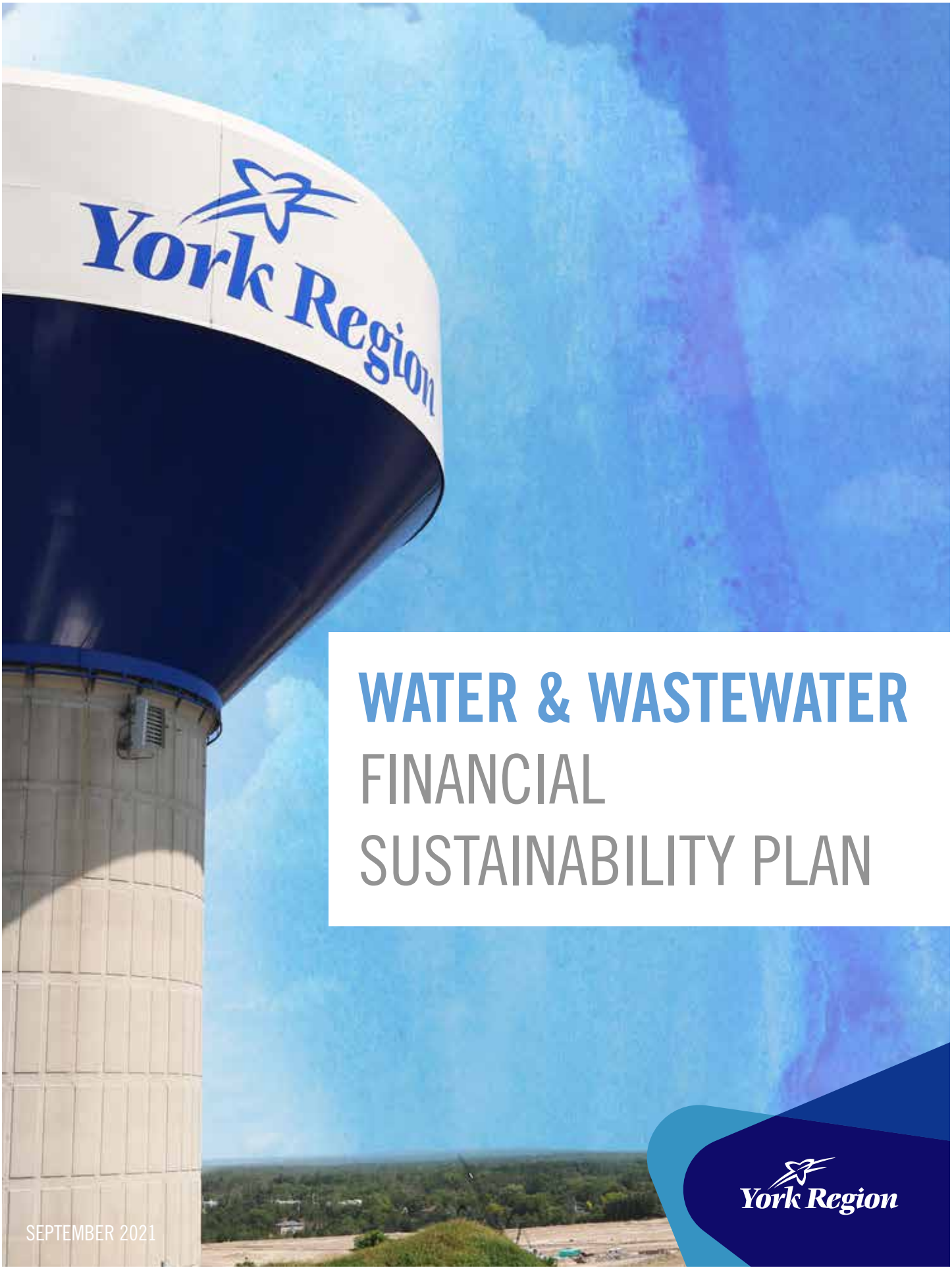


WATER & WASTEWATER FINANCIAL SUSTAINABILITY PLAN

SEPTEMBER 2021

York Region

This Financial Sustainability Plan was developed in 2020 and 2021 to support periodic review of York Region's wholesale rates for water and wastewater. York Region acts as a wholesale provider of water and wastewater services to its local municipalities.

