5.1.1.1 Toronto and Region Conservation Authority (TRCA)

In the Region of Peel, the jurisdiction of the Toronto and Region Conservation Authority (TRCA) includes the watersheds of Etobicoke Creek, the Humber River, and Mimico Creek. The Etobicoke Creek and Mimico Creek watersheds originate on the south slope of the Oak Ridges Moraine and extend south to Lake Ontario. They cover 21,100 and 7,700 hectares, respectively, and together support a population of over 400,000 people. The Humber River watershed is the largest in the Toronto area, originating on the Niagara Escarpment and the Oak Ridges Moraine and flowing south to Lake Ontario. The watershed is home to 732,000 people and covers nearly a thousand square kilometres.

5.1.1.2 Credit Valley Conservation (CVC)

Credit Valley Conservation's (CVC's) watershed is composed of 23 sub-watersheds, of which 21 are partly or completely within the Region of Peel. The watershed is comprised of 1000 square kilometers of land and includes the tributary area to the Credit River, which travels from its headwaters in Orangeville, Erin and Mono south to Lake Ontario. The CVC also has responsibility for several other local watersheds, including the small watersheds in Mississauga that feed directly into Lake Ontario[21].

5.1.1.3 Conservation Halton

Conservation Halton is responsible for three major watersheds and 18 smaller watersheds located in Halton Region, each of which ultimately drains into Lake Ontario. Small areas of Mississauga form part of the Joshua's Creek and Sixteen Mile Creek watersheds. The Joshua's Creek watershed forms part of the North Shore watershed. The Sixteen Mile Creek watershed covers 357 square kilometres of land, draining into Lake Ontario in the Town of Oakville.

5.1.2 Lake Ontario

Lake Ontario is one of the five Great Lakes of North America and it forms the southern boundary of the Region of Peel. Lake Ontario is a very prominent feature within the natural heritage system of the Region. The shoreline of Lake Ontario also has ecological, economic, aesthetic, recreational, historical and cultural importance. Many of these features must be protected to ensure that impacts on the natural ecosystems are minimized and shorelines, water quality and aquatic ecosystems are protected.

Lake Ontario is an important part of every life in the Region of Peel. It is the source of drinking water for the cities of Brampton and Mississauga and some parts of the Town of Caledon. It is also the final discharge of the wastewater treated at the two treatment facilities located on its shoreline in the City of Mississauga.

5.1.3 The Greenbelt

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 activities. It includes lands within the Niagara Escarpment and the Oak Ridges Moraine Conservation.

The Greenbelt Plan sets out three geographic specific policies that apply within the Protected Countryside: the Agricultural System, the Natural System and Settlement Areas. Each of these areas has its own set of geographic specific policies as well as general policies that apply.

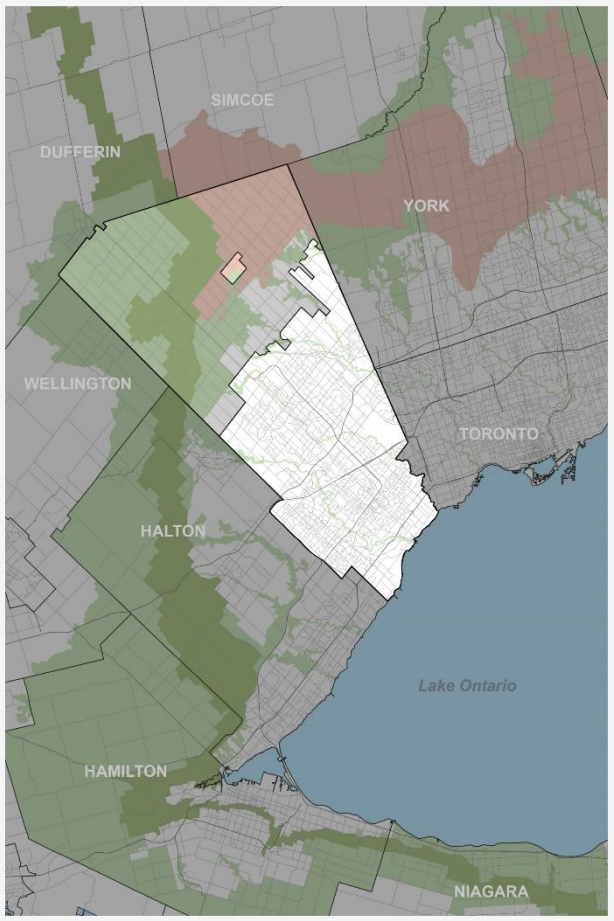


Figure 8 – Provincial land use designations.

5.1.4 Niagara Escarpment

The Niagara Escarpment is a provincially significant 725-kilometre-long geological feature, a portion of which runs through Peel. The Niagara Escarpment is a source of some of southern Ontario's prime rivers and streams, and contains significant heritage features, rare plants and significant habitats. The Escarpment and lands in the vicinity are protected by the Niagara Escarpment Plan.

In 1990, the United Nations Educational, Scientific and Cultural Organization (UNESCO) named Ontario's Niagara Escarpment a World Biosphere Reserve. This designation recognizes the natural features and ecological importance of the Niagara Escarpment.

5.1.5 The Oak Ridges Moraine

The Oak Ridges Moraine is a provincially significant prominent upland area that runs east to west through southcentral Ontario, intersecting the Region of Peel. Strategically located north of, and parallel to Lake Ontario, the Moraine divides the watersheds draining south into western Lake Ontario from those draining north into Georgian Bay, Lake Simcoe and the Trent River system. The Moraine has a unique combination of geological, hydrological, topographical and biotic attributes. It performs several essential functions providing significant natural habitat, surface water resources, groundwater resources, and landform character that make its protection and long-term management paramount to the residents of Ontario.

The Niagara escarpment and Oak Ridges Moraine form the foundation of southcentral Ontario's natural heritage and greenspace systems. **Appendix 2C** presents a figure outlining in greater detail the Greenbelt, Niagara Escarpment and Oak Ridges Moraine Plan Areas in the Region of Peel.

5.1.6 Greenlands System

The Greenlands System in the Region of Peel consist of Core Areas, Natural Areas and Corridors, and Potential Natural Areas and Corridors that contain important ecological features, forms or functions that provide favourable conditions for uninterrupted natural systems and maximum biodiversity. The Region of Peel recognizes the importance of the protection of this natural environment to maintain the integrity and long-term sustainability of the ecosystem in the Region of Peel and neighboring municipalities.

Appendix 2C presents a figure outlining the Core Areas of the Greenlands System in the Region of Peel.

Some elements of the Region of Peel's Greenlands Systems are shown in **Figure 9** and further described in the sections below. More detailed information about the elements of the Greenlands System is provided in **Appendix 2B**.

Figure 9 – Elements of the Greenland System.

5.1.7 Environmentally Sensitive Areas

Environmentally Sensitive or Significant Areas (ESAs) are places where *ecosystem* functions or features warrant special protection. ESAs are natural areas identified as significant and worthy of protection on three criteria: ecology, hydrology and geology. The Provincial Government, through the *Planning Act* and the Provincial Policy Statement, requires municipalities to develop policies to protect natural heritage features. The Region of Peel uses ESAs as a means to protect natural areas that may include but are not limited to: rare or unique plant or animal populations or habitats, plant or animal communities and concentrations of ecological functions such as wetlands, fish habitat, woodlands, habitat of rare species, groundwater recharge and discharge areas and ANSIs.

5.1.8 Areas of Natural and Scientific Interest

Areas of Natural and Scientific Interest (ANSIs) are areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education. There are several ANSIs across the Region that are designated by the province according to standardized evaluation procedures. ANSIs are ranked by the Ministry of Natural Resources and Forestry (MNRF) as being either provincially or regionally significant.

5.1.9 Significant Woodlands

The Region of Peel recognizes the importance of woodlands and trees to the health and quality of life in the community. The Region's policies encourage the protection and restoration of forests, including trees, hedge rows, wooded areas and significant woodlands. Where the Region is undertaking infrastructure work, the Region will, where feasible, protect and preserve existing woodland resources.

5.2 Socio-economic and Cultural Environment

The Region of Peel includes a diverse mixture of land uses including urban, suburban, rural, agricultural and natural landscapes. The Region has outlined a Regional Urban Boundary, shown in **Figure 10**, to provide direction on which lands are being proposed for urban purposes and which lands are to remain agricultural or rural.

Figure 10 – Regional urban boundary.

5.2.1 Urban System

The Urban System contain lands within the Regional Urban Boundary including lands for urban development, urban growth centres, intensification corridors and the Toronto Pearson International Airport, as well as lands protected as part of the natural environment.

5.2.2 Urban Growth Centres and the Regional Intensification Corridor

Urban growth centres and the Regional intensification corridor are major locations of intensification that include compact forms of urban development and redevelopment providing a range and mix of housing, employment, recreation, entertainment, civic, cultural and other activities for Peel residents and workers and other residents of adjacent areas. Significant residential land uses have developed over the years in proximity to major arterial roads and highways with expected higher intensification concentrated in urban growth centres and intensification corridors.

5.2.3 Employment Areas

Employment areas are key centres of economic activity designated in area municipal official plans. These lands will remain important for the Region to maintain a healthy economy and will accommodate uses such as manufacturing, warehousing, offices, and associated retail and ancillary facilities.

5.2.4 Toronto – Lester B. Pearson International Airport

Toronto Pearson International Airport, located in the City of Mississauga, is one of Canada's busiest airport and an important element in the GTHA's transportation and economic systems. Because of its significance, it is a priority for the Region to ensure that new development is compatible with Airport operations and allows the Airport to function efficiently while recognizing existing and approved land uses and other considerations.

5.2.5 Rural System

The Rural System has diverse natural and rural landscapes that are outside of the Regional Urban Boundary. This system includes the Protected Countryside as identified in the Greenbelt Plan and lands identified and protected as part of the natural environment and resources in the Regional Official Plan. Other components of Peel's Rural System include the Brampton Flying Club, three Rural Service Centres, an Estate Residential Community, other rural settlements and rural area.

Appendix 2C presents a figure outlining in greater detail the Regional Urban Boundary and Urban and Rural Systems.

5.2.6 Prime Agricultural Area

The Prime Agricultural Area is part of the Region's rural system consisting of protected lands for long-term use for agriculture. These lands represent natural resources of major importance for the economic sustainability of the Region that should be preserved and protected.

The Region of Peel supports the continuation of a thriving, healthy and viable agricultural industry in the Region including diversification, agricultural innovation and new practices in all aspects of the industry.

Appendix 2C presents a figure outlining the Prime Agricultural Area in the Region of Peel.

5.2.7 Mineral Aggregates Resources Areas

Planning responsibility for mineral aggregate resources is shared among the Province, the Region and the local municipalities. The Region of Peel Official Plan identifies areas designated as having high potential mineral aggregate resources which have economic benefits such as reducing the transportation costs of supplying materials for urban development in the region and attracting value-adding processing facilities that use aggregates and shale as raw materials. Mineral aggregate resources are an important component of the economic development and employment opportunities in the Region and therefore appropriate resource areas should be protected for possible use. **Appendix 2C** presents a figure outlining areas with high potential for mineral aggregate resources.

5.2.8 Cultural Heritage

The Region of Peel and the local municipalities encourage and support heritage preservation and recognizes the significant role of heritage in developing the overall quality of life for residents and visitors. The Region is committed to identify, preserve and promote cultural heritage resources for present and future generations.

The Region of Peel follow established provincial guidelines to identify, preserve and interpret the cultural heritage features, structures, archaeological resources, and cultural heritage landscapes. Cultural heritage policies established by the Region include the need for appropriate assessment, preservation, interpretation and/or rescue excavation of cultural heritage and archaeological resources including mitigation measures as prescribed by the Province.

The 2020 Water and Wastewater Master Plan reviewed the cultural heritage and archaeological features at a high level to provide a context of features within the study area. The individual projects identified in the Master Plan will require future review under legislative development planning processes and the MEA Class EA process. These investigations will include both archaeological and cultural heritage studies such as determining the requirements for a cultural heritage evaluation report and/or heritage impact assessment(s). This will be particularly important for projects located outside of existing or future right or ways or in previously undisturbed areas. During project implementation, these investigations will be completed and next steps will be determined.

For areas identified in the Region of Peel where water and wastewater servicing projects will be subject to future Schedule B or C Municipal Class EAs, a cultural heritage assessment report and archaeological assessment will be conducted. Due to potential changes in construction, alignment and location, the details of these investigations are not known at the Master Plan stage.

Natural, Socio-**Economic and Cultural Environments were considered in the preparation of the 2020 Master Plan. However, it is recognized that additional detailed studies will be required on an individual basis for projects subject to Schedule B and C Municipal Class EA studies.**

5.3 Existing Water System

The Region of Peel's lake-based water system, shown in **Figure 11**, services the City of Mississauga, the City of Brampton, and parts of the Town of Caledon. Water is supplied from Lake Ontario by two water treatment plants (WTP) and conveyed by the transmission and distribution systems.

The two water treatments plants, the A.P. Kennedy WTP and the Lorne Park WTP, are located at the shoreline of Lake Ontario in the City of Mississauga.

The transmission system consists of the two treatment facilities, transmission mains, pumping stations, reservoirs and elevated tanks. Due to the width of the Region's lake-based service area, the transmission system has been divided into three main trunk systems: West, Central and East. The transmission system provides direct supply to the local water distribution system which consists of the water mains extending down to the water service level for each customer. Combined, all the components of the transmission and distribution systems deliver water to users through seven pressure zones separated by approximately 30-metre intervals of elevation.

The Region of Peel also maintains four municipal groundwater systems servicing rural communities in the Town of Caledon. These municipal groundwater systems are not included in the 2020 Master Plan.

