2022 YORK REGION WATER AND WASTEWATER MASTER PLAN

AUGUST 2022

York Region

LAND ACKNOWLEDGMENT

We acknowledge York Region is located on the traditional territory of many Indigenous peoples such as the Anishinaabeg, Haudenosaunee, Huron-Wendat and Métis peoples and the treaty territories of the Haudenosaunee, Mississaugas of the Credit First Nation and Williams Treaties First Nations. This land is now home to many diverse Indigenous peoples. York Region is located within the boundaries of the Nanfan Treaty, Treaty 13 and the Williams Treaties. There are also other land claims and treaty rights involving portions of York Region that have not been resolved. The Chippewas of Georgina Island First Nation is a Williams Treaty First Nation and the closest First Nation community to York Region.

Mayor
Frank Scarpitti
City of Markham

Regional Councillor
Don Hamilton
City of Markham

Regional Councillor
Jack Heath
City of Markham

Regional Councillor
Joe Li
City of Markham

Regional Councillor
Jim Jones
City of Markham

Mayor
David West
City of Richmond Hill

Mayor
Maurizio Bevilacqua
City of Vaughan

Chairman & CEO
Wayne Emmerson

Regional Councillor
Joe DiPaola
City of Richmond Hill

Regional Councillor
Mario Ferri
City of Vaughan

Regional Councillor
Carmine Perrelli
City of Richmond Hill

Regional Councillor
Gino Rosati
City of Vaughan

Mayor
John Taylor
Town of Newmarket

Regional Councillor
Linda Jackson
City of Vaughan

Regional Councillor
Tom Vegh
Town of Newmarket

A Message from York Region Chairman and CEO and Members of Regional Council

Whether a long time resident or new to one of our many vibrant communities, one thing all York Region residents can depend on is access to safe, reliable and efficient delivery of water and wastewater services.

As a thriving Region, careful planning is done to ensure key water and wastewater infrastructure, including pipes, sewers and water treatment plants, can effectively meet current and future demands.

The 2022 Water and Wastewater Master Plan Update looks ahead to our future and identifies the infrastructure and programs required to support our projected growth to 2 million residents and nearly 1 million jobs by 2051.

This Master Plan Update builds on the 2016 plan and continues to support greater resiliency in our water and wastewater systems by using One Water principles to guide decision-making.

The new plan integrates water and wastewater initiatives with the Region's Official Plan, the Transportation Master Plan and other strategies to ensure service excellence meets the needs of our rapidly growing Region in the most cost-effective way.

Together, we remain steadfast in our commitment for building strong, caring and safe communities.

Mayor
Margaret Quirk
Town of Georgina

Regional Councillor
Robert Grossi
Town of Georgina

Mayor
Tom Mrakas
Town of Aurora

Mayor
Virginia Hackson
Town of East Gwillimbury

Mayor
Steve Pellegrini
Township of King

Mayor
Iain Lovatt
Town of Whitchurch-Stouffville


York Region

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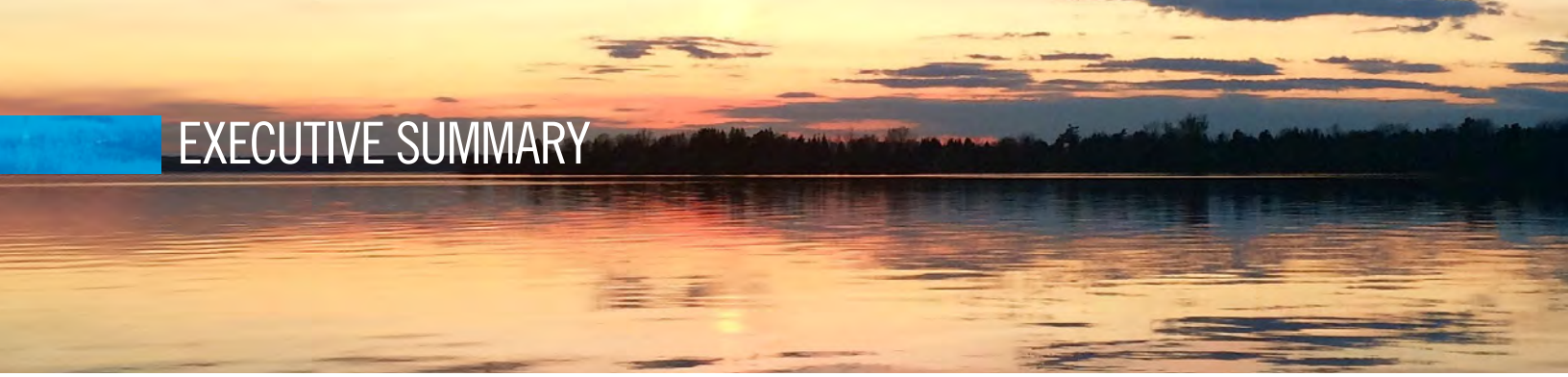


EXECUTIVE SUMMARY

Executive Summary

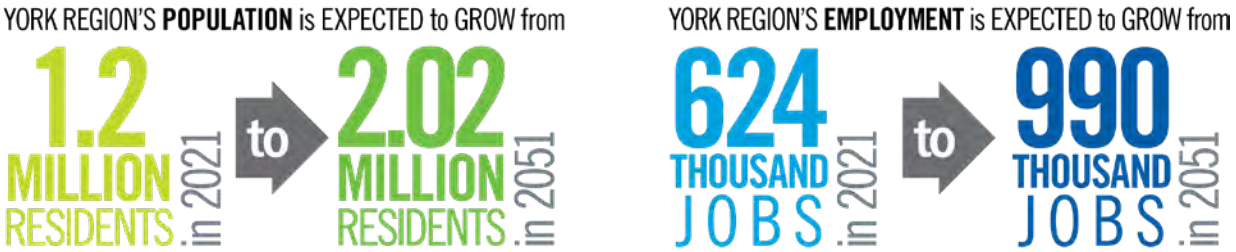
The Regional Municipality of York's Water and Wastewater Master Plan is a key document that details how the Region will provide safe, reliable services to new growth over the long term. It evaluates infrastructure systems in a broad land-use and environmental context and describes, at a high level, the projects needed to supply drinking water and manage wastewater in future.

The Master Plan is updated periodically to reflect changing conditions and new information. This update to the 2016 Master Plan followed a process prescribed by the Municipal Engineers Association Municipal Class Environmental Assessment, an approved process under the provincial *Environmental Assessment Act*.

It was undertaken in conjunction with a Municipal Comprehensive Review carried out by the Region that incorporated a new provincial growth forecast into the Regional Official Plan, and with an update to the Transportation Master Plan. This process included extensive consultation and engagement with partners and stakeholders.

While reflecting the new growth forecast to 2051 (shown in Figure E.1 below), this update concludes that the overall direction of the 2016 Water and Wastewater Master Plan remains valid. The update also recognizes how the One Water concept, first described in the 2016 Master Plan, is being more fully incorporated into master planning. One Water helps achieve a sustainable water future by recognizing that water is a finite resource and finding ways to preserve its value in all settings.

Figure E.1 Population and Employment Growth Forecast in York Region Through the Provincial Growth Plan



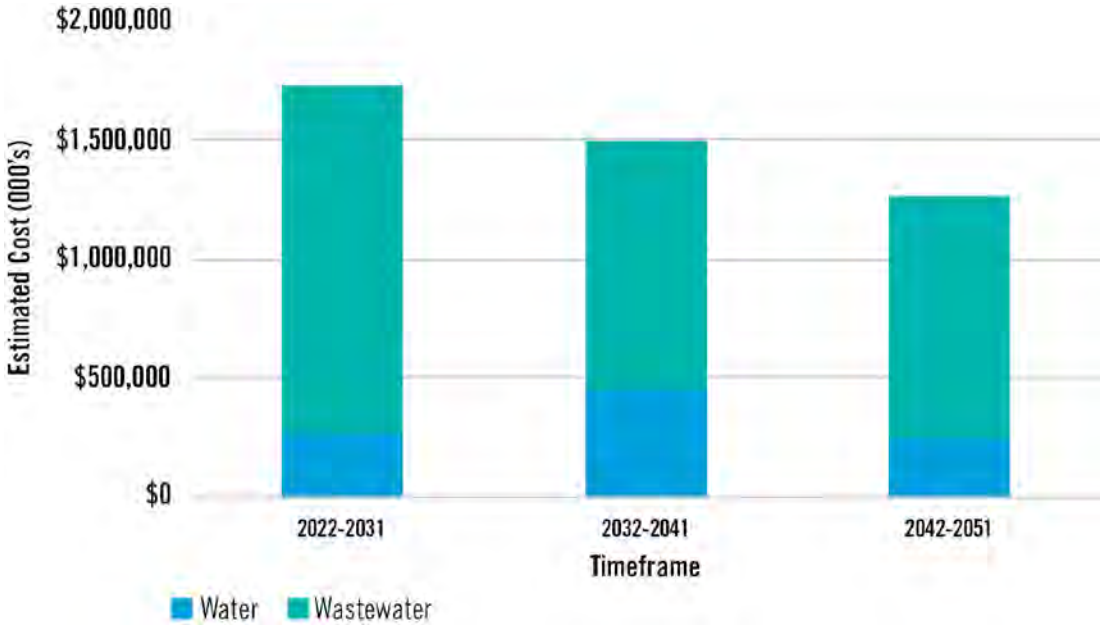
The preferred strategy set out in 2016 and validated through this update is for future growth in the Region to be serviced largely by leveraging and expanding existing water and wastewater systems. Through existing intermunicipal agreements, most drinking water would continue to come from Lake Ontario, and treated wastewater would mostly be returned to that watershed.

Groundwater will continue to round out our supply in the central area, with Lake Simcoe supplying the northern end of the Region. Communities currently serviced by stand-alone water and wastewater systems will continue to be serviced by those systems, except for Kleinburg in the City of Vaughan which will eventually be connected to the York Durham Sewage System.

The York Durham Sewage System and Duffin Creek Water Pollution Control Plant in Pickering (co-owned with Durham Region) will be upgraded and expanded, with a new York Region-owned Water Reclamation Centre to be established (pending outstanding provincial approvals) in the Lake Simcoe watershed.

The estimated cost to implement the water and wastewater infrastructure projects in this updated Master Plan is $4.5 billion, comprising $1.0 billion for water and $3.5 billion for wastewater. These growth projects and costs will feed into the Region's Development Charges Bylaw as it is updated in 2022. Figure E.2 below shows the planned capital expenditures over the 30-year planning horizon.

Figure E.2 Growth-related Capital Infrastructure Costs



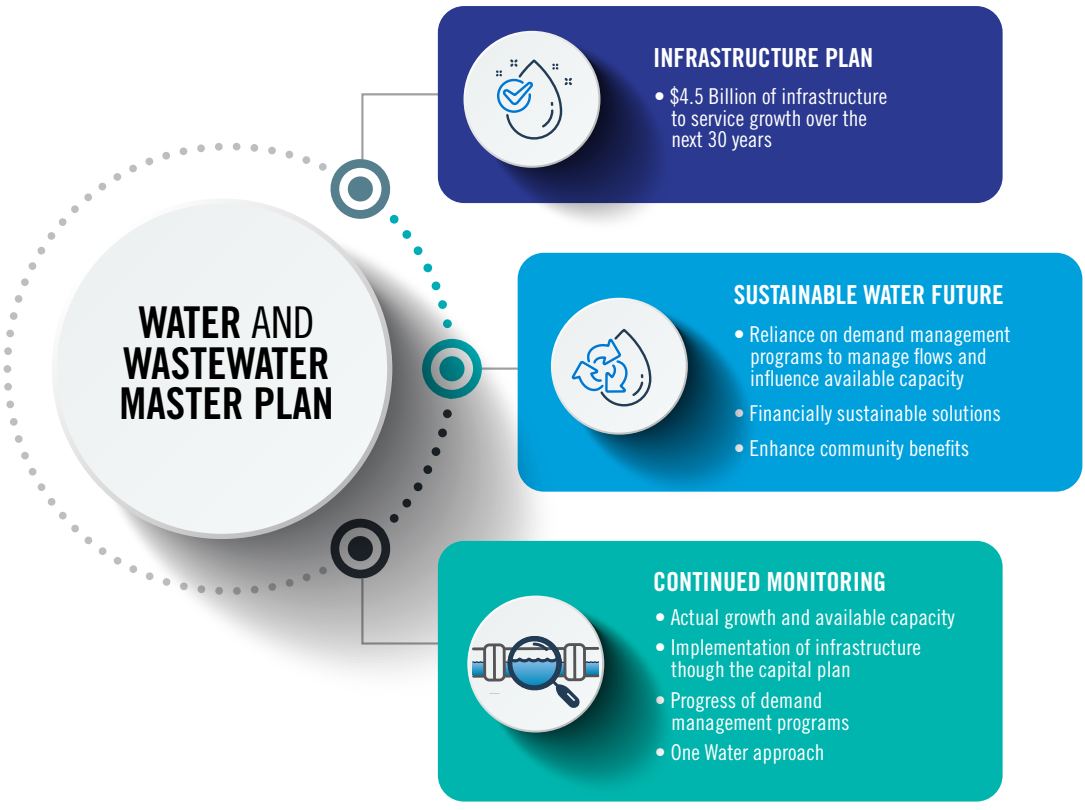
Ongoing programs to manage demand through water conservation and inflow and infiltration reduction are integral to the infrastructure strategy to ensure we can meet increased demand cost-effectively with a continued decline in per-capita water use. This demand management approach is in line with our One Water principles, which are reflected in programs and plans to address climate change and enhance water equity and livability. Water equity ensures that all residents and businesses have access to clean, safe and affordable water services while maximizing community benefits and fostering resilience in the face of a changing climate.

This updated Master Plan meets all applicable regulatory requirements, including a limit on water transfers between the Lake Ontario and Lake Simcoe/Lake Huron watersheds under a bi-national Great Lakes agreement. It also accords with overarching goals and objectives set out in the Region's Vision, Strategic Plan and other corporate and departmental plans. To ensure financial sustainability and in line with principles endorsed by York Regional Council, this Master Plan will better leverage existing infrastructure systems and more tightly align pacing of new capital projects with actual growth.

As this update was finalized, the Region continued to await provincial approval of the Water Reclamation Centre needed to add wastewater capacity in the north. An Individual Environmental Assessment for this project was completed and submitted to the province in mid-2014. Given the rigorous study completed for the Water Reclamation Centre and the time and money invested to date, this project continues to be considered an essential part of the preferred servicing strategy for Aurora, East Gwillimbury and Newmarket.

With completion of this update, the preferred strategy and associated infrastructure plan are carried out through projects funded through the ten-year capital plan. Budgets for specific infrastructure projects are updated as necessary through the Region's annual budget. Over time, the Environmental Services capital plan responds to such factors as new financial constraints, delays or scope changes in project delivery, market constraints and actual growth that differs from forecast.

All forecasts and outlooks are inherently uncertain, and this uncertainty increases as the time horizon extends further into the future. A range of programs, plans, analyses and activities allow for adaptation to changing conditions as plans are implemented in the coming years. Nonetheless, there are limits on the Region's ability to accommodate unexpected circumstances. This underscores the need to seek the right balance – between costs, growth patterns, environmental preservation, and the needs of existing customers – as the Region acts to implement the Master Plan.



1.0 INTRODUCTION

1.1 WATER AND WASTEWATER MASTER PLAN PURPOSE

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The Regional Municipality of York's Water and Wastewater Master Plan sets out an approach to meet the needs of the Region's growth. To reflect changing conditions and new information, the plan is updated periodically, generally on a five-year cycle. This update reflects revised growth forecasts identified in A Place to Grow: Growth Plan for the Greater Golden Horseshoe and incorporated in the Regional Official Plan.

Since creation of the Region's first master plans in the 1990s, a key purpose has been to ensure the infrastructure serving new growth is cost effective and resilient. The most recent update in 2016 added a new purpose to the plan: to develop an integrated, long-term strategy for sustainable water and wastewater services. This speaks to the need to focus on environmental, social, and financial sustainability beyond the five-year time horizon.

MASTER PLAN OBJECTIVES:

1. Develop a cost-effective, resilient water and wastewater infrastructure plan to service future growth to 2051 and beyond.
2. Develop an integrated, long-term approach to provide sustainable water and wastewater services.

The Water and Wastewater Master Plan informs updates to York Region's Development Charges Bylaw by detailing funding the Region will need to collect in development charges to recover capital investments made in growth-driven capital projects.

THE PROBLEM STATEMENT FOR THIS MASTER PLAN UPDATE IS DEFINED AS FOLLOWS:

"Building on previous Master Plan recommendations, York Region is updating its long-term water and wastewater servicing strategies and infrastructure program to accommodate 2.02 million people and 990,000 jobs by 2051 in accordance with the Regional Official Plan in an environmentally, socially and fiscally responsible manner."

1.2 YORK REGION'S ROLES IN WATER AND WASTEWATER

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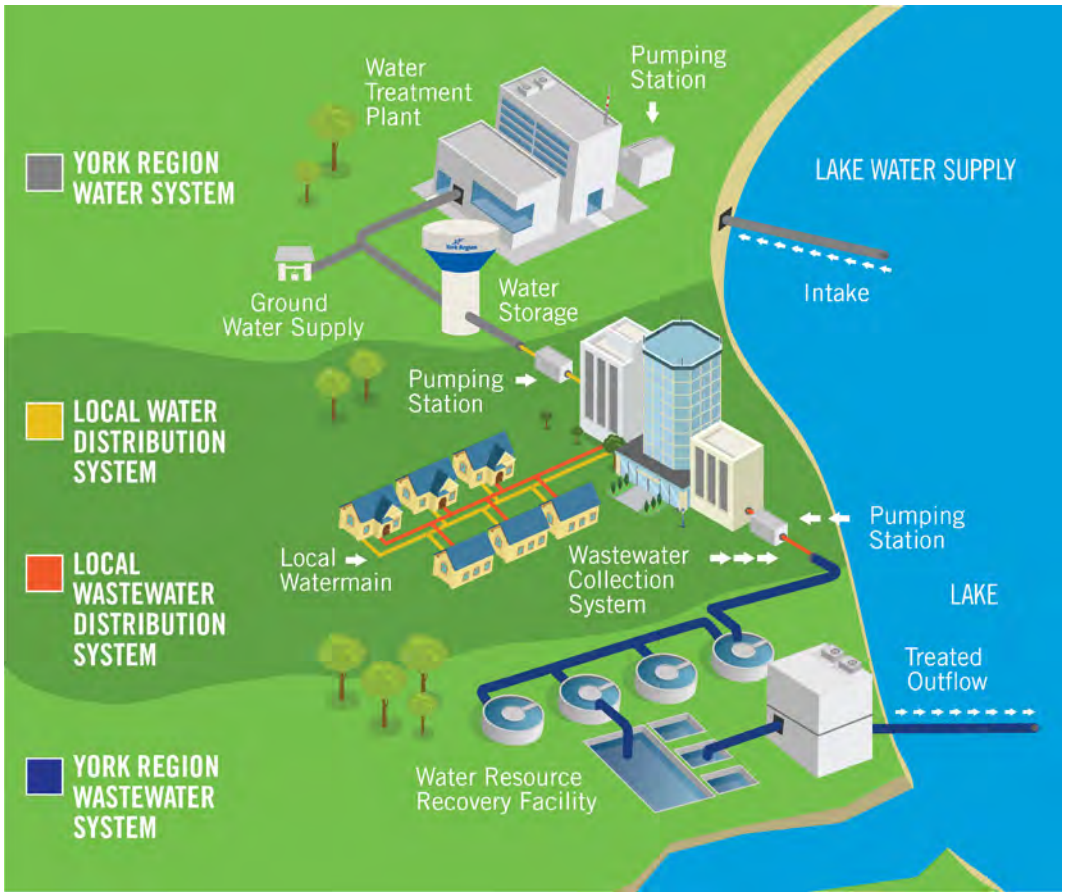
York Region is a wholesale provider of drinking water, responsible for water production, treatment, storage and bulk supply to its cities and town. Regional transmission mains transfer water to infrastructure owned and operated by the local cities and towns, which in turn distribute it directly to end users.

Similarly, York Region acts as a wholesale provider of wastewater services, collecting wastewater from local municipal sewers and conveying it through a network of trunk sewers and pumping stations to treatment plants.

York Region and its cities and towns share responsibility for water and wastewater systems and services, as shown in Figure 1.1.

Figure 1.1 Regional and Local Water and Wastewater Service Delivery in York Region



York Region works with its nine local municipal partners to coordinate timely service delivery in the short and long term, guided by policies within the Regional Official Plan, and in consultation with conservation authorities on such issues as source water protection.

1.3 MASTER PLAN CONTEXT AND ALIGNMENT WITH REGIONAL COUNCIL'S VISION

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The Water and Wastewater Master Plan is developed in the context of Regional strategies and plans. As outlined in the diagram below, the Master Plan is a corporate plan providing the key functions of water and wastewater service planning and implementation to 2051:

Figure 1.2 Regional Strategies and Plans Shaping the Water and Wastewater Master Plan

Vision guides York Regional Council and staff decisions towards achieving "Strong, Caring, Safe Communities." York Region's Vision, Strategic Plan, Multi-Year Budget, Departmental Plans and Individual Performance Plans adhere to the Accountability Framework (Figure 1.3) to achieve our commitments to Council for our communities. Departmental planning is key to aligning departmental priorities with the Strategic Plan, Multi-Year Budget and, ultimately, the Vision. Departmental Plans are informed by and support: the Regional Official Plan, Master Plans, Council direction, provincial and federal mandates and/or other regulatory/legislative requirements.

Figure 1.3 York Region's Accountability Framework

Master Plans for infrastructure are coordinated with updates to the Regional Official Plan in a process known as a Municipal Comprehensive Review. This helps ensure consistent communication with interested parties and better integration of all plans to manage costs. The Regional Official Plan outlines policies to guide growth and economic, environmental and community planning decisions. The Master Plan works in concert with the Regional Official Plan to ensure that servicing can be provided to meet growth demands in the Region.

1.4 HOW THE PLAN UPDATE WAS CARRIED OUT

The Strategic Plan, updated every four years, is a roadmap emphasizing priorities over each term of York Regional Council. In 2019, Regional Council adopted the 2019-2023 Strategic Plan. Specific goals and objectives influencing water and wastewater master planning include:

- Support safe communities by ensuring water meets all relevant standards
- Build sustainable communities and protect the environment by delivering and promoting environmentally sustainable services
- Deliver trusted and efficient services by ensuring reliable, responsive, effective, efficient and fiscally responsible service delivery while managing the Region's assets for current and future generations

These goals and objectives are reflected in this plan through its attention to ensuring delivery of high-quality drinking water and wastewater services using safe, reliable infrastructure that minimizes impacts on the environment and is financially sustainable.

The Regional Fiscal Strategy helps to achieve long-term financial sustainability through carefully managing the Region's capital plan, reserves and debt. Its influence on infrastructure planning is described in Section 4.3. The fiscal strategy also affects the Region's annual budget, which includes a 10-year capital plan that is updated each year.

Other Regional plans play a role in how the Water and Wastewater Master Plan is implemented. These include asset management plans, demand management strategies and climate change plans, discussed in Section 3.3.

Of particular importance is the Region's adoption of a One Water approach to managing water resources. One Water leverages the natural water cycle to make the best use of every source of water, including water that has passed through municipal systems. It also helps minimize the use of other inputs, including energy, to mitigate climate change impacts.

1.4 HOW THE PLAN UPDATE WAS CARRIED OUT

Over time, the Region's master planning process has matured, leading each update to become more streamlined. Building out York Region communities and infrastructure systems focuses increasingly on carefully integrating new components into water and wastewater systems already in place to derive the greatest value possible from both existing and new investments.

The Master Plan Process

This Water and Wastewater Master Plan update, like previous ones, followed guidance of the Municipal Engineers Association on infrastructure master planning set out in its Municipal Class Environmental Assessment document.

Master plans are defined as "long range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles." In other words, a master plan looks at one or more infrastructure systems or groups of related projects in a broad land use and environmental context. This results in a high-level plan that identifies and justifies the need for future individual projects. At the master plan stage, however, projects are conceptual in nature. Details of specific solutions – including location, final size and choice of technology – are evaluated in the local context and defined as specific projects are carried out through the municipal class environmental assessment process, described further in this section.

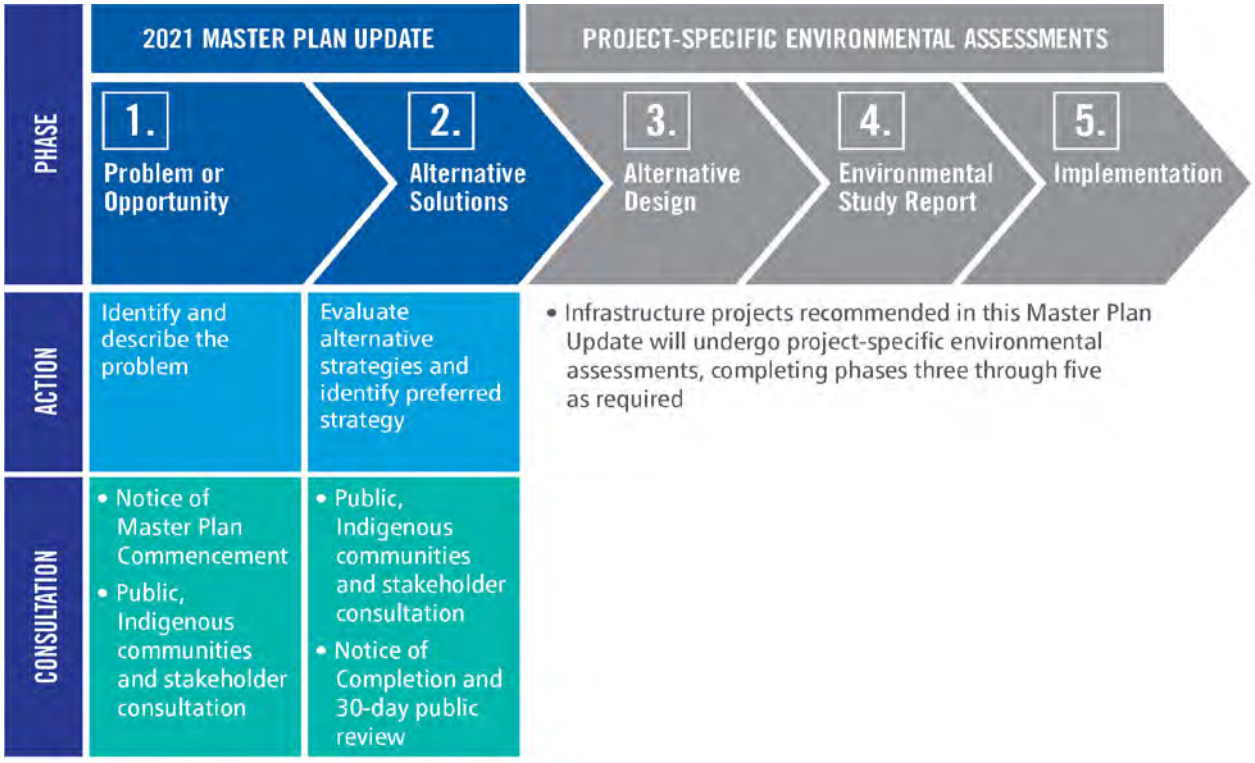
1.4 HOW THE PLAN UPDATE WAS CARRIED OUT

Depending on the nature and complexity of an individual project, it may be subject to further review under the provincial *Environmental Assessment Act*, as discussed in Section 2.6. The Act provides for a municipal class environmental assessment for municipal projects that are similar in nature, are carried out routinely, have a predictable range of environmental effects, and respond to mitigating measures. Most infrastructure projects undertaken by the Region fall within the framework for municipal class environmental assessments.

The Act also provides for a comprehensive environmental assessment process, less frequently used, that applies to large, complex projects with the potential for significant environmental effects. This is referred to as a full or individual environmental assessment.

Figure 1.4 outlines the municipal class environmental assessment process and requirements for each phase. The number of phases to be completed for a particular project depends on the nature of the project. The Municipal Engineers Association requires that a master plan follow, at a minimum, the first two phases of the process. This update to the Master Plan followed phases 1 and 2.

Figure 1.4 Municipal Class Environmental Assessment Process



Note: The Region uses the terms "Alternative Strategies" and "Preferred Strategy" to describe what the Municipal Engineers Association process calls "Alternative Solutions" and "Preferred Solution"

1.4 HOW THE PLAN UPDATE WAS CARRIED OUT

Use of Approach 1 in Preparing the Master Plan

Different approaches can be used to develop a master plan. York Region followed Approach 1 set out in Appendix 4 of the current Municipal Engineers Association Municipal Class Environmental Assessment document.

As part of Approach 1, the Master Plan identifies how each individual project is expected to proceed through the environmental assessment process. In some cases, this will involve following phases 3, 4 and/or 5 as shown in Figure 1.4. Schedule B and C projects will undergo project-specific environmental assessments to fulfil the municipal class environmental assessment consultation and documentation requirements. All schedule B projects will require filing of the Project File Report for public review. All Schedule C projects will fulfil phases 3 and 4 of the Class Environmental Assessment process prior to filing an Environmental Study Report for public review. This is discussed in more detail in Section 7.1 on implementation.

By providing the rationale for all projects, the Master Plan fulfills the first two phases of the municipal class environmental assessment process and supports any future environmental assessments that may be needed.

Consultation and Engagement Were Key

Consultation and engagement throughout development of a master plan, supported by frequent and timely communication, are key requirements of the master planning process. With this Master Plan update, engagement occurred through various mechanisms, including one-on-one meetings, correspondence and public open houses. After the COVID-19 pandemic was declared in early 2020, face-to-face activities moved to virtual platforms.