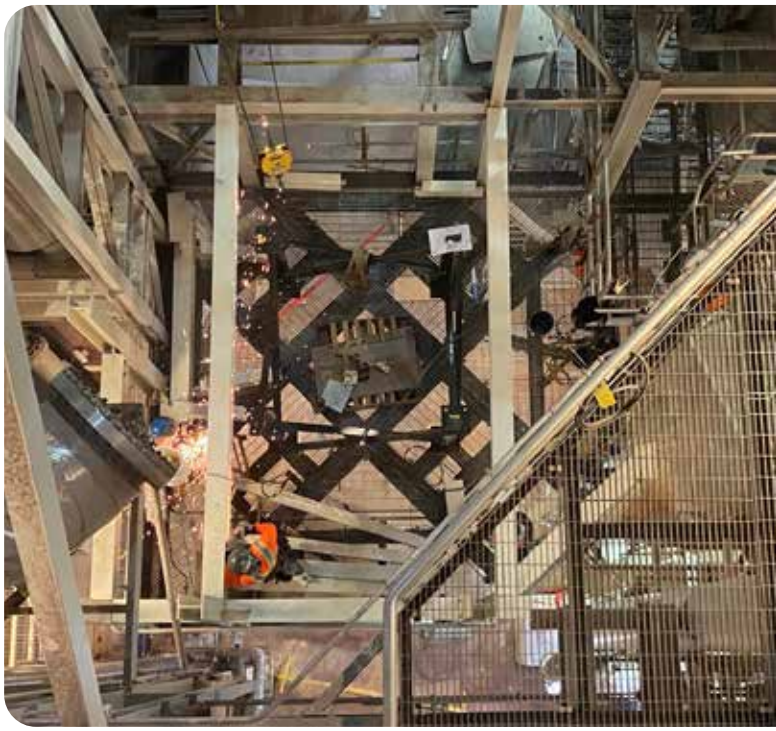
EXECUTIVE SUMMARY

This Financial Sustainability Plan was developed in 2020 and 2021 to support periodic review of York Region's wholesale rates for water and wastewater. York Region acts as a wholesale provider of water and wastewater services to its local municipalities, which in turn set retail rates and provide services to end users. This document updates the previous plan, which Regional Council approved in 2015.

Water and wastewater rate-setting is guided by goals and principles that recognize the importance of both operational excellence in delivering services and long-term financial sustainability.

Financial sustainability requires the Region to set prices that cover the full costs of providing services, including both day-to-day operating expenses and contributions to reserves. Setting water and wastewater rates that cover full costs of providing services is a best practice in the industry and a goal to which York Region has been committed for more than a decade.

With approval of the recommendations of this Financial Sustainability Plan, York Region is expected to achieve and maintain full cost recovery over the approval period of April 1, 2022 to March 31, 2028.



With approval of the recommendations of this Financial Sustainability Plan, York Region is expected to achieve and maintain full cost recovery over the approval period of April 1, 2022 to March 31, 2028.

The recommendations are that:

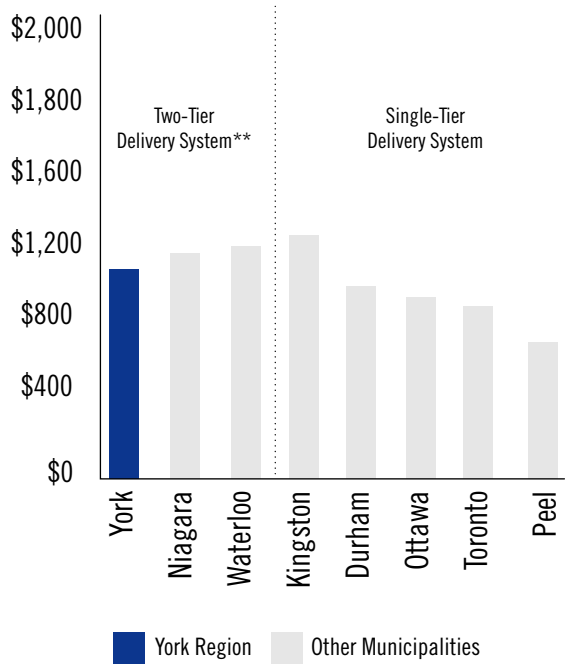
- A total of $28.24 million be transferred from water and wastewater rate stabilization reserves to the respective asset management reserves for each service. The purpose of the transfer is to offset the impact on asset management reserves of rate increases that were deferred in 2020 and 2021 in response to the COVID-19 pandemic. Rate stabilization reserves would remain at an adequate level after the transfer.
- Annual water and wastewater wholesale rates be increased by 3.3% on April 1 each year from 2022 to 2027, resulting in the annual cost per cubic metre outlined below:

Water And Wastewater Rates	
Year Starting	**Combined Wholesale Rate ($/m3)**
April 1, 2022	$3.18
April 1, 2023	$3.28
April 1, 2024	$3.39
April 1, 2025	$3.50
April 1, 2026	$3.62
April 1, 2027	$3.74

With an average household income in the Region of more than $120,000, current and proposed rates meet all standard tests of affordability for water and wastewater.