A full description of the existing system is contained in **Volume 3 – Water Master Plan.**

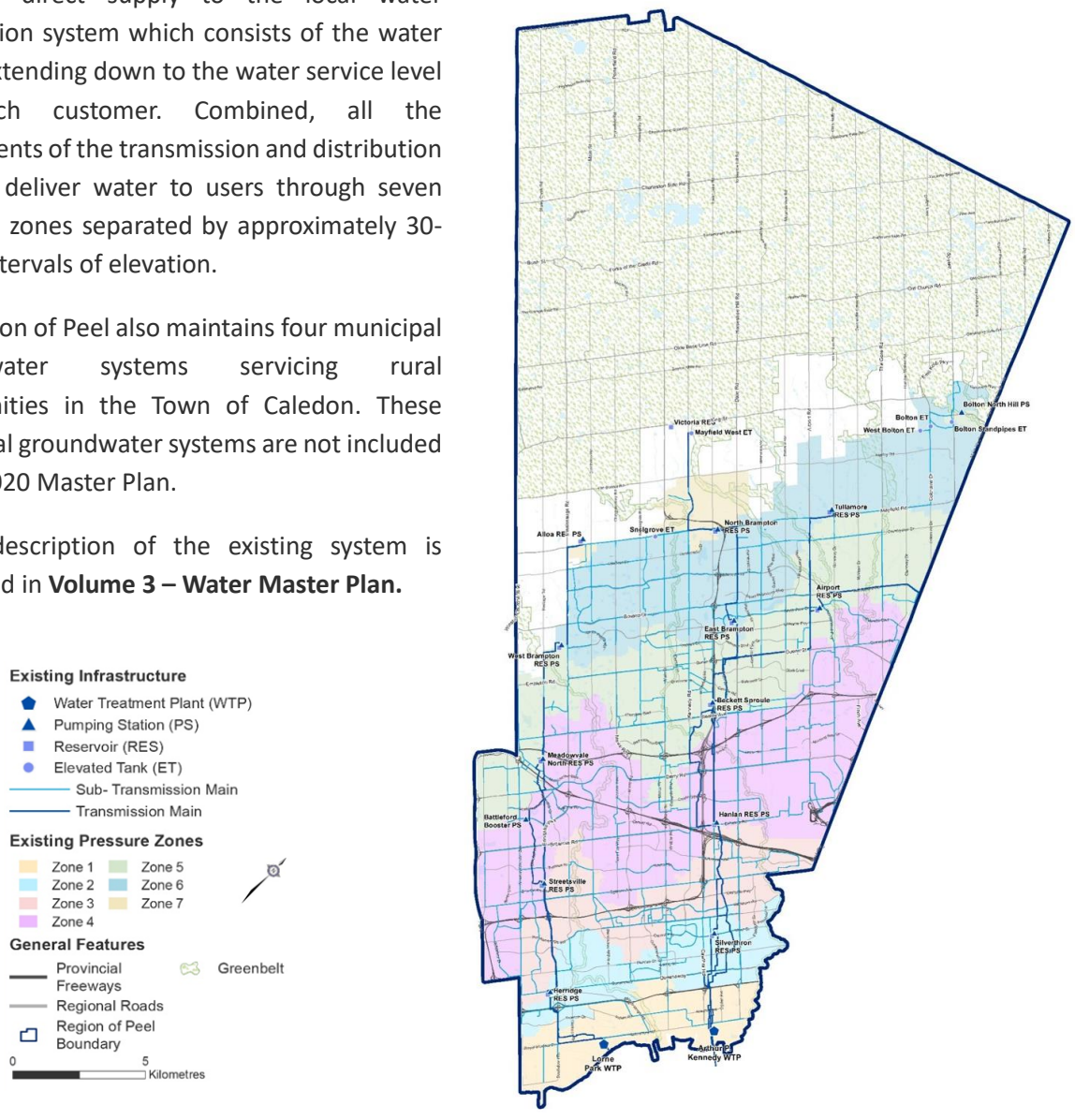


Figure 11 – Existing water system.

5.4 Existing Wastewater System

The lake-based wastewater system, shown in **Figure 12**, services the City of Mississauga, the City of Brampton and parts of the Town of Caledon. The system generally consists of two wastewater treatment plants (WWTP): the G.E. Booth WWTP and the Clarkson WWTP, and three trunk sewer systems (McVean, East and West) which convey flows through sewage pumping stations, force mains, trunk and local gravity sanitary sewers, to the treatment plants for final treatment and discharge to Lake Ontario.

The McVean trunk system connects to the east trunk system via the McVean pumping station that discharges flows into the East Brampton trunk sewers. The east and west trunk sewer systems service areas are approximately divided by the watershed boundary between the Etobicoke Creek and the Credit River. The two systems are connected via the west-to-east sanitary trunk sewer, which can be used to divert some wastewater flows by gravity from the west trunk system to the east trunk system at Highway 407.

Both trunk systems provide direct conveyance for the local wastewater collection system which consists of the sewers extending down to the sanitary service lines for each user.

A full description of the existing system is contained in **Volume 4 – Wastewater Master Plan.**

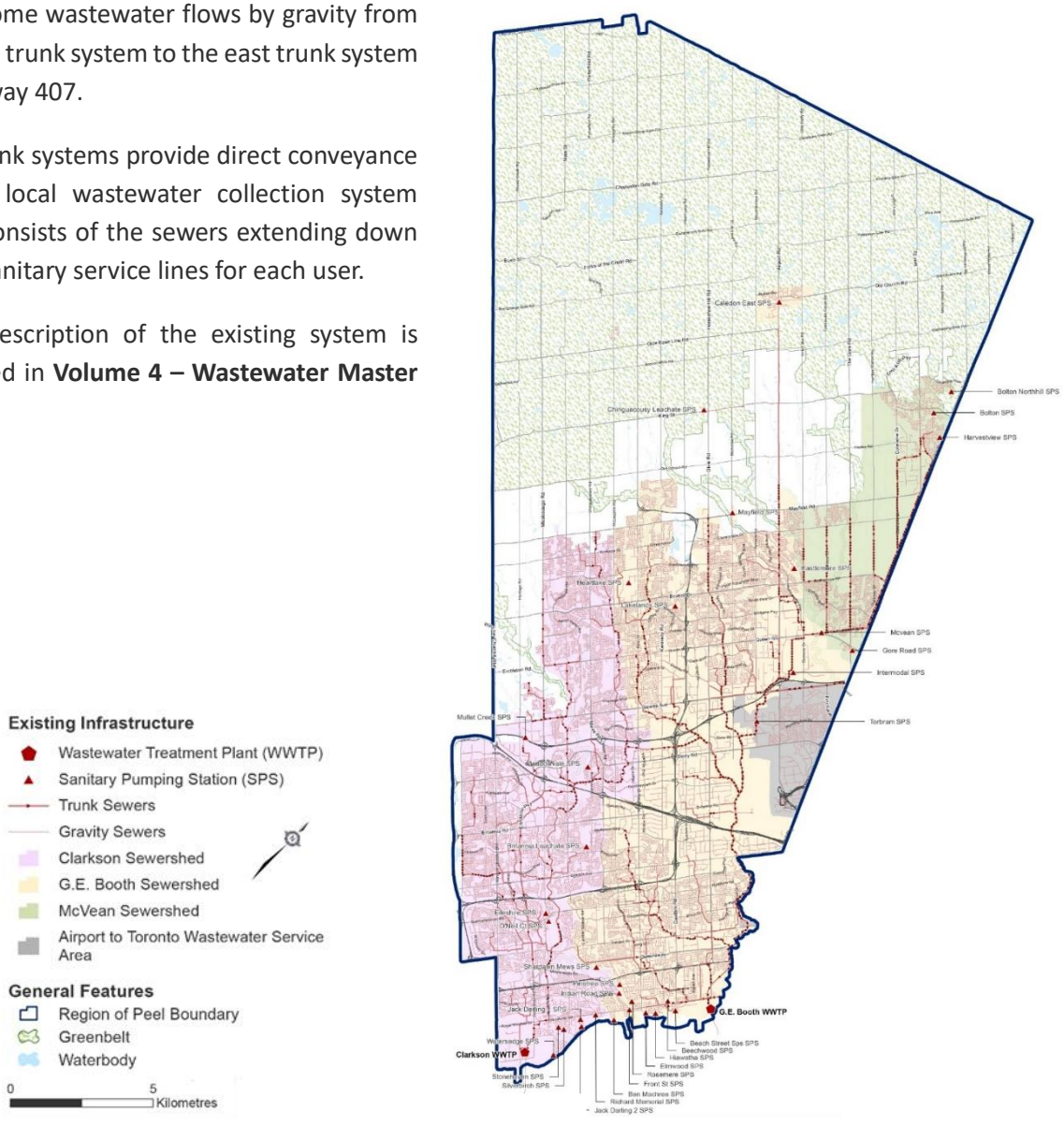


Figure 12 – Existing wastewater system.

6.0 Implementation and Financing

6.0 Implementation and Financing

6.1 Development Charges Input

In addition to the overall servicing strategies, detailed lists of the water and wastewater projects are developed as part of the Master Plan including their associated estimated capital costs. Further information on the costing process is provided in **Volumes 3** and **4.**

A key component of a Master Plan is the overall financing and financial affordability of the capital program. As growth occurs within the Region of Peel, water, wastewater, stormwater, roads, sidewalks, libraries, parks and other growth-related infrastructure benefiting from increased population and employment must be constructed. The primary method for the Region to recover these costs is Development Charges (DC). The overall philosophy for DCs is that "growth pays for growth".

The Master Plan program forms the basis for the Development Charges Background Study, which will be required for an update to the Region's Development Charges By-law. Although the Master Plan Capital Program is driven by the growth needs to meet the 2041 horizon, there may be some other benefits that certain projects provide that are reviewed as part of the DC process:

Benefit to Existing (BTE): If a growth-related project provides added benefit to relieve a capacity or condition deficiency, there may be opportunity to allocate some of the project cost to a Benefit to Existing category and is excluded from the DC costs. These costs are generally assigned to the rates-based capital budget.

Out of By-law (OBL): The Master Plan identifies projects to service growth to the 2041 horizon. However, there are some cases where strategic oversizing of infrastructure may be recommended to service beyond the 2041 horizon (either in Greenfield areas or within infill/intensification areas). In general, the cost premium for oversizing these projects is allocated to the OBL category and is excluded from the DC costs.

All projects that are subject to either BTE or OBL are reviewed on a case-by-case basis. The methodology for the cost splits is outlined in the DC Background Study.

6.2 Implementation

The 2020 Master Plan preferred servicing strategies will support the short- and long-term servicing needs of the approved growth areas and intensification areas and provide flexibility for servicing potential growth areas in the future. The strategies will also support meeting operational requirements, water quality and level of service objectives.

The preferred servicing strategies and capital plans will provide preliminary recommended timing of projects in-service years, as well as timing for required studies and design components.

Further implementation tasks are related to the Municipal Class EA process, which requires review of each project's EA schedule. Under the Municipal Class EA, Schedule A and A+ projects are pre-approved and may proceed directly to implementation.

While the Master Plan provides the foundational strategies for the more complex and detailed projects as part of the overall servicing strategy, projects that fall under Schedule B and C require separate Class EA studies.

These separate studies could include, but are not limited to:

- Watershed impacts/source water protection,
- Climate change impacts,
- Inventory of Environmental, Cultural, Archaeological, Hydrogeological, Geotechnical, etc., and
- Lifecycle cost implications, Asset Management Plans.

Implementation of these studies ensures alignment with the Region's and other agencies' overall goals and objectives.

At the time of completion of this document, the world was going through a social disruption due to Covid-19. Implications of this disruption on growth are uncertain at this time, and it is also uncertain how this may impact timing and implementation of the master plan capital program. In the longer term, the overall program and servicing strategies will remain valid, however the 2020 Master Plan reflects the best information available at this time. Through the Region's integrated approach to growth management, the plan will be refined to reflect any short, medium and long term impacts resulting from the pandemic.

7.0 Future Considerations

7.0 Future Considerations

The 2020 Master Plan was focused on developing a long-term servicing strategy to meet the needs of future growth to 2041 while supporting the appropriate level of service to existing residents and businesses. The 2020 Master Plan also considered potential impacts beyond 2041 including the following considerations:

7.1 Buildout and Higher Intensification

Buildout growth is generally seen as a maximum population and employment projection that a certain land use type can support. This can be estimated using density assumptions for both intensification/infill areas as well as greenfield areas.

Buildout growth was considered in the development of the water and wastewater strategies for specific projects that were strategically oversized to account for an estimated level of growth beyond the current planning projections to 2041.

However, it is understood that the buildout growth is a theoretical estimate driven by several variables and is subject to changes in the market, development pressures, etc. As such, impacts of buildout on servicing strategies and currently planned projects will require continual review and update.

7.2 GTA West Transportation Corridor Route Planning and EA Study

To support the policy direction in the *Growth Plan for the Greater Golden Horseshoe*, the Ontario Ministry of Transportation (MTO) commenced the formal environmental assessment (EA) process for the GTA West Corridor[22]. The purpose of this study is to examine long-term transportation problems and opportunities and consider alternative solutions to provide better linkages between *Urban Growth Centres* within the GTA West Corridor Preliminary Study Area, such as Downtown Milton, Brampton City Centre, Vaughan Corporate Centre and Downtown Guelph.

The Study is being undertaken as an Individual EA in accordance with the *Ontario Environmental Assessment Act*.

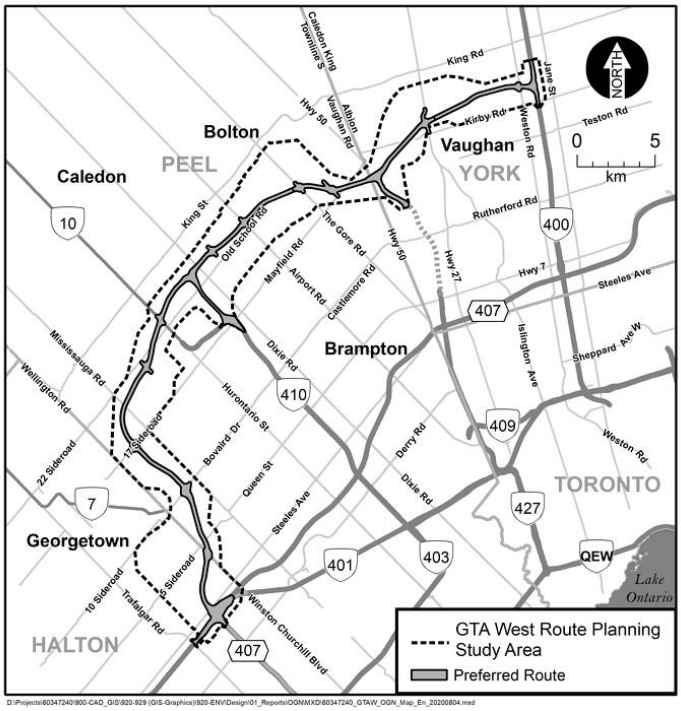


Figure 13 – GTA West route planning study area.

Stage 2 of the study was initiated in early 2014 to build upon the recommendations from the first stage. Stage 2 was cancelled in February 2018, and later resumed in June 2019. This stage is focusing on identifying the route and developing the preliminary design for the new multimodal transportation corridor. The new corridor will extend from Highway 400 (between Kirby Road and King-Vaughan Road) in the east to the Highway 401/407ETR interchange area in the west, and will feature a 400-series highway, a transitway, and potential goods movement priority features. As part of Stage 2, route alternatives for the new multimodal transportation corridor were generated within a Route Planning Study Area. On August 7, 2020 the Ministry of Transportation confirmed the preferred route for the new 400-series highway. The GTA West Corridor Study Area and Preferred Route is presented in **Figure 13.**

The GTA West Corridor Environmental Assessment Study is scheduled to be completed by the end of 2022. The capital projects included in the 2020 Master Plan have taken into consideration potential impacts from preliminary information related to the GTA West Corridor. However, the strategies and recommended infrastructure will require further review as more detailed information is available on the GTA West Corridor and the anticipated increased growth and intensification that is likely to occur along the corridor.

7.3 GTAA Union Station West

The Greater Toronto Airports Authority (GTAA) plans to build a new passenger processing facility to support Toronto Pearson International Airport and to serve as a major transit hub called "Union Station West"[23]. The new station will help improve access to the airport and will also allow for more passenger processing.

Design work is already underway and the GTAA is working with Metrolinx to study potential transit connections to the airport. The station will be located within GTAA lands. The first phase of the facility is expected to be open by the late 2020s, while the station is planned to be complete in the early 2030s.

The "Airport Employment Zone" around Toronto Pearson is the second-largest employment zone in Canada. Union Station West will be a major multi-modal transit hub that will serve the airport and the employment area and reduce congestion on the surrounding road network.