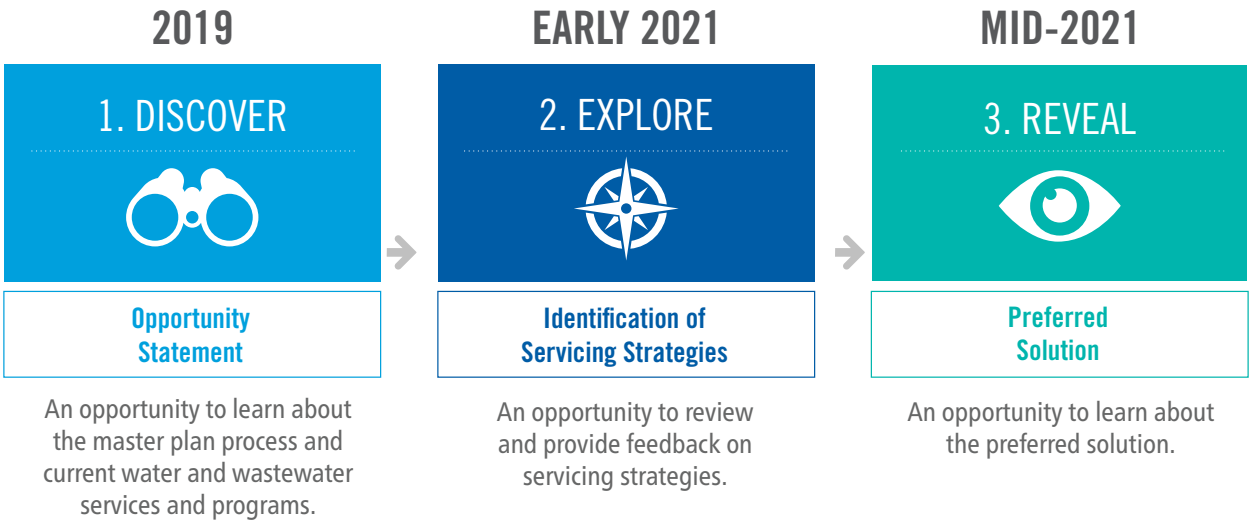
Three public open houses held over the course of the update provided a chance for residents and others to learn more about the Master Plan update and the Region's water and wastewater services. The first was delivered in person in fall of 2019 and drew 165 attendees. The second and third took place virtually due to pandemic restrictions: the second in winter 2021 with 83 participants and the third in summer 2021 with 108 participants.

Outreach included notice of open houses through newspaper advertisements as well as group emails and social media. Throughout the process, the Region maintained a dedicated web page on its website (york.ca/waterplan) providing up-to-date information, including open house materials.

1.4 HOW THE PLAN UPDATE WAS CARRIED OUT

Consultation and engagement took place through three phases over the course of updating the Master Plan:

Figure 1.5 Consultation and Engagement Milestones



Those identified as having an interest in the Master Plan update were notified of opportunities to give feedback at each milestone in Figure 1.5. The process was designed to ensure feedback was taken into consideration. More information on the consultation approach and those identified as having an interest can be found in Appendix B.1. Section 2.5 provides a summary of Indigenous communities, partner and stakeholder views, and Appendix B sub-volumes provide notices used to communicate the Master Plan update along with detailed feedback gathered through the open houses.

In the balance of this update:

- **Section 2** outlines the general context for master planning, including factors specific to the Region as well as the regulatory framework that applies to water and wastewater
- **Section 3** provides an overview of the existing Regional systems
- **Section 4** discusses the planning outlook, including forecasts of population and water use, for the period covered by this update
- **Section 5** explains how the preferred servicing strategy was selected
- **Section 6** outlines related infrastructure needs and costs
- **Section 7** outlines implementation, detailed costs and monitoring

2.0 GENERAL CONTEXT

2.1 CURRENT YORK REGION POPULATION AND ECONOMY

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Established in 1971, York Region consists of nine local municipalities: the cities of Markham, Richmond Hill and Vaughan; the towns of Aurora, East Gwillimbury, Georgina, Newmarket and Whitchurch-Stouffville and the Township of King.

Its central location directly north of the City of Toronto in the Greater Toronto Area has helped to make the Region one of the fastest-growing and large municipalities in Ontario. At the time of its creation, it had just under 200,000 residents and 50,000 jobs. Over the past 50 years, it has grown more than seven-fold to 1.2 million people and 600,000 jobs in more than 54,000 business establishments across several industries. It has also become one of Canada's most diverse communities.

2.2 GEOGRAPHY AND NATURAL ENVIRONMENT

York Region extends roughly 60 kilometres north from its border with Toronto at Steeles Avenue to the south shore of Lake Simcoe and is approximately 40 kilometres wide. In total, it covers 1,776 square kilometres.

Two geographical features have had a major influence on how the Region delivers drinking water and manages wastewater:

- It is the only municipality of its size in the Greater Toronto and Hamilton Area that lacks direct access to Lake Ontario
- It is divided by the Oak Ridges Moraine, so that its northern half is in the Lake Simcoe/Lake Huron watershed and its southern half is in the Lake Ontario watershed, with the dividing line shown in Figure 2.1

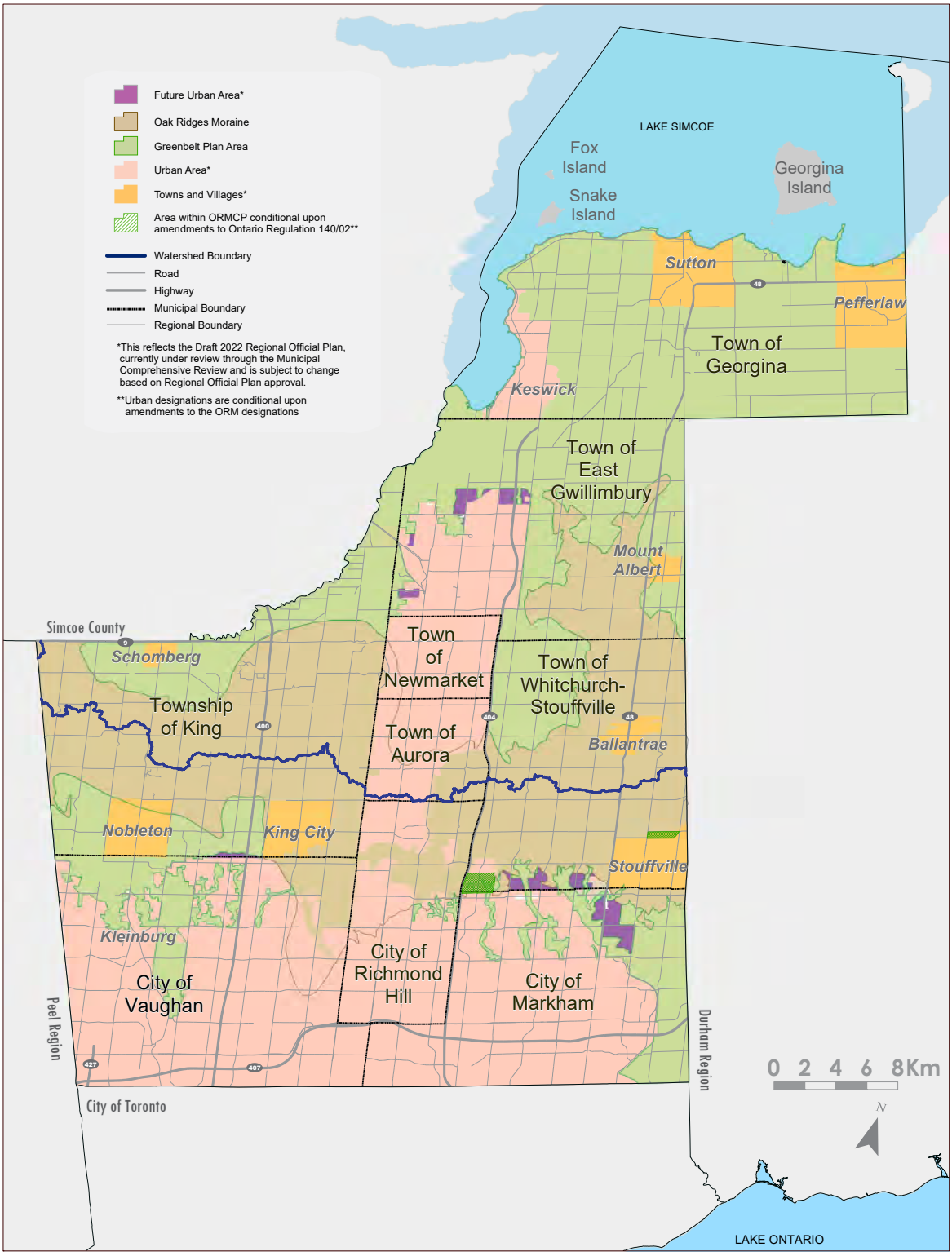
Lack of direct access to Lake Ontario has required the Region to form strong water partnerships with the neighbouring Region of Peel and City of Toronto, which provide drinking water from Lake Ontario that together meet 90% of the needs of York Region's residents. Likewise, the Region has partnered with Durham Region and Region of Peel to return wastewater for treatment and return to Lake Ontario. Combined with the local municipal responsibility for serving customers, this has shaped York Region systems that are dominated by large pipes, storage and treatment facilities and pumping stations.

The second geographical feature — the watershed boundary — is important in light of a bi-national agreement limiting movement of water from one Great Lakes watershed to another. This is discussed in Section 2.6 which summarizes the regulatory framework.

Protection of natural features is a priority for the Region in planning and constructing water and wastewater projects. Figure 2.1 shows the nine cities and towns that make up York Region, along with general land designations.

2.2 GEOGRAPHY AND NATURAL ENVIRONMENT

Figure 2.1 York Region and Local Cities and Towns



Appendix A.1 provides maps of natural environmental features in York Region.

2.3 CULTURAL HERITAGE AND ARCHAEOLOGICAL RESOURCES

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Archaeological resources in York Region include sites that may contain artifacts, remains of structures, cultural deposits or subsurface strata of human origin.

Physical remains of cultural heritage can be extremely fragile. Policies in the Regional Official Plan commit York Region to responsible archaeological management, and its Regional Archaeological Management Plan outlines the process for archaeological assessments.

Project-specific environmental assessments will include detailed assessment of archaeological and cultural heritage features and the project's potential impacts and, where applicable, mitigation measures.

2.4 INDIGENOUS PRESENCE AND STEWARDSHIP

The cultural history of what is now York Region began with the arrival of hunting bands in the area roughly 11,000 years ago. Water was central to the lives of these Indigenous peoples: it provided their drinking water, fishing resources and major transportation routes. To this day, many Indigenous people who live in the area continue traditional water-related practices and activities.

For Indigenous peoples, water is viewed as more than just a valuable resource, and is recognized as a sacred gift, the lifeblood of the Earth that connects all living things. In many Indigenous communities, women are recognized as the keepers of the waters, who teach the importance of responsible stewardship of land and water.

The next section summarizes engagement with Indigenous communities and how their feedback was considered.

2.5 INDIGENOUS COMMUNITIES, PARTNER AND STAKEHOLDER VIEWS

The Region relies on a range of partners and interested parties to meet residents' service needs. The Region kept the following groups informed of the progress of the update and sought their feedback. The points below summarize their interests and most frequently raised topics and explain how York Region considered the feedback:

Indigenous Communities

Engagement with Indigenous communities was coordinated with the Municipal Comprehensive Review and Transportation Master Plan update. The Region coordinated engagement individually based on their interest, capacity, and availability as there is currently no provincially approved framework for engaging with Indigenous communities. A consultant and Indigenous facilitator supported all engagement activities. The opportunity to engage with and learn from Indigenous communities was valuable, as their unique historic and cultural relationship to the land and water gives rise to important perspectives on how to manage the natural environment and water resources. The Region looks forward to continuing these conversations.

Feedback was received from several Indigenous communities and is summarized below.

- Indigenous communities encourage York Region to develop lasting, long-term relationships; this would provide a more proactive approach to involve communities in projects and initiatives at the outset allowing time for meaningful engagement and input

2.5 INDIGENOUS COMMUNITIES, PARTNER AND STAKEHOLDER VIEWS

- Many comments focused on protecting and sustaining the natural environment to address impacts arising from growth that may affect traditional Indigenous ways of life:
    - Mitigation of environmental threats such as invasive species
    - Impacts of climate change and stormwater
    - Increased public education on the impacts and ways to reduce emerging contaminants entering waterways
    - Ensure Indigenous rights and perspectives are acknowledged in the areas of water and wastewater management and recognizing the sacredness of water
- Comments on the Upper York Sewage Solutions project were received from the Chippewas of Georgina Island First Nation and the Mississaugas of Scugog Island First Nation; the Upper York Sewage Solutions project is described in further detail in section 2.6 and is subject to a separate approval Individual Environmental Assessment process; these comments were shared with the appropriate York Region staff

York Region acknowledges the relationship Indigenous communities have with the natural environment and acknowledges the central importance of water in the culture and lives of Indigenous people. York Region is committed to sustainable management and use of water and protection of the natural environment not only in the present, but also over the long term for future generations by:

- Sharing the importance of water and continued need for conservation and stewardship within its communities
- Continuing to deliver high quality water and wastewater services

Implementation of projects identified in the Master Plan will recognize the archaeological importance of the lands in York Region to Indigenous communities and will follow applicable regulatory requirements to consult and engage communities with Aboriginal or treaty rights.

Indigenous Communities

Indigenous communities in the Water and Wastewater Master Plan refers to First Nations (as recognized under the *Indian Act*) as well as Indigenous peoples including urban Indigenous who live throughout York Region and are not officially recognized under the *Indian Act*. This inclusive approach reflects a range of Indigenous peoples that have historical interests and/or treaty rights or live in York Region. View the treat map.

Local Cities and Towns

Local cities and towns are partners in delivering water and wastewater services, using infrastructure systems linked to the Region's systems, and face many of the same planning and operating complexities. Their feedback continues to help understand local concerns and provides opportunities to strengthen working partnerships. As the Region and local municipalities are jointly responsible for ensuring infrastructure to accommodate growth will be in place, coordinating local master plans with the Region's supports more integrated infrastructure planning. This is is an important consideration in delivering needed capacity.

2.5 INDIGENOUS COMMUNITIES, PARTNER AND STAKEHOLDER VIEWS

- Local municipal engagement showed support for timely, well-paced and coordinated infrastructure delivery and planning; in light of near-term wastewater capacity constraints due to delays in provincial approval of Upper York Sewage Solutions (discussed in more detail in Section 2.6), local municipalities were interested in exploring innovative interim servicing solutions with the Region so that development can continue
- York Region continues to coordinate servicing needs with local municipal partners through ongoing processes, including capacity assignments, project-specific environmental assessments and day-to-day operations. Section 7.1 discusses how infrastructure projects recommended through the master plan are delivered, with careful monitoring and adaption to changing circumstances

Servicing Partners

Our neighbouring municipalities of Durham Region, Peel Region and City of Toronto are important partners to York Region in providing services. York Region has long-term agreements with them for supplying drinking water and/or conveying and treating wastewater through their own infrastructure or, in the case of the York Durham Sewage System, agreements for ownership and operation of our co-owned infrastructure in Durham Region.

- As with local municipalities, our engagement with Toronto, Peel and Durham staff pointed to an interest in continuing to work together to meet the needs of growth and optimize the infrastructure that provides York Region with water and wastewater services

Conservation Authorities

Conservation authorities are local agencies mandated by the province to ensure that watersheds and the natural habitats they contain are conserved, restored and managed responsibly. The Region straddles two watersheds, so both the Toronto and Region Conservation Authority and the Lake Simcoe Region Conservation Authority operate within its boundaries. Both frequently partner with the Region on watershed-related initiatives.

- Conservation authorities expressed significant interest in using the One Water approach mentioned in Section 3.4, as they are frequently involved in implementing specific projects and programs with that focus
- Conservation authorities highlighted directions for York Region to consider in managing and mitigating impacts of growth and land use decisions on watershed conditions; a summary appears below:
    - Aim to make the most efficient use of water infrastructure by continuing water conservation activities
    - Ensure source protection policies are embedded in municipal policies and master planning
    - Make the best use of existing infrastructure by maximizing efficiencies through optimization
    - Enhance infrastructure resiliency to accommodate extreme weather events
- Through engagement on the Master Plan and other initiatives, the conservation authorities also encouraged York Region to continue the dialogue on how best to integrate the One Water approach into watershed planning and master planning

2.5 INDIGENOUS COMMUNITIES, PARTNER AND STAKEHOLDER VIEWS

Land Developers

The building and land development industry plans and constructs homes, offices and commercial/industrial buildings that accommodate growth across the Region and must connect to water and wastewater services. Engagement with the York chapter of the Building Industry and Land Development Association (BILD), which represents larger developers in the Greater Toronto Area, was coordinated with the Municipal Comprehensive Review and update to the Transportation Master Plan; land developers who are not BILD members were able to provide input through public open houses.

- The industry is concerned about future system capacity and timing and growth-related costs, which are recovered through development charges on new construction; like local municipalities, they expressed frustration in the protracted provincial approval process for infrastructure solutions to deal with servicing constraints in the towns of Aurora and Newmarket and the communities of Holland Landing, Queensville and Sharon in the Town of East Gwillimbury

Residents and Businesses

Residents and businesses are the ultimate customers of Regional and local municipal water and wastewater services.

- Many of their comments focused on environmental and long-term supply and water quality concerns, which York Region considered in assessing strategies to service growth; water quality, quantity and access are also discussed in Section 7.2 as elements of water equity and livability
- Another area of interest was availability and timing of water and/or wastewater services for a specific community or future employment area; this Master Plan addresses broad-based and Region-wide needs; local municipalities provide service to individual customers, with growth-related projects for their communities generally identified in their secondary plan or servicing master plan

Provincial Ministries and Agencies

As required by the municipal class environmental assessment master plan process, the provincial Ministry of the Environment, Conservation and Parks was kept informed at key milestones. The Ministry of Heritage, Sport, Tourism and Culture Industries was also notified because of its role in heritage preservation, as were other provincial ministries and agencies.

- The Ministry of the Environment, Conservation and Parks provided feedback on the draft report that highlighted guidance and consideration of requirements (including source protection) for future implementation of proposed projects identified in the Master Plan

Despite a variety of perspectives, every group or organization has a role in the sustainability of water and wastewater infrastructure — and in managing water resources as a whole — because of the central importance of water in day-to-day living. In that light, participants were very interested in our One Water approach and saw it as a positive step towards sustainability at a range of scales.

Feedback collected through consultation and engagement was considered as input to the Master Plan and ongoing water and wastewater programs and initiatives. Details can be found in Appendix B and its sub-volumes.

2.6 REGULATORY AND POLICY FRAMEWORK

2.6 REGULATORY AND POLICY FRAMEWORK

Important considerations in planning water and wastewater systems include laws and plans protecting the natural environment and sensitive geographical areas, policies around growth, and guidance around selection, design, and operation of infrastructure.

The following sections cite and describe relevant regulatory and policy considerations. This update to the Water and Wastewater Master Plan has been drafted for consistency with these requirements.

Places to Grow Act, 2005

The provincial *Places to Grow Act, 2005*, gives the Ontario government the power to designate growth areas throughout the province and develop related growth plans.

York Region is part of the Greater Golden Horseshoe, an area of some 10,000 square kilometres in south-central Ontario that is one of the fastest-growing areas in North America. A Place to Grow, the current growth plan for the Greater Golden Horseshoe, provides population and employment forecasts out to 2051.

The plan's policies guide infrastructure planning and investment decisions to accommodate population and employment growth. Key content of relevance to the Water and Wastewater Master Plan is summarized below:

- **Policy 3.2.1** requires planning for new or expanded infrastructure to be integrated with long-range land use planning scenarios, as well as environmental and financial plans, supported by relevant studies; infrastructure planning should help achieve minimum intensification and density targets in the plan and aim to provide enough infrastructure in strategic growth areas
- **Policy 3.2.6**, which guides planning of water and wastewater systems, makes optimization and improved efficiency within existing systems priorities; water and wastewater plans should be supported by strategies for energy and water conservation and water demand management and be informed by watershed planning
- **Policy 4.2.9** requires that municipalities develop and implement strategies in support of water conservation, including objectives around demand management and maximizing reuse and recycling of water

Other sections of the plan reiterate existing policies and legislative requirements as set out below.

Provincial Policy Statement, 2020

The 2020 Provincial Policy Statement, issued under the provincial *Planning Act*, provides policy direction on matters of provincial interest related to land use planning and development. As a key part of Ontario's planning system, the statement sets the policy foundation for regulating the development and use of land. Municipal official plans and planning decisions must be consistent with policies of the Provincial Policy Statement.

2.6 REGULATORY AND POLICY FRAMEWORK

York Region Wastewater Act, 2021

In 2014, the Region completed an individual environmental assessment for the proposed Upper York Sewage Solutions initiative. This project would accommodate growth in the towns of Aurora, East Gwillimbury and Newmarket through three main components: a Water Reclamation Centre near the East Holland River in the Lake Simcoe/Lake Huron watershed, a phosphorus offset reduction program and a twinned forcemain (pumped sewer pipe) from the Town of Newmarket to the Town of Aurora. The 2016 Water and Wastewater Master Plan identified Upper York Sewage Solutions as part of its preferred servicing strategy. To date, the provincial government has allowed the forcemain twinning to go ahead but has not rendered a decision on the other components.

In October 2021, the provincial government enacted the *York Region Wastewater Act, 2021*. This legislation puts an indefinite hold on any decision by the Minister of the Environment, Conservation and Parks on the Upper York Sewage Solutions environmental assessment, prevents any further action being taken by York Region to advance this project and seeks to limit the province's liability for taking these steps. The province has also appointed the York Region Wastewater Advisory Panel to provide confidential advice on options to address wastewater servicing capacity needs in the upper parts of York Region.

Given the work and expense already completed in the environmental assessment and other preparation, and the pressing need to meet provincial deadlines for updating the Development Charges Bylaw, the Region will continue to plan for the Upper York Sewage Solutions initiative until it is directed otherwise.

Environmental Assessment Act

As Section 1.4 noted, the Master Plan update identifies a high-level preferred strategy to be implemented through specific projects over the next 30 years. These may be subject to different requirements under the provincial *Environmental Assessment Act*, depending on their nature and scope. Section 7.1 provides more details.

While the Master Plan update was being carried out, the province announced changes to the *Environmental Assessment Act* with the goal of modernization. The Region has experienced long delays in getting approvals for key projects, including not just the Upper York Sewage Solutions initiative, but also expansion of the Duffin Creek Water Pollution Control Plant on Lake Ontario, including the most recent outfall capacity expansion, which created uncertainty and added costs. York Region has advocated strongly for changes that allow critical infrastructure to be planned and delivered in a predictable manner while protecting the natural environment. York Region staff are hopeful the Province of Ontario's Environmental Assessment modernization approach will speed-up approvals and contribute to post-pandemic economic recovery. The Region advocated for the following changes in the *Environmental Assessment Act* to provide better process certainty and reduce costs:

- Exempting low risk projects from the environmental assessment process
- Driving more predictable timelines through defined, time-based processes similar to process for transit projects
- Creating a new 'growth related infrastructure project' designation that is exempt from Ministerial bump-ups
- Enhanced approaches to Indigenous and public engagement

2.6 REGULATORY AND POLICY FRAMEWORK

Changes to the Act are intended to streamline the environmental assessment process for most projects and will result in changes to the approvals process to be followed for Regional projects. Regulations to implement new environmental assessment processes are currently under development by the province, which will outline the process to be followed for future Regional projects, including those listed in Section 6. The Master Plan has been structured to adapt to this regulatory change when it occurs.

Great Lakes Agreements

The Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement between Ontario, Quebec and the Great Lakes states in the United States governs the transfer of water between Great Lakes watersheds. A transfer occurs any time water is taken from one watershed and moved into another and requires unanimous approval from all signatories to the agreement. Regulations under the provincial *Ontario Water Resources Act* support limitations and requirements imposed on transfers set out under these agreements.

In 2010, after gaining approval from all Great Lakes states and provinces, York Region was granted an intra-basin transfer authorizing a transfer of up to 105 million litres of water a day from the Lake Ontario watershed to the Lake Simcoe/Lake Huron watershed with return flow to Lake Ontario. This daily limit is a factor in determining how best to meet the needs of the Region's communities north of the Lake Ontario watershed boundary as they grow. It also underscores the importance to York Region of conservation and greater self-sufficiency in water supply and wastewater treatment.

Protection of the Greenbelt, Oak Ridges Moraine and Lake Simcoe

The Greenbelt, a broad band of land encircling much of south-central Ontario, covers 69% of the land base within York Region's geographic boundaries. The Greenbelt Plan, created under the provincial *Greenbelt Act, 2005*, permanently protects natural heritage and water resource systems within it and supports agriculture as its main land use. The Greenbelt Plan prevents York Region from using lands within a "Protected Countryside" area for future urban growth. It restricts building or locating infrastructure in the plan area. Lake-based water and wastewater services cannot be extended to communities in the plan area not already receiving lake-based services unless public health is at risk or an existing settlement area is expanded.

2.6 REGULATORY AND POLICY FRAMEWORK

The Oak Ridges Moraine is a component of the Greenbelt. An important source of groundwater recharge, the moraine is protected by its own provincial legislation and conservation plan under the *Oak Ridges Moraine Conservation Act, 2001*. Generally, where the Oak Ridges Moraine plan covers a specific geographic area, it takes precedence over policies in the Greenbelt Plan. Future growth cannot generally be accommodated except in approved settlement areas, and there are restrictions on how and where infrastructure can be located. Servicing considerations for select communities located within the Greenbelt and Oak Ridges Moraine are included in Appendix A.7. This information could be used as a basis to consider municipal servicing implications if provincial policy restrictions are removed in the future.

Covering much of the northern part of the Region, Lake Simcoe and its tributaries make up an area of special natural environmental interest, containing wetlands, forests and other natural features. Human-related pressures, including phosphorus loading, led to creation of the provincial *Lake Simcoe Protection Act, 2008* and an associated Lake Simcoe Protection Plan. The Protection Plan limits phosphorus discharges, including those from municipal wastewater treatment facilities and does not allow for any new wastewater treatment facility to be built unless it replaces an existing treatment facility. In addition, Provincial environmental policy often issues competing requirements focused on areas that are easier to regulate, not necessarily the most significant sources. There is a need for more integrated policy thinking to mitigate conflicts like the Hazardous and Special Products Regulation which recommends consumers use up left over fertilizer which conflicts with provincial regulations for controlling non-point sources of nutrients.

In addition to provincial protection, York Region's Official Plan recognizes these systems and key natural features that support healthy ecosystems, such as valleylands, woodlands, streams and lakes. It sets out policies around use, protection and enhancement of the Regional Greenlands System, which includes many of these features. These policies underlie the objective of this Master Plan to deliver sustainable servicing and align with the watershed plans discussed below.

Protection of Watershed Health

Under the provincial *Conservation Authorities Act*, the Toronto and Region Conservation Authority and Lake Simcoe Region Conservation Authority have undertaken watershed and subwatershed planning for decades. This work helped inform the Municipal Comprehensive Review and infrastructure planning. Plans are available on the website of the Toronto and Region Conservation Authority and Lake Simcoe Region Conservation Authority.

Through project-specific environmental assessments, design and construction will meet the Toronto and Region Conservation Authority's Living City Policies, and will fulfil the requirements of Ontario Regulation 166/06 including efforts to avoid, minimize, mitigate and compensate for impacts to the natural heritage and hazard systems.

2.6 REGULATORY AND POLICY FRAMEWORK

Rouge National Urban Park

Created by federal legislation in 2015, the Rouge National Urban Park is a new type of protected area —a national park within an urban area that includes part of the City of Markham and Town of Whitchurch-Stouffville within York Region. Regional infrastructure is located within or close to the park, so this update considered the park's management plan. When infrastructure work needs to be done in or near the park, the Region will protect its natural features. Both the Rouge National Urban Park agreement and the *Rouge National Urban Park Act* provide a strong foundation for protecting a broad range of Regional interests including: growth management, infrastructure (e.g. water wastewater and roads), agriculture, transit and utilities. The agreement provides for future infrastructure needs, protects easements and allows for maintenance activities including the ongoing rehabilitation of the York Durham Sewage System.

Other Regulatory Considerations

Ontario has put in place a "multi-barrier" approach to safeguard drinking water. This is an integrated system of measures and tools that together prevent or reduce contamination from water source to tap. Legislative elements of the approach include:

- *The Safe Drinking Water Act, 2002*, which sets out rigid requirements for drinking water operations and water quality; the Act imposes a standard of care on those responsible for municipal drinking water systems
- *The Clean Water Act, 2006*, which requires development of watershed-based protection plans for municipal water sources; in each of the 19 watershed-based source protection regions across Ontario, a local committee developed a plan to protect existing and future drinking water sources; York Region is represented on two committees: the South Georgian Bay Lake Simcoe Source Protection Region for the Lake Huron watershed; and the Credit Valley, Toronto and Region and Central Lake Ontario Source Protection Region for the Lake Ontario watershed; as required by source protection plans, the Regional Official Plan evaluates potential growth areas to ensure that current or planned service capacity of groundwater supply wells would not be adversely affected
- *The Ontario Water Resources Act*, which provides for consideration, management and protection of Ontario's waters by regulating water takings and sewage disposal

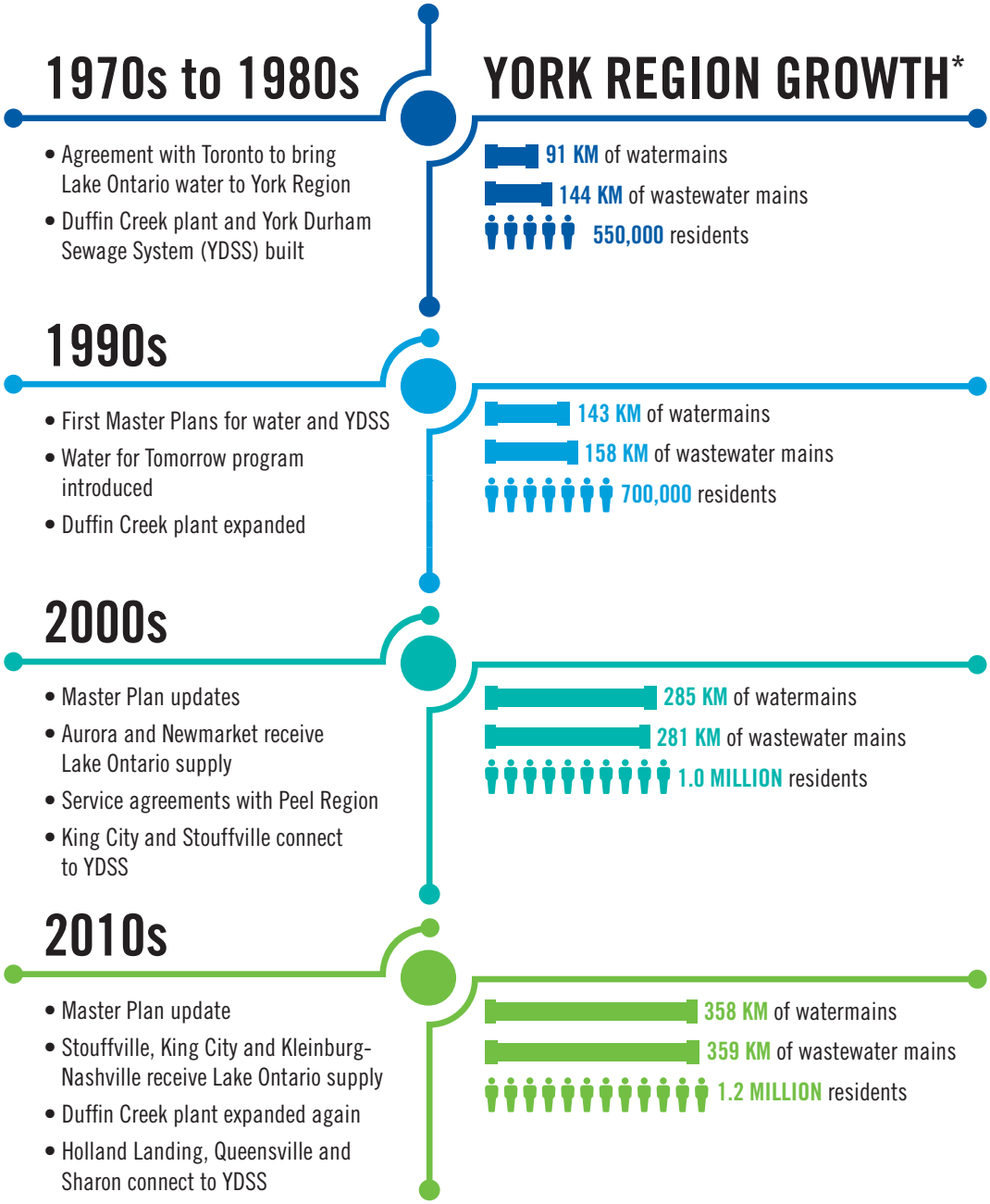
The Region is committed to complying with all relevant elements of Ontario's regulatory and policy framework. Requirements were considered at a high level in developing the Master Plan and will be fully reflected in project-specific environmental assessments.