The change at the Regional level taking effect April 1, 2022, is expected to add $21 a year, or $1.75 a month, to an average water bill. York Region's average water bill remains the lowest among Ontario regional municipalities with a two-tier delivery system.

Average 2021 Water Bills* in Large Ontario Municipalities



**Bill based on published 2021 retail rates and water consumption of 207 m3 per year, which is the average for all residential property types in York Region*

*** Weighted average bill across lower-tier municipalities by population*

With an average household income in the Region of more than $120,000, current and proposed rates meet all standard tests of affordability for water and wastewater. In 2020, however, Regional Council deferred rate increases planned for April 1, 2020 and April 1, 2021, owing to concerns about the economic impact of lockdowns and restrictions in response to the COVID-19 pandemic. An expected shortfall in revenues as a result was managed

by reducing budgeted contributions to asset management reserves in 2021. The recommended transfer of funds from the rate stabilization reserves would bring asset management reserves back to the appropriate level.

The forecast model underlying revenue projections was developed for the 2015 Financial Sustainability Plan. It reflects three main factors: the growth in demand for water as the population grows, the response in demand when the price goes up, and seasonal use in a year of average summer weather. Having performed well at forecasting demand from 2016 to 2020, the model continued to be used for this update.

Because of factors like the ongoing adoption of more water-efficient technology and a shift to smaller homes and lot sizes, consumption is expected to rise at a slightly slower rate than population. Pricing also plays a role, with consumption decreasing slightly as rates go up. Price-driven decreases in demand are expected to moderate with the new rate structure, after larger rate increases leading up to 2020.

Recommended rates were set at a level expected to generate enough revenues to cover projected costs.

Day-to-day operating cost projections in the model are based on the Region's agreements with neighbouring municipalities for water and wastewater services and infrastructure, and on expected population growth and inflation.

Costs also include contributions to reserves for rate stabilization in case of unexpected changes to the plan, and reserves that are used for asset management.

This Financial Sustainability Plan sets out an updated approach to maintaining the rate stabilization reserves that reflects the potential need to address both in-year and longer-term risks to revenues, expenses, or both. This refinement was shaped in part by the pandemic experience.

Asset management reserves are used in place of user-rate-funded debt to pay for renewal of the large water and wastewater asset base, valued at $7.7 billion in 2020. By adding to asset management reserves, the recommended rates support the Region's plan of eliminating user rate debt by 2040. Asset management reserve contributions are also designed to achieve the Regional goal of intergenerational equity, which means that current and future residents will make equal annual contributions.

With the growth in asset management reserves, debt service has decreased from 17% of costs in 2015 to the current 3% and is expected to decline further to 2% by 2027.

INTRODUCTION

York Region's Financial Sustainability Plan for water and wastewater rates was initially approved by Regional Council in 2015 and provided the basis for expected rate increases from 2016 to 2021.

This update reports on results of the Plan to date and sets out the proposed water and wastewater rate structure slated to start on April 1, 2022.

The purpose of the Plan update is to meet the Region's commitment to recovering all costs of providing water and wastewater services through rates charged to customers. These costs broadly comprise day-to-day operating expenses and the costs of rehabilitating and replacing existing assets as they age.

Water and wastewater rates are designed to align with the Region's fiscal strategy, which helps to reduce reliance on debt and ensure fairness to water and wastewater customers now and in future.

York Region acts as wholesaler to its local municipalities

The Regional Municipality of York, also called "York Region" or "the Region" in this document, provides a range of services to its 1.2 million residents and roughly 54,000 businesses, often in partnership with the nine local municipalities that operate within the Region.

As required by provincial legislation, the Region acts as a wholesale provider of water and wastewater services to its local municipalities.

These responsibilities reside within the Environmental Services department, which is guided by specific goals and principles to ensure it meets its operating, capital, regulatory and financial requirements.

As the wholesale provider of drinking water, York Region:

- Purchases water from the Region of Peel and the City of Toronto, which together supply more than 85% of York Region's total municipal drinking water
- Operates and maintains two surface-water treatment plants and 24 groundwater treatment facilities (including 40 production wells) to meet the balance of drinking water demand
- Provides and delivers drinking water through 22 pumping stations, 44 elevated water tanks and reservoirs and 360 kilometres of transmission mains
- Works with Peel and Toronto on joint initiatives to ensure adequate supply (for example, sharing the costs of capital projects and optimizing system performance)

Long-term arrangements with Peel and Toronto are necessary because York Region is the only regional municipality in the Greater Toronto Area that lacks direct access to Lake Ontario.