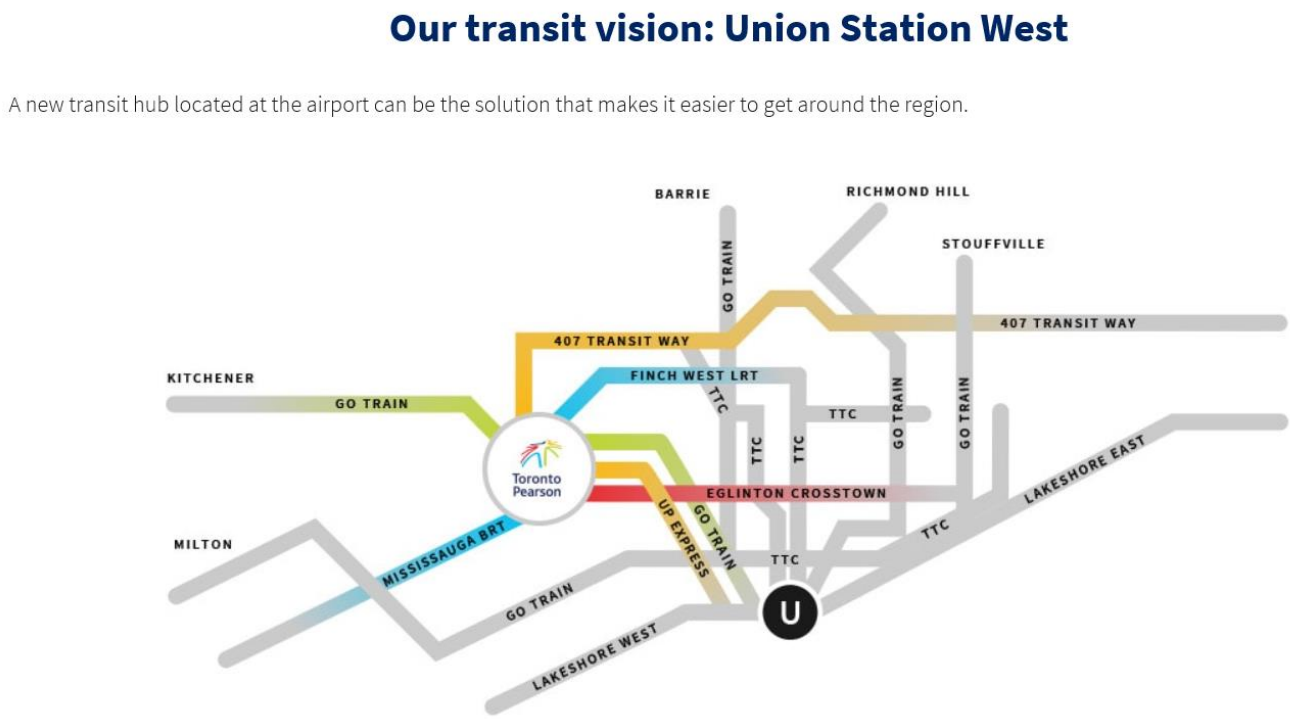


Figure 14 – GTAA Union Station West.

Union Station West and future development and intensification in the Airport Employment Zone will likely increase water demands and wastewater flows in the system. This could have an impact on the existing and current planned water and wastewater infrastructure in the area, and on the servicing strategies developed in the Master Plan. As this plan is developed, additional population growth, employment growth, water demands, wastewater flows, and servicing needs and opportunities will be identified. The 2020 Master Plan has considered this impact, but the servicing strategies are based on the ROPA level of growth in this area at this time.

7.4 Higher Order Transit

As with other major transportation infrastructure developments in the Region, the impacts on the existing and planned water and wastewater infrastructure by Higher Order Transit projects should be considered. Potential impacts could include relocation of infrastructure and increased water demands and wastewater flows in the system due to intensification along new corridors and transit nodes. The 2020 Master Plan has reviewed major infrastructure alignments and coordinated with transportation information available at this time. Detailed, area-specific servicing studies would be required to determine specific infrastructure impacts related to Higher Order Transit.

Higher Order Transit generally operates in its own dedicated right-of-way, outside of mixed traffic, and therefore can achieve a frequency of service greater than mixed-traffic transit. Higher order transit can include heavy rail (such as subways), light rail (such as streetcars), and buses in dedicated rights-of-way[24]. The following Higher Order Transit projects are proposed in the Region:

7.4.1 Dundas BRT

Dundas Street Bus Rapid Transit (BRT) is a major transit project proposed by Metrolinx along Dundas Street through most of Mississauga. With 20 stops and three terminals across approximately 40 km, BRT will ensure greater flexibility, shorter travel times, higher frequency service, and increased reliability for its users. The goal of implementing BRT within the existing Dundas Street corridor will be to balance transit priority needs and create a pedestrian friendly environment while accommodating and avoiding traffic congestion.

The Dundas BRT project is proposed as part of the 2018 Dundas Connect Master plan, a guide for future urban growth and intensification along the Dundas Street Corridor. The Dundas Connects Master Plan was endorsed by the City in June of 2018.

Figure 15 – Dundas Street BRT concept.

7.4.2 407 Transitway

The Ontario Ministry of Transportation (MTO) recently completed an Environmental Assessment for the planning and preliminary design of a 407 Transitway from west of Hurontario Street at the boundary of the Cities of Brampton and Mississauga, to east of Highway 400 in the city of Vaughan. The Transitway facility will include approximately 23 km of runningway and several stations that will include parking facilities, transit integration and other amenities. The main objective of the study is to implement the transitway initially as Bus Rapid Transit (BRT) with the potential to convert to Light Rail Transit (LRT) in the future. The study area for the proposed transitway can be seen in the images below.

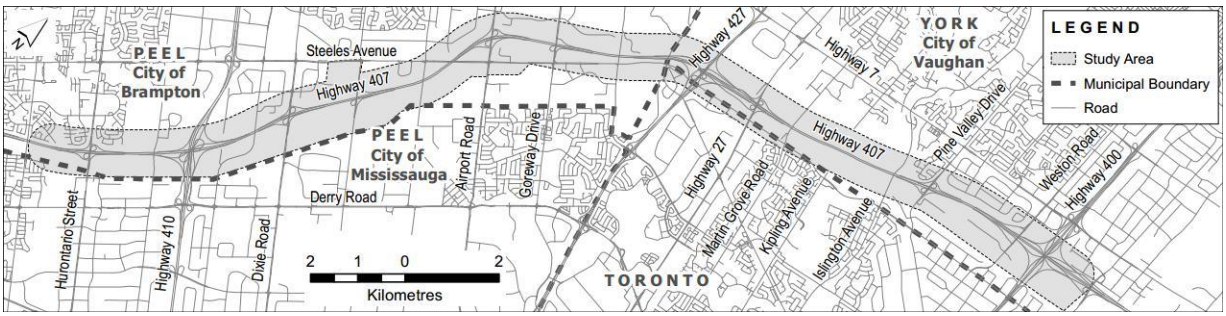


Figure 16 – Study area for the proposed 407 Transitway segment.

MTO is currently undertaking an additional Environmental Assessment and preliminary design for a 407 Transitway from west of Brant Street to west of Winston Churchill Boulevard. The 407 Transitway will be two-lanes running along the Highway 407 Corridor. This transitway facility will include 35 km of runningway and a number of stations whose locations will be determined as part of the study. The station layouts will be planned to include vehicular and pedestrian access, park and ride and pick-up/drop off facilities, bus lay bay facilitates, on street integration with local transit, shelters, buildings and other amenities. The transitway and the stations will initially be designed to support a two-lane busway service with potential for future conversion to a two-track LRT technology.

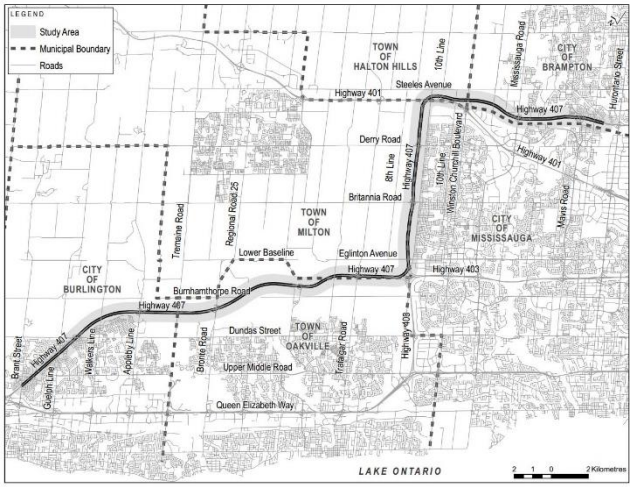


Figure 17 – Study area for the proposed 407 Transitway segment.

Both transitway segments will form part of the 150km long high-speed interregional facility planned to be constructed on right of way that parallels Highway 407 from Burlington to Highway 35/115 with stations, parking and access connections.

7.4.3 Hurontario LRT

The Hurontario Light Rail Transit (LRT)[25] is a major transit project proposed along Hurontario Street in the cities of Mississauga and Brampton, with a corridor that will run from Lake Ontario to downtown Brampton. With 19 stops and its own dedicated lanes, the Hurontario LRT aims to ensure a smooth, fast and convenient ride between Mississauga and Brampton while avoiding traffic congestion.

The Hurontario LRT project is expected to be complete by fall 2024 with the design, build, finance, operate and maintain contract awarded in October of 2019.

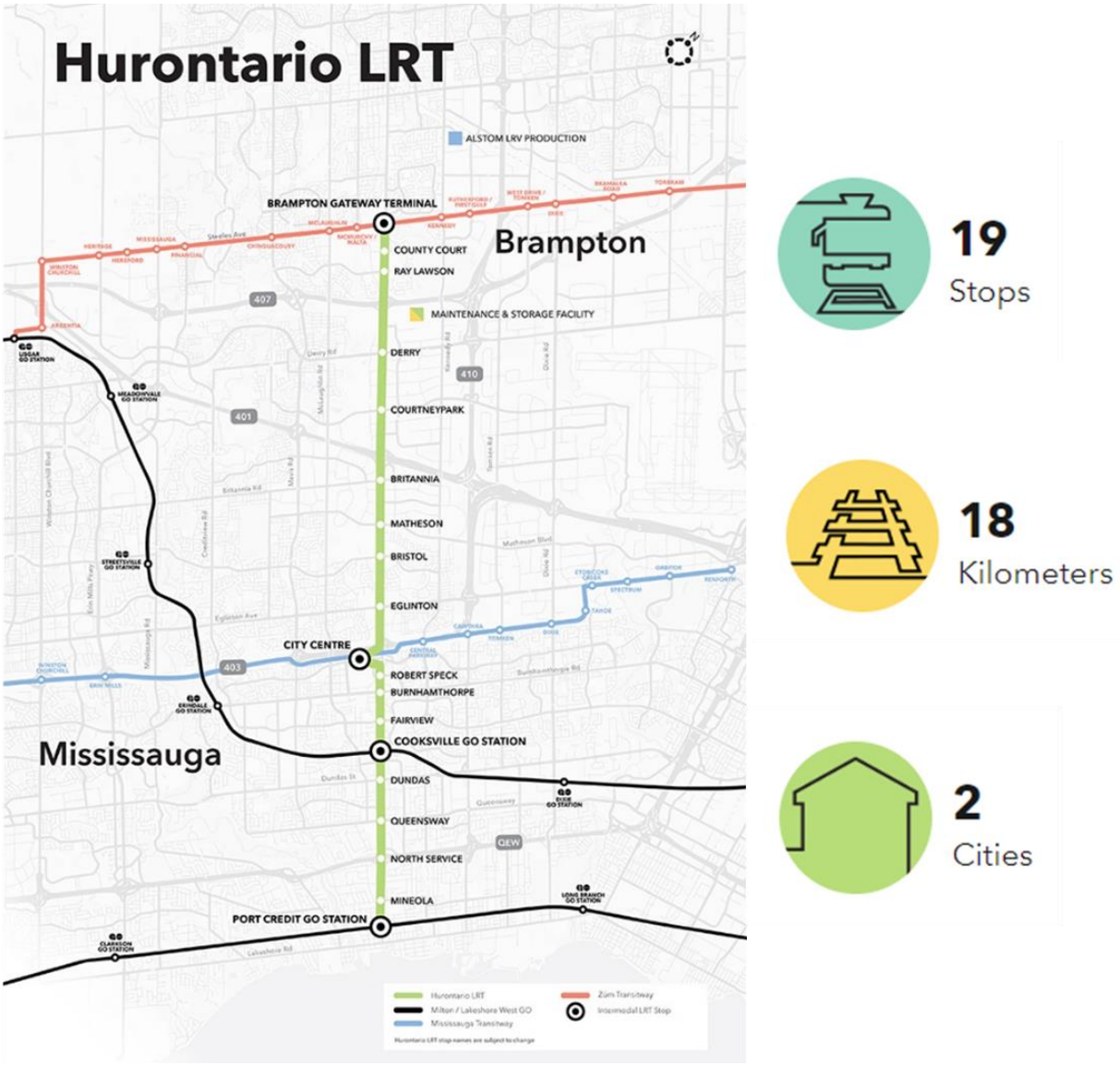


Figure 18 – Hurontario LRT alignment.

7.5 Climate Change

Adaptation to climate change is one of the guiding principles in the development of servicing strategies that make up the 2020 Master Plan. Factors such as maximizing the use of existing infrastructure, designing systems for more frequent and intense wet weather events, preference for gravity versus pumped solutions, and providing for adequate system security, among others; were considered in the context of climate change and the development of servicing strategies.

Potential impacts of climate change on the Regional Water and Wastewater infrastructure includes:

- Increased water demands.
- Exceeded sewer capacities and potential for flooding.
- More frequent overflows at wastewater treatment plants and sewage pumping stations.
- Higher concentration of contaminant/loadings in wastewater.
- Increased inflow and infiltration.
- Increased bank erosion affecting the stability of built infrastructure.
- More pressure on operations and maintenance.
- Increased impacts to natural systems.

For the 2020 Master Plan, and any future master plan update, it is important for the Region that the water and wastewater servicing strategies align with the corporate objectives of reducing greenhouse gas emissions and providing for services and assets that are more resilient to extreme weather events and future climate conditions.

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2A

REGIONAL MUNICIPALITY OF PEEL

APPENDIX 2A

Servicing Principles and Policies

Water and Wastewater Servicing Principles and Policies Paper

2020 Water and Wastewater Master Plan

Prepared by:
GM BluePlan Engineering for:

The Regional Municipality of Peel

Project No. 715022
February 2020

Table of Contents

1 INTRODUCTION

The Region of Peel retained GM BluePlan Engineering to prepare the 2020 Water and Wastewater Master Plan ("2020 Master Plan") for the Region's lake-based water supply and wastewater collection system. The purpose of this report is to review the water and wastewater policies and guiding principles which are integral to provide guidance and direction to the master planning process.

1.1 Study Background and Objectives

Providing safe, reliable and sustainable water and wastewater services is an important matter to the public and to the municipalities in charge of planning, operating and maintaining the water and wastewater systems. Applying appropriate policies is essential to make sure that adequate planning and design principles are followed while developing servicing strategies, implementing the water and wastewater capital programs and system upgrades, as well as in the operation and maintenance of these systems.

Development of the water and wastewater principles and policies have been built on existing documentation and other related sources including:

- The Region of Peel Official Plan
- Federal and Provincial policies and legislation
- Design and development standards
- Municipal By-Laws
- Existing municipal policies and procedures

The objectives of this Principles and Policy Paper include, but are not limited to:

- Providing direction for planning and identifying water and wastewater servicing issues that may have an impact to growth options
- Providing direction for normal operation and maintenance of the water and wastewater system (the policies do not replace normal operation and maintenance procedures or best practices)
- Providing direction for development and evaluation of servicing strategies for the Master Plan
- Ensuring appropriate design and costing criteria are utilized for developing servicing strategies for the Master Plan
- Setting policies that are reasonably implemented
- Setting policies that are robust and sustainable

Although best management practices and criteria are updated over time, the context, intent and validity of the policies should remain intact.