3.0 OVERVIEW OF WATER AND WASTEWATER IN YORK REGION

3.1 EVOLUTION

As York Region has grown, its water and wastewater services and systems have evolved to keep pace. Figure 3.1 provides an overview of key decisions and events that have significantly shaped the Region's servicing strategy.

Figure 3.1 York Region Servicing History



**Regional water and wastewater mains only. Length of mains and population cumulative over each decade.*

3.2 CURRENT SYSTEMS

3.2 CURRENT SYSTEMS

The following sections provide an overview of water and wastewater systems currently in service.

The Master Plan focuses on municipal servicing only. It excludes developments serviced by privately owned and operated communal water and wastewater systems. Through the Municipal Comprehensive Review, interest was expressed in the provision of water and wastewater services for the communities of Ballantrae, Gormley and Vandorf-Preston Lake in the Town of Whitchurch-Stouffville. These communities were not considered for significant growth nor for provision of municipal servicing because of current provincial policy restrictions. In addition, interest was expressed for an increase in servicing capacity in Nobleton in the Township of King and Mount Albert in the Town of East Gwillimbury, which are not considered for significant growth due to provincial policy restrictions. Appendix A.7 outlines considerations for servicing these communities currently restricted through provincial policy if those restrictions are lifted in the future. It also includes further information about private communal systems.

Water Systems

The Regional water system supplies roughly 123 billion litres of water to residents and businesses annually, enough to fill about 50,000 Olympic-size swimming pools.

Through agreements with neighbouring municipalities, over 90% of York Region's total supply has come from Lake Ontario in recent years, with groundwater supplying close to 7% and water from Lake Simcoe the remaining amount. Groundwater, which is drawn from municipal wells, may be a community's only supply, or in some areas may be mixed with Lake Ontario water.

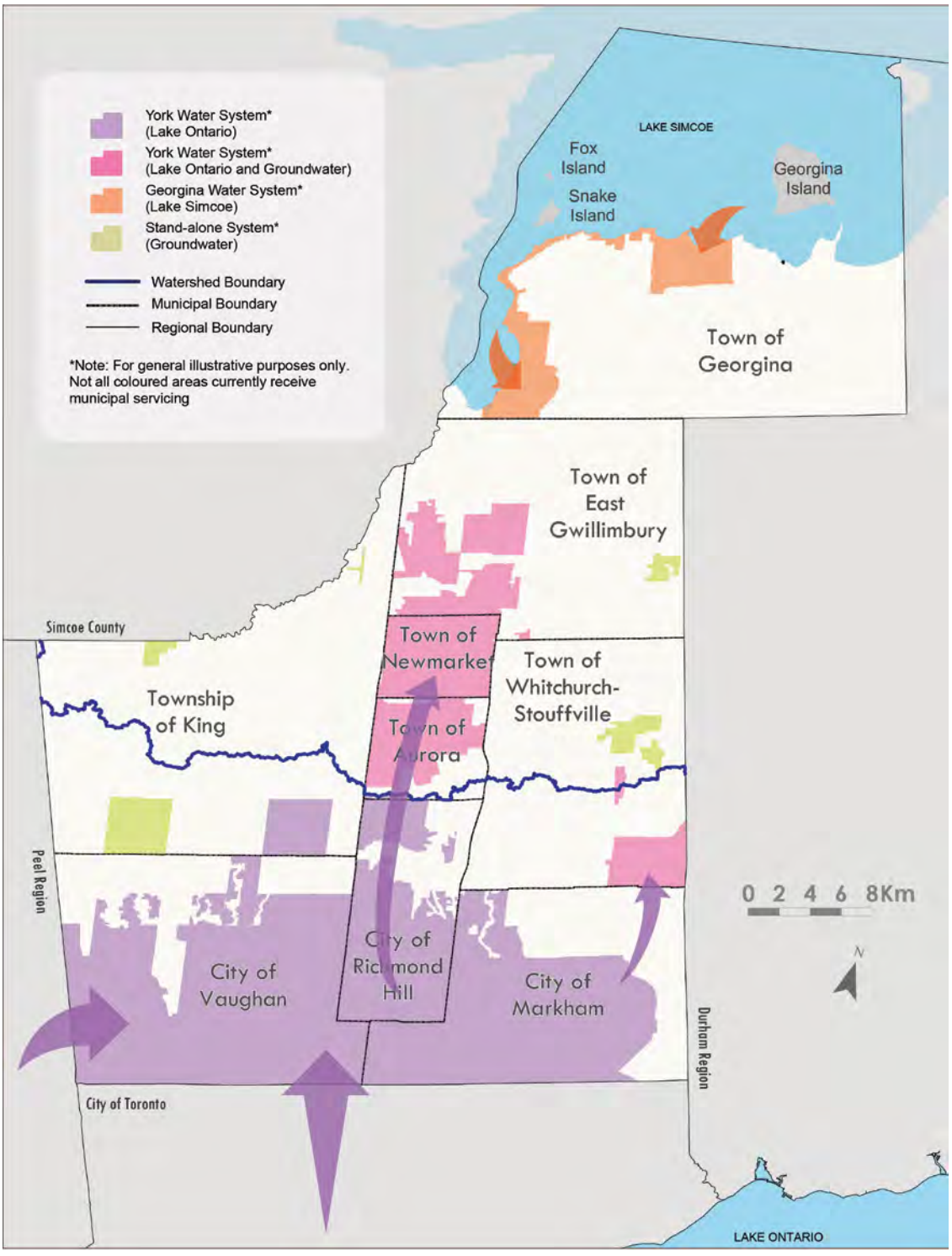
York Region's water infrastructure is made up of:

- The York water system, which is the Region's largest drinking water treatment and supply system; it services the towns of Newmarket and Aurora, parts of the Town of East Gwillimbury (Holland Landing, Queensville and Sharon), King City in the Township of King, the community of Stouffville in the Town of Whitchurch-Stouffville and the cities of Markham, Richmond Hill and Vaughan; this system distributes Lake Ontario water. In the towns of Aurora, Newmarket and East Gwillimbury, Lake Ontario supply is blended with groundwater from the Yonge Street aquifer, and in the community of Stouffville it is supplemented with local groundwater
- The Georgina water system, which draws water from Lake Simcoe to serve residents of the Town of Georgina
- Five stand-alone groundwater supply systems, which service communities in the Greenbelt Plan area where regulation prevents lake-based supply, as explained in Section 2.6. These groundwater systems are in the communities of Ansnorveldt, Nobleton and Schomberg in Township of King; Ballantrae-Musselman's Lake in the Town of Whitchurch-Stouffville; and Mount Albert in the Town of East Gwillimbury

3.2 CURRENT SYSTEMS

Figure 3.2 illustrates York Region's water systems and sources of supply. Most York Region residents are served by one of these municipal water systems. Many farms and other rural properties, however, rely on private on-site water systems such as wells.

Figure 3.2 York Region Water Systems and Sources of Supply in 2021

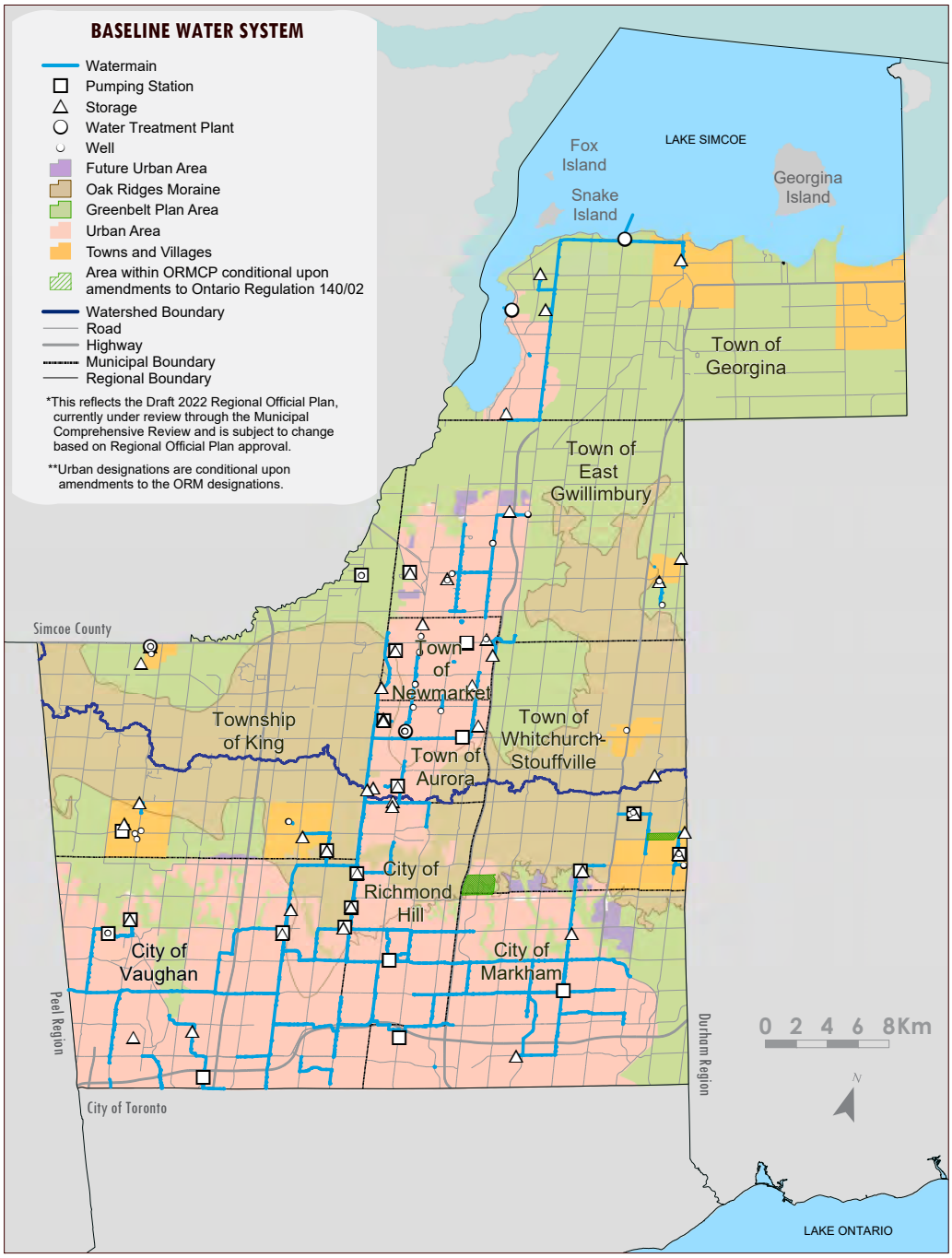


3.2 CURRENT SYSTEMS

The water system is continually evolving as new infrastructure is constructed, modified or taken off-line. For the purpose of this Master Plan, the baseline water infrastructure system included all infrastructure in place or under construction before January 2022. The baseline is shown in Figure 3.3.

The baseline was the starting point from which this Master Plan update assessed the need for any additional water servicing. Appendix A.2 provides a detailed discussion of York Region's current water infrastructure system.

Figure 3.3 York Region's Baseline Water Infrastructure Systems in 2021



3.2 CURRENT SYSTEMS

Wastewater Systems

As with water supply, York Region has agreements with neighbouring municipalities for wastewater treatment:

- With Durham Region, it co-owns the Duffin Creek Water Pollution Control Plant, trunk sewers and other infrastructure located in Pickering; the Duffin Creek plant treats about 85% of the Region's wastewater
- Through the York-Peel servicing agreement, Peel Region treats about 10% of the Region's wastewater

The balance of wastewater is treated at seven water resource recovery facilities wholly owned by the Region. Of the total treated annual wastewater flow, about 95% is discharged into the Lake Ontario watershed and 5% into the Lake Simcoe/Lake Huron watershed.

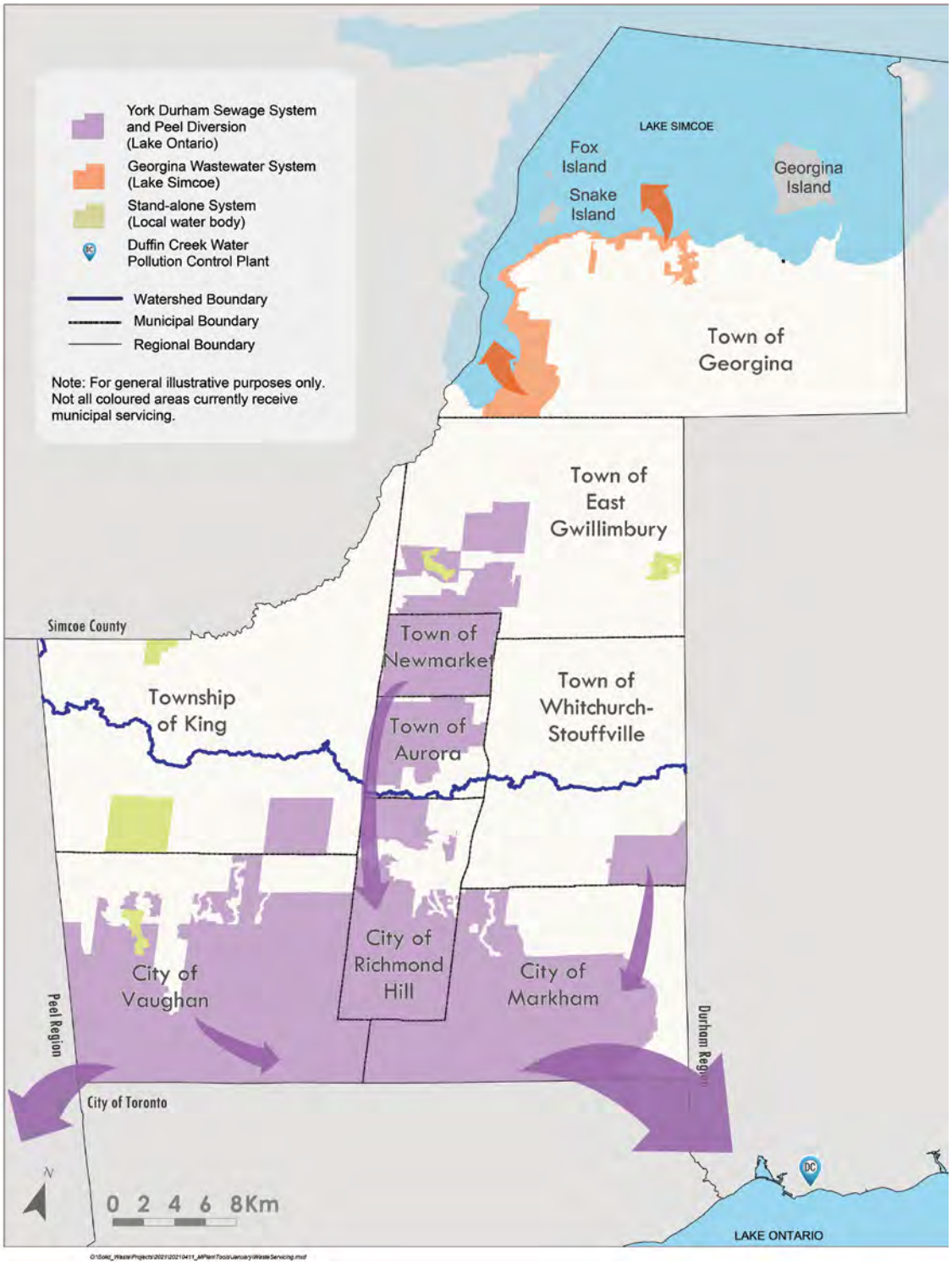
Regional wastewater infrastructure includes:

- The York Durham Sewage System, which broadly refers to the Duffin Creek Water Pollution Control Plant, other wastewater infrastructure in the City of Pickering and an associated sewer network that serves the cities of Markham, Richmond Hill and Vaughan; the towns of Aurora and Newmarket; the community of Stouffville in the Town of Whitchurch-Stouffville; King City in the Township of King and parts of the Town of East Gwillimbury (Holland Landing, Queensville and Sharon)
- The Peel Diversion System, which conveys flows from part of the City of Vaughan for treatment in the Peel Region system
- The Keswick and Sutton water resource recovery facilities in the Town of Georgina in the Lake Simcoe/Lake Huron watershed
- Stand-alone wastewater systems in four communities: Nobleton in the Township of King, and Kleinburg in the City of Vaughan in the Lake Ontario watershed, and Holland Landing (also connected to the York Durham Sewage System) and Mount Albert in the Town of East Gwillimbury and Schomberg in Township of King in the Lake Simcoe/Lake Huron watershed

3.2 CURRENT SYSTEMS

Figure 3.4 illustrates York Region's wastewater systems and receiving water bodies. Most residents in York Region are connected to municipal services. Many farms and other rural properties rely on private servicing such as wells and septic systems.

Figure 3.4 Regional Wastewater Systems in 2021

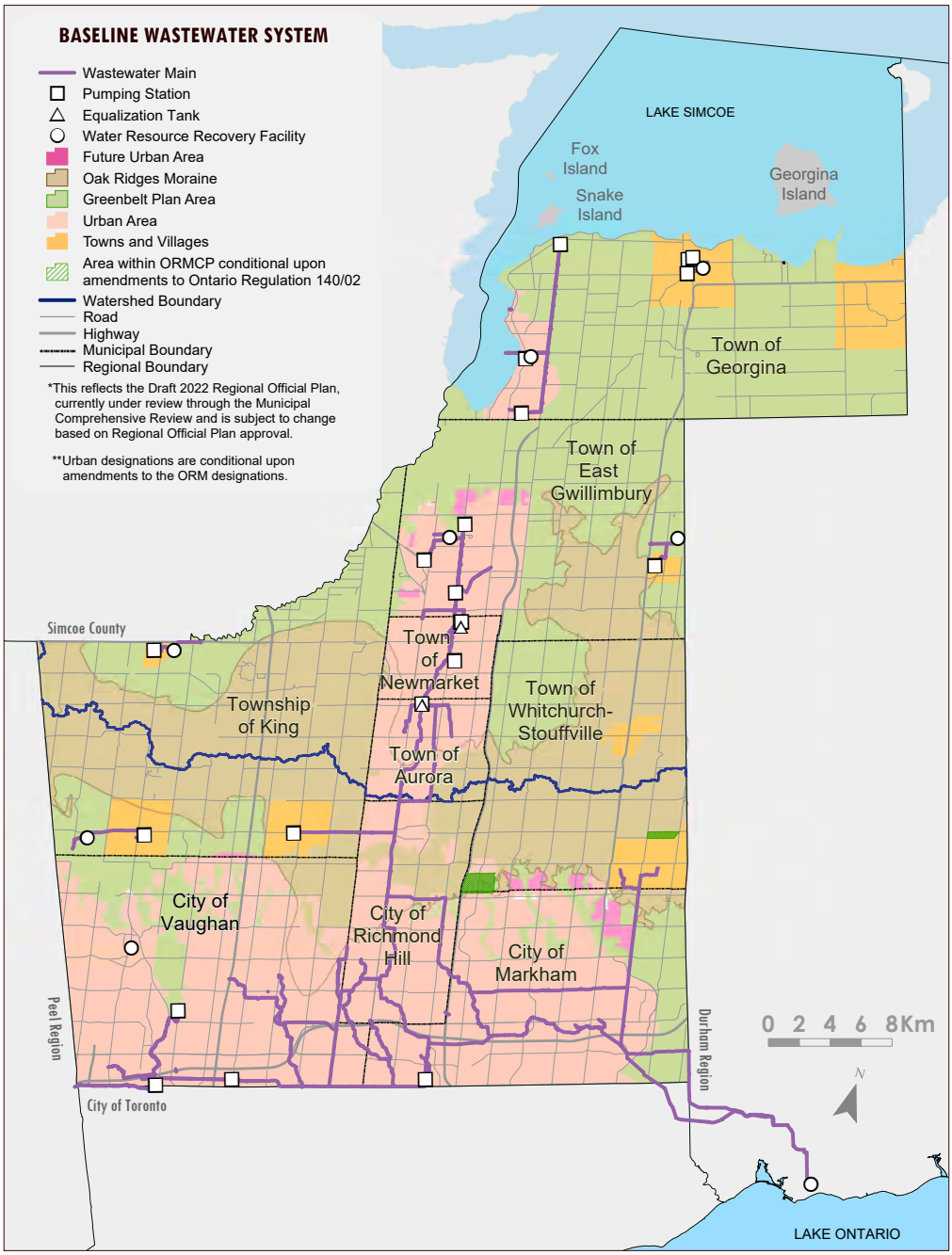


3.2 CURRENT SYSTEMS

The baseline wastewater infrastructure systems are shown in Figure 3.5.

A detailed explanation of York Region's existing wastewater infrastructure systems can be found in Appendix A.2. Like our regional water systems, our wastewater infrastructure systems constantly evolve. This Master Plan update considers all infrastructure in place or under construction before January 2022 as the baseline in assessing the need for additional wastewater servicing.

Figure 3.5 York Region's Baseline Wastewater Infrastructure Systems in 2021



3.3 CURRENT PROGRAMS AND INITIATIVES SUPPORTING INFRASTRUCTURE

Going hand in hand with the 30-year plan for new infrastructure projects set out in this Master Plan is a suite of programs and initiatives, including those outlined below, to manage system demand, care for assets and address climate change. By reducing the burden on infrastructure, such programs lessen or defer the need to expand and add to systems, and are key to efficient and cost-effective servicing.

Water Conservation

Since York Region introduced the 1997 Long-Term Water Supply Master Plan and the Water for Tomorrow program, water conservation plans have been key to managing the demand for water. Over the past 23 years, an estimated 27 megalitres a day has been saved because of the Region's Water for Tomorrow and Long-Term Water Conservation Strategy programming, the latter introduced in 2011.

This work has translated into declining per capita residential consumption. Between 2016 and 2020, water consumption per capita averaged 194 litres a day for single-family households, down from 207 litres a day over the previous five-year period. This value excludes total system demand, which includes total consumption from all sectors, including non-revenue water. The Region's aspirational goal is to reduce residential consumption to an average of 150 litres by 2051. It is important to note that while this goal is valuable to discourage wasting water and to price services equitably, water and wastewater systems must be designed based not on average flows, but on the highest expected flows, as discussed in Section 4.2. York Region manages demand on water and wastewater systems through programs that encourage communities, residents and businesses to consider how much water they use, when they use it and how they dispose of it.

The Region's Long-Term Water Conservation Strategy and programs, updated in 2021, emphasize cost-effective opportunities to realize long-term water savings, as described further in Section 7.2. The updated strategy is available in Appendix C.1.

Inflow and Infiltration Reduction

Groundwater and water from rain or snow storm events can get into the sanitary sewer and treatment system through processes called inflow and infiltration.

The results can include sewage backups in basements, higher costs to treat wastewater because of the extra water and possible overflows at pumping stations or spills to the natural environment. The problem is expected to worsen because climate change is resulting in more frequent and severe rain, ice and snowstorms, and temperature fluctuations that can bring rapid snow melt.

Since 2011, York Region's Inflow and Infiltration Reduction Strategy has been integral to the Region's water demand management, saving more than 20 million litres of inflow and infiltration a day through partnerships and programs with local municipalities and the development industry. The 2021 update of the Inflow and Infiltration Reduction Strategy builds on these successes and aims to reduce inflow and infiltration by 40 million litres a day by 2031, double the current level of reduction. This will further optimize the wastewater system and improve system resiliency in the face of extreme weather, as described in Section 7.2. The updated strategy is available in Appendix C.2.

3.3 CURRENT PROGRAMS AND INITIATIVES SUPPORTING INFRASTRUCTURE

Asset Management

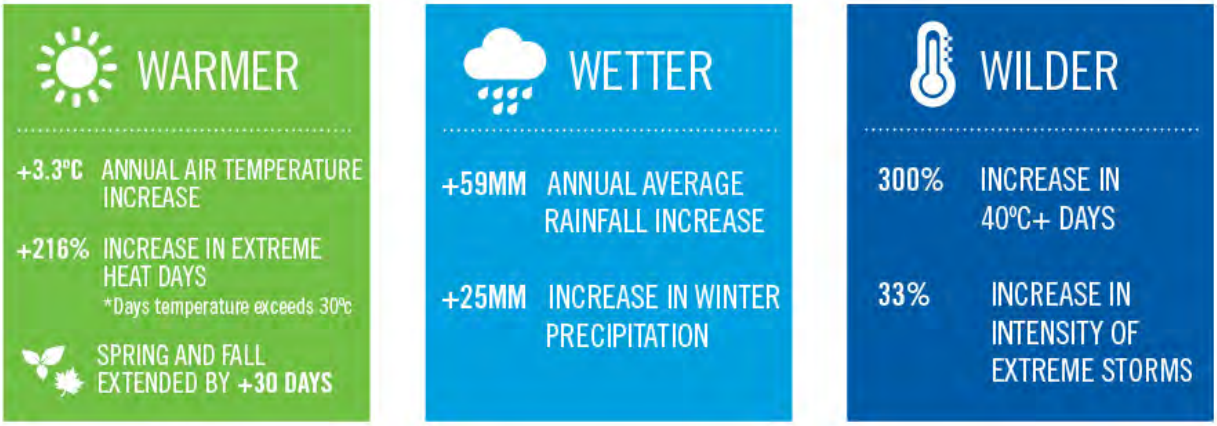
Asset management planning for municipal infrastructure is another provincial regulatory requirement under Ontario Regulation 588/17 influencing infrastructure planning. The Region developed a Corporate Asset Management Policy and related plan with the goal of minimizing costs of infrastructure over its entire life cycle, from construction through operation to decommissioning. The Corporate Asset Management Plan, adopted by Regional Council in 2018, considers inspection, repair, renewal, replacement and other needs over a 100-year time horizon. In recognition of the importance of managing and maintaining infrastructure assets to ensure sustainable service delivery, a comprehensive Water and Wastewater Asset Management Plan was developed in 2017 to provide input to the Corporate Asset Management Plan. Updates to both of these asset management plans are anticipated by 2024. To ensure financial sustainability, reserves are maintained through the water and wastewater user rates to recover the full costs of providing services, including day-to-day operating expenses and contributions to reserves to cover current and future rehabilitation and replacement costs. This principal of full cost recovery is a long-standing Regional commitment that is outlined in the Region's Water and Wastewater Financial Sustainability Plan.

To get the most value from investments and minimize disruption to communities, the Region looks for alignment with the timing of this renewal work with growth-related projects, wherever possible.

Climate Change and Energy Conservation

As outlined in York Region's draft Climate Change Action Plan, a changing climate is already bringing more extreme and less predictable weather (Figure 3.6), which puts additional pressure on infrastructure.

Figure 3.6 Predicted Climate Trends for York Region by 2050



3.3 CURRENT PROGRAMS AND INITIATIVES SUPPORTING INFRASTRUCTURE

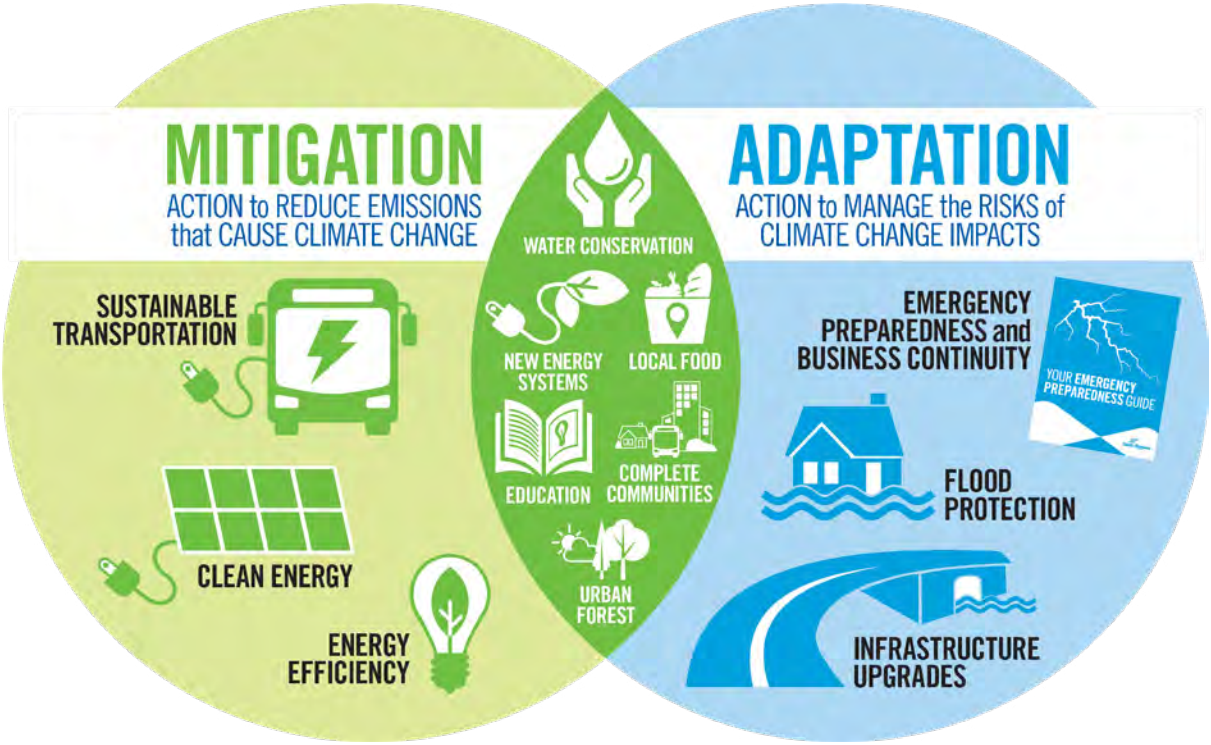
Addressing climate change calls for two approaches: mitigation and adaptation. Mitigation refers to reducing greenhouse gas (GHG) emissions to slow human-induced global warming. Adaptation refers to taking action to reduce negative impacts associated with existing and future climate change. Examples of mitigation and adaption actions are illustrated in Figure 3.7.