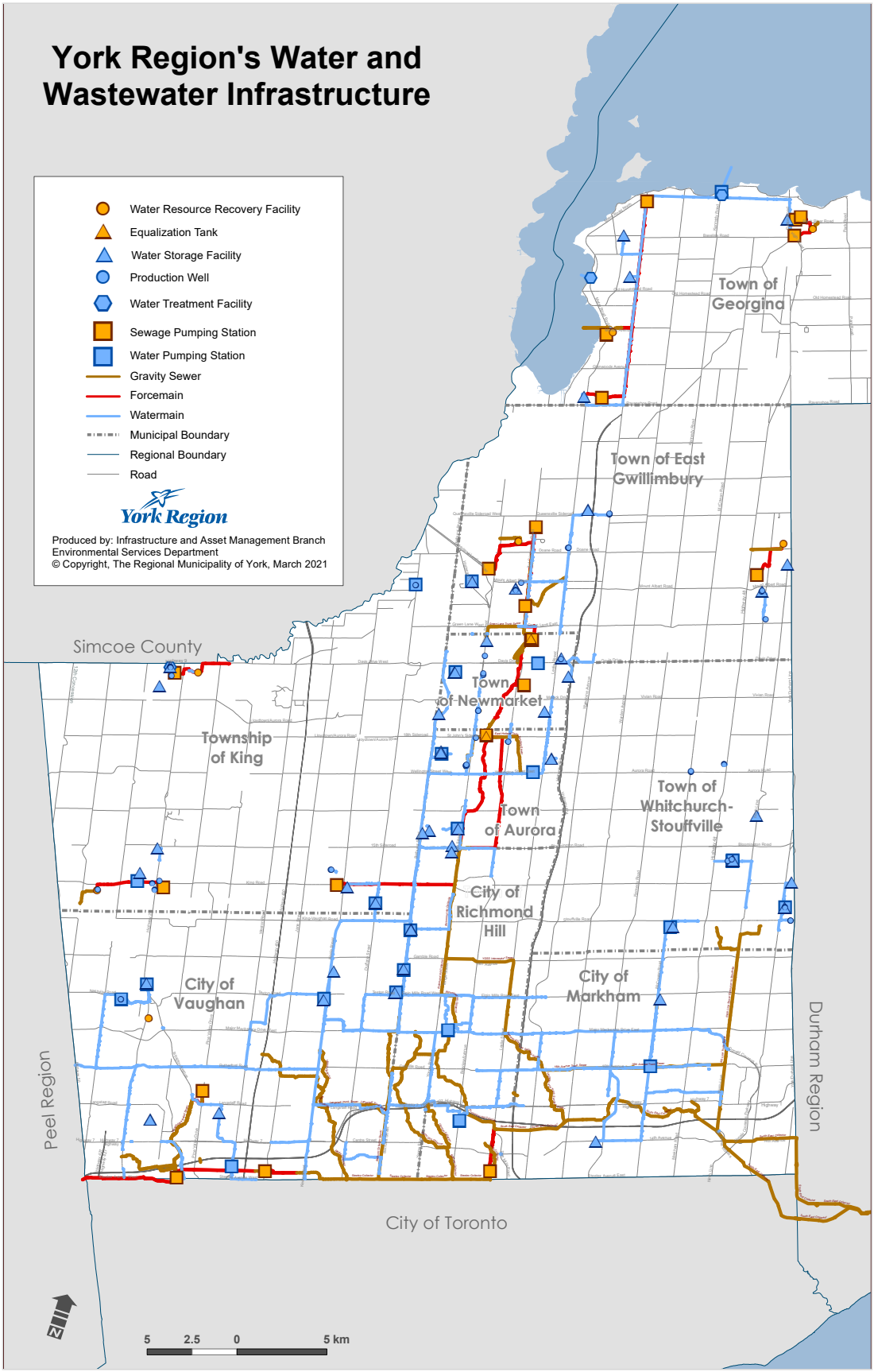
In providing wastewater services, York Region relies heavily on the York Durham Sewage System, which was commissioned by the provincial government in the late 1960s and assumed by York Region and Durham Region in 1997. The system consists of a wastewater collection network and the Duffin Creek Water Pollution Control Plant, which is located in Pickering and co-owned by the two regional municipalities.