1.2 Approach

The approach in establishing and implementing the water and wastewater policies is as follows:

1. Develop general policies as well as separate water and wastewater policies.
2. Address issues related to the full cycle of water and wastewater services from the water source to the customer, from the customer to the treated wastewater discharge and final discharge to recipient water body.
3. Highlight key criteria and best practices related to each policy.
4. Review and discuss principles and policy with the Region of Peel.
5. Consolidate the general, water and wastewater policies in the Policy Paper.
6. Utilize the policy and/or best management practices outlined in the Policy Paper to guide the development of servicing strategies for the Master Plan.
7. Implement and utilize the policies, guidelines and best practices within the day-to-day decision making for planning and operation of the water and wastewater systems.

2 SERVICING PRINCIPLES AND POLICIES

As part of the 2020 Master Plan, 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 Region of Peel is looking to build and maintain efficient, reliable, sustainable and well managed water and wastewater systems that provide superior level of service to the public. In order to capture these goals, the servicing principles and policies as outlined below:

1. General Servicing Policies
2. Water Servicing Policies
3. Wastewater Servicing Policies

The above 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.

The following sections provide details for each servicing policy.

2.1 General Lake-Based Servicing Policies

Policy No.	Policy Area	Policy Statement	Servicing Implications
G.01	Municipal Servicing	*"The Region of Peel 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 and Growth Plan."*	• Planning and design of servicing strategies will optimize use of existing infrastructure where possible. • Infrastructure will be coordinated and designed within typical Regional exercises including Official Plan updates, growth projections and development coordination. • Timing of growth will be reviewed with consideration to a reasonable implementation schedule for infrastructure required to meet the projected growth. • Municipal servicing will be implemented using typical standards (MECP Guidelines, Region of Peel Standards Guidelines and Drawings, etc.)
G.02	Environmental Protection	*"The Region of Peel shall consider, protect and endeavor to minimize impact to the natural, built and cultural environment and heritage of the community."*	• Servicing studies shall consider the Natural Environment and Heritage Policies in the Region Official Plan. • Services will be planned through the appropriate Environmental Assessment process to ensure full regard for the natural and cultural heritage.
G.03	Planning Horizon	*"The Region of Peel shall ensure that the design of water and wastewater infrastructure recognizes the potential for growth beyond the time horizon of the Official Plan."*	• Recognize that the service life of infrastructure may be greater than the current planning horizon. • Consider, where appropriate, potential for growth beyond the time horizon of the Official Plan for the planning and sizing of infrastructure. • Evaluate the value of strategic oversizing versus future twinning of services, and the operational impacts of oversizing compared with phased upgrades. • Consider potential ultimate site requirements, potential for phasing implementation and construction and minimizing disruption to residents and the environment.

Policy No.	Policy Area	Policy Statement	Servicing Implications
G.04	Reserve Capacity	*"The Region of Peel shall endeavor to maintain sufficient reserve capacity in its water and wastewater infrastructure and facilities to provide operational flexibility and meet potential changes in servicing conditions."*	• Recognize there is a time frame required to implement expansion of the infrastructure and facilities and initiate planning, the Environmental Assessment process, design and construction for expansion with consideration of the in-service date. • Day to day operation and maintenance of infrastructure and facilities requires flexibility for operating conditions, fluctuating flows, equipment shutdowns, maintenance, emergency operations and other unforeseen conditions. • Inability to maintain adequate operating capacity will trigger future expansions or upgrades of the infrastructure. • Additional capacity for infrastructure and facilities will consider full rated capacity and appropriate reserve capacity defined through design criteria.
G.05	System Reliability and Security	*"The Region of Peel shall endeavor to provide reliability, redundancy and security in its water and wastewater systems with attention to high risk and critical areas."*	• Recognize that all systems are susceptible to some level of failure or breakdown or need to be taken out of service for regular maintenance. It is reasonable to provide a level of reliability to ensure an acceptable level of service is maintained.
G.06	Location of Municipal Services and Facilities	*"The Region of Peel shall locate all of its services and facilities on public property or on municipally-owned easements."*	• Any new and existing infrastructure will be located within road right-of-ways, or on Region-owned property (including designated lots and easements). • Adequate property size will be maintained to facilitate all day-to-day activities and emergency response. • Adequate property will be acquired to meet future infrastructure requirements, where these requirements are known.
G.07	Climate Change	*"The Region of Peel shall be aware of and consider the potential impact of climate change on planning and sizing of infrastructure."*	• Address water, natural heritage and land management issues related to climate change through integrated watershed management. • Water and wastewater infrastructure and facilities will be designed with consideration to the potential impacts to and from climate change.

Policy No.	Policy Area	Policy Statement	Servicing Implications
G.08	Energy Efficiency	*"The Region of Peel shall design water and wastewater facilities with consideration to energy use."*	• Facilities will be planned and designed with consideration to minimize overall lifecycle costs, including capital and operating/maintenance costs. • All aspects of planning, design, operation and maintenance should consider efficiency and optimization. • Attention to energy use will provide significant opportunity to optimize lifecycle costs. • Maintenance management systems should be developed by the Region to ensure that equipment is properly maintained and operating efficiently. • Alternative infrastructure strategies will be considered to minimize energy (i.e. water storage vs pumping).
G.09	Integrated Infrastructure Program	*"The Region of Peel shall harmonize planning and servicing policies and strategies with Provincial and Regional policies and strategies"*	• Comply with the requirements of the *Greenbelt Protection Act* and the *Places to Grow Act.* • Review the impact of provincial requirements on required infrastructure. • Coordination and integration will ensure servicing policies and strategies are aligned.
G.10	Level of Service	*"The Region of Peel shall outline the Level of Service Objectives through the Master Plan and endeavor to meet/exceed the minimum requirements as outlined in the objectives."*	• Consistency with best management practices and processes and equipment within facilities will be ensured. • Incorporate feedback from Operations and Maintenance staff. • Review and evaluate strategies developed through the Master Plan based on their ability to meet requirements outlined in the Level of Service Objectives.
G.11	Inter-Regional Collaboration	*"The Region of Peel shall meet the servicing requirements of the York-Peel water and wastewater agreement and the Toronto-Peel Wastewater agreement:*	• Plan for future water supply and wastewater flow in order to meet the terms of the existing agreements

Policy No.	Policy Area	Policy Statement	Servicing Implications
G.12	Sustainability	*"The Region of Peel shall endeavour to undertake sustainable planning, designing, operation and maintenance of the Water and Wastewater Systems."*	• Plan, design, operate and maintain Water and Wastewater Systems that are Environmentally, Financially, Operationally, Legislatively, and Socially Sustainable. • Financial Sustainability shall consider and utilize appropriate funding mechanisms including but not limited to Development Charges, local cost to development, rates and reserves to provide a long term balanced and equitable plan to fund the delivery of servicing.
G.13	Source Water Protection	*"The Region of Peel shall ensure that watershed planning will inform the water and wastewater infrastructure planning and master planning process"*	• Servicing alternatives will be developed to align with the Source Water Protection Synthesis Report by ensuring that source protection policies are embedded in municipal policies and master planning. • Encourage sustainable water use to enhance, protect and maintain the quality, quantity and safety of water sources.
G.14	Term of Council Priorities	*"The Region shall ensure that the 2018-2022 Term of Council Priority to Build Environmental Resilience is met"*	• Develop and implement water and wastewater strategies that aim to ensure the community is resource efficient, emits less greenhouse gases, and is healthier and better prepared for the impacts of climate change. • The water and wastewater master plan strategies shall consider the ToCPs that relate to additional climate change related plans and strategies (i.e. reducing the risk of basement flooding during wet weather events and limiting stormwater quantity and quality concerns.)

2.2 Lake-Base Water Servicing Policies

Policy No.	Policy Area	Policy Statement	Servicing Implications
W.01	Health & Safety	*"The Region of Peel shall promote health, productivity and safety of the community through design, construction and maintenance of the Region's potable water infrastructure."*	• Prepare ongoing and comprehensive strategies to manage existing and future water servicing needs. • Planning and implementation of the potable water systems will be consistent with legislative policies and guidelines. • Ensure that municipal servicing will be implemented under typical design standards (MECP Guidelines, Region criteria and standards).
W.02	Raw Water Quality	*"The Region of Peel shall endeavor to enhance, protect and maintain quality, quantity and safety of its raw water sources."*	• Discharge a high-quality effluent from Peel's wastewater treatment plans that comply with MECP guidelines and regulations as applicable. • Monitoring of water sources is required to ensure safe yield limit of the water taking is occurring and evaluate and optimize the water treatment plant intake location if necessary. • Continue participation in the International Joint Commission on the Great Lakes and address water quality issues for Lake Ontario.
W.03	Treatment & Distribution Water Quality	*"The Region of Peel shall meet or exceed legislated water quality criteria."*	• Water quality will meet, at a minimum, all legislated criteria. • Maximize the potential capacity ad performance of the facilities and equipment to achieve the best water quality on an on-going basis. • Implement industry best practices to ensure water quality is maintained. • Review the economics, reliability and water quality impacts of implementing new technology.
W.04	Water Demand Projections	*"The Region of Peel shall utilize a water demand projection methodology that recognizes recent water supply data and current consumption trends."*	• Forward-looking water demand projections in the Master Plan must appropriately identify future water needs to ensure the best estimate for infrastructure capacity and timing. • Utilize a demand starting point methodology based on recent water supply conditions. • Establish current water design criteria and standards for new growth.

Policy No.	Policy Area	Policy Statement	Servicing Implications
W.05	Distribution Requirements	*"The Region of Peel shall provide potable water at adequate pressure and flow to its customers and provide reliability and security throughout the water distribution system."*	• Provide pressures which meet current design criteria and standards. • Review and optimize Pressure Zone Boundaries throughout the Region as required. • An adequate combination of storage capacity, pumping capacity, and stand-by power will be provided to meet the desired level of service under emergency conditions. • Reliability and security objective can be achieved through implementing best practices.
W.06	Fire Flow Requirements	*"The Region of Peel shall consider the MECP guidelines and the Fire Underwriters guidelines for establishing the acceptable level of fire flow."*	• Provide pressures, fire flows and an adequate level of fire storage which meet current design criteria and standards. • Determine level of service to be provided under emergency conditions including fire flow demand conditions and duration to be met.
W.07	Water Efficiency and Consumption Trends	*"The Region of Peel shall be aware of the impacts water efficiency and conservation has on the water network."*	• Continue to assess water demand conditions and determine reasonableness of trends (potential lower/higher water use and consumption). • Utilize water efficiency studies where available. • Apply where appropriate demand trends (efficiency) into future design criteria and growth forecasts. • Apply awareness to how water efficiency and consumption trends will impact strategies and scheduling of future infrastructure.
W.08	Water Supply and Distribution Security	*"The Region of Peel shall plan, design, construct, operate and maintain the water system to balance level of service and security of supply to the customers."*	• Continue to implement standards, criteria, and standard operating procedures for the water system. • Maintain an awareness and integration between the Regional water system and local distribution system. • Maintain appropriate standards for the local water system.

Policy No.	Policy Area	Policy Statement	Servicing Implications
W.09	Design Criteria	*"The Region of Peel shall utilize reasonable design criteria for establishing and evaluating servicing scenarios"*	• Criteria should be based on historical records and projections and MECP guidelines. • Consider separate criteria for urban and rural areas. • Consider differentiating criteria for land uses.
W.10	Costing Criteria	*"The Region of Peel shall utilize reasonable costing criteria for establishing and evaluating servicing scenarios"*	• Reasonable Master Plan level costs established that account for additional costs due to known constructability factors.
W.11	Pressure Zone Boundaries	*"The Region of Peel shall establish pressure zone boundaries that balance system pressures, watermain sizing, pumping capacity and storage capacity to achieve level of service under normal operating conditions, fire flow conditions, and emergency conditions."*	• Where feasible, provide a minimum of 1 standby pump in each pumping station servicing a pressure zone. • Where feasible, provide pumping capacity to meet the greater of peak hour demand or maximum day demand plus fire flow at each pumping station servicing a pressure zone based on the servicing area of the pumping station. • Where feasible, provide floating storage to each pressure zone to support operating, fire and emergency storage. • Where floating storage is not feasible, the "closed" pressure zone should be minimized in size and service population. • The "closed" pressure zone must be serviced by pumping capacity meeting the greater of peak hour demand or maximum day demand plus fire flow. • Where the "closed" pressure zone is serviced by an inline booster pumping station with no direct suction side storage, the service area must maintain 35 psi under average day demands and under emergency operating conditions where no boosted pumping is available.

2.3 Lake-Based Wastewater Servicing Policies

Policy No.	Policy Area	Policy Statement	Servicing Implications
WW.01	Health & Safety	*"The Region of Peel shall promote health, productivity and safety of the community through design, construction and maintenance of the Region's wastewater infrastructure."*	• Prepare a comprehensive strategy to manage existing and future water servicing needs. • Ensure that and implementation of the wastewater systems are consistent with legislative policies and guidelines. • Municipal servicing will be implemented under typical standards (MECP Guidelines, Region criteria and standards).
WW.02	Receiving Water Bodies	*"The Region of Peel shall endeavor to enhance, protect and maintain quality, quantity and safety of its receiving water bodies."*	• Wastewater effluent discharges will meet, at a minimum, all legislated criteria. • Continue participation in the International Joint Commission on the Great Lakes and consider policies related as such.
WW.03	Wastewater Treatment and Collection Requirements	*"The Region of Peel shall meet as a minimum the requirements of the Environmental Compliance Approvals set out by governing bodies and the appropriate legislated treatment and collection criteria."*	• Wastewater quality (air and effluent) will meet as a minimum all legislated criteria. • Manage wet weather conditions (inflow / infiltration) through asset management and flow monitoring programs to minimize extraneous flows and maximize efficient use of available wastewater infrastructure. • Implement industry best practices to ensure effluent quality is maintained. • Review the economics, reliability and effluent quality impacts of implementing new technology.
WW.04	Wastewater Flow Projections	*"The Region of Peel shall utilize a wastewater flow projection methodology that recognizes recent wastewater flow and treatment data and current consumption trends."*	• Forward-looking wastewater flow projections in the Master Plan must appropriately identify future wastewater needs to ensure the best estimate for infrastructure capacity and timing. • Utilize a demand starting point methodology based on historical wastewater flow conditions. • Establish current wastewater design criteria and standards for new growth.

Policy No.	Policy Area	Policy Statement	Servicing Implications
WW.05	Separated Wastewater and Stormwater Systems	*"The Region of Peel shall plan and maintain separate wastewater and stormwater systems."*	• Continue to build, maintain, and operate separated wastewater and stormwater systems. • Endeavor as part of I &I reduction measures to identify and remediate existing sanitary sewer cross connections and implement strategy to prevent future cross connections and stormwater impact on the wastewater system
WW.06	Wastewater Collection and Pumping Systems	*"The Region of Peel shall provide adequate reliability and security in wastewater pumping systems."*	• Consider adequate level of facility storage, system storage, standby power, twinning and other security measures to manage emergency conditions
WW.07	Wet Weather Flow Criteria	*"The Region of Peel shall utilize current wet weather flow criteria to determine peak wet weather flows and size wastewater infrastructure."*	• Notwithstanding existing conditions, the Region shall consider planning for new growth consistently across all systems. • The level of service under wet weather conditions will be established through the Master Plan design criteria. • Consideration to environmental, social and financial factors as well as the feasibility for implementation should be given when determining the wet weather criteria.

3 POLICY IMPLEMENTATION

This Policy Document has been structured such that additional policies may be added as required. The policy statements themselves have been worded such that they should remain relevant over time, though these can also be edited as required.

It is anticipated that through technological innovations, regulatory changes, and updated servicing priorities, some of the criteria or best practices will require updating in the future. The policy structure should allow this to be done without necessarily having to edit the actual policy statement.

4 SUMMARY

The Policy Document has been developed as part of the Region of Peel 2020 Water and Wastewater Master Plan.