The Region is committed to mitigating impacts of climate change with a goal of achieving net-zero GHG emissions by 2050. York Region's Energy Conservation and Demand Management Plan lays out programs and projects to reduce energy use and GHG emissions associated with the delivery of Regional services. The plan is updated every five years as required under the *Electricity Act, 1998*. The last update, completed in 2019, features short, medium and long-term GHG reduction targets to 2051.

The main use of energy in water and wastewater systems is for pumping and wastewater aeration. Energy use can be reduced by operating more efficiently and encouraging water conservation. In line with the Energy Conservation and Demand Management Plan, potential GHG emissions were considered in selecting a preferred strategy, as described in Section 5, Table 5.2: Results of Evaluating Two Alternative Water Servicing Strategies.

Even with substantial mitigation efforts, York Region will continue to feel climate change impacts, and needs to adapt to these and take action to reduce its negative impacts. As the plan is implemented, making sure assets are resilient in the face of expected higher temperatures and wetter/drier extremes may call for updating design requirements.

Figure 3.7 Examples of Mitigation and Adaptation Actions



3.4 USING THE ONE WATER APPROACH

3.4 USING THE ONE WATER APPROACH

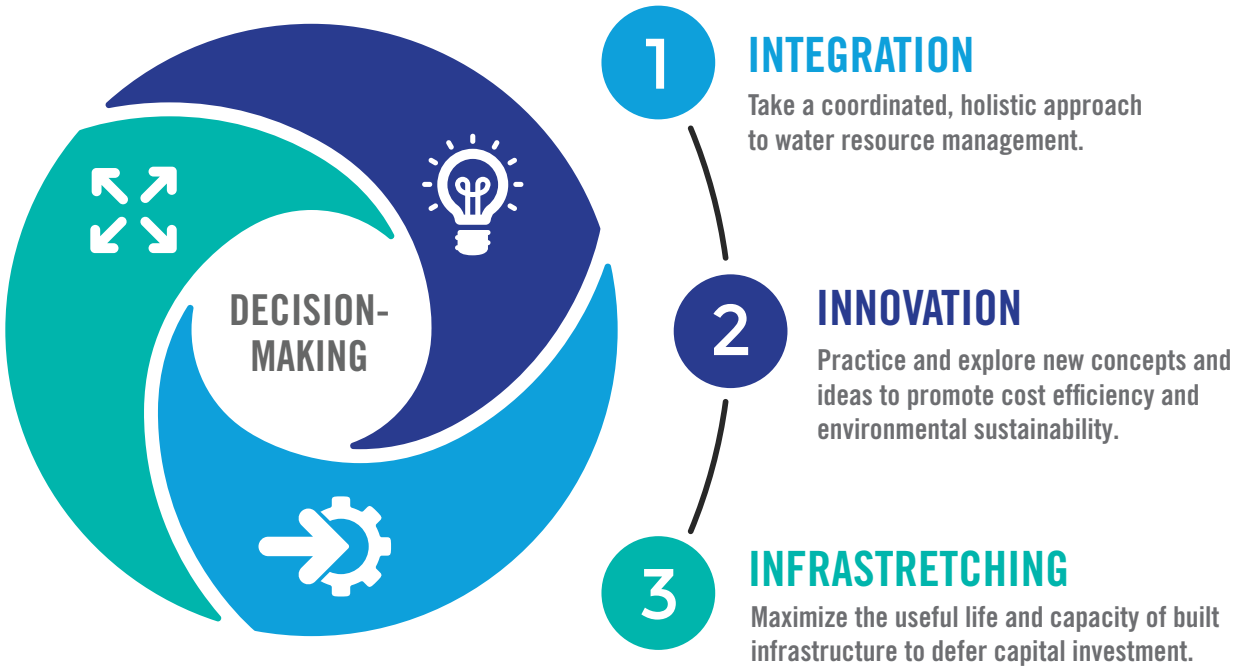
An important purpose of this Master Plan update is ensuring long-term sustainability of water and wastewater systems, following the direction of York Regional Council at the time of the 2016 update.

The Region is increasingly using an integrated One Water approach to work towards greater sustainability. Adopted by utilities around the world, One Water recognizes that all sources of water – drinking water, wastewater, recycled water, rainwater, stormwater and more – are part of a finite global resource. By leveraging previously untapped sources of water and natural instead of built solutions, One Water benefits communities and the environment while costing less than traditional approaches.

Recognizing municipal water systems as part of the larger water cycle in the natural world aligns with the circular economy concept that focuses on conserving, reusing and repurposing resources, not just extracting, using and disposing of them.

In York Region, the three guiding principles of One Water are integrate, innovate and 'infrastretch' as defined in Figure 3.8 below.

Figure 3.8 One Water Guiding Principles



3.4 USING THE ONE WATER APPROACH

Integrate

- One Water recognizes all forms of water are ultimately connected in a complex, living system
- To better manage and protect that living system, people must work together to share and connect their plans, practices, knowledge and information
- Integrating also means working together within the Region to create a collaborative One Water culture by adopting whole systems thinking, joining up plans and practices, and building relationships with entities throughout and even beyond the Region

Innovate

- Innovative solutions to complex problems are needed to enhance systems and services by better matching water sources and water uses; innovation can be a new idea, product or new way of doing things that achieves more with the same or fewer resources
- One Water should inspire and support innovative approaches that add value to water services for the benefit of residents, businesses and the environment

Infrastretch

- The One Water approach is critical to making infrastructure more resilient, reliable and cost effective
- Infrastretching is a term used by York Region which means maximizing the useful capacity and useful life of built infrastructure to minimize and/or defer capital investment; this principle focuses on the physical water and wastewater assets as well as on supportive green infrastructure

Water Reuse Research Demonstration Project

York Region continues to explore new opportunities to expand its One Water approach through research and innovation.

In 2020, the Region completed the award-winning Water Reuse Research Demonstration Project, which involved reusing treated wastewater effluent for irrigation at a sod farm. The project received the Ontario Water Works Association (OWWA) 2020 Water Efficiency Award.

The demonstration project identified some limitations in applying reused water, including salt content from water softeners used in the area. York Region is now researching potential non-agriculture applications, for example, street tree irrigation or other commercial or industrial uses by nearby businesses. Through an economic feasibility study in 2022, York Region hopes to identify businesses that can use reused water from wastewater or dewatering sites.

3.4 USING THE ONE WATER APPROACH

Natural Infrastructure to Mitigate Hazards of Changing Climate

Impacts of climate change are particularly magnified for people living in urban areas, where urban heat island effect will increase temperatures on average 1 to 3 degrees Celsius, and in extreme cases 12 degrees Celsius compared to surrounding rural areas. Heat waves have been identified as the primary weather-related disaster causing death in the world.

To help mitigate the hazards of extreme temperatures and flooding, York Region, with funding provided through the Federal Disaster Mitigation and Adaptation Fund, is adding more than 400,000 trees, seedlings and shrubs in urban areas.

In the face of climate change, an investment in natural infrastructure is a sound, cost-effective investment for the long term, with benefits that increase over time.

Our One Water approach is most effective and fully realized when all three of these principles are brought together to solve complex problems facing water services and communities.

One Water goes far beyond the Region's own actions. Just as the natural water cycle operates at different scales, from small ponds and creeks to vast oceans, One Water ideas and initiatives can take place at the household, business, community or watershed level.

Big Data Analytics and Machine Learning for Improved Wastewater System Response and Forecasting

York Region aims to enhance wastewater system resiliency by using a model powered by machine learning that can quickly and accurately predict the sanitary sewer system's response to rainfall.

The model is based on real-time data collected from over 350 monitoring locations. It will help inform smarter operational decisions and improve the design and management of infrastructure with better confidence and greater cost effectiveness.

4.0 OUTLOOK

4.1 UPDATE TO GROWTH PLAN FORECASTS AND EXPECTED INTENSIFICATION

4.1 UPDATE TO GROWTH PLAN FORECASTS AND EXPECTED INTENSIFICATION

This updated Master Plan refines the long-term servicing strategy that was outlined in 2016. The refinements largely reflect revised planning projections to 2051 developed through the Municipal Comprehensive Review, which informed the updated Regional Official Plan.

These planning projections are based on 2020 Ontario government updates to population and employment forecasts in A Place to Grow: Growth Plan for the Greater Golden Horseshoe. Provincial direction is outlined in Section 2.6.

In addition to updating forecasts in 2020, the province extended the forecast period by 10 years, from 2041 to 2051. Overall, significant growth is expected across York Region by 2051, as shown in Figure 4.1. This represents the addition of roughly 800,000 people and 345,000 jobs between 2021 and 2051, the greatest percentage growth of any Greater Toronto and Hamilton Area municipality.

Figure 4.1 Population and Employment Growth Forecast in York Region through the Provincial Growth Plan

4.1 UPDATE TO GROWTH PLAN FORECASTS AND EXPECTED INTENSIFICATION

The province requires municipalities to identify and plan for infrastructure needed to support its growth forecasts. York Region and other regional municipalities, in coordination with local municipal planners, distribute provincial projections to the local level.

Updated figures for York Region, taken from the Municipal Comprehensive Review, are shown in Table 4.1 and Figure 4.2 below.

In southern York Region communities, urban boundaries will expand considerably in the cities of Markham and Vaughan. Areas of high intensification are also planned, with greater density of residents and jobs than was expected in 2016.

Table 4.1 Distribution of Population and Employment in York Region to 2051*

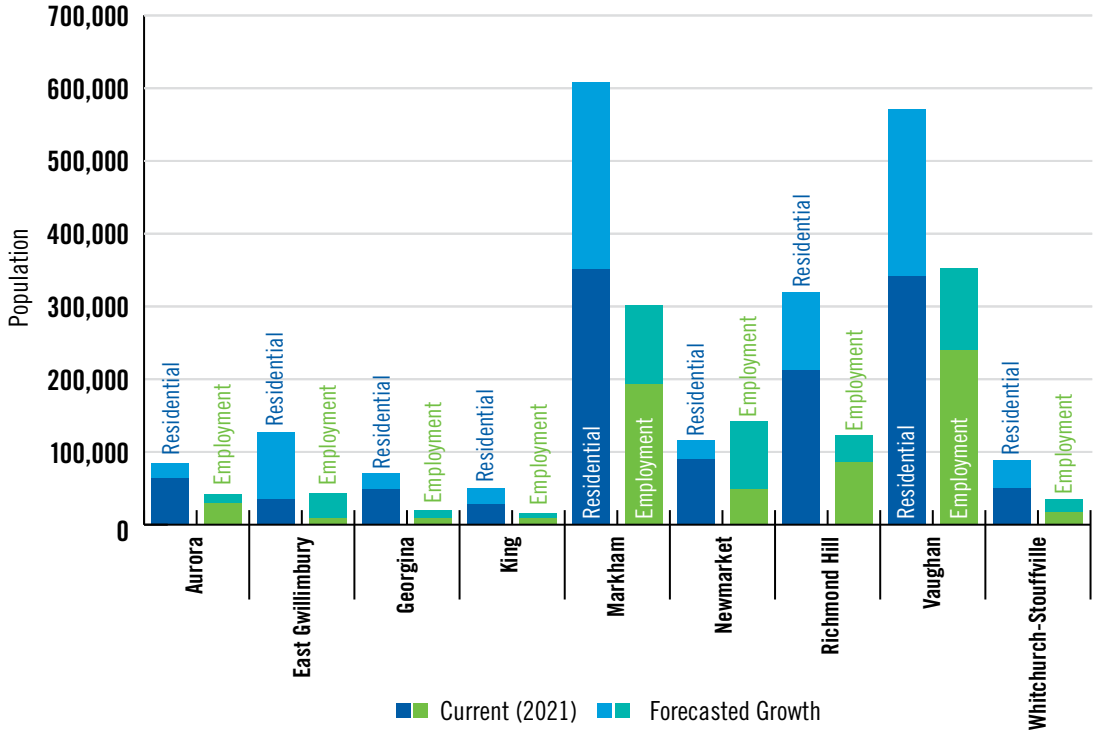
Local Municipality	Population	Employment
Aurora	84,700	41,300
East Gwillimbury	127,600	43,700
Georgina	70,100	20,700
King	50,100	16,400
Markham	608,800	301,700
Newmarket	115,900	58,500
Richmond Hill	319,800	122,800
Vaughan	570,600	351,600
Whitchurch-Stouffville	88,200	34,500
York Region	**2,035,800**	**991,200**

**This reflects the Draft 2022 Regional Official Plan and is subject to change based on Regional Official Plan approval.*

Major growth is also forecast in the north, particularly in the Town of East Gwillimbury, where significant new land will be brought into the urban boundary. Moderately higher growth than set out in 2016 is planned in the towns of Aurora and Newmarket.

4.1 UPDATE TO GROWTH PLAN FORECASTS AND EXPECTED INTENSIFICATION

Figure 4.2 Where New Population and Employment will go by 2051*



**This reflects the Draft 2022 Regional Official Plan and is subject to change based on Regional Official Plan approval.*

On October 21, 2021, York Regional Council approved a growth scenario for the 2022 Regional Official Plan update. This scenario includes 50% intensification annually to 2041 and 55% annually from 2041 to 2051. Four motions were approved with respect to growth and urban expansion in the City of Markham, Township of King and the towns of East Gwillimbury and Whitchurch-Stouffville. Section 6 and Appendix A.7 further discuss how water and wastewater servicing has been considered for each motion.

As well as providing the Regional forecast, the province sets out minimum intensification and density targets through A Place to Grow. The emphasis is on compact growth that is ideally supported by transit.

Transit has become a more important consideration with extension of the subway line from the City of Toronto into York Region. A link to Vaughan Metropolitan Centre was completed in 2017, triggering major high-intensity development in that area. More recently, the provincial and federal governments announced their support for the Yonge North Subway Extension Project, extending the Yonge line to the Langstaff Gateway area near Highway 7 and Yonge Street in Richmond Hill, which is a Regional priority.

The Region has also introduced a new framework in the Regional Official Plan for major transit station areas, which aims to support the development of transit-supportive communities around higher order transit stations. Over 70 major transit station areas have been identified across the Region, supported by a comprehensive set of policies, mapping and density targets to help guide local municipalities on planning for major transit station areas.

4.2 WATER AND WASTEWATER FLOW PROJECTIONS

4.2 WATER AND WASTEWATER FLOW PROJECTIONS

Projections of expected water and wastewater flows are a key input to planning future servicing.

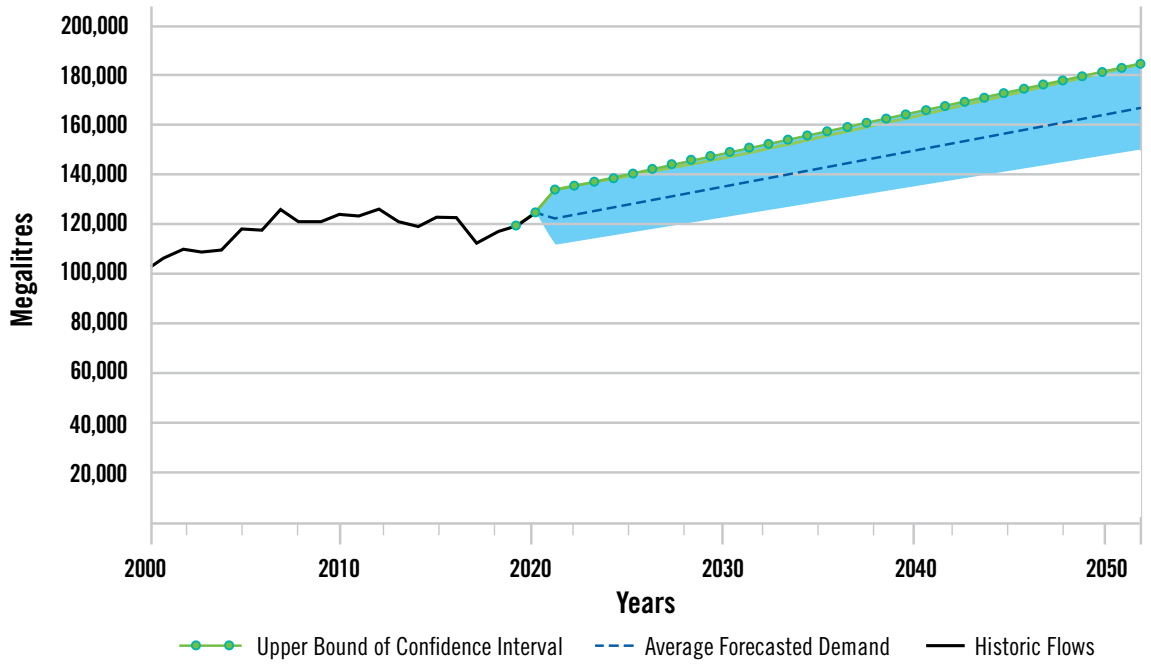
Forecast Water Flows

The model used by the Region to forecast annual water demand was first developed in 2015 as part of a water and wastewater user rate study. Since then, it has been regularly monitored and was recently reviewed for the 2021 update to the user rate study and this Master Plan.

The model was developed by analyzing how demand for water in York Region is affected by population growth, price changes and average summer weather. Generally, demand goes up as population grows, although this is offset somewhat by declining per capita water consumption. Price increases also tend to moderate consumption increases. Summer weather that is drier and/or hotter than average boosts consumption, while cool, wet weather reduces it.

For infrastructure master planning, the forecast model uses the population forecasts in the Municipal Comprehensive Review, water prices as set out in the 2021 user rate study and average summer temperatures in York Region. The updated projection to 2051 is shown in the graph below:

Figure 4.3 Forecast Annual Regional Water Demand to 2051



The light blue shaded band shows the 95% confidence interval above and below the average. Statistically, actual demand can be expected to fall within this band 95% of the time. This is a reminder that all forecasts are subject to uncertainty.

4.2 WATER AND WASTEWATER FLOW PROJECTIONS

For greater certainty that adequate servicing will be in place when needed, and in line with previous master plans, the Region used the upper bound of the projection in Figure 4.3 – that is, the highest predicted demand within the 95% confidence interval — as the starting point for planning.

This gave a forecast for total water demand across the Region. Table 4.2 shows the design consumption rates for residential and employment sectors. The table shows that per person daily water consumption in litres per capita per day (Lpcd), whether at home or in a workplace, is expected to decrease over time because of water conservation efforts. These rates underpinned the analysis of future water needs.

Table 4.2 Residential and Employment Water Consumption Design Rates to 2051

Design Rate	Year					
	2021	2026	2031	2036	2041	2051
Residential (Lpcd)	221	214	207	200	195	195
Employment (Lpcd)	161	159	158	155	151	151

While these design rates are useful in determining general water needs, water consumption varies from day to day and can increase sharply during the summer, especially during a long spell of hot, dry weather. For this reason, design of water infrastructure inflates average demand by a "peaking factor" to consider consumption expected on highest demand day of the year. Other localized factors affecting water demand, such as proportion of residential to employment areas, are also factored into analysis of future needs in different areas.

Appendix A.4 provides more information on water demand forecasting and Appendix A.3 outlines technical design criteria. The Region monitors actual flows on an ongoing basis and regularly reviews design rates, updating them as needed as part of master plan updates – typically on a five-year cycle.

Considering Long-term Impacts of Working From Home on Water Demand Forecasting

Working from home during the pandemic shifted the usual consumption pattern between industrial/commercial/institutional (ICI) and residential with the residential share increasing and the ICI share dropping as businesses were closed and many residents began working from home. Despite this change in relative use by these sectors there was no discernible impact on total Regional water use. Impacts of any lasting changes in consumption patterns due to the pandemic will continue to be monitored and considered in future modelling.

4.3 FISCAL AND LAND USE PLANNING IMPLICATIONS

Wastewater Flow Projection

In dry weather, flows collected in the wastewater system correlate well with the amount of drinking water consumed.

Design of wastewater systems must consider "wet weather flow" conditions because some water inevitably enters the sanitary sewer system as a result of rainfall or snowmelt. This drives peak flows that the system must accommodate. The Region sizes its wastewater system to handle flows that would result from a 25-year storm event – a storm of such size and intensity that it would typically happen only once every 25 years.

For this Master Plan update, the Region reviewed its 25-year design storm to consider the latest measured flow data as well as the potential for climate change to result in more extreme weather events. This review found that the current design storm continues to be valid.

Appendix A.3 and A.4 provide more information on technical design criteria and wastewater flow forecasting respectively.

4.3 FISCAL AND LAND USE PLANNING IMPLICATIONS

The Master Plan is guided by the Region's capacity to pay for new infrastructure. In particular, it needs to consider the impact of providing service to more people and more jobs in the Region, especially in areas of higher growth and intensification.

Growth-related infrastructure is primarily funded by development charges levied on new development. The provincial *Development Charges Act, 1997* governs development charges. As required by the Act, municipalities set out development charges in a bylaw that is updated at least every five years. Master plans and the annual budget inform the development of the development charge background study and bylaw. The Region's Development Charges Bylaw is being updated, with the revised bylaw to be in place by June 2022.

Infrastructure is designed to achieve economies of scale and is built before growth happens and development charges are collected. Debt is needed to bridge the gap between when infrastructure investments are made and when costs are recovered through development charges, but this approach must be used judiciously to avoid unsustainable debt levels and manage risk associated with timing of collections.

In recent years, the Region has experienced lower than forecast development and, as a result, lower than expected development charge collections. The lower development charge collections in turn increase the Region's need to issue debt to bridge the timing between expenditure and development charge collections. As well, in some cases, infrastructure investments have been made in areas where growth has not happened as expected. Rising costs to deliver capital projects and delays in receiving approvals also contributed to increasing debt pressure.

4.3 FISCAL AND LAND USE PLANNING IMPLICATIONS

The Regional Fiscal Strategy, which aims to strike a balance between current and long-term financial needs, is addressing these impacts. The strategy achieves balance by carefully managing the capital plan, building reserves for future needs and limiting the use of development-charge-supported debt. Greater accuracy in forecasting growth, supported by continual monitoring and adjustment in plans as needed, also helps the Region provide the right service at the right time.

Through the Municipal Comprehensive Review and updates to the master plans, two key goals were to distribute local municipal growth to better leverage existing infrastructure systems and more tightly align the pacing of new capital projects with actual growth. These goals promote financial sustainability and were in line with principles endorsed by York Regional Council in June 2019. They are key to creating fiscal room for the next generation of infrastructure projects, including the Region's share of the Yonge North Subway Extension. Phasing growth is important to ensure that communities are developed as complete communities, that residents will have access to a wide range of services and amenities within the same community (such as schools, parks, libraries, transit and jobs) in a timely manner. Phasing new communities is further outlined in chapter 4 of the Draft Regional Official Plan in the "Phasing in New Community Areas" policies.

Major changes in planning can affect servicing plans, as they may require infrastructure to be upsized, projects to be advanced and/or new projects added. Section 7.1 provides more details on how the Region takes an adaptive approach to implementation to accommodate such changes.

5.0 OPTIONS FOR SERVICING GROWTH

5.1 ARRIVING AT A PREFERRED STRATEGY FOR SERVICING

5.1 ARRIVING AT A PREFERRED STRATEGY FOR SERVICING

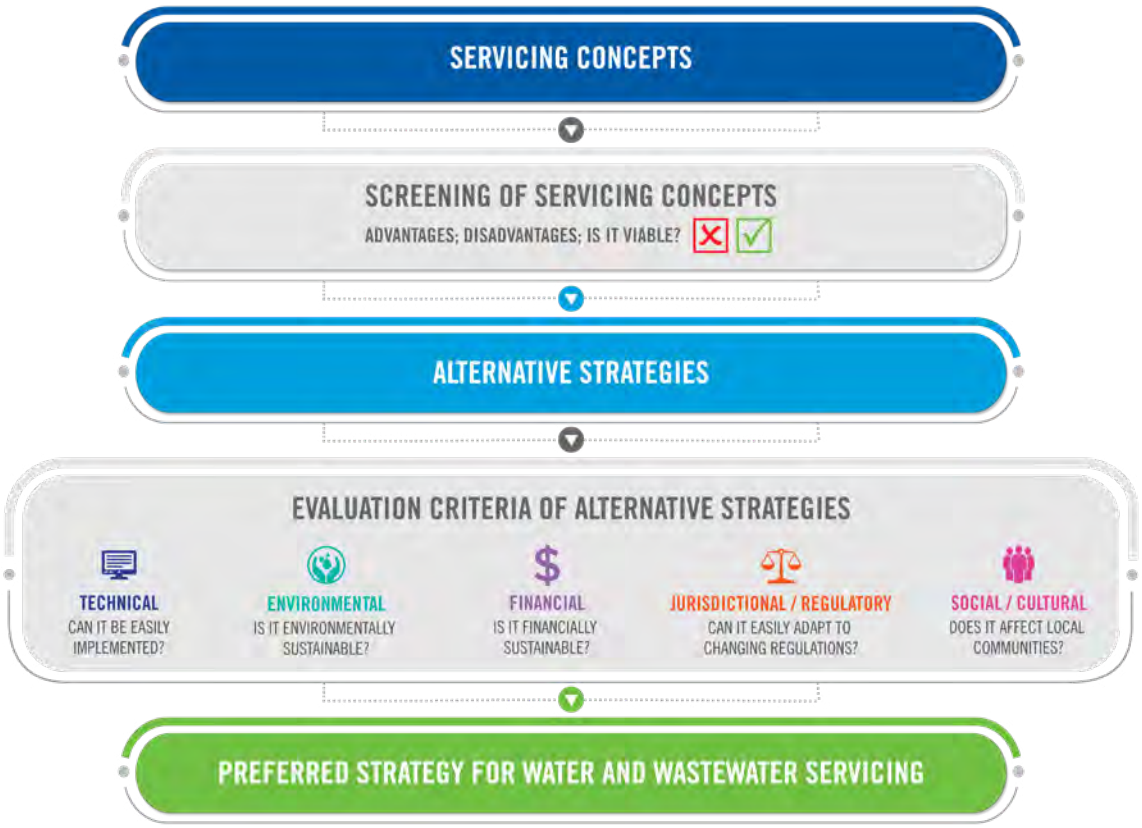
The Municipal Engineers Association framework for master planning considers water and wastewater servicing needs in the context of the whole servicing system.

This Master Plan update identified a preferred strategy for servicing through a two-stage process:

1. Screening of servicing concepts, which are various techniques or tools available to the Region that could be used independently or in combination to address servicing needs at a conceptual level
2. Developing and evaluating alternative strategies; these evolve from the servicing concepts to yield comprehensive and feasible approaches to address water and wastewater servicing needs

The diagram in Figure 5.1 shows the process:

Figure 5.1 Identifying a Preferred Strategy



The starting point for the review was the preferred strategy identified in the 2016 Master Plan update and subsequent studies and analyses.

5.2 THE 2016 DIRECTION TO MEET GROWTH NEEDS

5.2 THE 2016 DIRECTION TO MEET GROWTH NEEDS

The preferred strategy from the previous Master Plan update is referred to as the 2016 Servicing Strategy. It planned for future growth in the Region to be serviced largely by leveraging and expanding existing water and wastewater systems. Most drinking water would continue to come from Lake Ontario, and most wastewater would be returned to that watershed for treatment.

Key elements of the 2016 Servicing Strategy are:

- Introduce water supply from Lake Simcoe to supplement the current Lake Ontario and groundwater supply in the Town of East Gwillimbury and parts of the Town of Newmarket, and return wastewater flows to Lake Simcoe via the proposed Water Reclamation Centre and related infrastructure
- Continue to supply the cities of Markham, Vaughan and Richmond Hill and part of the Township of King with Lake Ontario water and return the related wastewater flows to Lake Ontario via the York Durham Sewage System
- Continue to supply the towns of Whitchurch-Stouffville and Aurora and most of the Town of Newmarket with blended groundwater and Lake Ontario water and return wastewater flows via the York Durham Sewage System. A portion of wastewater flows from the Town of Newmarket will be treated at the Water Reclamation Centre
- Continue to supply the Town of Georgina with Lake Simcoe water and return wastewater flows via the Keswick and Sutton water resource recovery facilities
- Continue to supply stand-alone communities with groundwater and return wastewater flows to individual water resource recovery facilities in those communities

Since 2016, the Region has been moving ahead on approved projects from the 2016 Servicing Strategy:

- York Regional Council approved adding a new pump to the Maple Pressure District 8 pumping station in the City of Vaughan
- The province approved the environmental assessment for additional water and wastewater service in northeast Vaughan
- The province approved the environmental assessment for the Duffin Creek Water Pollution Control Plant outfall strategy
- The Region commissioned a new twin forcemain (pumped sewer pipe) between the towns of Newmarket and Aurora in 2021, making the system more reliable and resilient

5.3 SCREENING THE CONCEPTS

The province permitted twinning of the forcemain from Upper York Sewage Solutions to go ahead owing to system security concerns, making it the only component of the proposed Upper York Sewage Solutions initiative yet approved. As a result of delays in approving the other components, York Regional Council authorized two interim projects in 2018 to provide capacity to meet growth needs in the towns of Aurora, East Gwillimbury and Newmarket:

- Upgrades to the Aurora sewage pumping station, completed in 2021
- A new pumping station near the intersection of Yonge Street and Henderson Drive in the Town of Aurora, on which construction started in summer 2021

The costs and disruptions related to these projects would have been avoided if the province had provided timely approval of Upper York Sewage Solutions, which remains valid to this day and has been awaiting a provincial decision on the environmental assessment since it was submitted in 2014.

The 2016 strategy also included continuing demand management programs like water conservation and inflow and infiltration reduction. These programs, which support environmental and financial sustainability, fit well with the One Water approach that the Region began integrating into its planning in 2016.