In its role as wholesale wastewater provider, York Region:

- Collects wastewater from the local municipalities and conveys it to treatment plants through a system of 360 kilometres of sewer pipe, 21 pumping stations and two wastewater equalization tanks
- Supports the management and operation of the Duffin Creek plant, which treats about 85% of the Region's wastewater
- Manages an agreement with the Region of Peel for the treatment of roughly a further 10% of the Region's wastewater
- Operates and maintains seven wholly-owned water resource recovery facilities located mainly in the northern part of the Region that treat the balance

The map on the next page shows the major elements of York Region's water and wastewater systems.

York Region is the only regional municipality in the Greater Toronto area that lacks direct access to Lake Ontario.


York Region's Water and Wastewater Infrastructure
Water Resource Recovery Facility
Equalization Tank
Water Storage Facility
Production Well
Water Treatment Facility
Sewage Pumping Station
Water Pumping Station
Gravity Sewer
Forcemain
Watermain
Municipal Boundary
Regional Boundary
Road
York Region
Produced by: Infrastructure and Asset Management Branch
Environmental Services Department
© Copyright, The Regional Municipality of York, March 2021
Town of Georgina
Town of East Gwillimbury
Simcoe County
Township of King
Town of Newmarket
Town of Aurora
Town of Whitchurch-Stouffville
City of Richmond Hill
City of Vaughan
City of Markham
Peel Region
Durham Region
City of Toronto
5 2.5 0 5 km

York Region water quality continues to receive highest marks

York Region continues to be a leader in supplying drinking water that meets stringent provincial standards and in how it collects, analyzes and shares water quality data.

- In 2020, 100% of 17,923 laboratory analyzed samples and 99.99% of 39.5 million continuous monitoring analyzer readings were within regulated standards. All adverse results were addressed and reported.
- All provincial inspections of the Region's drinking water systems scored 100% in 2020.
- York Region received excellent scores in the Chief Drinking Water Inspector's Annual Report Card for the Province's 2019-2020 fiscal year, with a score of 99.98% for water samples meeting Ontario's drinking water quality standards, and an inspection score of 100%.

In addition, the Ontario Public Works Association recognized York Region in 2020 for management innovation as a leader in drinking water data management and public transparency.

Regional surveys show that residents also value water and wastewater service quality. About two-thirds of residents are confident that their tap water is safe and reliable. In a yearly survey carried out in fall 2020, 82% of respondents reported feeling positive about the quality of water services, making it one of the highest-rated Regional services, and more than half of residents are satisfied with all aspects of water and wastewater services' performance. The highest-rated areas for satisfaction were that the Region ensures drinking water-related infrastructure is well maintained (90%) and that there is a reliable long-term supply of drinking water (89%).

Other York Region water and wastewater responsibilities include:

- Metering and billing for water purchased by the local municipalities, and billing for wastewater collected and conveyed, using uniform Region-wide rates per cubic metre
- Ensuring its systems meet regulatory requirements, including the Province's Drinking Water Quality Management Standard, and operate to International Organization for Standardization (ISO) standards
- Planning for, undertaking and managing the building of new infrastructure and expanding, rehabilitating and replacing existing assets
- Carrying out compliance functions and collecting applicable fees and charges for activities other than providing service to the local municipalities (for example, enforcing the Region's Sewer Use Bylaw)
- Working with partners including the University of Toronto, Trent University, Ryerson University and University of Waterloo on innovative research and development projects
- Working with its local municipalities, conservation authorities and other partners to improve system efficiency, conserve water and protect drinking water sources

After receiving water from the Region, the local municipalities deliver it to their residents and businesses at rates and structures which they determine. Similarly, they collect wastewater from their residents to send to the Region's system and apply local wastewater fees. With a few exceptions, the Region assumes for the purposes of wastewater billing that volumes are the same as water delivered.

Most residents of the Region are connected to a municipal water and wastewater system. A small number of residents in rural areas of the Region are serviced by private wells and/or septic systems.

What is full cost recovery and why is it desirable?

In Ontario, municipal councils set water and wastewater rates. Unlike electricity rates, these are not subject to formal regulation.

Rate structures generally balance several considerations, including:

- Generating enough revenue to pay for day-to-day operations, regulatory compliance and asset rehabilitation and replacement, and to be prepared for unforeseen events
- Setting rates that encourage conservation and help prevent water being wasted
- Recognizing that because cash needs for asset rehabilitation and replacement are uneven from year to year, reserves need to be built up gradually for these purposes to protect customers from annual rate shocks
- Avoiding a subsidy to the service from the general tax base, especially where some taxpayers are on private systems
- Conversely, avoiding a risk that water rates generate more revenue than the water and wastewater service needs over the long term
- Recognizing how consumer demand changes as a result of rate increases and considering the affordability of rates

As this list indicates, some considerations are at odds with others — for example, encouraging conservation while considering affordability.