The general, water and wastewater principles and policies developed in this document will provide guidance and direction to the master plan process.

The policies and principles should also form part of the Region's day to day planning, design, construction, operations and maintenance practices for the water and wastewater systems.

2B

REGIONAL MUNICIPALITY OF PEEL

APPENDIX 2B

Baseline Environmental Overview

Environmental Overview Report

2020 Water and Wastewater Master Plan

Prepared by:
GM BluePlan Engineering for:

The Regional Municipality of Peel

Project No. 715022
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Appendices

1 INTRODUCTION

The Region of Peel consists of the area municipalities of the City of Brampton, the City of Mississauga and the Town of Caledon. Located in Southern Ontario, the Region of Peel is part of the Greater Golden Horseshoe area, one the most dynamic and fast-growing regions in Canada and North America.

As one of the fastest growing municipalities in Ontario, readily available and accessible public water and wastewater infrastructure is essential to the viability of existing and growing communities within the Region. The Region of Peel's population is expected to grow to almost 2 million people by 2041[1]. This means that by 2041, the Region needs to accommodate water and wastewater servicing for over 540,000 new residents and 275,000 additional jobs.

The Region of Peel initiated the 2020 Water and Wastewater Master Plan ("2020 Master Plan") for its lake-based water and wastewater systems to balance the needs of growth with the protection and preservation of natural, environmental and heritage resources. As part of the Master Plan a Baseline Environmental Overview was completed to describe the applicable environmental policies and provide a synopsis of existing conditions in the master plan study area.

[1] *A Place to Grow, Growth Plan for the Greater Golden Horseshoe, 2019*

2 POLICY OVERVIEW

2.1 Federal Context

2.1.1 Federal Fisheries Act

The key national legislation for the protection of fish habitat is the *Fisheries Act.* The primary goal of the *Act* is to protect fish habitat from biological, physical or chemical alterations that are harmful and/or destructive. Fisheries and Oceans Canada, in conjunction with various other agencies (Environment Canada, Ontario Ministry of Natural Resources, Ontario Ministry of the Environment, Conservation and Parks (MECP)) are responsible for the enforcement and management of fisheries resources according to various portions of the *Fisheries Act*.

There are two significant components of this legislation in relation to watercourse crossings. These include:

Section 35(1): No person shall carry on any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational, or aboriginal fishery, or to fish that support such a fishery.

Section 36(3): No person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water.

A deleterious substance means any substance that, if added to any water, would degrade, alter or form part of a degradation/alteration process of the quality causing harm to fish or fish habitat, limiting the use of fish by humans.

2.1.2 Species at Risk Act

The purposes of the *Species at Risk Act (SARA)* is to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity, and to manage species of special concern to prevent them from becoming endangered or threatened.

The SARA has legislative coverage that extends throughout all federal lands. In Ontario, the SARA will take precedence for habitat protection and stewardship efforts for migratory birds and aquatic species designated “at risk”.

Species are designated at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), an independent body of experts that assesses wildlife according to a broad range of scientific data. The COSEWIC reviews research information on population and habitat status, trends and threats and applies assessment criteria based on international standards. The federal Cabinet then decides whether those species should get legal protection under the Act. Once a species is added to the list and protected officially under SARA, a recovery strategy must be developed. For endangered species, this strategy must be developed within a year of the listing; for threatened or extinct species, it must be developed within two years.

2.2 Provincial Context

2.2.1 The Planning 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.

2.2.2 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 the Region of Peel water and wastewater infrastructure include:

Policy 1.2.6.1

Major facilities and sensitive land uses should be planned to ensure they are appropriately designed, buffered and/or separated from each other to prevent or mitigate adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term viability of major facilities.

Policy 1.3.1

Planning authorities shall promote economic development and competitiveness by […] ensuring the necessary infrastructure is provided to support current and projected needs.

Policy 1.3.2.1

Planning authorities shall plan for, protect and preserve employment areas for current and future uses and ensure the necessary infrastructure is provided to support current and projected needs.

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.
b. available to meet current and projected needs.

Policy 1.6.2

Planning authorities should promote green infrastructure to complement infrastructure.

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 1.6.4

Infrastructure and public service facilities should be strategically located to support the effective and efficient delivery of emergency management services.

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.
    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. prepares for the impacts of a changing climate.
    3. is feasible and financially viable over their lifecycle.
    4. 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. Where municipal sewage services and water services are not available, planned or feasible, planning authorities have the ability the consider the use of other servicing options as set out in the Provincial Policy Statement.

Policy 1.6.8.3

Planning authorities shall not permit development in planned corridors that could preclude or negatively affect the use of the corridor for the purpose(s) for which it was identified.

New development proposed on adjacent lands to existing or planned corridors and transportation facilities should be compatible with, and supportive of, the long-term purposes of the corridor and should be designed to avoid, mitigate or minimize negative impacts on and from the corridor and transportation facilities.

Policy 1.8.1

Planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and climate change adaptation through land use and development patterns which: […]

1. promote design and orientation which:
    a. maximizes energy efficiency and conservation and considers the mitigating effects of vegetation.
    b. maximizes opportunities for the use of renewable energy systems and alternative energy systems.

2.2.3 Greenbelt Plan

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, 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 activities[2]. 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 Greenbelt Act (2005) affects development and water and wastewater infrastructure planning. According to the 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:

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

- 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 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.

2.2.4 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 May 16, 2019 replacing the 2017 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 2019

Growth Plan provides that the applicable time horizon for land use planning is 2041. Policy 1.1.2 of the PPS allows the Region's 2041 population and employment anticipated growth forecasts estimates to be used in this document. The following table provides the population and employment forecasts.

Table 1 – Peel Region population and employment forecasts.

Peel Region	2031	2036	2041
Population	1,770,000	1,870,000	1,970,000
Employment	880,000	920,000	970,000

Source: 2019 Growth Plan for the Greater Golden Horseshoe

An overview of the 2019 Growth Plan and its key updates from its predecessor is provided below:

A. Intensification and Density Targets

The following minimum intensity and density targets have been updated in the 2019 Growth Plan, taking effect at the next municipal comprehensive review with no further increase in 2031. The intensification and density targets are now scaled to the municipality's degree of urbanization.

- Updated minimum intensification targets for municipalities - Region of Peel is included in this change, with a minimum intensification target of 50% of all residential development within delineated built-up areas.
- Updated minimum designated greenfield area density targets for municipalities – Region of Peel is included in this update, with a minimum designated greenfield area density target of no less than 50 residents and jobs combined per hectare

The 2017 Growth Plan identified 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. In the 2019 Growth Plan, intensification should be prioritized around strategic growth areas and is encouraged throughout delineated built-up areas.

B. Employment Lands

Land use changes within employment areas to non-employments land use may now be permitted before the next municipal comprehensive review provided that:

- There is a need for the change;
- The change would not adversely affect the overall viability of the employment area or achievement of minimum intensification and density targets in the Growth Plan and other related policies;
- There exists or there is a plan for infrastructure and public service facilities to accommodate the proposed land use;
- The land can maintain a significant number of jobs; and,
- There would not be any party of the employment area classified as a provincially significant employment zone

Section 3.2.5 of the Growth Plan establishes the water and wastewater system policies to support growth:

1. Municipalities should generate sufficient revenue to recover the full cost of providing municipal water and wastewater systems.
2. For lands within the Greenbelt Area, all policies regarding water and wastewater systems or stormwater set out in provincial plans, applicable to lands within the Greenbelt Area, continue to apply.
3. Municipalities are encouraged to plan and design municipal water and wastewater systems that return water to the Great Lake watershed from which the withdrawal originates.
4. Construction of new, or expansion of existing, municipal or private communal water and wastewater systems should only be considered where the following conditions are met:
    a. Strategies for water conservation and other water demand management initiatives are being implemented in the existing service area;
    b. Plans for expansion or for new services are to serve growth in a manner that supports achievement of the intensification target and density targets;
    c. Plans have been considered in the context of applicable inter-provincial, national, bi-national, or state-provincial Great Lakes Basin agreements.
5. Through sub-area assessment, the Minister of Infrastructure, in consultation with municipalities and other stakeholders, will undertake an analysis of the implications of forecasted growth for water and wastewater servicing.
6. Municipalities that share an inland water source and/or receiving water body, should co-ordinate their planning for potable water, stormwater, and wastewater systems to ensure that water quality and quantity is maintained or improved.
7. Municipalities, in conjunction with conservation authorities, are encouraged to prepare watershed plans and use such plans to guide development decisions and water and wastewater servicing decisions.
8. Municipalities are encouraged to implement and support innovative stormwater management actions as part of redevelopment and intensification.

2.2.5 Endangered Species Act

The *Endangered Species Act (ESA)*, originally written in 1971, was updated in 2007, later coming into force in 2008. The legislation was the first in Canada to combine mandatory habitat protection with a science-based approach to listing species for protection.

The purposes of this *Act* are:

1. To identify species at risk based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge.
2. To protect species that are at risk and their habitats, and to promote the recovery of species that are at risk.
3. To promote stewardship activities to assist in the protection and recovery of species at risk.

Species thought to be at risk in Ontario are initially determined by The Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the provincial Ministry of Natural Resources and Forestry

(MNRF), species will be added to the provincial list of endangered and threatened species in compliance with the ESA. The ESA immediately provides habitat protection to all species listed as threatened, endangered or extirpated.

2.2.6 Niagara Escarpment Plan

The Niagara Escarpment Plan includes a variety of topographic features and land uses extending 725 kilometers from Queenston on the Niagara River to the islands off Tobermory on the Bruce Peninsula. Designated a UNESCO World Biosphere Reserve in 1990, the Niagara Escarpment is an internationally recognized landform and is the cornerstone of Ontario's Greenbelt.

The Niagara Escarpment is a protected area under the Province of Ontario's *Niagara Escarpment Planning and Development Act* and the Niagara Escarpment Plan. The Plan serves as a framework of objectives and policies to strike a balance between development, protection and the enjoyment of this important landform feature and the resources it supports. The Plan outlines land use designations, development criteria and related permitted uses, including farming, forestry and mineral resource extraction.

The objectives of the Niagara Escarpment Plan are:

1. To protect unique ecologic and historic areas.
2. To maintain and enhance the quality and character of natural streams and water supplies.
3. To provide adequate opportunities for outdoor recreation.
4. To maintain and enhance the *open landscape character* of the *Niagara Escarpment* in so far as possible, by such means as *compatible* farming or forestry and my preserving the *natural scenery.*
5. To ensure that all new development is compatible with the purpose of the Plan.
6. To provide for adequate public access to the Niagara Escarpment.
7. To support municipalities within the Niagara Escarpment Plan Area in their exercise of the planning functions conferred upon them by the *Planning Act.*

2.3 Oak Ridges Moraine Conservation Plan

The Oak Ridges Moraine Conservation Plan (ORMCP) (2017) is a regulation to the Oak Ridges Moraine Conservation Plan Area. The plan provides for land use and resource management direction to provincial ministers, ministries, agencies, municipalities, landowners and other stakeholders on how to protect the ecological and hydrological features and functions of the land and water resources within the Moraine.

The Oak Ridges Moraine is one of Ontario's most significant landforms. This irregular ridge stretches 160 kilometers from the Trent River in the east to the Niagara Escarpment in the West. Located north of and parallel to Lake Ontario, the Moraine divides the watersheds draining south into western Lake Ontario from those draining to Georgian Bay, Lake Simcoe and the Trent River System. The Moraine shapes the present and future form and structure of the Greater Toronto region, and its ecological functions are critical to the region's continuing health.

Some of the objectives of the ORMCP include:

- Protecting the ecological and hydrological integrity of the ORM Area.

- Ensuring that only land and resource uses that maintain, improve or restore the ecological and hydrological functions of the ORM Area are permitted.
- Maintain, improve or restore all the elements that contribute to the ecological and hydrological functions of the ORM Area, including the quality and quantity of its water and its other resources.
- Provide for land and resource uses and development that are compatible with the other objectives of the Plan.

2.4 Conservation Authority Regulations

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 several responsibilities and functions in the land use planning and development process.

The Region of Peel contains portions of five watersheds, under the jurisdiction of Credit Valley Conservation (CVC), Toronto and Region Conservation (TRCA), Conservation Halton (CH), Nottawasaga Valley Conservation and Lake Simcoe Region Conservation Authority. However, Conservation Halton, Lake Simcoe Region and the Nottawasaga Valley Conservation Authorities are not considered part of the lake-based study area, and CVC and TRCA will be the Conservation authorities predominantly involved given that their respective watersheds cover most of the Peel Region.

TRCA and CVC act as 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. To this end, Conservation Authorities are required to review and provide comments on policy documents and applications.

TRCA and CVC also administer Ontario Regulation (O. Reg) 166/06 and O. Reg 160/06 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).

2.5 Sustainable Water & Sewage Systems Improvement and Maintenance Act

Bill 13 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 it 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.

2.6 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.
- To conserve and sustain water resources for present and future generations.

To further the purposes of the Act, the MECP 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 MECP municipal water sustainability plans for municipal water services, municipal wastewater services and municipal stormwater 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.

2.7 Safe Drinking Water 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.
- Inspections and enforcement to determine compliance with the Act.

2.8 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.
- That all plans and actions be based on sound science.

2.8.1 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.

The Region falls within two source protection areas:

1. Toronto Source Protection Area
2. Credit Valley Source Protection Area

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 Region of Peel falls within one Source Water Protection Region:

1. Credit Valley, Toronto and Region and Central Lake Ontario (CTC)

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), Event Based Areas (EBA) and

Vulnerable Scoring Areas for Groundwater and Surface Water (VSA) as well as water quantity vulnerable areas. According to the Source Protection Plan[3];

- 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.*
- *EBAs are areas where spills from a specific activity within an EBA would cause a significant risk to the drinking water source and hence the activity would be identified as a significant threat.*

The locations of these source water sensitive areas are provided on a map in Appendix C.4.

[3] *Drinking Water Source Protection. Approved Source Protection Plan: CTC Source Protection Region. 2015. https://ctcswp.ca/protecting-our-water/the-ctc-source-protection-plan/. Accessed on March 19, 2019*

2.9 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.

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

The proposed CCME Wastewater System Effluent Regulations were published in March 2010, with the final Regulations published on June 29, 2012 and 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.

CCME developed the Canada-wide strategy for the management of municipal wastewater which provides a strategy for municipalities to manage their wastewater including National Performance Standards for wastewater discharges, pollution prevention measures, regular monitoring of facilities and risk management activities to be implemented for sanitary and combined overflows.

The Strategy requires that all facilities achieve minimum National Performance Standards and develop and manage site-specific Effluent Discharge Objectives. The Strategy also 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 Regulations apply to any wastewater system that has a capacity to deposit a daily volume of effluent of 100 cubic metres[4] 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 follows[5]:

- 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 (TSS) in the effluent of less than or equal to 25 mg/L;
- Average concentration of total residual chlorine (TRC) 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.

2.11 CEPA – Inorganic Chloramines and Chlorinated Wastewater Effluents

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 or equal to 5,000 cubic metres of effluent were required to lower their total residual chlorine (TRC) levels to less than 0.02 mg/L or lower by December 15, 2009[6].

2.12 MECP Procedure F-5-1 Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works

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 be upgraded as soon as possible.

The Procedure stipulates effluent design objectives for Biochemical Oxygen Demand (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.

[4] http://laws-lois.justice.gc.ca/eng/regulations/SOR-2012-139/FullText.html, Application 2(1)

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

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

2.13 Region of Peel Official Plan

The Regional Official Plan (ROP) is Regional Council's long-term policy framework for to assist the Region in decision making. It sets the Regional context for detailed planning by protecting the environment, managing resources, directing growth and setting the basis for providing Regional services in an efficient and effective manner. The ROP provides direction for future planning activities and for public and private initiatives aimed at improving the existing physical environment.