5.3 SCREENING THE CONCEPTS

At a high level, the following concepts for servicing new growth are theoretically available to York Region:

1. Do nothing
2. Limit growth
3. Expand and optimize the infrastructure system
4. Implement demand management measures

Optimize

Optimization, also called infrastretching, means maximizing the useful capacity and useful life of built infrastructure to minimize and/or defer capital investment. An example of this is managing the timing of flows in the wastewater pipe network to smooth peak flows at capacity bottlenecks. Optimization can allow for system expansion to be done strategically, as needed.

To screen these servicing concepts, the Region considered applicable regulations, technical and financial implications, and potential impact on the natural environment and communities at a high level to assess the advantages and disadvantages of each servicing concept. Table 5.1 describes each of the concepts as well as results of screening.

5.3 SCREENING THE CONCEPTS

Table 5.1 Screening of Water and Wastewater Servicing Concepts

Concepts	Description	Advantages	Disadvantages	Is this option viable?
Do nothing	A hypothetical concept that acknowledges growth will occur but provides no plan or action to ensure additional water and wastewater servicing needs are met.	• No costs for new or expanded infrastructure • No construction impacts	• Inadequate service to residents and businesses; potential for wastewater spills; inability to service future growth • Public health risk and inability to comply with *Safe Drinking Water Act, 2002 and Ontario Water Resources Act*	**No** This option would put York Region in direct violation of *Ontario Water Resources Act and Safe Drinking Water Act, 2002*.
Limit growth	A concept that limits growth to what existing water and wastewater systems can serve so as not to trigger new growth infrastructure needs.	• No costs for new or expanded infrastructure • No construction impacts	• Inadequate servicing to meet Regional Official Plan and A Place to Grow targets	**No** This option puts York Region in direct violation of *Places to Grow Act, 2005*.
Expand and optimize existing systems	Leverage existing infrastructure systems and expand strategically as needed.	• Enables long-term growth in line with *Places to Grow Act, 2005* • Ensures compliance with *Safe Drinking Water Act, 2002 and Ontario Water Resources Act* • Makes best use of existing plans and agreements (i.e. Region's capital plan, long-term agreements with Durham, Toronto and Peel)	• Capital costs may be significant • Construction impacts residents and businesses and potentially impacts the natural environment	**Yes** This option is an essential component of long-term servicing that meets the needs of York Region's communities now and in the future.
Demand management	Continue efforts to conserve water, reduce inflow and infiltration, and explore water reuse.	• Reduces new infrastructure needs, costs and impacts, including impacts on natural environment • Aligns with regulation and legislation	• Can't meet future servicing needs alone • Requires ongoing costs to deliver programs • Difficult to predict impacts on consumption over the long term	**Yes** This concept is a key to integrated water management and cost-efficient servicing.

5.4 DEVELOPING ALTERNATIVE STRATEGIES TO ADDRESS WATER AND WASTEWATER SERVICING NEEDS

This screening stage confirmed that high-level concepts for long-term servicing remain the same as in the 2016 Master Plan: expand and optimize the existing system and continue measures to manage demand.

Both concepts are needed because managing all future demand without new infrastructure would not be feasible and expanding the system without demand management would not make best use of financial or water resources.

5.4 DEVELOPING ALTERNATIVE STRATEGIES TO ADDRESS WATER AND WASTEWATER SERVICING NEEDS

The second stage of the process involved developing and evaluating high-level alternatives, called alternative strategies, based on these two concepts.

Alternative Strategies for Water Servicing

At the Regional scale, this update confirmed that future water supply capacity as outlined in the 2016 Master Plan is sufficient to service future growth, even though the planning horizon has been extended to 2051.

The 2016 update explored two alternative strategies and both were carried forward for review in this update. These strategies are referred to as the York Water System with Northern Connection and York Water System without Northern Connection strategies. They appear in Figures 5.2 and 5.3. Both strategies assume continued water conservation efforts. In addition, most long-term drinking water needs would be met through:

- Continued use and expansion of Lake Ontario water supply to service the cities of Markham, Richmond Hill and Vaughan, and King City in the Township of King
- Continued use of groundwater supply blended with Lake Ontario water to service the towns of Aurora, Newmarket, East Gwillimbury (the communities of Holland Landing, Sharon and Queensville) and community of Stouffville
- Continued use of groundwater supplies in communities serviced by stand-alone systems
- Continued use of Lake Simcoe water supply to service the Town of Georgina

These two alternative strategies differ only in how they would meet future demand for drinking water in the north end of the York Water System:

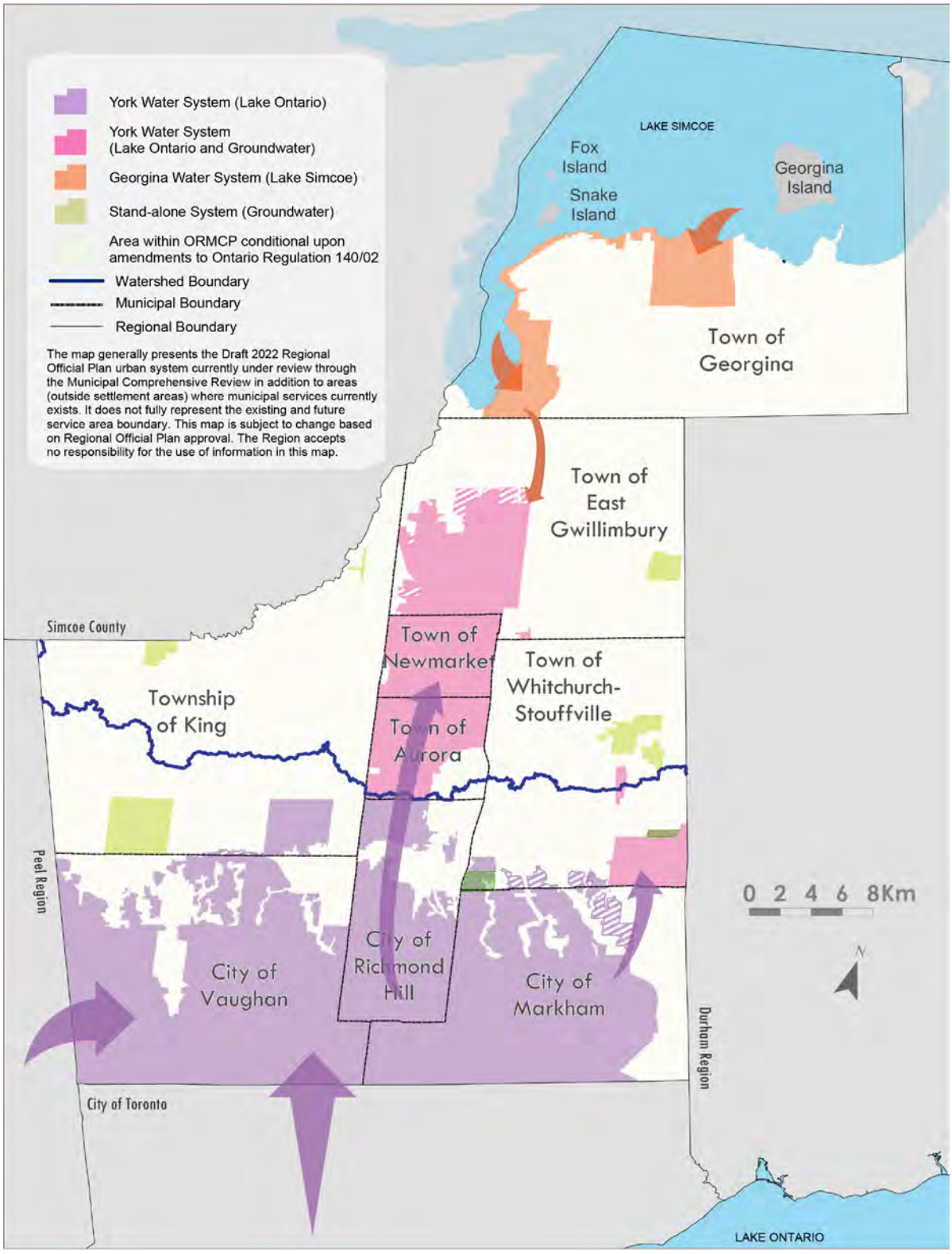
- **Strategy 1:** York Water System with Northern Connection, shown in Figure 5.2, proposes a future connection to bring water from Lake Simcoe to service a portion of the increased demand, including growth in the Town of East Gwillimbury
- **Strategy 2:** York Water System without Northern Connection, shown in Figure 5.3, supports future demand in the north wholly through a blended supply of groundwater and Lake Ontario water

As the Region's infrastructure systems are mature, the two alternative strategies for water servicing are very similar to each other and to existing arrangements. They can be considered alternative refinements to the existing system.

This update revisited these two alternative refinements and confirmed that the York Water System with Northern Connection Strategy, which was selected in 2016, remains preferred today. Benefits anticipated from the preferred strategy are discussed in Section 5.5.

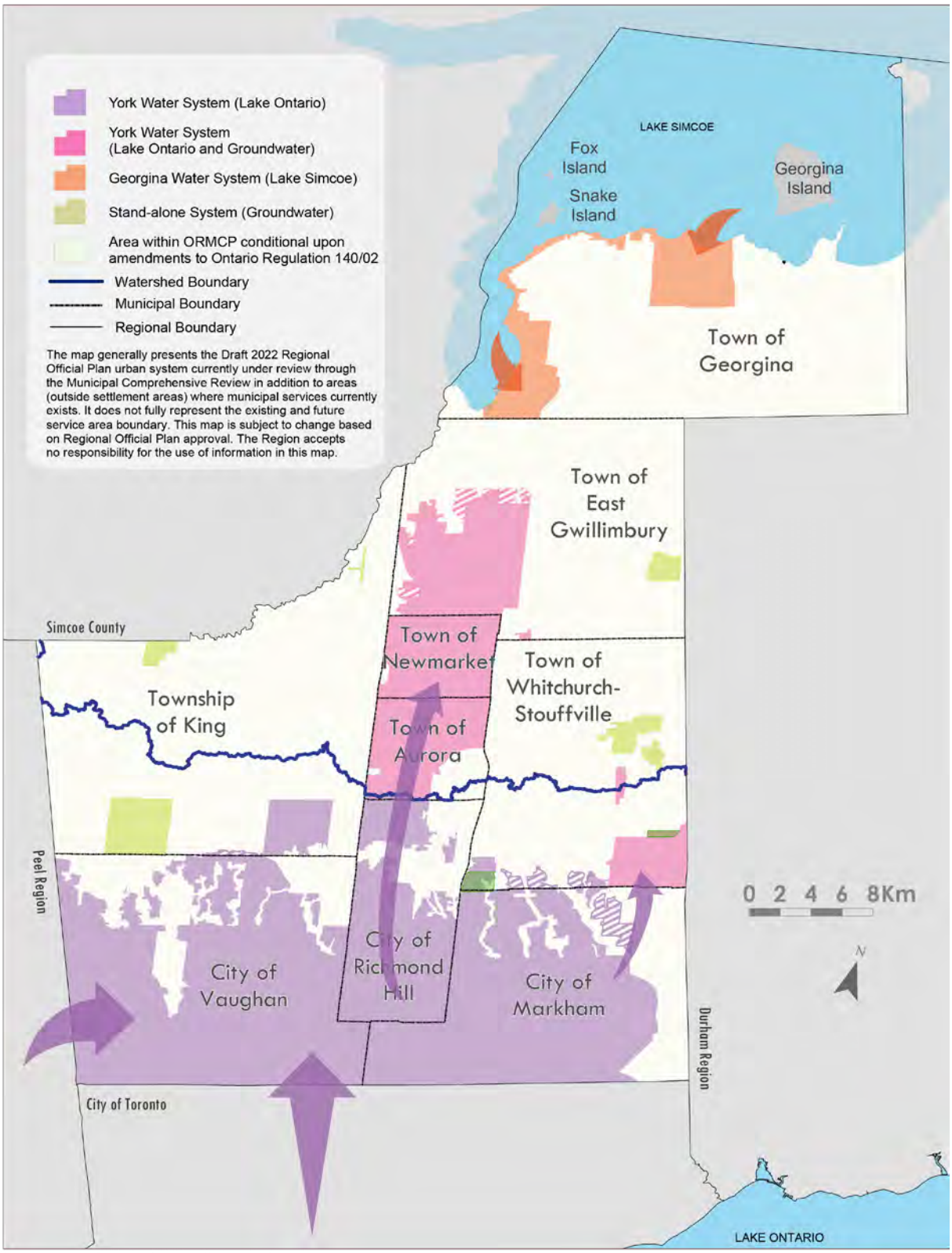
5.4 DEVELOPING ALTERNATIVE STRATEGIES TO ADDRESS WATER AND WASTEWATER SERVICING NEEDS

Figure 5.2 Strategy 1: York Water System with Northern Connection



5.4 DEVELOPING ALTERNATIVE STRATEGIES TO ADDRESS WATER AND WASTEWATER SERVICING NEEDS

Figure 5.3 Strategy 2: York Water System without Northern Connection



5.4 DEVELOPING ALTERNATIVE STRATEGIES TO ADDRESS WATER AND WASTEWATER SERVICING NEEDS

Preferred Strategy for Wastewater Servicing

As was the case in 2016, analysis of future wastewater needs showed that additional treatment and conveyance capacity will be needed to accommodate expected growth.

This update identified only one preferred strategy for wastewater servicing, which aligns with the direction set out in the 2016 Master Plan:

- Continued use of the York Durham Sewage System, including future expansion of the Duffin Creek Water Pollution Control Plant and the collector system, to service most of the Region's population
- Implementing the proposed Upper York Sewage Solutions by building and later expanding (subject to future environmental assessment(s)) a Water Reclamation Centre to service the Town of East Gwillimbury and a portion of the Town of Newmarket (this project also involves implementing a phosphorus offset program in the Lake Simcoe watershed)
- Continued use of the Peel Diversion System with increase in sewage flows from York up to agreed-upon limits to service areas in the City of Vaughan
- Continued use and future expansion of the Georgina Wastewater System to service the Town of Georgina
- Continued use and limited future expansion of stand-alone systems
- Continued inflow and infiltration initiatives to reduce burden on wastewater systems

This multi-faceted wastewater servicing strategy was the only one considered because:

- Future growth is expected to be spread throughout different sewersheds/wastewater systems, requiring increased capacity in several areas
- The advantages of Upper York Sewage Solutions were confirmed through extensive study and an individual environmental assessment

A key component of the preferred strategy is the Water Reclamation Centre proposed as part of Upper York Sewage Solutions. This initiative, which is still awaiting a provincial decision, is described in Section 2.6 above.

The Region has worked to build understanding and knowledge of the value of water reclamation, including completing a pilot project in which treated wastewater was used safely to irrigate non-food crops like sod, showing its value as a resource, not a waste product.

The protracted delay in approval of the Upper York Sewage Solutions individual environmental assessment continues to bring uncertainty to servicing plans and has put the Region's mandate under the Growth Plan for the Greater Golden Horseshoe in jeopardy. York Regional Council reaffirmed the Lake Simcoe solution as identified through the individual environmental assessment in January 2021.

Given the rigorous study this Upper York Sewage Solutions project has undergone, the time and money invested to date, the absence of a decision from the province and direction from York Regional Council, Upper York Sewage Solutions continues to be considered an essential part of the preferred strategy to meet growth needs of three York Region communities (East Gwillimbury, Newmarket and Aurora) located north of the watershed boundary.

5.5 EVALUATING ALTERNATIVE STRATEGIES

Major growth is expected elsewhere in the Region, particularly in the southern York Region communities, and this will require significant expansion of the York Durham Sewage System. The preferred strategy addresses this need as well.

5.5 EVALUATING ALTERNATIVE STRATEGIES

Two alternative strategies for water servicing were evaluated using several criteria, as outlined in Table 5.2 below, to determine the preferred strategy.

The evaluation for water servicing used the 2016 Master Plan assessment as a basis, including applying the same criteria, weighting and scoring. For each criterion, if one strategy was superior to the other, it received a score of 1 and the other received a score of 0. If both performed the same against the criterion, they both received a score of 1. A weighted score was then determined for each category of criteria, which included technical, environmental, financial, social and regulatory/jurisdictional considerations. The sum of the weighted criteria category scores yielded the total score for each alternative strategy.

This evaluation also incorporated the following new information:

- Updated flow projections from growth forecast to 2051
- Updated costs associated with each strategy
- High-level assessment of greenhouse gas emissions from each strategy

Table 5.2 summarizes the evaluation. Appendix A.5 provides more details, including the rationale for scoring of each criterion. The evaluation was completed at a high level aligned with a master plan process level of detail, with more in-depth analyses to be undertaken through project-specific environmental assessments.

As this Master Plan considers only one wastewater strategy to be feasible, no evaluation of wastewater alternatives was required.

Table 5.2 Results of Evaluating Two Alternative Water Servicing Strategies

Criteria category weighting	Evaluation criteria	Description of evaluation criteria	York Water System with Northern Connection	York Water System without Northern Connection
Technical 27%	Constructability	Volume and complexity of construction associated with strategy.	0	1
	Redundancy of supply/service	Improvement in redundancy of supply or service.	1	0
	Resilience to climate change	Ability of the strategy to reliably provide service under a changing climate.	1	1
	Water age	Impact on water age in the distribution system.	1	0
	Operations and maintenance	Requirement for additional and or new operations and maintenance resources. The complexity and maintainability of new assets.	1	1
	Energy efficiency and potential for GHGs	Energy intensity associated with the alternative in ekWh/ML.	1	0
	Total technical score		**5/6**	**3/6**
	Technical weighted score		**23/27**	**14/27**
Environmental 27%	Aquatic vegetation and wildlife	Potential impacts (from construction/ongoing operations) on local aquatic species/habitats, including locally significant or at-risk aquatic species.	0	1
	Terrestrial vegetation and wildlife	Potential impacts (from construction/ongoing operations) on local terrestrial species/habitats, designated areas, locally significant or at-risk species.	1	1
	Regional water balance	Intra-basin water balance of water transferred between Lake Ontario to Lake Huron basins. Based on average annual daily transfer in ML/d.	1	0
	Construction impacts on groundwater resources	Potential impact on groundwater quantity or quality during construction.	1	1
	Total environmental score		**3/4**	**3/4**
	Environmental weighted score		**20/27**	**20/27**
Financial 21%	Capital cost	Initial capital and commissioning costs to implement the strategy.	1	1
	Lifecycle cost	Lifecycle costs expected over a 100-year period.	1	1
	Total financial score		**2/2**	**2/2**
	Financial weighted score		**21/21**	**21/21**
Jurisdictional/ Regulatory 15%	Land requirements	Area of non-Regional land or length of easements required.	1	1
	Direct access to water supply	Improvement of direct access to water supply.	1	0
	Adaptability to changing regulation	Ability of strategy to adapt to anticipated changes in drinking water quality and wastewater effluent requirements.	1	1
	Total jurisdictional/regulatory score		**3/3**	**2/3**
	Jurisdictional/Regulatory weighted score		**15/15**	**10/15**
Social/Cultural 10%	Archaeological sites	Potential impact on registered/known archaeological features during construction or ongoing operations.	1	1
	Cultural/Heritage features	Potential impact on known cultural landscapes and built heritage features during construction or ongoing operations.	1	1
	Impacts during construction	Potential construction impacts due to noise, dust, odour or traffic.	1	1
	Long-term community impact	Long-term impact on local community and businesses, e.g. land use compatibility.	1	1
	Total social/cultural score		**4/4**	**4/4**
	Social/Cultural weighted score		**10/10**	**10/10**
Total score			**89/100**	**75/100**

5.5 EVALUATING ALTERNATIVE STRATEGIES

The updated evaluation confirmed that Strategy 1: York Water System with Northern Connection, which links Lake Simcoe to the north end of the York Water System, had the highest score and remains the preferred strategy for water servicing.

While the two alternative strategies ranked the same across several criteria, the York Water System with Northern Connection Strategy's technical and jurisdictional/regulatory advantages gave it the higher score. Looking in more detail at the scores in Table 5.2, the preferred strategy would:

- Reduce water age in parts of the Region, reducing potential water quality challenges
- Reduce energy consumption and emit fewer GHGs
- Improve water balance between the Lake Ontario and Lake Simcoe/Lake Huron watersheds, as explained in more detail below
- Improve the security of water supply by enabling flow between two water systems

Both alternative strategies for water servicing comply with the regional Great Lakes framework described in Section 2.6 that controls movement of water between Great Lakes drainage basins, including the limit set on the Region's transfer of water from Lake Ontario to the Lake Huron basin.

The advantage of the preferred strategy is that by serving some of the growth in the north with water sourced from the north, it relies less on water pumped from and returned to Lake Ontario. This reduces the volume of water transferred from one basin to another, while still supporting growth to 2051. While the cost to construct the alternative strategy is estimated to be lower, the difference is only 1%, which is negligible at this conceptual stage.

The preferred strategy (illustrated in Figure 5.4) would be implemented in tandem with the wastewater servicing strategy (illustrated in Figure 5.5).

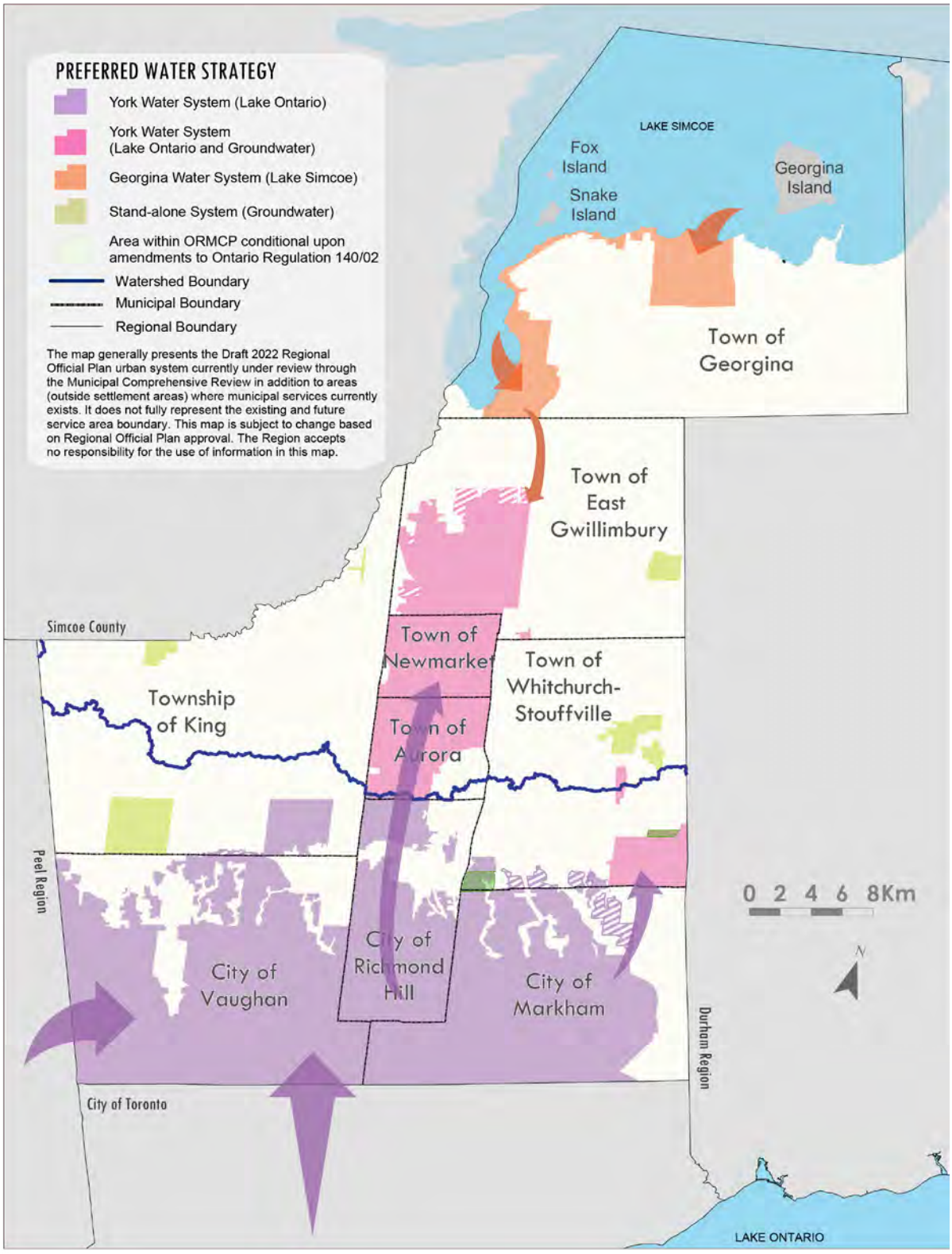
The combined water and wastewater strategy aligns with and advances principles of One Water because:

- The wastewater strategy's Water Reclamation Centre would apply state-of-the-art technology to turn used water from municipal systems into a safe, valuable resource instead of a waste product; the Region is interested in exploring future opportunities for water reuse in the future; the province does not currently have a water reuse framework in place; any future projects and initiatives for water reuse would be subject to additional approvals
- Wise decisions about design of water and wastewater infrastructure combined with programs to manage demand would infrastretch assets to prolong their life and reduce costs

In sum, the combination of Strategy 1: York Water System with Northern Connection and the preferred strategy for wastewater servicing represents a more holistic solution to address the needs of providing reliable, high-quality servicing and stewardship of watershed health.

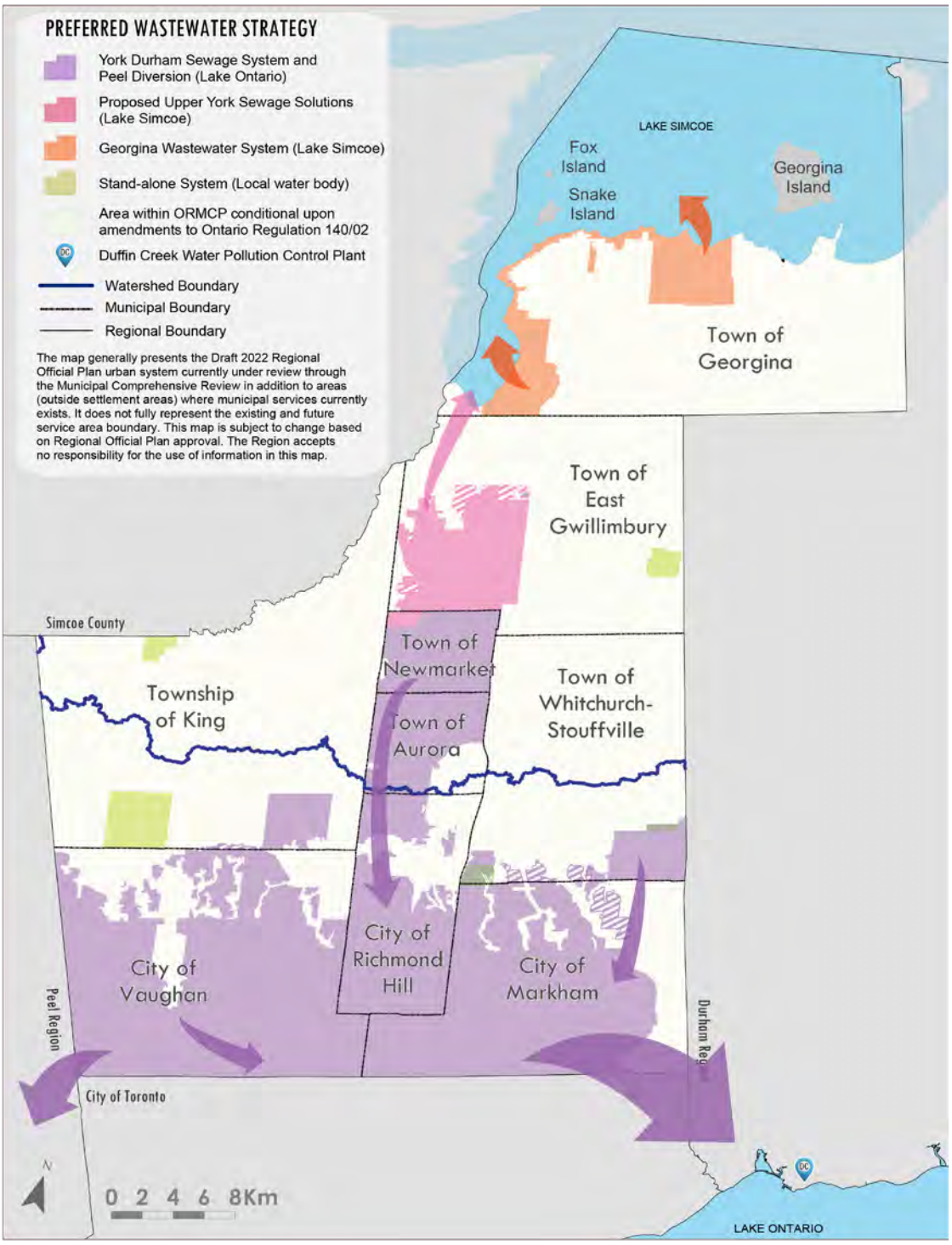
5.5 EVALUATING ALTERNATIVE STRATEGIES

Figure 5.4 Preferred Strategy for Water Servicing: York Water System with Northern Connection



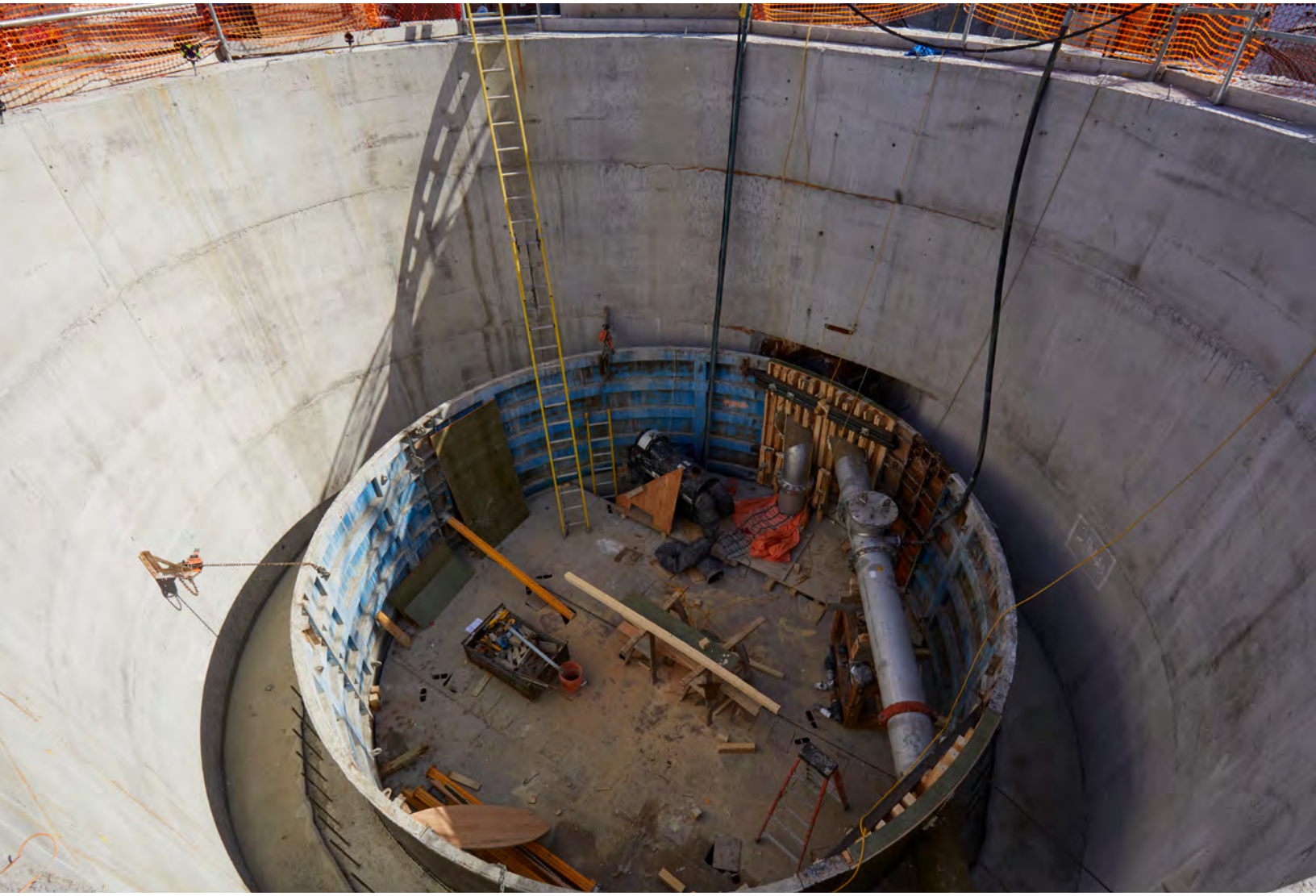
5.5 EVALUATING ALTERNATIVE STRATEGIES

Figure 5.5 Preferred Strategy for Wastewater Servicing



Section 6 describes the detailed infrastructure plan related to the high-level preferred strategies, while Section 7 discusses implementation.