To help municipal councils work through the issues, the provincial government, water organizations and other authorities have provided guidance. Their advice is consistent: rates must be high enough to cover all costs, and concerns about affordability are better addressed through programs targeted to those suffering financial hardship.

For example, full cost recovery pricing for water and wastewater was one of many recommendations made by a commission of inquiry into the 2000 Walkerton tragedy, in which seven people died from drinking contaminated water from the town's system. A subsequent expert panel assessing infrastructure needs in the sector made the same recommendation.

More recently, Canada's Ecofiscal Commission emphasized the importance of full cost recovery user rates in its September 2017 report entitled "*Only the pipes should be hidden: Best practices for pricing and improving municipal water and wastewater services*". The report noted that full cost recovery rates -- based on a robust asset management plan -- are essential for both economic and environmental sustainability.

While full cost recovery is not a legislated requirement in Ontario, regulations under the *Safe Drinking Water Act, 2002* require financial plans to detail and project total revenues and expenses. More details appear as Appendix A. Some other Canadian jurisdictions, including the provinces of Saskatchewan and Nova Scotia, have specific requirements to achieve full cost recovery through rates.

Full cost recovery is a long-standing York Region priority

York Region has been committed to reaching full cost recovery water and wastewater rates for several years.

In December 2008, Regional Council approved rate increases of 10% a year for both water and wastewater in each year from 2009 to 2011 inclusive. In May 2011, Council continued to recognize the importance of targeting full cost recovery pricing by approving an annual blended rate increase of 10% to 2015.

In 2014, a research study carried out for the Region noted that user-rate revenues did not yet cover all costs, particularly longer-term costs related to sustaining aging infrastructure.

This was an important consideration in developing the 2016 to 2021 rate structure. Rate increases were designed to ensure adequate contributions to asset management reserves. The plan included annual rate increases of 9.0% for each of the first five years, including 2020. In 2021, the year in which full cost recovery would be achieved, the increase would be 2.9%. Since 2015, the Region has updated information about asset management needs, which helped inform proposed rates going forward.

In 2020, owing to uncertainty about financial impacts of the COVID-19 pandemic, Regional Council maintained rates at the 2019 level instead of implementing planned increases of 9.0% starting April 1, 2020 and 2.9% starting April 1, 2021. The impacts are discussed in more detail, in the section titled "Results in 2020 and outlook for 2021".

" … most municipalities still do not set prices for water at levels that would encourage conservation, thereby allowing the overconsumption of water, and leading to increased demand for expensive infrastructure."

Paying for Water in Ontario's Cities: Past, Present, and Future

Asset management needs are better known

Asset management involves balancing asset cost, performance and risk. The goal is to deliver required performance at the best possible cost over an asset's life cycle within an acceptable level of risk and to have funds available for major asset rehabilitation and renewal when needed.

Provincial direction on water and wastewater systems emphasizes that full costs include the cost of maintaining, rehabilitating and, when necessary, replacing the assets that make up a municipality's water and wastewater system. Failure to reflect asset management needs totally and accurately in determining full costs has been cited as a widespread problem in municipal water and wastewater rate design.

Concerns about adequate funding for municipal assets of all types led to provincial legislation in 2017 that requires municipalities to prepare asset management plans.

In 2018, provincial regulations phasing in municipal asset management requirements came into effect. That year, Regional Council approved the Region's first Corporate Asset Management Plan, which formalized asset management practices across departments. The plan documented the state of infrastructure, including asset inventory, average asset life, asset condition and replacement values, for both core and non-core assets. In line with provincial requirements, it provided more detail on core infrastructure, including water and wastewater assets. Compliance with requirements came several years ahead of provincial deadlines. The Region continues to improve asset management, not only to meet provincial regulations, but to optimize practices for the benefit of its residents, businesses and local municipalities. The Corporate Asset Management Plan documents the state of the Region's infrastructure, including asset inventory, average asset life, asset condition and replacement values for all major assets. This information gives the Region an indication of the timing and magnitude of funding needed for future rehabilitation and replacements.

The plan includes a commitment to update estimated replacement values through the annual budget process. As of the fourth quarter of 2020, the figure for replacement of water and wastewater assets was $7.7 billion.

The Region gathers information on residents' attitudes to water and wastewater, including rates, at regular intervals. This plan drew on the results of a 2020 survey carried out for the update of the Region's Long Term Water Conservation Strategy and a 2021 survey on water rates, pricing and related issues.