The ROP was adopted by Council on July 11, 1996 and approved with modifications by the Minister of Municipal Affairs and Housing on October 22, 1996. Appeals of the Plan were forwarded to the Ontario Municipal Board (OMB). Sections of the Plan deemed not under appeal became effective on October 1, 1997. The latest ROP Office Consolidation is December 2018 which includes various amendments including growth management, employment areas, greenbelt conformity, natural heritage and agriculture.

The purpose of the ROP is to:

- Provide Regional Council with the long-term Regional strategic policy framework for guiding growth and development in Peel while having regard to protecting the environment, managing the renewable and non-renewable resources, and outlining a regional structure that manages this growth within Peel in the most effective and efficient manner.
- Interpret and apply the intent of Provincial legislation and policies within a Regional context using the authority delegated or assigned to the Region by the Province.
- Provide a long-term Regional strategic policy framework for the more specific objectives and land use policies contained in the area municipality official plans which must conform to this Plan.
- Recognize the duality in the Region of Peel between the urban nature of the Cities of Brampton and Mississauga and the primarily rural nature of the Town of Caledon.
- Recognize the need for effective environmental protection and management measures to ensure environmental sustainability.
- Recognize the importance of protecting and enriching the natural and cultural heritage of the Region of Peel.
- Provide for the health and safety of those living and working in Peel.
- Maintain and enhance the fiscal sustainability of the Region of Peel.

The ROP includes objectives and policies around the natural environment, water resources, and cultural heritage. These will be considered when assessing servicing alternatives.

Section 6.4 of the Official Plan discusses water and wastewater services. Key policies of relevant to municipal water and wastewater servicing are as follows:

It is the policy of Regional Council to:

Policy 6.4.2.1

Require and provide full municipal sewage and water services to accommodate growth in the Urban System to the year 2031, and the three Rural Service Centres to 2021. The provision of full municipal sewage and water services in the Urban System and the three Rural Service Centres will be subject to the Regional financial and physical capabilities.

Policy 6.4.2.2

Ensure that no development requiring additional or new water supply and/or sanitary sewer services proceeds prior to the finalization of a Servicing Agreement with the Region, confirming the responsibility for, and ability to provide, appropriate facilities for water supply and sewage disposal. In the case of plans of subdivision, confirmation will be required prior to draft approval, that servicing is or will be available.

Policy 6.4.2.6

Pursue, in cooperation with the area municipalities, the public and businesses, water conservation strategies designed to improve the efficiency of the Region's systems.

Policy 6.4.2.7

Ensure that the planning, construction, expansion, extension, operation and maintenance of water and sanitary sewer services protects the environmental systems and natural resources of Peel in a manner consistent with the objectives and policies in this Plan, the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan.

Policy 6.4.2.8

Reduce loads to the sanitary sewers and sewage treatment plants through the Region’s sewer use by-law, education and the proper disposal of household hazardous waste.

Policy 6.4.2.9

Pursue a water efficiency strategy with a goal to reducing per capita consumption by 10-15% over the next 20 years.

3 OVERVIEW OF EXISTING CONDITIONS

3.1 Physiography

The Master Plan Study Area falls within six physiographic regions. The Iroquois Plain, the Niagara Escarpment, the Oak Ridges Moraine, the South Slope, the Peel Plain and the Guelph Drumlin Field.

3.1.1 Iroquois Plain

The Lake Iroquois shoreline is marked by distinct shore-cliffs cut into the Halton Till, boulder pavements and gravel beaches that formed along the shore of Glacial Lake Iroquois. Fine Sand was deposited in nearshore areas which grade to silts and clays in the calmer offshore areas closer to present day Lake Ontario. The slightly sloping Iroquois Plain Region extends around the western part of Lake Ontario, from the Niagara River to the Trent River in the east.

3.1.2 Niagara Escarpment

The Niagara Escarpment is Ontario's most distinct landform ad was designated a UNESCO World Biosphere Reserve in 1990. The Niagara Escarpment trends approximately north to south through the Master Plan Study Area and stretches from the Niagara River to the northern end of the Bruce Peninsula. This region is identified by vertical cliffs of dolostones of the Amabel Formation and the Cataract Group, with red shales of the Queenston Formation found along the slopes. The ridge of dolostone bedrock can reach several hundred meters high in some places and is dominated by an irregular dolostone bedrock surface a few kilometers in width.

3.1.3 Oak Ridges Moraine

To the east of the Niagara Escarpment, the Oak Ridges Moraine physiographic region is present within the Master Plan Study Area. This distinct physiographic landform extends as a ridge of hilly terrain for 160 km from the Niagara Escarpment in the west to the Trent River in the east. The Oak Ridges Moraine was created as glaciers receded and deposited layers of sand and gravel that are separated by clay and till soils. The vast underground layers of sand and gravel collect and store rain water, which eventually resurfaces as cold, clean water that feeds the majority of the river systems in the Greater Toronto Area.

3.1.4 South Slope Region

The South Slope is the southern slope of the Oak Ridge Moraine, which is blanketed in glacial till soils. Both the Oak Ridge Moraine and the adjacent south slope extend laterally from the Niagara Escarpment to the Trent River. Included in the South Slope region is the Trafalgar Moraine that stretches across the north part of Oakville extending eastward into the Region of Peel. This land form is an end moraine composed of silt and clay rich Halton till sediment.

3.1.5 Peel Plain Region

The Peel Plain is a level-to-undulating tract of clay soils extending across the central portions of Regional Municipalities of York, Peel and Halton. The Credit, Humber, Don and Rouge Rivers have cut deep valleys across this plain, as have other streams such as Bronte, Oakville and Etobicoke Creeks. Each of these creeks has incised the underlying bedrock at depth particularly in their lower reaches.

The overburden material is comprised of the Halton clayey silt till containing large amount of Shale and limestone pebbles. In much of the Peel Plain, this situation has been modified by the presence of a veneer of laminated silt and clay. The clay is a heavy texture and more calcareous then the underlying glacial till. Like the South Slope in this area, the plain overlies the Queenston Formation red shales. As a consequence, the clay to the southwest of the Credit River is reddish in colour and lower in lime than the clay in the eastern end of the plain. There are exceptions to be noted in the general heavy texture of the soil. This is visible in various places were the stream valleys bordered by trains of sandy alluvium.

3.2 Aquatic Environment

The Credit River, Humber River, Etobicoke Creek, Mimico Creek and their tributaries form the major watersheds in the Region of Peel, although portions of other watersheds such as the Holland River, Nottawasaga River, Sixteen Mile Creek and Joshua Creek also lie within the Region of Peel. An overview of the major watersheds is provided below.

3.2.1 Credit River Watershed

The Credit River watershed is located in one of the most densely populated regions of Canada yet contains some of the most diverse landscapes in southern Ontario. The Watershed extends roughly from Caledon in the east to Halton Hills in the west and from Orangeville south to Lake Ontario at Port Credit. The Credit River Watershed is part of the Great Lakes Basin that drains to the St. Lawrence River and eventually the Atlantic Ocean. The most significant landscape features in the Credit River Watershed are the Niagara Escarpment, the Oak Ridges Moraine, and the Lake Ontario Shoreline.

The Watershed occurs through the Western Portion of the Region and is under jurisdiction of Credit Valley Conservation. The entire Credit River Watershed covers about 860 square kilometres.[7] Directly to the east and west of the Credit River are 14 smaller streams and creeks that drain directly into Lake Ontario, such as Cooksville Creek and Sheridan Creek.

3.2.2 Humber River Watershed

The Humber River Watershed encompasses 911 square kilometres and is home to more than 850,000 residents. The Watershed occurs through the Eastern Portion of the Region and is under jurisdiction of the Toronto Region Conservation Authority. The main branch of the river flows 126 kilometres from its source on the Niagara Escarpment to Lake Ontario. The East Humber is 63 kilometres and originates in the Kettle Lakes Region of Richmond Hill and King Township. The West Humber begins in Caledon, in the rolling hills of the south slope, and flows 45 kilometres over the Peel Plain in Brampton before joining the Main Humber in Toronto.

The entire Humber River watershed area includes 1800 kilometers of waterway and 600 bodies of water, and is home to 755 species of plan, 42 species of fish, and over 185 animal species[8].

[7] *CVC (2009). Credit Valley Conservation Rising to the Challenge. Credit Valley Conservation. Retrieved from: https://cvc.ca/wp-content/uploads/2011/02/RisingtotheChallenge.pdf*

[8] *TRCA. Watershed Features – Humber River. Retrieved from https://trca.ca/conservation/watershed-management/humber-river/watershed-features/*

3.2.3 Etobicoke Creek and Mimico Creek

The Etobicoke Creek and Mimico Creek Watersheds are generally referenced and managed together as a result of their close physical proximity and shared characteristics. Situated side by side in the western part of the TRCA jurisdiction, the two watersheds originate on the south slope of the Oak Ridges Moraine and travel south to Lake Ontario.

Together the Etobicoke Creek and Mimico Creek watersheds total approximately 29,000 hectares in size. The two watersheds run through the central portion of the lake-based study area extending from Lake Ontario, with the Etobicoke Creek Watershed extending through Mississauga and Brampton and into parts of Caledon, and the Mimico Creek Watershed briefly passing through the western part of Mississauga and into Brampton.

The Etobicoke Creek watershed is home to 503 species of plants and animals. The vast majority of the natural cover is located within river valleys or stream corridors and represents approximately 13.8% of the watershed.

The Mimico Creek watershed is a completely urbanized watershed with over 30% of its landmass featuring industrial land-uses and 60% of its reach artificially channelized[9].

3.2.4 Lake Ontario Watersheds

Fourteen watersheds, under the jurisdiction of Credit Valley Conservation, are classified in this report as Lake Ontario Watersheds, on account of their smaller size and direct drainage to Lake Ontario. These watersheds are listed in the table below with their total watershed area, and the areas within the Region of Peel.

Table 2 – Lake Ontario watersheds.

Watershed Name	Total Watershed Area (ha)	Area in Peel (ha)
Applewood Creek	441.07	439.87
Avonhead Creek	381.17	379.91
Birchwood Creek	349.0	349.00
Cawthra Creek	540.13	540.13
Clearview Creek	337.51	114.95
Cooksville Creek	2941.71	2941.71
Direct Lake Drainage	214.17	214.71
Lakeside Creek	165.60	165.60
Lornewood Creek	317.24	317.24
Moore Creek	29.72	29.72
Serson Creek	356.47	356.47
Sheridan Creek	1032.67	726.48
Tecumseh Creek	321.21	321.21
Turtle Creek	291.17	291.17

[9] *TRCA. Watershed Features – Etobicoke & Mimico. Retrieved from https://trca.ca/conservation/watershed-management/etobicoke-mimico-creek/watershed-features/*

4 ENVIRONMENTAL FEATURES OF THE STUDY AREA

This section of the report provides detailed environmental feature descriptions and inventory for the Region of Peel's lake-based study area.

4.1 Niagara Escarpment

The Niagara Escarpment is a provincially significant, 725 km long geological feature that extends into the northwestern corner of the Study Area. The particular combination of geological end ecological features along the Niagara Escarpment results in a landscape unequalled in Canada. It is also a source of some of Southern Ontario's prime rivers and streams, and contains some significant heritage features, rare plants and significant habitats. The Escarpment and lands in the vicinity of the Escarpment are protected by the Niagara Escarpment Plan which is administered by the Niagara Escarpment Commission.

4.2 Oak Ridges Moraine

The Oak Ridges Moraine is a provincially significant, prominent upland area that runs east to west through south central Ontario. Approximately 1,292 ha of the Oak Ridges Moraine occur within the study area, extending through the study area's northern limit. The Moraine was formed by glacial action between two opposing ice lobes within the last million years. The Moraine has a unique combination of geological, hydrological, topographical and biotic attributes. It performs several essential functions providing significant natural habitat, surface water resources, groundwater resources and landform character that make its protection and long-term management paramount to the residents of Ontario. It is protected by Provincial legislation.

4.3 Greenbelt

The Greenbelt extends across the northwestern half of the Region and with the exception of a small portion of the Greenbelt Plan Area in Brampton, the majority of the area falls within the Town of Caledon. The Greenbelt Plan also identifies river valley connections outside of the Greenbelt, which extend from the Greenbelt to Lake Ontario as external linkages of the Greenbelt's Natural System.

Greenbelt areas within the study area include areas designated as part of the Natural Heritage System. The Natural Heritage System includes areas of the Protected Countryside. Approximately 10,999 ha of the lands designated as Greenbelt – Protected Countryside occur within the study area.

4.4 Peel Greenland's System

The Greenland's System in Peel is intended to support and express the Region's vision for the protection of the natural environment and consists of Core Areas, Natural Areas and Corridors, and potential Natural Areas and Corridors. The following elements of the Greenlands System are to be interpreted, identified and protected in accordance with the policies of the Regional Official Plan.

4.4.1 Areas of Natural and Scientific Interest

Areas of Natural and Scientific Interest (ANSI) are areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education. ANSIs are designated by the province according to standardized evaluation procedures. ANSIs are ranked by the Ministry of Natural Resources and Forestry (MNRF) as being either provincially or regionally significant.

There are two types of ANSIs:

- Life science ANSIs are significant representative areas of Ontario's biodiversity and natural landscapes.
- Earth Science ANSIs contain significant representative examples of bedrock, fossil and landform features which are important to the scientific understanding on ongoing geologic processes.

4.4.2 Environmentally Sensitive or Significant Areas

Environmentally Sensitive or Significant Areas (ESAs) are places where ecosystem functions or features warrant special protection. These include rare or unique plant or animal populations or habitats, plant or animal communities, or concentrations of ecological functions. ESAs are identified by the conservation authorities according to their established criteria.

4.4.3 Escarpment Natural Areas

Escarpment Natural Areas include Escarpment slopes and related natural landforms, significant stream valleys and wetlands associated with the Escarpment, provincially significant life science ANSIs, and forested lands 300 metres back from the Escarpment. These areas are designated in the Niagara Escarpment Plan as Escarpment Natural Areas because they contain the most significant natural and scenic areas of the Escarpment.

4.4.4 Escarpment Protection Areas

Escarpment Protection Areas are important because of their visual prominence and their environmental significance. Escarpment Protection Areas include features that have been significantly modified by land use activities such as agriculture or residential development, land needed to buffer prominent Escarpment Natural Areas, and natural areas of regional significance.

4.4.5 Fish Habitat and Wildlife Habitat

Fish habitat and wildlife habitat are areas of the natural environment where plants, animals, fish and other organisms derive life support functions such as cover, protection, reproductive support, food and water. These habitats may be important on a year-round or seasonal basis. In addition to providing ecological functions that support species survival and biodiversity, fish and wildlife habitat contributes to the Region's economy and quality of life through wildlife-based tourism, wildlife viewing, nature appreciation, fishing and hunting. Fish and wildlife habitat that are afforded protection include wetlands, woodlands, Environmentally Sensitive or Significant Areas, Areas of Natural and Scientific Interest, portions of the Niagara Escarpment and the Oak Ridges Moraine, and valley and stream corridors.

4.4.6 Habitats of Threatened or Endangered Species

Habitats of threatened and endangered species, and other species of concern are habitats of those species which have been listed by the Ministry of Natural Resources and Forestry as occurring in sufficiently low population numbers, restricted geographic areas, or are sufficiently threatened by human activities, that their continued occurrence in Ontario is a matter of general conservation concern. Endangered and threatened species are listed in the Regulations under the provincial Endangered Species Act. Current lists of extirpated, endangered, threatened and special concern species are maintained by the Ministry of Natural Resources and Forestry.