6.0 THE INFRASTRUCTURE PLAN



6.0 THE INFRASTRUCTURE PLAN

THE INFRASTRUCTURE PLAN

Through the servicing strategy, the Water and Wastewater Master Plan provides the overall vision for how the Region will provide safe, reliable services to new growth over the long term. This long-term vision involves delivering projects that expand existing infrastructure and make systems more robust. This section outlines the infrastructure plan and identifies projects and costs to meet growth needs to 2051.

While the preferred water and wastewater servicing strategy is similar to the strategy identified in the 2016 Master Plan, there have been some changes. This update focused on refining details of the 2016 infrastructure plan to take into account the new 2051 planning horizon and updated Regional Official Plan. This resulted in some changes to expected infrastructure sizing, timing and costs. Refinements also considered how to reduce lifecycle costs and make the system overall more resilient.

Master plans identify the need for specific groups of projects to meet servicing needs and describe them at a high level to help plan for and guide future work. At this stage, however, projects are conceptual in nature. Details of specific solutions – including location, final size and choice of technology – are defined as specific projects are carried out, reflecting new information as it becomes available.

As in the 2016 Master Plan, this update identified upgrades and expansions to parts of the system to bring additional water supply to communities where local capacity would otherwise be constrained. Projects are planned and phased to address needs that vary across local municipalities in future years, as well as to meet overall Regional needs. For wastewater, upgrades and expansions of infrastructure will be needed to convey and treat wastewater flows from different catchment areas.

Table 6.1 highlights all the growth-related water and wastewater projects including phasing, cost and local municipality serviced. Section 6.7 provides details on the methodology used in calculating project costs. Figure 6.1 shows water-related infrastructure projects and expected phasing, while Figure 6.2 shows wastewater-related projects and phasing.

The following sections summarize the water and wastewater projects needed to support growth. As the Regional water and wastewater systems are designed to serve multiple municipalities, projects have been grouped accordingly.

Table 6.1 Growth-related Water and Wastewater Projects

MP ID	Project description	Estimated expenditures 2022-2051 (000's)	Planned implementation timeframe	Environmental Assessment (EA) Process	Municipality partially or fully serviced by this project								
					Town of Aurora	Town of East Gwillimbury	Town of Georgina	Township of King	City of Markham	Town of Newmarket	City of Richmond Hill	City of Vaughan	Town of Whitchurch-Stouffville
Cost-shared programs													
W1	**Toronto Water Supply - Cost-Shared Works** Continue implementation of cost-shared capital projects within the City of Toronto to permit gradual increase of water supply to York Region in accordance with current Servicing Agreement.	$ 77,800	Ongoing	Various	X	X		X	X	X	X	X	X
W2	**Peel Water Supply - Cost-Shared Works** Continue implementation of cost-shared capital projects within Region of Peel to permit gradual increase of water supply to York Region in accordance with current Servicing Agreement.	$ 16,160	Ongoing	Various	X	X		X		X	X	X	
WW1	**Peel System Cost-Shared Works** Continue implementation of cost-shared projects in the Region of Peel to allow diversion of York wastewater flows for treatment in Peel wastewater system in accordance with current Servicing Agreement.	$ 8,370	Ongoing	Various								X	
Water and wastewater treatment													
WW10	**Duffin Creek Water Pollution Control Plant Outfall Effluent Strategy** Optimize capacity of existing Duffin Creek Water Pollution Control Plant Outfall.	$ 12,340	2022-2031	Class EA completed 2019	X			X	X	X	X	X	X
WW11	**Duffin Creek Water Pollution Control Plant Stage 1 and 2 Chlorine Chamber Expansion** Construct a new chlorine contact chamber to increase the Duffin Creek Water Pollution Control Plant disinfection capacity.	$ 15,480	2022-2031	Schedule A	X			X	X	X	X	X	X
WW21	**Upper York Water Reclamation Centre** Construct a new Water Reclamation Centre in East Gwillimbury to accommodate growth and allow decommissioning of Holland Landing Lagoons as recommended in the Individual Class Environmental Assessment completed in 2014 (pending approval). This project will provide an overall benefit to the Lake Simcoe watershed through the integral phosphorus offsetting program component of Upper York Sewage Solutions.	$ 549,940	2022-2031	Individual EA completed 2014, pending approval	X	X				X			
WW19	**Holland Landing Lagoon Decommissioning** Decommission Holland Landing Lagoons following commissioning of the new Water Reclamation Centre.	$ 1,100	2022-2031	Schedule A+		X							
WW23	**Keswick Wastewater Servicing** Increase capacity of Keswick Water Resource Recovery Facility as recommended in the completed Class Environmental Assessment and implement growth related upgrades at Keswick Sewage Pumping Station.	$ 41,820	2022-2041	Class EA completed 2006			X						
WW13	**Nobleton Wastewater Servicing** Increase capacity of the Nobleton wastewater system to accommodate the population identified in the recently completed Class Environmental Assessment.	$ 21,970	2032-2041	Class EA completed 2021				X					

Table 6.1 Growth-related Water and Wastewater Projects (continued)

MP ID	Project description	Estimated expenditures 2022-2051 (000's)	Planned implementation timeframe	Environmental Assessment (EA) Process	Municipality partially or fully serviced by this project								
					Town of Aurora	Town of East Gwillimbury	Town of Georgina	Township of King	City of Markham	Town of Newmarket	City of Richmond Hill	City of Vaughan	Town of Whitchurch-Stouffville
Water and wastewater treatment (continued)													
W8	**Nobleton Water Servicing** Increase Nobleton well supply capacity in coordination with wastewater treatment expansion to accommodate the population identified in the recently completed Class Environmental Assessment.	$ 7,600	2032-2041	Class EA completed 2021				X					
W25	**Georgina Water System Upgrades** Expand Georgina Water Treatment Plant to its ultimate permitted capacity of 50 million litres per day and upgrade Georgina Water System disinfection system to allow integration with York Water System.	$ 21,810	2032-2041	Class EA completed 1998		X	X						
WW12	**Duffin Creek Water Pollution Control Plant Growth Expansions** Implement several upgrades to optimize and/or expand Duffin Creek Water Pollution Control Plant beyond the current capacity including a new outfall to accommodate growth in the York Durham System service area. Upgrades to be implemented in phases and are expected to be confirmed by future planning and EA studies.	$ 757,900	2032-2051	Schedule C	X			X	X	X	X	X	X
WW22	**Upper York Servicing Infrastructure Expansions 1 and 2** Expand the Water Reclamation Centre subject to a future Class Environmental Study to accommodate growth in East Gwillimbury and Newmarket.	$ 428,110	2032-2041 2042-2051	Schedule C		X				X			
WW24	**Sutton Wastewater Servicing** Expand Sutton Water Resource Recovery Facility to service growth in Sutton as recommended by the completed Class Environmental Assessment study and increase capacity of High Street and Woodriver Bend Sewage Pumping Stations.	$ 56,320	2032-2041	Class EA completed 2010			X						
Transmission, conveyance and pumping projects													
W4	**West Vaughan Water Servicing** Phase 1 - Improve pressure district interconnection in the Woodbridge service area prior to storage expansion. Phase 2- Increase storage capacity in Woodbridge and Kleinburg to accommodate growth in West Vaughan.	$ 25,020	2032-2041 2042-2051	Schedule A Schedule B								X	
W5	**York Peel Feedermain Upgrade** Install three pressure reducing valves along connection points to the York-Peel Feedermain to maintain acceptable pressures within Pressure District 6 distribution system as Peel supply increases to meet system demands.	$ 3,400	2022-2031	Schedule A	X	X		X		X	X	X	
W6	**Northeast Vaughan Water Servicing** Construct new Pressure District 8 and 9 pumping stations, two new Pressure District 8 elevated tanks and associated watermains to connect the Northeast Vaughan urban expansion area to the existing system as recommended by the completed Northeast Vaughan Class Environmental Assessment.	$ 100,040	2022-2031	Class EA completed 2019								X	

Table 6.1 Growth-related Water and Wastewater Projects (continued)

MP ID	Project description	Estimated expenditures 2022-2051 (000's)	Planned implementation timeframe	Environmental Assessment (EA) Process	Municipality partially or fully serviced by this project								
					Town of Aurora	Town of East Gwillimbury	Town of Georgina	Township of King	City of Markham	Town of Newmarket	City of Richmond Hill	City of Vaughan	Town of Whitchurch-Stouffville
Transmission, conveyance and pumping projects (continued)													
W10	**Richmond Hill Langstaff Gateway Provincial Urban Growth Centre Water Servicing** Install water system connections to service the proposed urban growth centre in Pressure District 6 as recommended by the completed Class Environmental Assessment.	$ 3,550	2022-2031	Class EA completed 2015					X		X		
W15	**Aurora East Booster Pumping Station Upgrades** Expand Aurora East Booster Pumping Station capacity including pipe upgrades and dedication of watermains to service growth in the east area of the north system.	$ 11,440	2022-2031	Schedule A	X					X			
W16	**Orchard Heights Reservoir Inlet Upgrade** Increase size of inlet and outlet piping at Orchard Heights Reservoir to facilitate increase of Lake Ontario water supply into communities in the north system as demand increases.	$ 1,550	2022-2031	Schedule A	X	X				X			
W17	**Eagle to Kirby Pumping Station Watermain** Install a new transmission main to connect Yonge Street watermain to the Glenway Reservoir and facilitate filling of the reservoir as demand increases due to growth in Newmarket Central and Newmarket West Pressure Districts.	$ 11,950	2022-2031	Schedule A+		X				X			
W18	**Newmarket West Water Servicing** Expand Kirby Pumping Station capacity and construct a new elevated tank and associated watermains to service growth in the Newmarket West Pressure District.	$ 28,570	2032-2041	Schedule B		X				X			
W20	**Green Lane Leslie Street Watermain** Phase 1 - Install a new transmission main along Green Lane to service growth and allow connection of Newmarket and East Gwillimbury delivery systems. Phase 2 - Install a new transmission main along Leslie Street to bring additional Lake Ontario supply as demand increases in the northeast parts of the system.	$ 30,990	2022-2031 2032-2041	Schedule A+		X				X			
W21	**East Gwillimbury Water Servicing** Phase 1 - Install a new transmission main to accommodate growth along Woodbine Avenue corridor. Phase 2 - Install a new transmission main Queensville Sideroad to provide additional supply to Holland Landing.	$ 42,820	2022-2031 2042-2051	Schedule A+		X							

Table 6.1 Growth-related Water and Wastewater Projects (continued)

MP ID	Project description	Estimated expenditures 2022-2051 (000's)	Planned implementation timeframe	Environmental Assessment (EA) Process	Municipality partially or fully serviced by this project								
					Town of Aurora	Town of East Gwillimbury	Town of Georgina	Township of King	City of Markham	Town of Newmarket	City of Richmond Hill	City of Vaughan	Town of Whitchurch-Stouffville
Transmission, conveyance and pumping projects (continued)													
WW2	**West Vaughan Sewage Servicing** Phase 1 - Increase capacity of Humber Sewage Pumping Station and construct a new gravity sewer to service growth in western parts of Vaughan as recommended by the completed Class Environmental Assessment study. Phase 2 - Construct a gravity sewer from the Kleinburg Water Resource Recovery Facility to connect to the north end of West Vaughan Sewage Servicing - Phase 1 to service growth in northwest Vaughan and Kleinburg. The projects allow decommissioning of the Kleinburg Water Resource Recovery Facility.	**$ 389,250**	**2022-2031 2032-2041**	**Class EA completed 2013**								X	
WW3	**Northeast Vaughan Wastewater Servicing** Construct new gravity sewer pipe to convey flows generated in northeast Vaughan area to the existing Langstaff Collector and York Durham Sewage System upgrades as recommended by the completed Class Environmental Assessment.	**$ 171,630**	**2022-2031**	**Class EA completed 2019**								X	
WW4	**York Durham Sewage System Conveyance Optimization** Install a flow gate at the Bathurst Collector to attenuate flows during wet weather conditions. Twin a segment of pipe conveying flows into the Newmarket Sewage Pumping Station to optimize existing wastewater conveyance capacity to service growth.	**$ 6,560**	**2022-2031**	**Schedule A**					X	X	X	X	
WW7	**Richmond Hill Langstaff Gateway Provincial Urban Growth Centre Wastewater Servicing** Construct gravity sewer to convey flows from Richmond Hill - Langstaff Gateway Regional Urban Centre to the Richmond Hill Collector as recommended by the completed Class Environmental Assessment.	**$ 15,180**	**2022-2031**	**Class EA completed 2015**					X		X		
WW9	**Primary Trunk Sewer** Construct a new trunk sewer from the terminus of the Southeast Collector at Valley Farm Road to the Duffin Creek Water Pollution Control Plant to service growth in the overall York Durham Sewage System service area.	**$ 228,600**	**2022-2031**	**Schedule C**	X			X	X	X	X	X	X
WW14	**King City Wastewater System Upgrades** Phase 1 - Optimize capacity of King City Sewage Pumping Station to accommodate interim growth in King City. Phase 2 - Expand King City wastewater pumping capacity and construct a new forcemain to accommodate long term growth in King City.	**$ 47,880**	**2022-2031 2042-2051**	**Schedule B**				X					
WW15	**Yonge Street Sewer Twinning** Increase conveyance capacity of Yonge Street Sewer to accommodate growth and allow rehabilitation of existing sewer.	**$ 65,930**	**2022-2031**	**Schedule B**	X			X		X	X		

Table 6.1 Growth-related Water and Wastewater Projects (continued)

MP ID	Project description	Estimated expenditures 2022-2051 (000's)	Planned implementation timeframe	Environmental Assessment (EA) Process	Municipality partially or fully serviced by this project								
					Town of Aurora	Town of East Gwillimbury	Town of Georgina	Township of King	City of Markham	Town of Newmarket	City of Richmond Hill	City of Vaughan	Town of Whitchurch-Stouffville
Transmission, conveyance and pumping projects (continued)													
WW16	**York Durham Sewage System Interim Servicing** Construct a new sewage pumping station and connecting sewer to the York Durham Sewage System as recommended by completed Class EA. This project allows growth before the Water Reclamation Centre is commissioned.	**$ 25,450**	**2022-2031**	**Class EA completed 2019**	X	X				X			
WW20	**East Queensville Sewage Pumping Station and Forcemain** Construct a new sewage pumping station just south of Queensville Sideroad and west of Highway 404 along with forcemain connecting to the West Queensville Sewage Pumping Station to service growth in parts of Queensville.	**$ 16,320**	**2022-2031**	**Schedule B**		X							
W3	**East Woodbridge Pumping Station Decommissioning** Decommission East Woodbridge Pumping Station, subject to outcome of a repurposing study.	**$ 1,260**	**2032-2041**	**Schedule A+**									
W7	**Vaughan Storage Expansion** Phase 1 - Construct first phase of a new reservoir to accommodate growth in Pressure District 6, a key centre through which supply is delivered to other pressure districts. Phase 2 - Construct a second phase of the new Vaughan reservoir and implement works to expand the Pressure District 9 Vaughan system including a new elevated tank and associated connecting watermain.	**$ 61,020**	**2032-2041** **2042-2051**	**Schedule B**								X	
W9	**North Richmond Hill Pumping Station Decommissioning** Decommission North Richmond Hill Pressure District 8 Pumping Station, subject to outcome of repurposing study.	**$ 1,470**	**2032-2041**	**Schedule A+**									
W11	**North Markham Water Servicing** Construct new facilities and associated watermains in Pressure District 7 and connect to the existing system. This project supports Markham urban expansion north of Elgin Mills Road and allows implementation of the York East Water Servicing project (W13). Phase 1 - Construct a new water pumping station with 37.5 million litres per day capacity and about 9 kilometres of connecting watermain to existing watermain at the intersection of Woodbine Avenue and Elgin Mills. Phase 2 - Construct a 20 million litre reservoir and about 4.6 kilometres of connecting watermain to the existing Elgin Mills watermain.	**$ 112,720**	**2032-2041**	**Schedule B**					X				
W12	**Stouffville Water Servicing** Expand Stouffville storage capacity to service new development. Project is expected to implemented in phases to maximize utilization of existing infrastructure. Phase 1 - Increase capacity of Stouffville Zone 2 booster pumping station before new storage facility is introduced. Phase 2 - Construct a new elevated tank and connecting watermain to provide long term storage capacity need in the service area.	**$ 15,330**	**2032-2051**	**Schedule B**									X

Table 6.1 Growth-related Water and Wastewater Projects (continued)

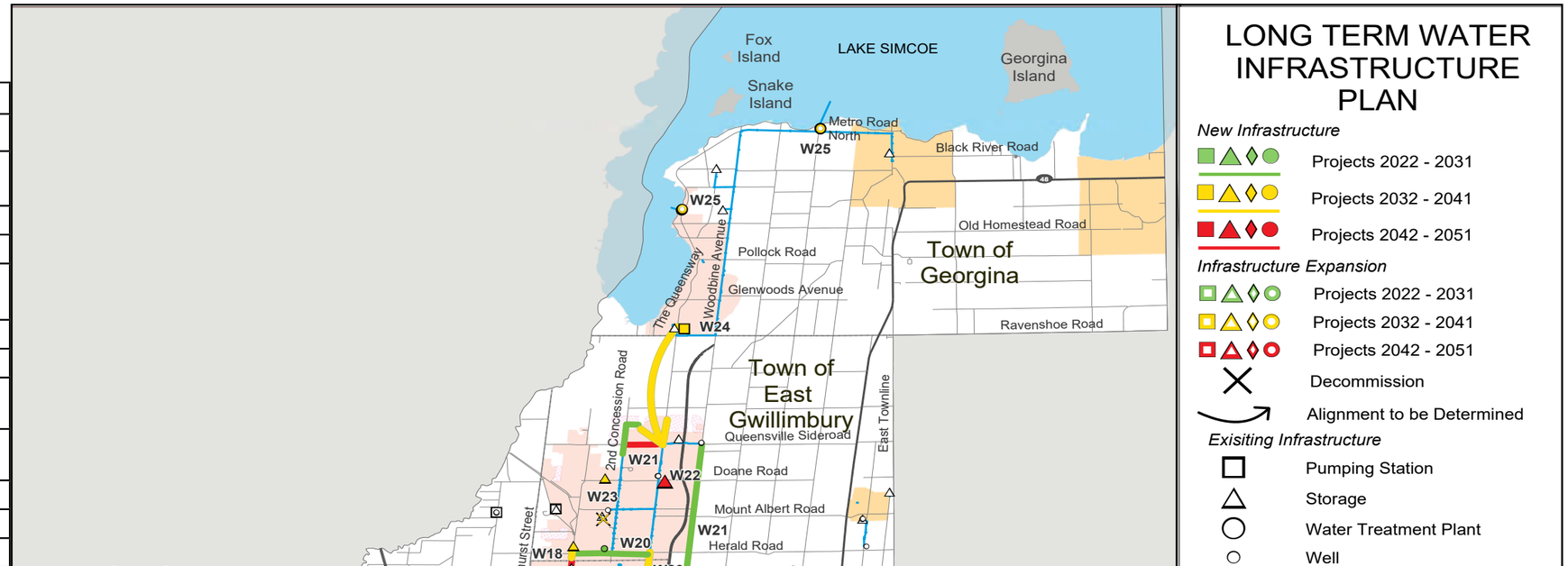
MP ID	Project description	Estimated expenditures 2022-2051 (000's)	Planned implementation timeframe	Environmental Assessment (EA) Process	Municipality partially or fully serviced by this project								
					Town of Aurora	Town of East Gwillimbury	Town of Georgina	Township of King	City of Markham	Town of Newmarket	City of Richmond Hill	City of Vaughan	Town of Whitchurch-Stouffville
Transmission, conveyance and pumping projects (continued)													
W13	**York East Water Servicing** Phase 1 - Construct a new pumping station at the new Markham reservoir site (W11), a new Reservoir in Aurora and associated watermain to bring additional Lake Ontario supply to the north water system as demand increases. Phase 2 - Construct a new pumping station at the new Aurora reservoir and associated watermain to service development on the eastern parts of the north system as demand increases.	**$ 148,530**	**2032-2041 2042-2051**	**Schedule B**	X	X				X			
W23	**Holland Landing Storage Expansion** Install a new elevated tank and connecting watermain to accommodate growth in Holland Landing and allow replacement of existing Holland Landing East Elevated Tank.	**$ 10,340**	**2032-2041**	**Schedule B**		X							
W24	**West Park Heights Pumping Station and Watermain** Construct a new pumping station, assumed to be located adjacent to the existing West Park Heights Reservoir in Keswick, and associated watermain to allow integration of York and Georgina Water Systems.	**$ 47,950**	**2032-2041**	**Schedule C**		X	X						
WW6	**Leslie Street Sewage Pumping Station and Forcemain** Phase 1 - Increase Leslie Street Sewage Pumping Station capacity. Phase 2 - Construct a new forcemain connecting the station to downstream York Durham Sewage System as flows increase due to growth.	**$ 65,240**	**2032-2041 2042-2051**	**Schedule A+**					X		X	X	
WW8	**North Markham Trunk Sewer** Construct approximately 2.1 kilometres new gravity sewer assumed to be located on McCowan Road from Major Mackenzie Drive East and connecting to the existing 16th Avenue Sewer.	**$ 43,200**	**2032-2041**	**Schedule B**					X				
WW17	**Newmarket Diversion Sewer** Construct a new sewer to divert flows from the Newmarket Pumping Station to the Sharon Trunk Sewer as flows increase due to growth.	**$ 29,800**	**2032-2041**	**Schedule B**						X			
WW18	**East Gwillimbury Sewage Pumping Station Expansions** Increase capacity of West Queensville, Second Concession and Holland Landing Sewage Pumping Stations to service growth. Works are expected to be accommodated within the original building footprint.	**$ 7,040**	**2032-2041**	**Schedule A+**		X							

Table 6.1 Growth-related Water and Wastewater Projects (continued)

MP ID	Project description	Estimated expenditures 2022-2051 (000's)	Planned implementation timeframe	Environmental Assessment (EA) Process	Municipality partially or fully serviced by this project								
					Town of Aurora	Town of East Gwillimbury	Town of Georgina	Township of King	City of Markham	Town of Newmarket	City of Richmond Hill	City of Vaughan	Town of Whitchurch-Stouffville
Transmission, conveyance and pumping projects (continued)													
W14	**Bloomington - Bayview Watermain** Construct a new watermain along Bloomington Road from Aurora South Reservoir to Bayview Avenue, and along Bayview Avenue connecting Wellington Watermain.	**$ 82,560**	**2042-2051**	**Schedule B**	X	X				X			
W19	**Yonge Street Watermain** Construct a new watermain on Yonge Street from Gladman Road to Green Lane to service proposed intensification along the Yonge Street corridor and connect the Newmarket Central and Holland Landing Pressure Districts.	**$ 46,200**	**2042-2051**	**Schedule A+**		X				X			
W22	**Queensville Elevated Tank No. 2** Construct a new elevated tank and connecting watermain to accommodate growth in Queensville and Sharon, and allow replacement of the Newmarket East Elevated Tank.	**$ 11,290**	**2042-2051**	**Schedule B**		X				X			
WW5	**York Durham Sewage System Expansion** Continue to expand York Durham Sewage System to support new developments including: A new relief sewer to divert flows from the Central Collector sewershed to the proposed Richmond Hill Langstaff sewer. Twinning a section of existing Steeles Collector Sewer to accommodate intensification in the Leslie Street Drainage Area. A new gravity sewer to support growth in the area serviced by Markham Collector which is expected to reach capacity as flows increase.	**$ 324,510**	**2042-2051**	**Schedule B**					X		X	X	
Demand management and supporting programs													
PROGRAM	**Water For Tomorrow Program**	**$ 29,770**	**Ongoing**	**None**	X	X	X	X	X	X	X	X	X
PROGRAM	**Water Master Plan Update**	**$ 7,060**	**Ongoing**	**Schedule B**	X	X	X	X	X	X	X	X	X
PROGRAM	**Water System Capacity Assessment**	**$ 21,220**	**Ongoing**	**None**	X	X	X	X	X	X	X	X	X
PROGRAM	**Inflow and Infiltration Reduction**	**$104,170**	**Ongoing**	**None**	X	X	X	X	X	X	X	X	X
PROGRAM	**Wastewater Master Plan Update**	**$7,070**	**Ongoing**	**Schedule B**	X	X	X	X	X	X	X	X	X
PROGRAM	**Wastewater System Capacity Studies**	**$58,610**	**Ongoing**	**None**	X	X	X	X	X	X	X	X	X

Figure 6.1 Long-term Water Infrastructure Plan

W1	Toronto Water Supply - Cost-Shared Works
W2	Peel Water Supply - Cost-Shared Works
W3	East Woodbridge Pumping Station Decommissioning
W4	West Vaughan Water Servicing
W5	York Peel Feedermain Upgrade
W6	Northeast Vaughan Water Servicing
W7	Vaughan Storage Expansion
W8	Nobleton Water Servicing
W9	North Richmond Hill Pumping Station Decommissioning
W10	Richmond Hill Langstaff Gateway Provincial Urban Growth Centre Water Servicing
W11	North Markham Water Servicing
W12	Stouffville Water Servicing
W13	York East Water Servicing
W14	Bloomington - Bayview Watermain
W15	Aurora East Booster Pumping Station Upgrades
W16	Orchard Heights Reservoir Inlet Upgrade
W17	Eagle to Kirby Pumping Station Watermain
W18	Newmarket West Water Servicing
W19	Yonge Street Watermain
W20	Green Lane Leslie Street Watermain
W21	East Gwillimbury Water Servicing
W22	Queensville Elevated Tank No. 2
W23	Holland Landing Storage Expansion
W24	West Park Heights Pumping Station and Watermain
W25	Georgina Water System Upgrades



LONG TERM WATER INFRASTRUCTURE PLAN

New Infrastructure

- Projects 2022 - 2031
- Projects 2032 - 2041
- Projects 2042 - 2051

Infrastructure Expansion

- Projects 2022 - 2031
- Projects 2032 - 2041
- Projects 2042 - 2051
- Decommission
- Alignment to be Determined

Exisiting Infrastructure

- Pumping Station
- Storage
- Water Treatment Plant
- Well
- Interconnection / Pressure Improvement
- Existing Watermain
- Future Urban Area*
- Urban Area*
- Towns and Villages*
- Area within ORMCP conditional upon amendments to Ontario Regulation 140/02**
- Road
- Highway
- Municipal Boundary
- Regional Boundary

*This reflects the Draft 2022 Regional Official Plan, currently under review through the Municipal Comprehensive Review and is subject to change based on Regional Official Plan approval.