How the work was carried out

In developing the initial Financial Sustainability Plan, the Finance and Environmental Services departments worked together to capture operational business needs, refine forecasts and align the proposed rate structure with corporate priorities. They also reviewed literature on water and wastewater financing policies and practices in use elsewhere, including other municipalities, to identify best practices in planning and forecasting.

For this update, a staff team drawn from the same departments assessed the user rate financial model and developed new proposals based on outcomes from 2016 to early 2021, and revisited the literature, including looking at new approaches to measuring affordability. Community and Health Services also provided valuable insights and advice on equity and affordability.

The financial modelling work for both the original plan and this update focused on projecting all costs involved in meeting demand for services and the revenues needed to cover these costs.

The Region introduced the "Water Is" campaign in 2013 to educate and inform the broader public about the cost and complexity of providing clean, safe drinking water, the importance of conservation, and the value of water and wastewater systems.

The Region gathers information on residents' attitudes to water and wastewater, including rates, at regular intervals. This plan drew on the results of a 2021 survey that captured changes in residents' attitudes towards water and its cost since 2015. The survey also gauged their confidence in York Region's water infrastructure and the safety of their drinking water. Results of a 2020 survey, carried out for the update of the Region's Long-Term Water Conservation Strategy, also proved useful. In addition, more general information was drawn from community opinion surveys in 2020 and 2021.

Engagement with local municipal partners

Ongoing engagement with the local municipalities, who form the core customer base as well as acting as partners in service delivery, was key in developing this update, as it was in developing the 2015 Plan.

The Region reached out to senior public works and financial staff within each local municipality to provide them with updates on the rate study, gather their feedback on potential rate structures and coordinate timing of key rate decisions for 2022 and beyond.

Outreach included a short discussion paper and questionnaire, presentations and follow-up virtual meetings in August and September 2020.

Feedback from local municipal partners is key to understanding local concerns and views on potential rate structure changes, affordability of rates, projected flows and costs of rehabilitating and replacing major infrastructure.

The balance of this document explains how the Region developed and updated its approach to ensuring a financially sustainable rate structure and provides results to date. It sets out options for future rate increases and adjustments to reserve policies, and identifies the 2022 to 2027 Financial Sustainability Plan ultimately selected by Regional Council.

Feedback from local municipal partners is key to understanding local concerns and views on potential rate structure changes, affordability of rates, projected flows and costs of rehabilitating and replacing major infrastructure.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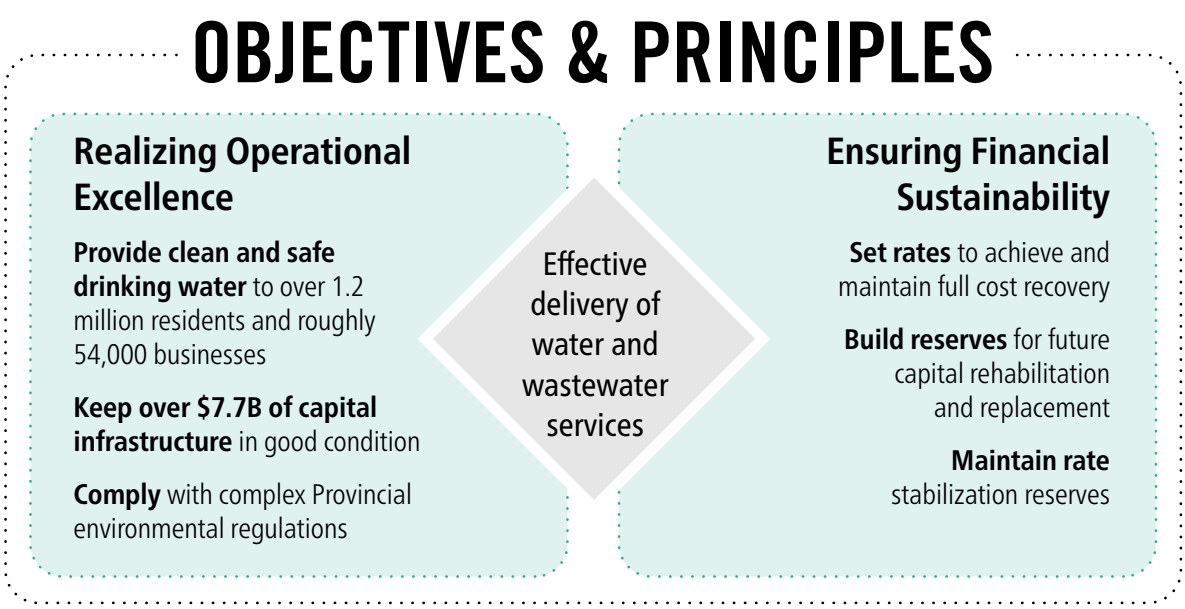
TO KEEP OUR
WATER SAFE,
CLEAN
AND AFFORDABLE