Significant wildlife habitats area areas that are approved by the Ontario Ministry of Natural Resources and Forestry that:

- Are necessary for the maintenance, survival and recovery of naturally occurring or reintroduced populations of endangered species
- Are areas that are occupied or habitually occupied by the species during all or any parts of its life cycle.

4.4.7 Natural Corridors

Natural corridors are lands that are in a natural state or that have the potential to be restored to a natural state that connect, link or border natural features and areas and provide ecological functions such as habitat, migration routes, hydrological flow, connections or buffering from adjacent impacts. Some woodlands, waterbodies, watercourses, valleylands, riparian zones, shorelines, and portions of the Niagara Escarpment natural heritage system, and intervening lands function as natural corridors in the Greenlands System. Natural corridors on lands that are not in a natural state but have the potential to be restored to a natural state to improve the integrity and function of the Greenlands System, are identified through the preparation of natural heritage studies.

4.4.8 Shorelines

The shorelines include bluffs and lands in immediate contact with, or in seasonally flooded areas adjacent to, lakes, rivers and streams. The littoral zone is the area along the shore of a lake from the water's edge into the water to a depth where there is a 2 percent loss of light at the bottom. Both the shoreline and littoral zone are important habitats at the boundary between terrestrial and aquatic ecosystems. Due to height and location, shorelines may in some instances also be associated with slope and/or erosion hazards.

4.4.9 Valley and Stream Corridors

Valley and stream corridors are the natural resources associated with river systems and are characterized by their landform, features and functions, and include associated ravines. Valley corridors and their associated ravines are distinguished from stream corridors by the presence of a distinct landform. Due to the hazards of valley lands they have remained mainly undeveloped and vegetated. Valley and stream corridors are natural linkages in the landscape having important ecological functions, providing habitat for fish and wildlife and acting as corridors for movement.

4.4.10 Wetlands

Wetlands perform many functions, including the provision of groundwater recharge and discharge, attenuating flood flows, trapping sediment, preventing coastal, shoreline and bank erosion and providing wildlife habitat for a diversity of species. The four major types of wetlands are swamps, marshes, bogs and fens.

Provincially Significant Wetlands (PSW) are determined by the MNRF based on a scientific point-based ranking system known as the Ontario Wetland Evaluation System (OWES). Wetlands are assessed based on a range of criteria, including biology, hydrology, societal value and special features.

4.4.11 Woodlands

Woodlands are ecosystems comprised of treed areas, and the immediate biotic and abiotic environmental conditions on which they depend. Woodlands provide a range of ecosystem functions including: attenuating flood flows, trapping air and water borne sediment, preventing erosion and stabilizing steep slopes, providing shade for cold water fisheries, enhancing groundwater recharge areas, providing habitat, and supporting species diversity. Woodlands are important because of their scarcity in Peel and the rest of the Greater Toronto Area. In addition to their ecological functions, woodlands are valued for their economic, social, and aesthetic benefits.

Significant woodlands are areas which are:

- Ecologically important in terms of features such as species composition, age of trees and stand history
- Functionally important due to their contribution to the broader landscape because of their location, size or due to the amount of forest cover in the planning area
- Economically important due to the site quality, species composition or past management history

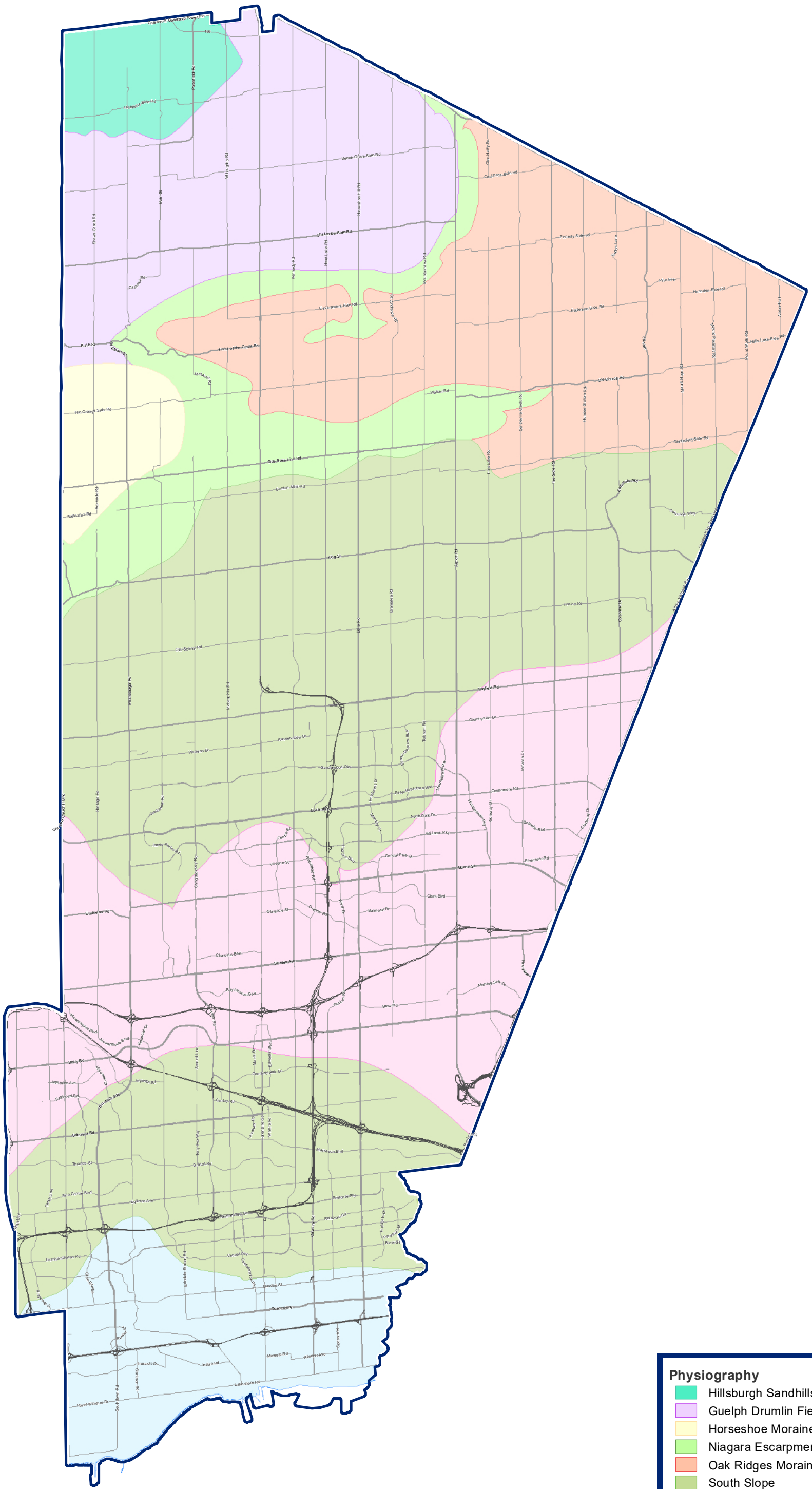
4.4.12 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) are evaluated and designated based on the criteria and guidelines in the Natural Heritage Reference Manual (NHRM), Significant Wildlife Habitat Technical Guide (SWHTG) and Significant Wildlife Habitat Mitigation Support Tool (SWHMiST). There are four general types of SWH: seasonal concentration areas, migration corridors, rare or specialized habitats and habitat for species of conservation concern.

4.4.13 Species at Risk

Species at risk (SAR) designations 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 MNRF, species are added to the provincial list of endangered and threatened species in compliance with the Endangered Species Act, which came into effect June 30, 2008. The Endangered Species Act provides habitat protection to all species listed as threatened or endangered. The Species at Risk in Ontario (SARO) List is contained in O. Reg. 230/08.

APPENDIX A:
PHYSIOGRAPHY



Physiography

- Hillsburgh Sandhills
- Guelph Drumlin Field
- Horseshoe Moraines
- Niagara Escarpment
- Oak Ridges Moraine
- South Slope
- Peel Plain
- Iroquois Plain

Region of Peel
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BASELINE ENVIRONMENTAL OVERVIEW

Physiography

BluePlan ENGINEERING

May 2020
715022-171-G
NAD 1983 UTM Zone 17N

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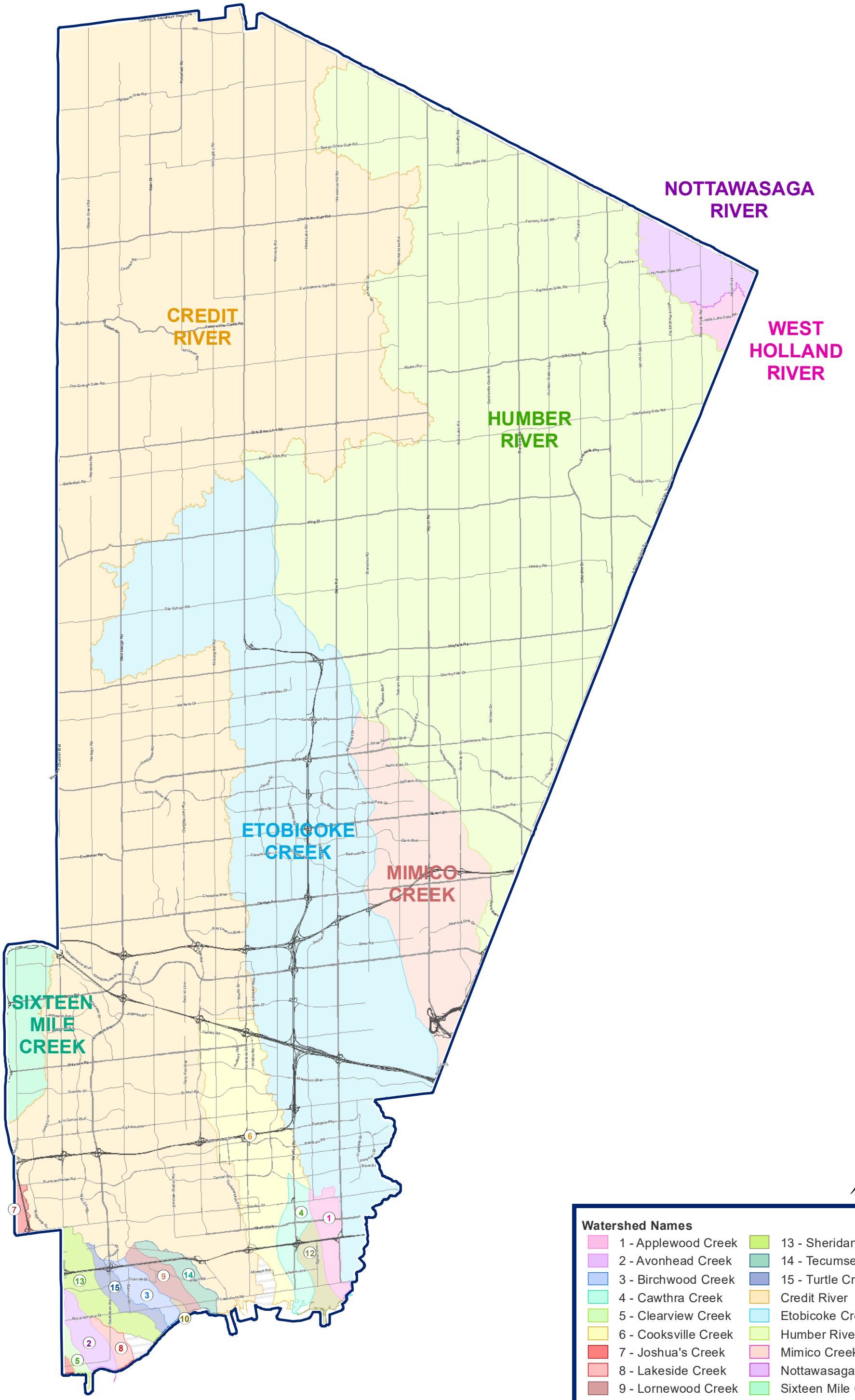
APPENDIX B:
AQUATIC ENVIRONMENT



Region of Peel
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BASELINE ENVIRONMENTAL OVERVIEW

Aquatic Environment - Watersheds

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May 2020
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NAD 1983 UTM Zone 17N

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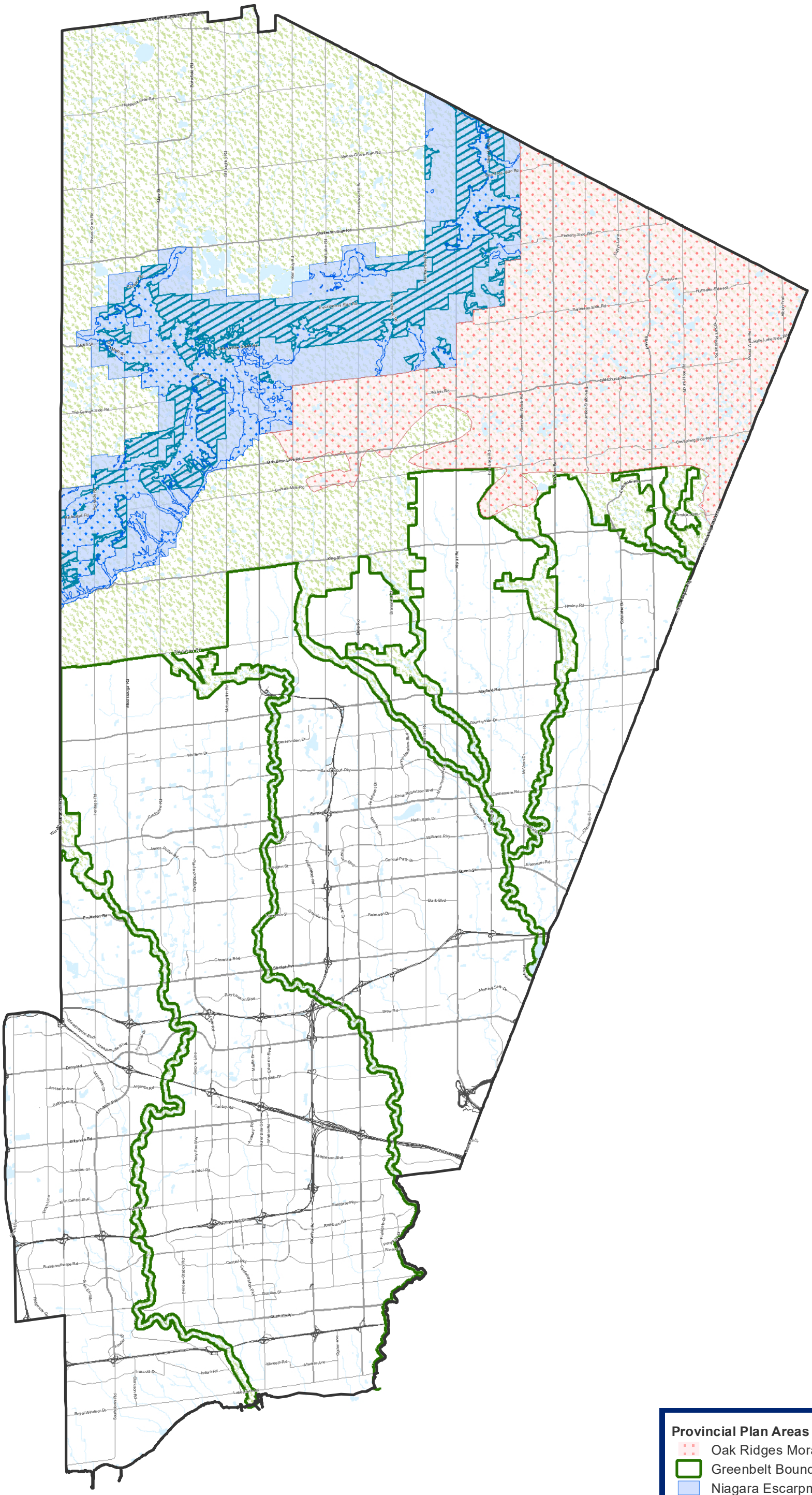
APPENDIX C:
ENVIRONMENTAL FEATURES