**Urban designations are conditional upon amendments to the ORM designations.

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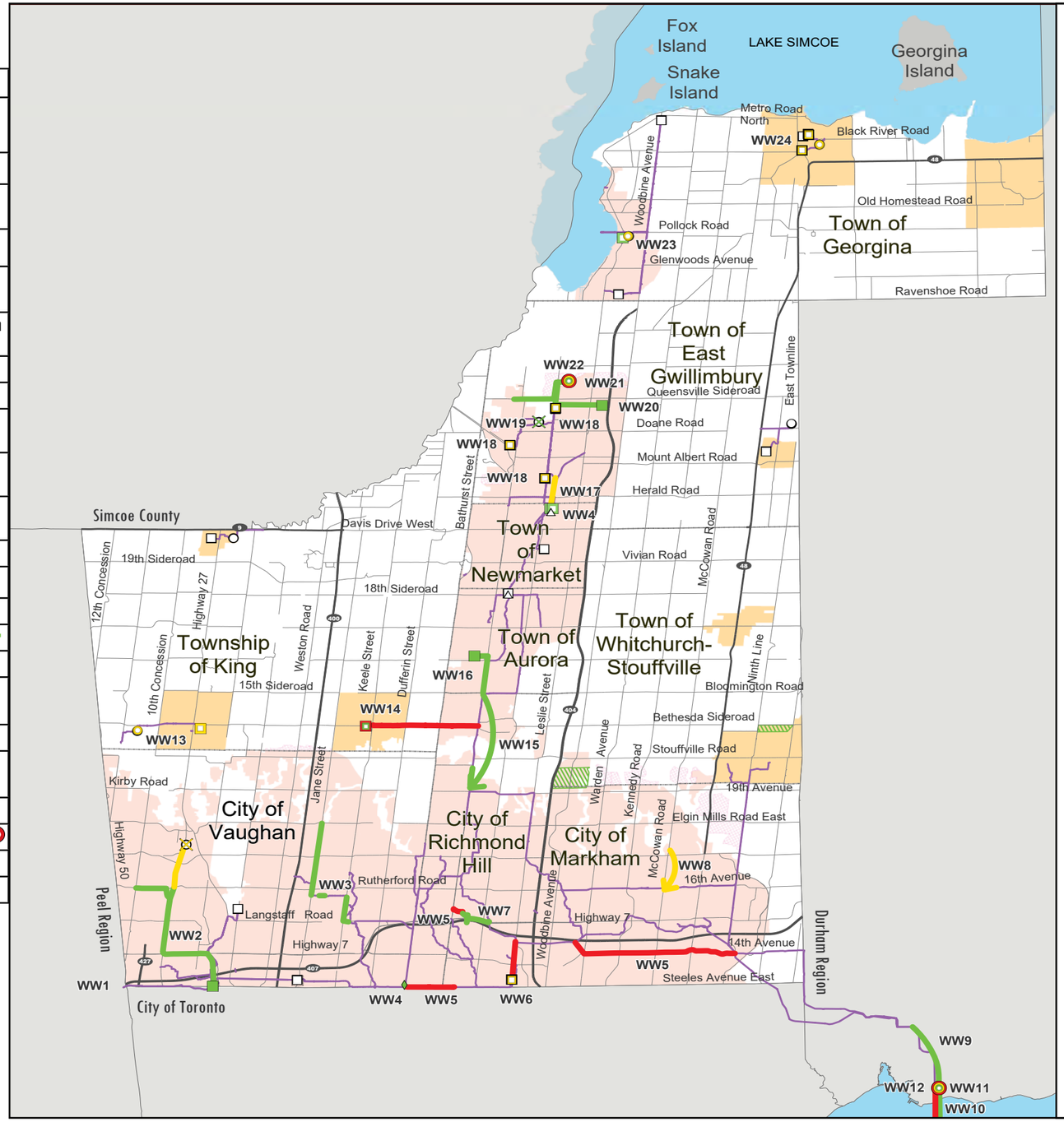
York Region

Produced by: The Regional Municipality of York, Environmental Services Department, Infrasturcture Asset Management Branch

Figure 6.2 Long-term Wastewater Infrastructure Plan

WW1	Peel System Cost-Shared Works
WW2	West Vaughan Sewage Servicing
WW3	Northeast Vaughan Wastewater Servicing
WW4	York Durham Sewage System Conveyance Optimization
WW5	York Durham Sewage System Expansion
WW6	Leslie Street Sewage Pumping Station and Forcemain
WW7	Richmond Hill Langstaff Gateway Provincial Urban Growth Centre Wastewater Servicing
WW8	North Markham Trunk Sewer
WW9	Primary Trunk Sewer
WW10	Duffin Creek Water Pollution Control Plant Outfall Effluent Strategy
WW11	Duffin Creek Water Pollution Control Plant Stage 1 and 2 Chlorine Chamber Expansion
WW12	Duffin Creek Water Pollution Control Plant Growth Expansions
WW13	Nobleton Wastewater Servicing
WW14	King City Wastewater System Upgrades
WW15	Yonge Street Sewer Twinning
WW16	York Durham Sewage System Interim Servicing
WW17	Newmarket Diversion Sewer
WW18	East Gwillimbury Sewage Pumping Station Expansions
WW19	Holland Landing Lagoon Decommissioning
WW20	East Queensville Sewage Pumping Station and Forcemain
WW21	Upper York Water Reclamation Centre
WW22	Upper York Servicing Infrastructure Expansions 1 and 2
WW23	Keswick Wastewater Servicing
WW24	Sutton Wastewater Servicing



LONG TERM WASTEWATER INFRASTRUCTURE PLAN

New Infrastructure

- Projects 2022 - 2031
- Projects 2032 - 2041
- Projects 2042 - 2051

Infrastructure Expansion

- Projects 2022 - 2031
- Projects 2032 - 2041
- Projects 2042 - 2051
- Decommission
- Alignment to be Determined

Exisiting Infrastructure

- Pumping Station
- Equalization Tank
- Water Resource Recovery Facility
- Flow Control Gate
- Wastewater Main
- Future Urban Area*
- Urban Area*
- Towns and Villages*
- Area within ORMCP conditional upon amendments to Ontario Regulation 140/02**
- Road
- Highway
- Municipal Boundary
- Regional Boundary

*This reflects the Draft 2022 Regional Official Plan, currently under review through the Municipal Comprehensive Review and is subject to change based on Regional Official Plan approval.

**Urban designations are conditional upon amendments to the ORM designations.

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6.1 REGIONAL PROJECTS TO ADDRESS REGION-WIDE SERVICING NEEDS

Several projects are particularly significant to the infrastructure system as a whole because they are critical to support Region-wide growth to 2051.

The York Water System services most of York Region, supplying drinking water to every local municipality except the Town of Georgina. Cost-shared projects with the City of Toronto and Peel Region identified in the 2016 Master Plan have been carried forward in this update to continue to increase supply of Lake Ontario water to the York Water System and support growth to 2051.

The York Durham Sewage System, which similarly collects wastewater flows from all local municipalities except the Town of Georgina, is expected to reach capacity and require significant investment within the 2051 planning horizon. Various projects to upgrade this system support most of the growth in York Region, and include:

- Substantial new work to expand the Duffin Creek plant beyond what was foreseen in the 2016 Master Plan given the longer planning horizon and twinning of the Primary Trunk Sewer that brings flows into the plant
- Upgrades and twinning of significant portions of the network of sewer pipes and pumping stations that bring flows into the Primary Trunk Sewer and eventually the Duffin Creek plant; while these projects will be located in Durham Region, as well as the cities of Vaughan, Markham and Richmond Hill, they will convey increased flows from growth occurring throughout York Region

In addition, York Region and Durham Region will complete a Primary System Master Plan following updates to their respective Regional Official Plans. This joint plan will forecast and refine future capital expansion requirements over a 30-year period for the Primary System, which consists of the Duffin Creek plant, Primary Trunk Sewer and some supporting infrastructure located outside the York Regional boundary. Appendix A.8 discusses some requirements and details that will be considered as the Primary System Master Plan is developed.

6.2 CITIES OF MARKHAM, RICHMOND HILL AND VAUGHAN

The southern cities of Vaughan, Markham and Richmond Hill are serviced by the most mature sections of the Region's York Durham Sewage System and York Water System. These systems also extend to serve communities further north, including the towns of Aurora, Newmarket, East Gwillimbury and Whitchurch-Stouffville and King City in the Township of King.

By 2051, the cities of Vaughan, Markham and Richmond Hill are expected to be home to about three-quarters of the Region's two million residents. To accommodate this growth, the Regional system will continue to supply Lake Ontario-based drinking water through the York Water System and return the related wastewater flows using the York Durham Sewage System.

Large infrastructure projects will be needed to connect expanded urban areas in west Vaughan, northeast Vaughan and north Markham to Regional water and wastewater systems, with timing of construction subject to future planning studies. Advancing the North Markham Water and Wastewater Servicing Environmental Assessment to 2024 addresses concerns raised by Markham and Stouffville. This advanced timeline enables a deeper analysis of service area population forecasts while keeping timing of construction in the second 10-year of the Master Plan until detailed work is complete in the Environmental Assessment. More localized upgrades will address intensification, including in the Richmond Hill/Langstaff Gateway area and growth areas in the City of Vaughan. The plan also identifies water expansion projects to support system resiliency for the entire York Water System.

The plan includes decommissioning the Kleinburg Water Resource Recovery Facility post 2036 and connecting the wastewater system in this area to west Vaughan infrastructure, in line with a completed environmental assessment.

York Regional Council passed a number of motions at a special meeting on October 21, 2021. One of the motions designated a portion of lands west of the Little Rouge as residential. The infrastructure plan developed for this Master Plan Update is sufficient to accommodate the growth associated with approval of this motion.

6.3 TOWNSHIP OF KING

6.3 TOWNSHIP OF KING

Although forecast to grow to approximately 50,000 residents by 2051, Township of King is expected to remain the smallest municipality in the Region. In King City, existing drinking water supplies through York Water System are expected to be adequate to meet growth needs to 2051 and wastewater needs will be addressed through phased upgrades to the King City wastewater system, which pumps flows into the greater York Durham Sewage System.

In Nobleton, increased servicing needs for wastewater and water to support expansion to 10,800 people have been identified for the stand-alone water resource recovery facility and groundwater wells through the recently completed environmental assessment. Servicing requirements for growth in Nobleton beyond 10,800 people was considered (see Appendix A.7) and was deemed not feasible due to provincial policy constraints and very high costs for further expansions/upgrades to the system.

One of the motions passed by York Region Council at its special meeting on October 21,2021 redistributed population growth of roughly 3,200 people from whitebelt/future urban areas – agricultural and rural lands outside settlements and the Greenbelt – as previously planned, to existing settlement areas in Township of King. The Township of King will work with the Region to identify any additional servicing needs related to this redistribution through ongoing monitoring processes.

6.4 TOWN OF WHITCHURCH-STOUFFVILLE

A combination of Lake Ontario water through the York Water System and groundwater wells in Stouffville will continue to meet drinking water needs in the Town of Whitchurch-Stouffville, which is expected to grow to over 88,000 residents by 2051. Additional capacity will be provided by:

- Optimizing supply and storage of groundwater from wells, in line with a completed environmental assessment
- Eventually expanding the pumping station bringing Lake Ontario water into the Town of Whitchurch-Stouffville and adding a new storage facility

Wastewater flows will continue to be conveyed through the York Durham Sewage System for treatment at the Duffin Creek plant, with no new projects required in the Town of Whitchurch-Stouffville.

One of the motions passed by York Region Council at its special meeting on October 21,2021 included adding areas in Gormley and Bethesda within the urban boundary to address growth interest.

Servicing of South Gormley Employment Expansion is contingent upon removal of provincial regulatory restrictions. As this growth is anticipated in the later years of the forecast post-2041, conceptual servicing options are outlined in Appendix A.7 that can implemented should provincial regulations change.

Servicing of Bethesda is also contingent upon removal of provincial regulatory restrictions. Depending on the magnitude of growth, a review of the wastewater system capacity would be appropriate to ensure existing Regional sewers could accommodate additional flows. No additional water upgrades beyond those already identified for the community of Stouffville are anticipated to be required.

6.5 TOWNS OF AURORA, EAST GWILLIMBURY AND NEWMARKET

For York Region communities in the Lake Huron watershed, expansion of the servicing system to support growth must give special consideration to a limit on the transfer of drinking water across watershed boundaries and the requirement to balance returning wastewater flows, as described in Section 2.6.

All three communities are expected to grow and together have approximately 328,000 residents by 2051 or about 16% of the Region's total population. The greatest expansion is planned in the Town of East Gwillimbury, where population will more than quadruple to reach over 127,000 people.

This growth will require additional drinking water, which will be provided by increasing supply from the current sources — Lake Ontario and groundwater — and adding a small amount of new Lake Simcoe supply:

- Several projects will bring more Lake Ontario water north into the towns of Aurora, Newmarket and East Gwillimbury
- Groundwater will continue to supply part of the water need, supported by such projects as the Green Lane and Leslie Street watermain
- Water supply from Lake Simcoe will be provided through a new infrastructure connection between the north end of the York Water System and the Georgina Water System
- A few local upgrades will accommodate areas expected to grow significantly

Wastewater flows from these communities will also require upgrades to the system in phases to convey these additional flows southward into the York Durham Sewage System, as well as northward to the proposed Upper York Sewage Solutions Water Reclamation Centre.

As noted in Section 5.2, York Region has put in place several interim solutions to address the shortfall in servicing capacity resulting from delayed approval of two key elements of Upper York Sewage Solutions.

One of the motions passed by York Region Council at its special meeting on October 21,2021 designated an urban area expansion into 70% of whitebelt lands in East Gwillimbury. This triggers the need for a second expansion of the Water Reclamation Centre by 2051. Given the continued delays of provincial approval, resulting in delays of the initial construction to at least 2029, it will be challenging to achieve two expansions of this facility by 2051.

Mount Albert Water Resource Recovery Facility was designed in 2004 to provide wastewater servicing for the ultimate population for the community of 6,000 people. With increased community density, there remains some land available for further development and a desire by the local municipality to complete the community to 8,000 persons. Since 2014, the Region has undertaken several studies to determine the feasibility of expanding capacity at the Mount Albert Water Resource Recovery Facility. These studies outlined significant costs to meet stringent phosphorus limits outlined the Lake Simcoe Protection Plan. More recently, a group of landowners funded an optimization study to see if the existing infrastructure could be stretched to complete the community. At the time of writing this report, discussions are ongoing between landowners, Town of East Gwillimbury staff and York Region staff regarding the potential to expand servicing capacity in Mount Albert from 6,000 to 8,000 people. No agreement has been finalized. Further information about the past study and proposed works can be found in appendix A.7.

6.6 TOWN OF GEORGINA

In addition, using the One Water principle of infrastretching, the Region in partnership with local municipalities and developers have found opportunities through inflow and infiltration reduction works to provide servicing capacity in constrained areas. Recently, inflow and infiltration works in the Town of Newmarket have supported non-profit housing initiatives. The Region will continue to look for opportunities to leverage inflow and infiltration reduction in other municipalities with capacity constraints to generate capacity to support non-profit housing initiatives.

6.6 TOWN OF GEORGINA

The Regional system will continue to supply the Town of Georgina, which is expected to roughly double in population to approximately 70,000 residents, with water from Lake Simcoe and return wastewater flows achieved via the Keswick and Sutton water resource recovery facilities.

Consistent with previous master plans, expansion of the Georgina Water Treatment Plant in line with the completed environmental assessment will provide increased water supply from Lake Simcoe.

The additional water supply will also support growth in the northern portions of the York Water System to build further resiliency in water supply sources.

As previous master plans have noted, the Keswick and Sutton water resource recovery facilities will be expanded as determined by completed environmental assessments and will service planned growth. Flows to the plants continue to be monitored, and once flows reach 70% of capacity, consideration will be given to include facility expansions in the 10-year capital plan, subject to available funding at that time. In addition, some upgrades to sewage pumping stations in Sutton will be needed to address constraints in the conveyance network.

6.7 UPDATED COST ESTIMATES

6.7 UPDATED COST ESTIMATES

The estimated cost of the infrastructure plan, including supporting programs, is an important input into the Region's Development Charges Bylaw. Costing models are used to develop conceptual estimates for the Master Plan. These models leverage the best available information from past and recent Regional projects to produce unit cost rates for various components that make up identified projects. Costs associated with engineering and technical studies, contingencies and/or project-specific requirements are also factored in. Further information on the cost estimation methodology is available in Appendix A.6.

The estimated cost to implement the infrastructure identified in the preferred servicing strategy is $4.5 billion and this total is broken down in Table 6.2 below.

Table 6.2 Summary of Master Plan Expenditures for Growth Capital Projects ($000's) to 2051

System	Year			Total ($000's)
	2022-2031	2032-2041	2042-2051	
Water	$273,640	$452,880	$252,950	$979,470
Wastewater	$1,461,010	$1,042,100	$1,008,390	$3,511,500
Total	**$1,734,650**	**$1,494,980**	**$1,261,340**	**$4,490,970**

Wastewater infrastructure makes up more than three-quarters of total costs. Substantial expansion of treatment capacity and the wastewater pipe network is needed. In comparison, water infrastructure and treatment capacity to service long-term growth are largely in place now, although additional water infrastructure is required to address specific constraints and growth areas.

Costs are highest in the first 10-year period from 2022-2031 because the proposed Upper York Water Reclamation Centre is planned to be completed during this timeframe (pending provincial approvals). Projects (like West and Northeast Vaughan Infrastructure) underway to connect expanded urban areas in the City of Vaughan to existing systems also represent a significant share of costs in this first decade.

Investment needs will continue into the following decades as the York Durham Sewage System, which handles the bulk of the Region's wastewater, is reaching capacity. Major works will focus on expanding its two components, the Duffin Creek plant and related sewer network. Other projects will expand and add to water and wastewater infrastructure to service communities in the Lake Simcoe watershed.

7.0 IMPLEMENTING THE PLAN

7.1 DELIVERING INFRASTRUCTURE PROJECTS

BUDGET AND CAPITAL PLAN

The Master Plan is prepared with the best currently available knowledge and information and is intended to guide actions and decisions at a high level.

Once the Master Plan is completed, the preferred strategy and associated infrastructure plan are carried out through projects undertaken as part of the York Region 10-year capital plan. The 10-year plan includes growth projects identified in the Master Plan and renewal projects to maintain asset condition as identified in the Asset Management Plan.

The 10-year capital plan is updated annually. As well as rolling forward one year, the updated plan responds to such other factors as new financial constraints, delays or scope changes in project delivery, population increases or growth patterns that differ from forecast, and changes in asset management needs informed by condition assessments.

ENVIRONMENTAL ASSESSMENTS

The municipal class environmental assessment process sets out the scope and level of investigation for different types of projects based on the nature of a project and potential environmental effects. Projects are classified into different schedules that contain descriptions of proposed works. Schedule B and C projects require project-specific class environmental assessments, following the requirements of the *Environmental Assessment Act*. An alternative process are full or individual environmental assessments under Part II of the Act for large scale projects that are not capable of being addressed by the municipal class environmental assessment process.

Project-specific environmental assessments provide a detailed inventory of relevant environmental conditions and assess potential impacts. The process includes consultation with Indigenous peoples, regulatory agencies and the public. Where applicable, measures to avoid or mitigate impacts are identified. Through this process, project needs and assumptions made in the Master Plan are re-evaluated and defined in further detail and a preferred solution is identified.

As discussed in Section 2.6, several changes are in progress to the environmental assessment process set out by the *Environmental Assessment Act*. As these changes come into effect, York Region will adapt how it undertakes projects to remain in compliance with the Act.

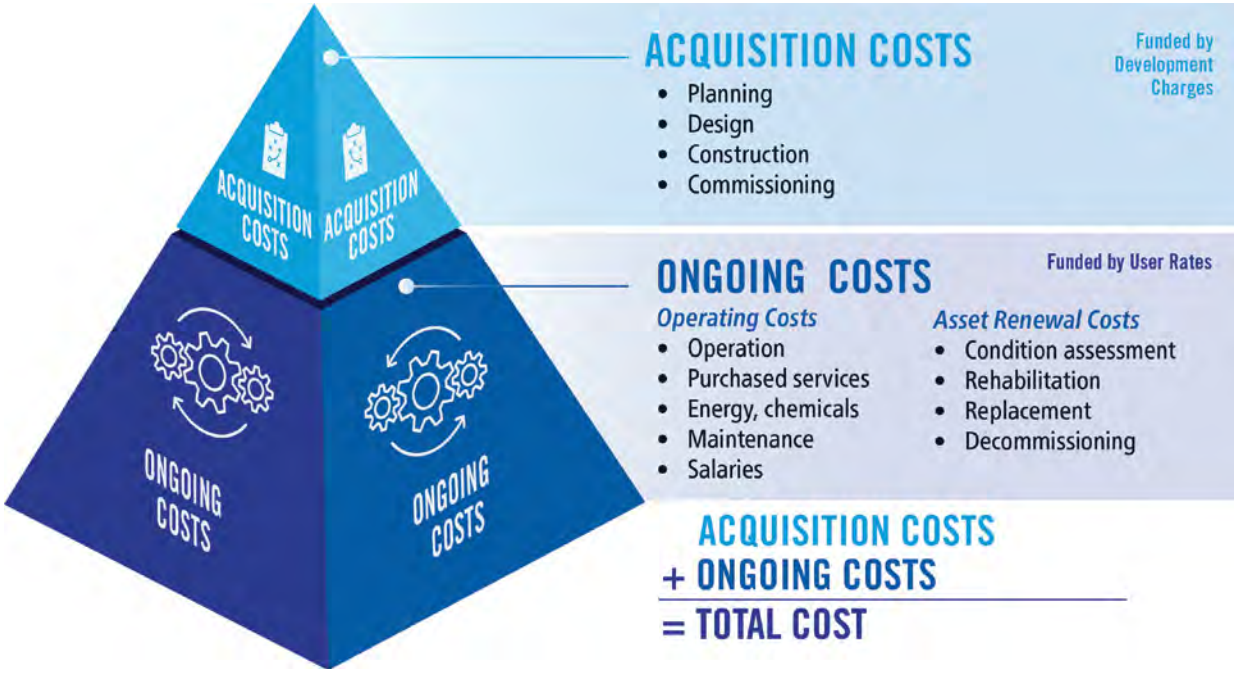
7.1 DELIVERING INFRASTRUCTURE PROJECTS

LONG-TERM FINANCIAL SUSTAINABILITY

Long-term financial sustainability of the water and wastewater system is driven by the total cost of providing services. Managing these costs is critical so services remain affordable to residents and businesses.

With new infrastructure, acquisition costs often receive more attention than ongoing costs of operation, repair and renewal. While acquisition costs can be substantial, ongoing costs over the entire useful life of an asset are generally higher. New growth-related assets will need to be replaced eventually. As well, the Region has ongoing costs related to agreements with partner municipalities. Figure 7.1 shows all of these costs of servicing, as well as how they are funded.

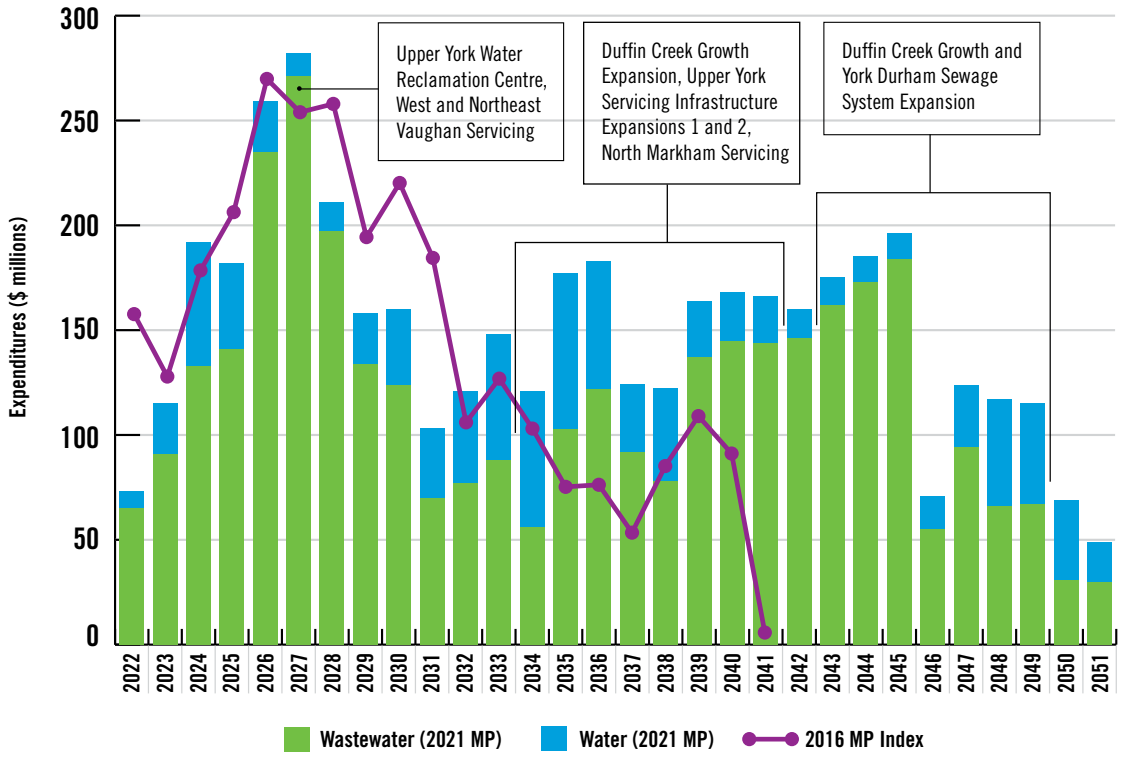
Figure 7.1 - Total Cost of Servicing



Acquisition Costs

The estimated cost of acquiring new infrastructure identified in this Master Plan update is $4.5 billion. Expected timing of investments is shown in Figure 7.2. Together with remaining capacity in the existing system, this new infrastructure will support growth to 2051.

Figure 7.2 - Estimated Costs to Acquire Growth-related Infrastructure



Note: All costs are expressed in 2020 dollars and do not account for inflation

As noted in Section 6.7, wastewater components of the infrastructure plan make up most of the investment needed. Peaks in the graph reflect major project expenditures to implement the Upper York Water Reclamation Centre, Duffin Creek plant expansions and servicing urban expansion areas.

Expenditures are weighted in the first 10 years and, to a lesser degree between 2032 and 2041, as key systems need to be expanded or improved so that servicing is in place to support growth in later years.

7.1 DELIVERING INFRASTRUCTURE PROJECTS

Compared to the previous Master Plan, this update includes over a billion dollars of additional infrastructure to support the extended planning horizon to 2051. Costs were updated for projects carried forward from the 2016 Master Plan, to account for inflation and changes to scope and sizing, which contributed to the higher cost of the infrastructure program. To provide servicing to 2051, a few large projects are required including:

- Water Reclamation Centre Expansion 2 - estimated cost over $200 million
- Duffin Creek Water Pollution Control Plant Expansions - estimated cost over $500 million
- York Durham Sewage System Conveyance Expansion - estimated cost approximately $325 million
- Plus a few additional smaller projects including York East Water Servicing and King City Wastewater - estimated cost over $150 million

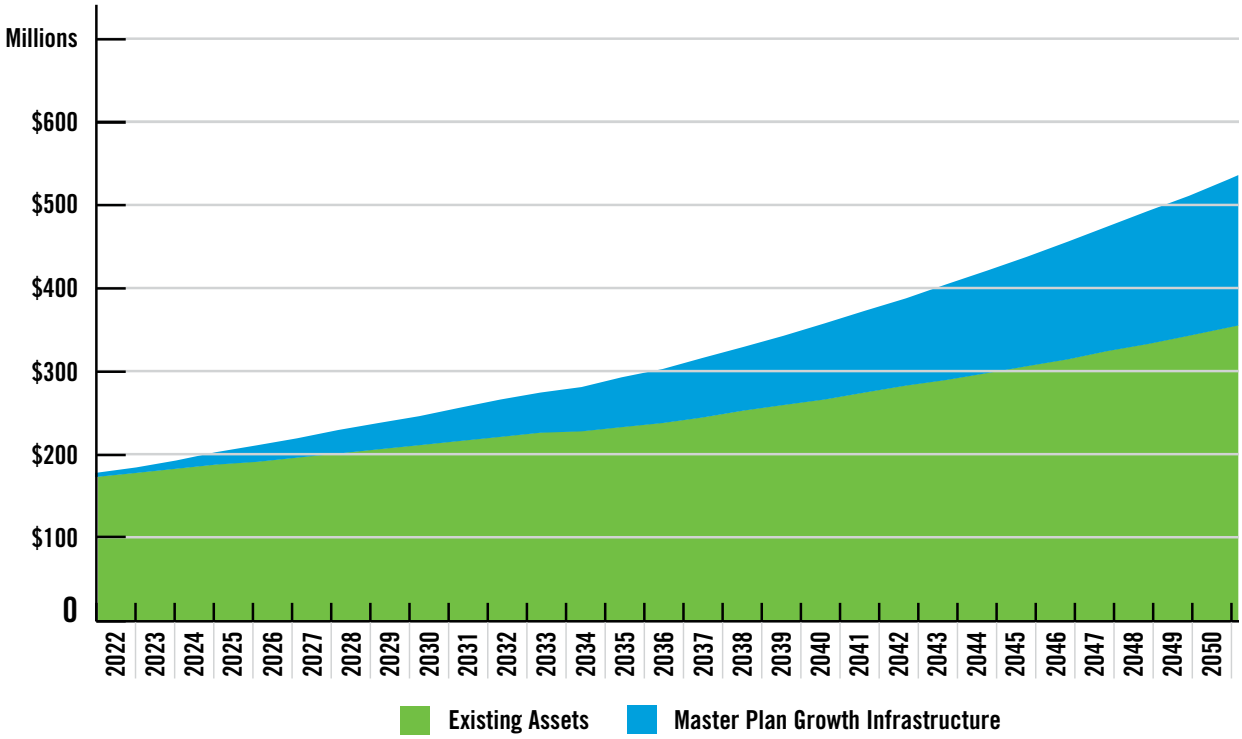
Ongoing Costs

As new infrastructure components are added to the existing water and wastewater asset base, they increase the Region's ongoing costs. As shown in Figure 7.1, ongoing costs include both day-to-day operating costs and renewal costs.

New infrastructure contributes to higher day-to-day operating costs as additional assets will require energy and chemical inputs, staffing and routine maintenance. Another source of future operating costs to support growth will also come from purchased services through the Region's long-standing servicing agreements with neighbouring regions and the City of Toronto. These purchased services include water services provided by Peel Region and the City of Toronto, a wastewater service agreement with Peel Region and the co-ownership and operating agreements with Durham Region for the York Durham Sewage System primary system including the Duffin Creek plant.

Figure 7.3 shows expected operating costs associated with both the Region's existing system and the new water and wastewater infrastructure needed to support growth. The area in blue shows the incremental increase in operating costs as more assets are brought online to service growing communities. Operating costs associated with the existing asset base shown in green are also expected to increase over time in pace with inflation.