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BASELINE ENVIRONMENTAL OVERVIEW

Environmental Provincial Plan Areas

BluePlan ENGINEERING

May 2020
715022-171-G
NAD 1983 UTM Zone 17N

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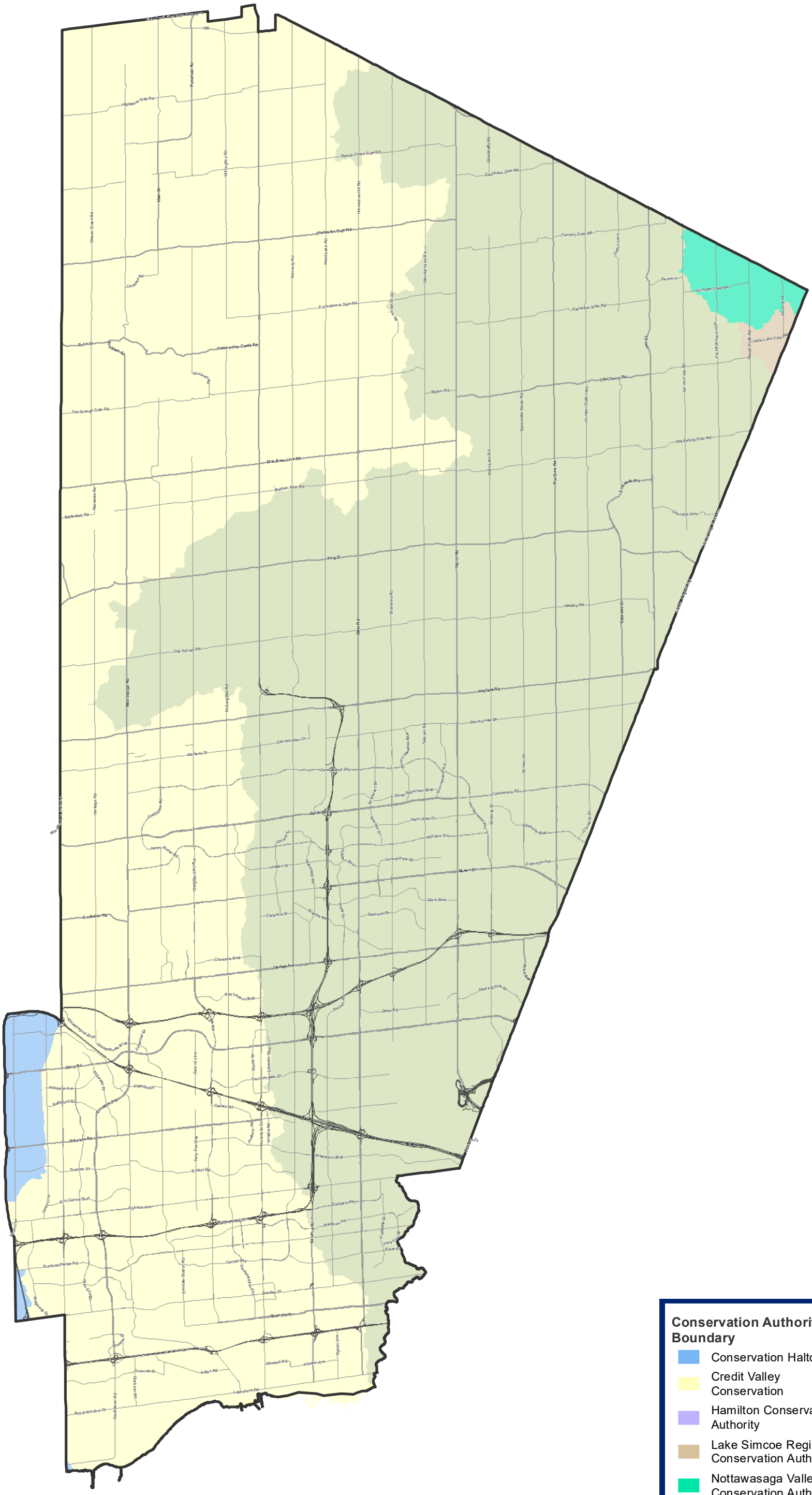

0 4.5 Kilometres

Conservation Authority Boundary

- Conservation Halton
- Credit Valley Conservation
- Hamilton Conservation Authority
- Lake Simcoe Region Conservation Authority
- Nottawasaga Valley Conservation Authority
- Toronto and Region Conservation Authority

Region of Peel
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BASELINE ENVIRONMENTAL OVERVIEW

Conservation Authority Jurisdictions

BluePlan ENGINEERING

May 2020
715022-171-G
NAD 1983 UTM Zone 17N

0 4.5 Kilometres

Environmental Features

- Watercourse and Waterbodies
- Valleys
- Woodlands
- Areas of Natural and Scientific Interest (ANSI)
- Environmentally Sensitive Areas (ESA)
- Provincially Significant Wetlands

Natural Heritage System Area Type

- NHS Area (Undifferentiated)
- Core Area
- Linkage Area

Region of Peel
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BASELINE ENVIRONMENTAL OVERVIEW

Natural Heritage Features

BluePlan ENGINEERING

May 2020
715022-171-G
NAD 1983 UTM Zone 17N

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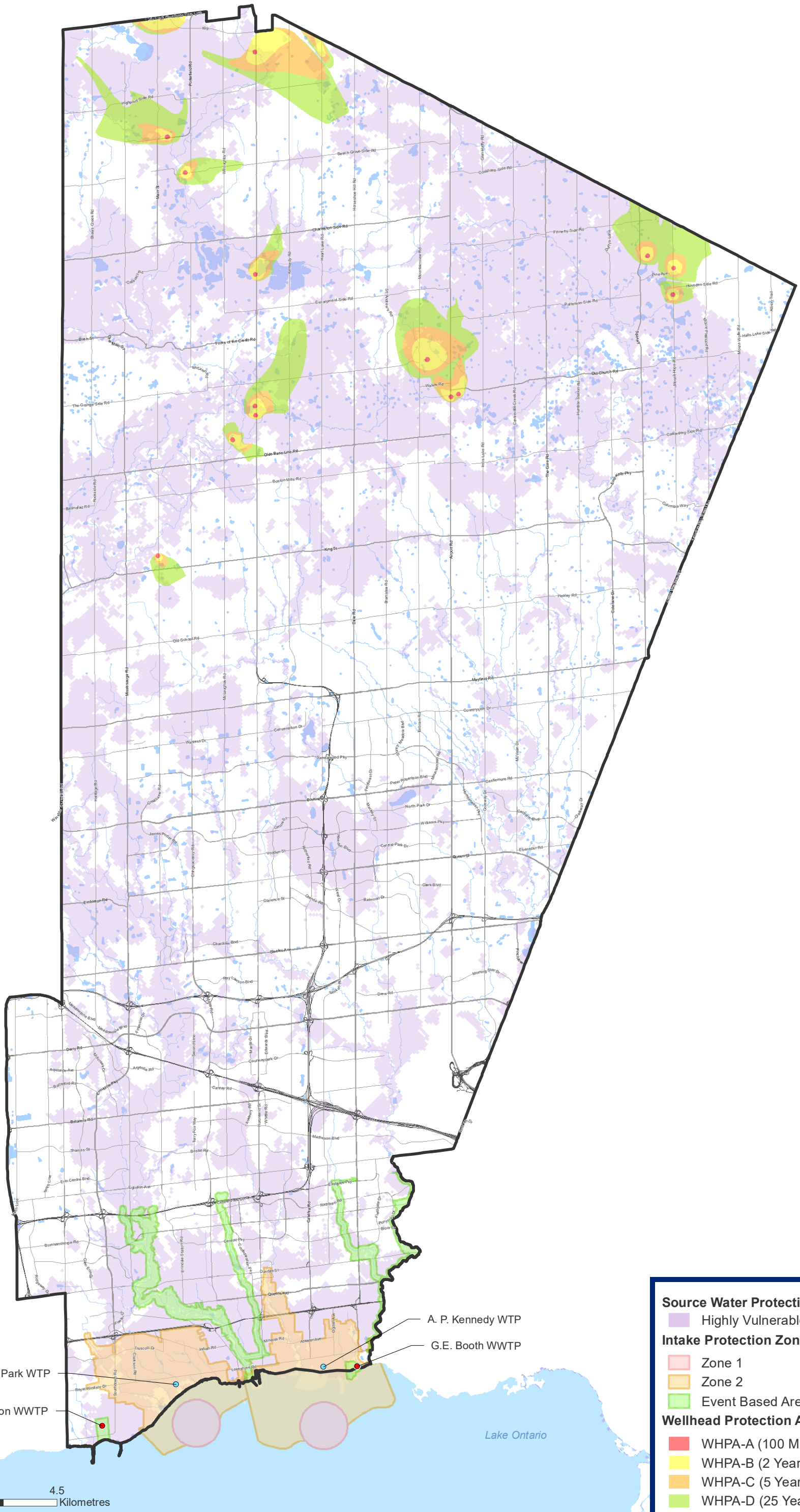

Source Water Protection
- Highly Vulnerable Aquifers

Intake Protection Zones (IPZ)
- Zone 1
- Zone 2
- Event Based Areas

Wellhead Protection Areas
- WHPA-A (100 Metre Zone)
- WHPA-B (2 Year Zone)
- WHPA-C (5 Year Zone)
- WHPA-D (25 Year Zone)

Region of Peel
working with you

BASELINE ENVIRONMENTAL OVERVIEW

Source Water Protection

BluePlan ENGINEERING

September 2020
715022-171-G
NAD 1983 UTM Zone 17N

Document Path: W:\GTA\715000\715022 - Region of Peel W WW MP3_WPI3_GIS\715022-171-G-Source Water Protection (MSP).mxd

2C

REGIONAL MUNICIPALITY OF PEEL

APPENDIX 2C

Region of Peel Official Plan Figures and Schedules

Region of Peel
Working for you

Official Plan

This Figure is for illustrative purposes only. Changes may be made periodically to this Figure without requiring an amendment to this plan.

Information outside of Peel Region is shown on this Figure for illustrative purposes to display inter-regional linkages.

GRAND RIVER
NOTTAWASAGA RIVER
CREDIT RIVER
HUMBER RIVER
HOLLAND RIVER
ETOBICOKE CREEK
MIMICO CREEK
SIXTEEN MILE CREEK
DON RIVER

ORANGEVILLE
DUFFERIN COUNTY
MONO
ADJALA-TOSORONTIO
SIMCOE COUNTY
ERIN
ERIN VILLAGE
WELLINGTON COUNTY
CALEDON
HALTON HILLS
HALTON REGION
BRAMPTON
MISSISSAUGA
MILTON
OAKVILLE
KING
YORK REGION
VAUGHAN
TORONTO
LAKE ONTARIO

Legend

- CREDIT RIVER
- DON RIVER
- ETOBICOKE CREEK
- GRAND RIVER
- HOLLAND RIVER
- HUMBER RIVER
- MIMICO CREEK
- NOTTAWASAGA RIVER
- SIXTEEN MILE CREEK
- DIRECT LAKE DRAINAGE

1. Applewood Creek
2. Avonhead Creek
3. Birchwood Creek
4. Cawthra Creek
5. Clearview Creek
6. Cooksville Creek
7. Joshua's Creek
8. Lakeside Creek
9. Lornewood Creek
10. Moore Creek
11. Morrison Creek
12. Serson Creek
13. Sheridan Creek
14. Tecumseh Creek
15. Turtle Creek
16. Wedgewood Creek

Scale:

0 1 2 3 4 5 6 7 8 9 10 Km

0 1 2 3 4 5 miles

WATERSHED BOUNDARIES

FIGURE **3**

June 2012

Region of Peel

Working for you

Official Plan

This Schedule forms part of the Region of Peel Official Plan and should be read in conjunction with the Plan's written text and with the area municipal official plans.

Information outside of Peel Region is shown on this Schedule for illustrative purposes to display inter-regional linkages.

Legend

- Greenbelt Area *
- Protected Countryside
- Natural Heritage System
- Rural Service Centre
- Village/Industrial-Commercial Centre
- Hamlet
- Niagara Escarpment Plan Area
- Oak Ridges Moraine Plan Area
- Settlement Areas Outside the Greenbelt
- River Valley Connections Outside the Greenbelt
- Ninth Line Lands **

* As identified in Ontario Regulation 59/05

** These lands are identified in the Region of Halton Official Plan as the Ninth Line Corridor Policy Area. Currently, the policies of the Region of Halton and the Town of Milton official plans apply to these lands. A future amendment will bring these lands into conformity with the Region of Peel Official Plan.

Scale:

0 1 2 3 4 5 6 7 8 9 10 Km

0 1 2 3 4 5 miles

GREENBELT PLAN AREA LAND USE DESIGNATIONS

SCHEDULE **D3**

In Effect

February 2016

Region of Peel

Working for you

Official Plan

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Information outside of Peel Region is shown on this Schedule for illustrative purposes to display inter-regional linkages.

Where there is a discrepancy between Schedule A and the identification of Core Areas in the text of the Plan, the text shall govern, unless otherwise specifically stated.

Legend

- Core Areas of the Greenlands System
- Core Areas Outside Peel
- Area with Special Policies (Refer to Figure 2)
- 2031 Regional Urban Boundary

Scale:

0 1 2 3 4 5 6 7 8 9 10 Km

0 1 2 3 4 5 miles

CORE AREAS OF THE GREENLANDS SYSTEM IN PEEL

SCHEDULE **A**

In Effect

November 2013

Region of Peel
Working for you

Official Plan

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Information outside of Peel Region is shown on this Schedule for illustrative purposes to display inter-regional linkages.

Legend

- Urban System
- Rural System
- Conceptual Urban Growth Centre
- Rural Service Centre
- Estate Residential Community
- Airport
- Urban Area outside Peel Region
- Study Area Boundary *(Refer to Policy 5.4.3.2.7)
- Area with Special Policies (Refer to Figure 2)
- Regional Intensification Corridor (Conceptual)
- Railway
- Regional Urban Boundary
- Ninth Line Lands **
- North West Brampton Urban Development Area
- Mayfield West Phase 2 Settlement Area

* Study Area Boundary was established by Ontario Municipal Board Decision/Order No. 0719 on August 1, 1997.
** These lands are identified in the Region of Halton Official Plan as the Ninth Line Corridor Policy Area. Currently, the policies of the Region of Halton and the Town of Milton official plans apply to these lands. A future amendment will bring these lands into conformity with the Region of Peel Official Plan.

Scale:

0 1 2 3 4 5 6 7 8 9 10 Km

0 1 2 3 4 5 miles

REGIONAL STRUCTURE

SCHEDULE D

In Effect

February 2016

Region of Peel
Working for you

Official Plan

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Legend

- Prime Agricultural Area
- Area with Special Policies (Refer to Figure 2)
- 2031 Regional Urban Boundary

Scale:

0 1 2 3 4 5 6 7 8 9 10 Km

0 1 2 3 4 5 miles

PRIME AGRICULTURAL AREA

SCHEDULE **B**

In Effect

October 2015