Figure 7.3 Operating Cost of Water and Wastewater Systems

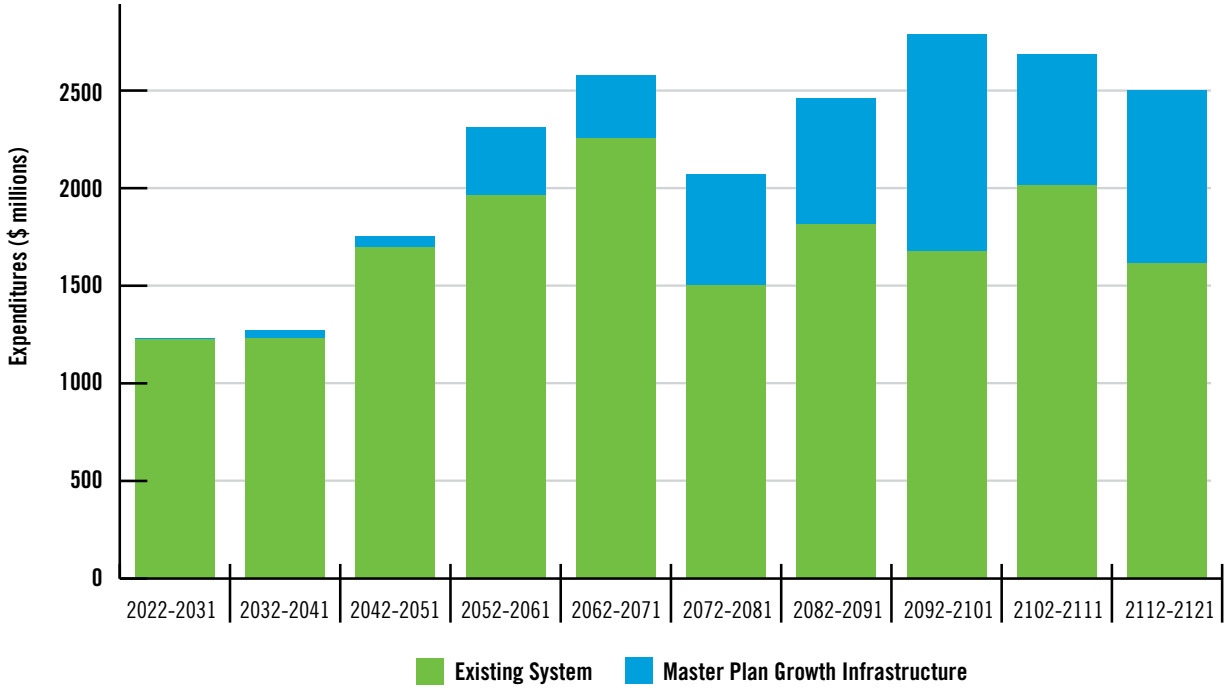


Note: Dollar amounts include inflation

As assets age, they will need to be rehabilitated and eventually replaced. This spending is known as renewal costs and over the past 5 years, has averaged about $100 million annually. Together, existing and new assets will require more than $20 billion in renewal costs over the next 100 years.

As shown in Figure 7.4, water and wastewater renewal needs are expected to be lower in the near term as the Region's water and wastewater systems are still relatively young. As the new infrastructure identified in this Master Plan ages, incremental renewal costs are expected to increase over time as different components come due for renewal. The Region uses a 100-year time frame for renewal needs that reflects the long life of most major water and wastewater assets. Together, existing and new assets will require more than $20 billion in renewal costs over the next 100 years.

Figure 7.4 Estimated Cost of Renewal for Water and Wastewater Assets Over the Next 100 Years



Note: Dollar amounts are before inflation

Funding

The Region follows provincial requirements and industry best practice in funding the costs of water and wastewater services.

York Region's costs to acquire water and wastewater assets to meet growth needs are primarily funded by development charge revenue, as discussed in Section 4.3. Development charges are collected from developers to support growth-related infrastructure provided by the municipality.

As recommended by industry groups and other authorities, user rates pay for the full costs of providing ongoing services. Full costs are made up of day-to-day operating expenses and larger, more sporadic costs to rehabilitate and replace assets. The latter are covered by a share of user rate revenue that goes each year into asset replacement reserves. The Region's Water and Wastewater Financial Sustainability Plan explains how user rates fully fund capital needs without the use of debt in a manner that is fair to both current and future generations.

Financial sustainability of water and wastewater systems is not just about having the upfront capital to build assets but also being able to pay ongoing costs. Should anticipated growth not be realized, the Region may face two financial pressures: reduced collections of development charges and lower-than-forecast revenues from end users. For this reason, the Region will continue to leverage existing infrastructure systems as much as possible and more tightly align pacing of new capital projects with actual growth, as discussed in Section 4.3.

7.1 DELIVERING INFRASTRUCTURE PROJECTS

Considering Total Cost of Servicing to Make Better Decisions

Decisions about the type and design of an asset used to provide service can have a profound impact on costs over its entire useful life. This is an important aspect of infrastructure planning and implementation. By the time infrastructure is commissioned, up to 95% of the opportunity to influence or reduce these costs has already passed.

The Master Plan provides the first key opportunity to minimize these costs. In evaluating potential alternative strategies to service planned growth, it considers both the upfront acquisition cost and ongoing costs. The Master Plan is also the first point for deciding whether new assets are required, what types of new assets should be considered, where they are needed and when they need to be built or acquired.

In moving from master planning to implementing specific projects, the Region will make the next level of decisions that influence total costs. These decisions around design elements like technology or material or location of assets for ease of access must balance financial considerations with technical, reliability, safety and other needs.

MONITORING AND ADAPTING

This Master Plan provides a high-level roadmap for delivering servicing over the long term by determining the need for future infrastructure projects and supporting programs using the best available information and understanding. Over time, assumptions need to be monitored. Updates and course corrections will happen as things change or better information becomes available.

Potential Sources of Change from Plan

The further a forecast looks into the future, the higher the level of uncertainty. Over the next 30 years, growth patterns will continue to evolve and servicing needs may change as a result.

In particular, the pace of high-density development is very likely to increase over time in response to market demand. The exact location and timing of these elements of growth are uncertain, as are its impacts.

Minister's Zoning Orders can bring additional uncertainty to growth plans as they are sometimes approved without local or Regional input, which means infrastructure plans may not reflect increased service population. Where approval is given through a Minister's Zoning Order, it will be out of sync with planned services in the expected time frame because the Master Plan did not foresee the related development.

Aside from growth happening differently than envisioned, infrastructure projects are conceptual at this stage. Thus, implementation might be more complex and timing of delivery longer than originally considered. The Region might also face fiscal constraints that could require changes to future infrastructure identified in the plan as the Region continues to grow.

Ways of Monitoring and Adapting

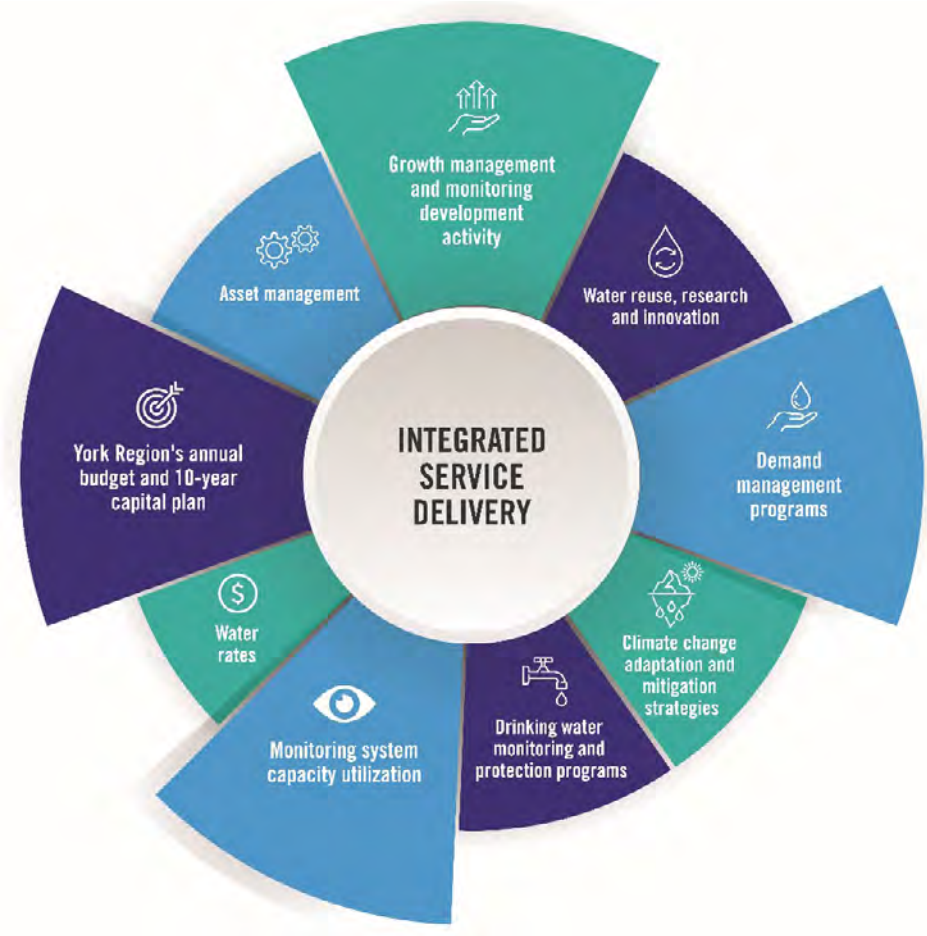
One Water principles were adopted to guide the decision-making process of the Master Plan and will continue to be instrumental in the ongoing monitoring and adaptation during implementation.

One Water's holistic approach provides a framework for adaptive management through:

- Integration, which means creating synergies and increasing efficiency in systems by closely monitoring the effects of demand management and asset management initiatives
- Innovation, which involves exploring new concepts and ideas throughout implementation to promote cost-efficiency and environmental sustainability
- Infrastretching, which maximizes useful capacity and life of the existing system and established long-term servicing agreements

Figure 7.5 shows the range of programs, plans, analyses and activities in the Environmental Services department and across the Region that support adaptation to changing conditions.

Figure 7.5 Integrated Approach to Water and Wastewater Service Delivery



7.1 DELIVERING INFRASTRUCTURE PROJECTS

Closely monitoring available capacity in the infrastructure system and development activity enables the Region to coordinate servicing capacity with growth/development, as the province requires municipalities at a minimum to provide a three-year supply of residential units. Demand management programs to encourage water conservation and reduce inflow and infiltration help make more capacity available in the Regional system.

The Region's proactive management of water and wastewater servicing capacity will effectively support development needs while minimizing risks associated with over-extending the infrastructure system. Three key elements of proactive capacity management include:

- Modeling to understand available system capacity and near-term restrictions
- Monitoring including both flow monitoring and allocation tracking
- Coordinated management of capacity assignment and continued refinement of infrastructure plans as needed and where feasible when development needs deviate from master plans

The 10-year capital plan sets out sequencing of projects/programs to meet growth and asset management needs. The capital plan is reviewed each year as part of the budget, which provides an opportunity to recalibrate plans to reflect changing circumstances. Shifting circumstances considered in capital plan updates include financial pressures, changes to projects in implementation and coordination with other projects including asset management works or infrastretching and optimization initiatives. Recalibrating inevitably involves trade-offs. Within a fixed budget, adding, advancing or expanding a project means something else has to be reduced or removed, and related spending may never be recouped.

Limitations

While the Region strives for flexibility in implementing infrastructure, there are limits on its ability to accommodate unexpected circumstances:

- Large Regional infrastructure projects take considerable time: seven years from plan to completion is typical, but larger projects can take more than a decade
- The size of projects means that they must be timed appropriately; expanding or adding infrastructure earlier than planned can have both financial and operational consequences, the latter because of such potential impacts as poor water quality
- Infrastretching has its limits; pushing existing assets too far beyond their capacity can increase operating risks and may reduce the level of service to existing users beyond acceptable limits
- Prolonged delays in receiving provincial approvals result in major costs and risks that the Region cannot reasonably plan for; this Master Plan update continues to consider the Water Reclamation Centre a key component of long-term servicing for the three municipalities in the Upper York area; should the province render a decision requiring a different direction, there would be numerous implications including considerations outside of this Master Plan update

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

These factors underscore the need to continually seek the right balance — between costs, growth patterns and the needs of existing customers. Monitoring growth, system capacity and evolving circumstances are key to adapting service delivery to needs as they change.

Over the next 30 years, as growth and development patterns become clearer, municipal comprehensive reviews and master plan updates will provide several opportunities to recalibrate the water and wastewater servicing plan. In addition, timing of delivery can be adjusted through the budget process.

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

The Region considers One Water the best approach for managing water resources wisely because it is based on understanding and leveraging the natural water cycle. This approach strives to make the best use of every source of water, including water that has passed through municipal systems. One Water can provide innovative solutions to complex problems that are effective and benefit communities and the environment while costing less than traditional approaches. It also helps minimize use of other inputs, including energy, to mitigate climate change impacts.

Ongoing collaboration with key partners like the conservation authorities and local municipalities is key to advancing One Water using its principles of integration, innovation and infrastretching. With its broad impacts and influences, One Water is woven throughout the sections below, which touch on existing and potential new initiatives to address water challenges and opportunities. The Region will continue integrating One Water into its approaches to planning and delivering solutions to help define a sustainable future.

YORK REGION
ONE
WATER

THROUGH **PARTNERSHIPS** AND **INNOVATION**,
ONE WATER MAKES **THE BEST**
POSSIBLE USE OF WATER FROM **EVERY SOURCE**
TO SUSTAIN **HEALTHY PEOPLE,**
HEALTHY COMMUNITIES AND A
HEALTHY ENVIRONMENT.

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

DEMAND MANAGEMENT

Long-Term Water Conservation Strategy

Demand management plays an integral role in planning the Region's water and wastewater infrastructure. Managing water demand through water conservation and efficiency adds real capacity to existing and future infrastructure systems, in turn reducing the amount of energy consumed and GHG emissions released and is a prime example of the One Water principle of infrastretching.

A September 2021 update to the Region's Long-Term Water Conservation Strategy identified four overarching objectives:

1. Promote the responsible use of water as a resource
2. Apply a One Water approach to enhance water system sustainability and promote efficiency
3. Reduce water consumption as population increases for sustainable long-term servicing
4. Be a water efficiency and conservation influencer for residents, the industry and regulatory partners

The strategy's five program areas focus on cost-effective ways to realize long-term water savings:

1. Support Regional and local cities and towns' efforts to reduce system losses and other sources of non-revenue water
2. Continue to raise awareness and engage residents and students on conserving water, especially in outdoor uses, and encourage greater water efficiency in new residential developments
3. Support conservation among industrial, commercial and institutional water users through programs and targeted incentives
4. Continue to advance research into centralized municipal and decentralized water reuse
5. Demonstrate leadership by improving the efficiency of York Region's own facilities and operations

Appendix C.1 provides the full updated strategy.

To successfully deliver this Master Plan update, the Region will require support from its local cities and towns and the province, as well as collaboration with other jurisdictions and stakeholders. It will implement, evaluate and refine its programs over the next five years.

Inflow and Infiltration Reduction Strategy

Reducing inflow and infiltration from the wastewater systems provides real capacity to existing systems and defers the need for future infrastructure to service growth; this is a prime example of the One Water principle of infrastretching. Integrating inflow and infiltration reduction into day-to-day operational needs and decision making and implementing advanced technologies and intelligent information systems are also examples of the integration and innovation principles of One Water.

In September 2021, the Region's Inflow and Infiltration Reduction Strategy was updated. Main objectives of the 2021 strategy update are:

- Ensure continuous progress is made towards reaching the 2031 inflow and infiltration reduction target of 40 million litres a day; this target is required to meet the Southeast Collector Trunk Sewer individual environmental assessment condition of approval set by the province in 2010
- Support Regional growth and sustainability goals while balancing overall cost and benefits
- Refine partnership framework to enhance inflow and infiltration reduction programming at both the Region and nine local municipalities
- Continue to be an inflow and infiltration reduction leader, promoting innovation, adaptation, and digital integration in data collection and analysis to drive actions towards the long-term reduction target

The strategy update is organized around five program areas:

1. Enhance partnerships among York Region, local municipalities and the development community, all of which have a role to play in reducing unnecessary water entering the sanitary sewer system
2. Monitor flows and continue to collect data to set local municipal inflow and infiltration reduction targets and pinpoint high-priority areas for local improvement efforts
3. Advance data collection and analytics by installing more meters in Regional trunk sewers and using innovative tools to analyze flow data and better plan and track work
4. Expand assessment and rehabilitation programming, refine policies and bylaws and enhance partnership initiatives with developers for continued inflow and infiltration reduction in existing sanitary sewer systems
5. Develop and adopt a new development standard for inflow and infiltration management consistently across the Region and introduce monitoring requirements for the prevention of inflow and infiltration in new sanitary sewer systems

Appendix C.2 provides the full updated strategy.

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

CLIMATE CHANGE ACTIONS

York Region's draft Climate Change Action Plan identifies actions in priority areas to help address climate change. These actions focus on corporate-specific actions and community-level activities to improve resilience to climate change and achieve integration and co-benefits through implementation. Integrating efforts to mitigate and adapt is the most effective way to manage climate change risks.

The plan is founded on the following goal:

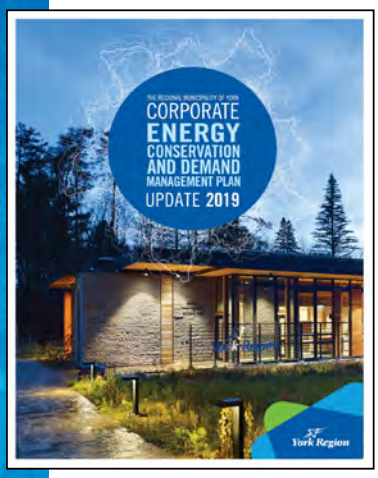
Working together, the strong, caring and safe communities of York Region will continue to thrive under changing climate conditions.

It aims to achieve two major outcomes:

- Reduce GHG emissions with a long-term goal of becoming a net-zero Region by 2050
- Increase resilience and capacity of the Region to withstand and respond to current and future climate events

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

As noted in Section 3.3, the corporate Energy Conservation and Demand Management Plan looks for ways to reduce emissions across Regional government. Currently, approximately 90% of the energy used in water and wastewater facilities is from electricity. The plan, updated most recently in 2019, also identified energy savings from reducing water consumption, since water supply and wastewater conveyance both require energy for pumping, and from putting efficiency measures in place at individual facilities.



Energy Conservation and Demand Management Plan

The Energy Conservation and Demand Management Plan (2019) identified a suite of projects, initiatives and other activities to position York Region to achieve its long-term aspirational goal of net-zero carbon emissions.

- Continued implementation of water conservation and inflow and infiltration reduction programs
- **Energy conservation** and **process** optimization measures like improvements to heating and cooling systems and pump optimization
- **Renewable Energy** measures include implementing heat recovery systems and installing photovoltaic solar

Climate adaptation is also important. Adapting means taking action to reduce negative impacts of existing and future climate change. Regular maintenance and inspection keep our infrastructure in a good state of repair, which helps make it more resilient in case of extreme weather events. Some of this work, on wastewater infrastructure, is done in partnership with conservation authorities and servicing partners.

In recent years, climate change adaption measures have been implemented to improve the Region's resiliency to a changing climate. For example, drinking water sources have been evaluated using 10-year drought scenarios to understand risks to groundwater sources, which drove development of specific policies under the Source Protection Plans for York Region. For wastewater systems, a 25-year design storm scenario was used to allow for sufficient consideration of climate change on wastewater capacity. To build on this work, a climate change roadmap has been completed in 2020 to identify and address the highest future climate risks to York Region's water and wastewater infrastructure as shown in Figure 7.6. It focuses on:

- Designing systems for climate resilience
- Improving corporate internal governance and culture regarding climate change
- Improving the capacity to adapt at an operational level
- Building knowledge of climate risks
- Reducing negative impacts to the environment from the servicing system

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

Many of the 33 actions outlined in the roadmap were developed to directly align with actions discussed in the draft Climate Change Action Plan so that it can serve as a component of the broader corporate plan. Over the next five years, work will be undertaken to update design guidelines, embed climate change lens in the Environmental Assessment process, update emergency operating and business continuity procedures to address high risks, refine odour management programs and develop performance metrics to measure progress toward a resilient water and wastewater system.

The Region will continue to implement initiatives and monitor climate risks that increase resilience of infrastructure and delivery of water and wastewater services.

Figure 7.6 Climate Risks to Regional Water and Wastewater Infrastructure

CLIMATE EVENT	EFFECT	RISK	IMPACTED ASSET
TEMPERATURE INCREASE AND EXTREME HIGH TEMPERATURES	Increased microbial activity	Odour events	Sewage pumping stations
EXTREME RAINFALL	Poor raw water quality	Treated water quality weakens	Water treatment plants
EXTREME RAINFALL	Power outages/ equipment failures	Loss of service	Water treatment plants and pumping stations
EXTREME RAINFALL	Corrosion/breaks	Odour events and spills to the environment	Wastewater mains
EXTREME RAINFALL	Disinfectant breaks down more quickly	Treated water quality weakens	Water pumping stations, watermains and storage facilities
DROUGHT	High demand for water	Decreased availability of water	Groundwater wells

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

Blue-green Infrastructure: One Water in Action

The power of combining all three elements of One Water is illustrated by what is called "blue-green infrastructure." It innovates by integrating natural processes — the use of trees, other vegetation and landscaping to enhance community well-being by improving flood protection, urban heat island mitigation and water quality improvements. In addition to having a positive benefit on the environment, blue-green infrastructure saves money by avoiding or reducing the use of built facilities and processing.

One important application of blue-green infrastructure is using landscaping and vegetation around buildings and along waterways to reduce the threat of flooding. Heavy rainfall can easily overwhelm eavestroughs and other runoff channels, resulting in flooded basements and low-lying areas, stormwater getting into sanitary sewers and waterways overflowing their banks. Simple measures such as disconnecting downspouts from municipal storm systems and collecting water in rain barrels instead, planting trees and shrubs, sloping land away from buildings and reducing paved areas can significantly reduce these risks.

Both Lake Simcoe and Toronto and Region conservation authorities are encouraging York Region and local cities and towns to support integration of green infrastructure into asset management planning and to continue to monitor and support the region's forest assets, including street trees.

In York Region and across Canada, the value of blue-green infrastructure is recognized through the federal Disaster Mitigation and Adaptation Fund (DMAF), which encourages actions like the planting of street trees to absorb storm water instead of relying completely on municipal sewer systems. York Region has successfully received DMAF support to manage the effects of climate change by planting more trees in the right places. This work helps reduce water run-off in urban areas and reduces the impact of heat islands.

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

WATER EQUITY AND LIVEABILITY

Around the world, growth, economic trends and changes in the climate are raising concerns about equitable access to safe, reliable water and wastewater services. These same factors are raising questions about how communities can remain liveable in the coming decades as growth drives the need for more infrastructure projects.

Water equity provides a new lens with which to view the services York Region provides to residents and businesses in partnership with local municipalities.

The US Water Alliance has identified a framework to advance water equity, which from a York Region perspective would be built on three pillars:

- Ensure all users of municipal systems have access to clean, safe, affordable water service
- Maximize community benefits of water and wastewater solutions
- Foster community resilience in the face of a changing climate

Access to Clean, Safe, Affordable Water Services

The first pillar is a reminder that water equity relates to the cleanliness and safety of supply as well as its affordability. As part of the recent update to the Financial Sustainability Plan for the Region's water and wastewater, affordability of water bills was reviewed using new standards that take lower-income households into consideration. The conclusion was that rates continue to be affordable for most residents but the high cost of housing in the Region may be creating challenges that go beyond the affordability of water bills. The recommended best practice for water and wastewater utilities is to consider affordability support programs for low income households, rather than keep water rates and wastewater services low for all customers. Some help is available to those facing financial challenges, including water-specific financial relief programs in two local municipalities.

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

Water Quality Management

Drinking water varies from place to place and can be influenced by factors such as hardness, chlorine and even age (how long water stays in a pipe). Groundwater tends to be harder than surface water, picking up minerals like calcium and magnesium as it travels slowly through sediments. It may also contain other minerals like iron and sodium. Drinking water is highly regulated and measures of water quality include both health/safety requirements as well as aesthetic targets. The Region and local cities and towns work together to maintain a safe drinking water system and ensure water quality that meets provincial standards.

A multi-barrier approach, underpinned by stringent provincial regulations, proactively protects drinking water and public health. Some elements include source water protection, training of operators, system audits, a strict provincial inspection and enforcement program, as well as extensive water quality sampling and system monitoring. For example, in 2021, York Region collected and performed 16,639 laboratory-analyzed tests and approximately 40 million point-in-time readings were recorded by 376 continuous monitoring analyzers.

In the long-term, some infrastructure-related examples of water quality management include:

- Timing new water infrastructure carefully to limit oversizing, which can lead to increased water age
- Upgrading treatment at some York Region groundwater well facilities to improve the quality of water in communities; groundwater treatment upgrades (valued at over $100 million) will be phased at multiple York Region well facilities over the next 15 years; groundwater wells diversify water supplies available to the Region which supports flexible and resilient servicing in the face of changing climate
- Renewal of several York Region water storage facilities (valued at over $100 million over the next 10 years) to keep water storage facilities (like reservoirs and water towers) in good condition
- Enhancing maintenance and cleaning of water storage facilities and distribution system
- Researching emerging contaminants and anticipating operational challenges to identify potential risks early

While not specifically growth-related, water quality continues to be key consideration in long-term service planning.

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

York Region is a leader in supplying drinking water that meets stringent provincial standards. In 2020, 100% of laboratory-analyzed samples were within regulated standards, and all provincial inspections of the Region's drinking water systems scored 100%. These scores reflected systems and operations in communities across the Region. Through a focus on operations excellence including implementing an Integrated Management System (comprising the Drinking Water Quality Management Standard along with ISO 14001) the Region is working to ensure our drinking water remains safe now and into the future.

Maximize Community Benefits of Water and Wastewater Solutions

Traditional infrastructure projects can be disruptive to communities during construction and historically have impacted the natural environment, for example, by covering or altering existing watercourses.

While a regulatory framework to minimize environmental damage and mitigate impacts is now in place, newer approaches like One Water show how working with natural processes can significantly reduce the impacts of built solutions.

Similar work on this front is taking place around the world. For example, the Water Services Association of Australia is investigating how to broaden traditional approaches to improve community outcomes.

One of their important goals is liveability. This can guide York Region, local cities and towns and conservation authorities on several fronts, including:

- Providing and encouraging "blue-green" infrastructure and traditional blue infrastructure (water and wastewater infrastructure recommended through this Master Plan) that aligns with One Water approaches
- Using water and greening to reduce heat in the urban landscape, providing resilience to heat events and improving air quality
- Engaging with communities to educate and encourage water-related initiatives at every scale, including individual properties

The Australian water association has developed a framework that provides guidance on leading, building capacity, engaging the community and developing the right policy and regulatory arrangements to make communities more livable through water-based initiatives. This may provide a roadmap as York Region acts on this Master Plan.

Foster Community Resilience in the Face of a Changing Climate

Community resilience in the face of a changing climate is a key goal of the Region's draft Climate Change Action Plan, which includes a commitment to an equitable transition as communities address climate challenges. Climate change impacts will not affect every resident or every area the same way. Having more information about specific vulnerabilities will be essential in developing the right responses to differing climate change impacts. The Region will continue to guide and encourage the creation of complete communities and will also work to ensure infrastructure systems are built and maintained for both the current and future climate.

7.2 ACHIEVING A SUSTAINABLE WATER FUTURE

MEASURING SUCCESS

To achieve York Region's vision of strong, caring, safe communities, the Region sets and measures progress on key priorities set out in the 2019 to 2023 Strategic Plan. Annual reporting ensures objectives are met. Delivering and promoting environmentally sustainable services stress the importance of demand management activities. Ensuring fiscally responsible, reliable, and responsive service delivery means services are delivered to residents and businesses in the Region in the most efficient and effective way possible. Successful implementation of this Master Plan will be evaluated by providing available capacity to ensure we meet the Provincial Policy Statement 2020. Municipalities must as a minimum provide three-year supply of residential units, with an option to consider a five-year servicing supply. This performance indicator is also outlined in the Regional Official Plan and reported to Council as part of the capacity monitoring report.

Developing a deeper understanding of current and potential water equity concerns and opportunities in York Region could provide a broader view of the impact that water plays in York Region's residents' lives, health and enjoyment and in the economic vitality of its communities.

A growing number of United States and international utilities have been developing One Water initiatives to respond to regional water challenges. Research is being carried out by the Water Research Foundation to help utilities and municipalities identify effective strategies and viable technological, policy, institutional, and financial pathways towards One Water. The Region will continue to review and integrate knowledge and learnings from other jurisdictions into its own programs and plans as it advances toward a sustainable water future.

8.0 CONCLUSION

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CONCLUSION

Realizing the aspirations of the Region's Vision will depend on operating water and wastewater systems responsibly and efficiently, and meeting growth needs prudently.

This Master Plan update, which outlines $4.5 billion in growth projects, supports those goals. It aligns with the Municipal Comprehensive Review process by ensuring there is enough capacity in the right areas of the Region at the right time as the Region's population reaches a forecast 2.02 million by 2051.

The Master Plan is a dynamic document that will be recalibrated as needed to ensure investments align with actual growth. The plan is expected to be updated within the next five years in coordination with the next updates to the Regional Official Plan and Transportation Master Plan. As with this and previous plans, it will seek out the views of residents, Indigenous communities, municipal councils and staff and others to help inform its direction.

Safe and reliable water and wastewater services are central to social, environmental, and economic well-being. The COVID-19 pandemic that began two years ago has served as a reminder of how quickly and dramatically conditions can change, and how public service delivery must be ready to respond. Sobering new studies, as well as reports of unprecedented severe weather around the world, underscore the need to address climate change and protect people and the environment.

8.0 CONCLUSION

Wisdom harnessed to technology can go a long way in creating a better social order, a world in which all creation can survive and enjoy life to the fullest.

Intebeja Mani (John Snow)
Chief of the Stoney Nation,
These Mountains Are Our Sacred Places

Meeting such challenges requires well-designed and maintained systems supported by highly proficient staff and leading-edge technology.

And it requires the wisdom to understand that water is a precious and finite resource.

Demand management programs like water conservation, inflow and infiltration reduction and energy conservation and demand management play an integral role in planning and delivering the Region's water and wastewater services. That is why sustainable planning for infrastructure is increasingly linked to the One Water approach, which recognizes the value of water in all forms and settings and stresses the need to support and work with natural processes.

York Region will also maintain rates that cover the costs of operating and renewing water and wastewater assets and help prevent water being wasted. It will continue to work with local municipalities, partners, the development industry and others to turn the principles of One Water into action.

With this 2022 Master Plan update, York Region remains at the forefront in delivering water and wastewater services that depend on excellence in building and operating complex systems. By embodying the leading-edge principles of One Water, it will contribute to building stronger communities across York Region and a healthier, more resilient environment for all.

Intebeja Mani (1933 - 2006) was a visionary Indigenous leader, statesman, philosopher and spiritual leader. As Chief of the Stoney Nation, Mani helped protect the rights of all Indigenous peoples by bringing attention to Indigenous issues. He is immortalized through his teachings and writings.

2022 YORK REGION

WATER AND WASTEWATER MASTER PLAN

AUGUST 2022

York Region