BACKGROUND

A safe, reliable and sustainable system

Rates and rate-setting are guided by goals and principles that recognize the importance of both a safe, reliable system and long-term financial sustainability:



Developing and updating the 2015 Financial Sustainability Plan

There are two major aspects to developing a financial plan for water and wastewater that ensures the full costs of providing the services are recovered through rates:

- Determining what "full costs" are over the long term
- Determining the rates that will yield revenues equal to those costs over the long term

Developing a full cost recovery financial plan is a complex exercise. It involves predicting future cash needs and revenues and the timing of cash inflows and outflows. It requires an understanding of high-level organizational goals and must ensure rates follow well-thought-out principles. The plan must also be flexible to respond to actual outcomes.

As a result of these complexities, the Region recognizes the need to update the plan with relevant information and monitor results regularly. This has been reflected in refinements to the Financial Sustainability Plan outlined in this update.

Appendix B outlines in more detail each of the steps in developing the plan and explains adjustments made for this update.

The user rate financial model

The user rate financial model (also called "the rate model") brings together all expected costs and projected consumption based on the demand forecast. The rate model then uses this information to determine annual rates that will ensure revenues cover costs.

The size and condition of the water and wastewater network are major factors driving costs. The discussion of costs therefore starts by looking at assets the Region already owns and future infrastructure mapped out in the Water and Wastewater Master Plan.

This is followed by a discussion of operating costs, including reserve contributions, and how they are expected to reflect capital plans and other drivers.

Revenues reflect both consumption and annual rates. Discussion of these factors is followed by considerations and principles in setting rates, including affordability.

Capital investments drive operating costs

Water and wastewater capital comprises built facilities and equipment such as treatment plants and pumping stations, and linear assets such as watermains and sewers. The Region's capital plans include both providing new assets to serve growth and renewing existing assets.

New water and wastewater assets to service growth are largely covered by development charges and do not directly impact the water rates. It is expected new users, as they connect to the system, will largely support the cost of operating these new assets through water and wastewater rates.

"At a minimum, [water and wastewater] plans should consider… operating, maintenance, and administration costs; research and development expenditures; existing and future capital costs; historical underinvestment; and outstanding debt obligations. When possible, asset-management plans should also consider social costs (i.e., the costs borne by society), such as the cost of protecting the natural assets that are the ultimate source of our water."

Only the Pipes Should be Hidden: Best Practices for Pricing and Improving Municipal Water and Wastewater Services

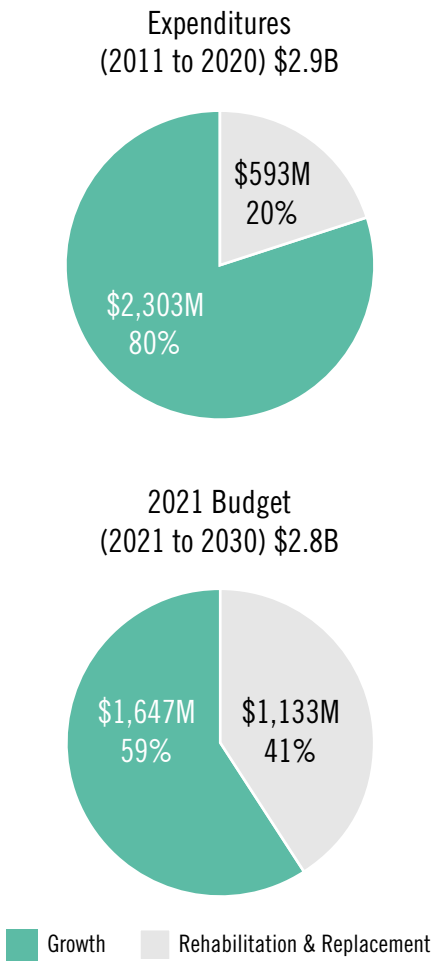
Canada's Ecofiscal Commission, September 2017

At present, the Region's assets are relatively young. For example, the average age of its watermains, at 19 years, was the lowest among all municipalities reported in the Municipal Benchmarking Network of Canada 2019 Performance Measurement Report. In many large cities, the average age was decades older.

As the asset portfolio ages, however, the focus of spending is shifting gradually toward rehabilitation and replacement, as well as the increasing maintenance and repair needs of the existing asset portfolio over the coming decades.

The charts below show how the portion of the capital plan related to water and wastewater renewal needs has increased in recent years:

Shift In Water And Wastewater Capital Needs

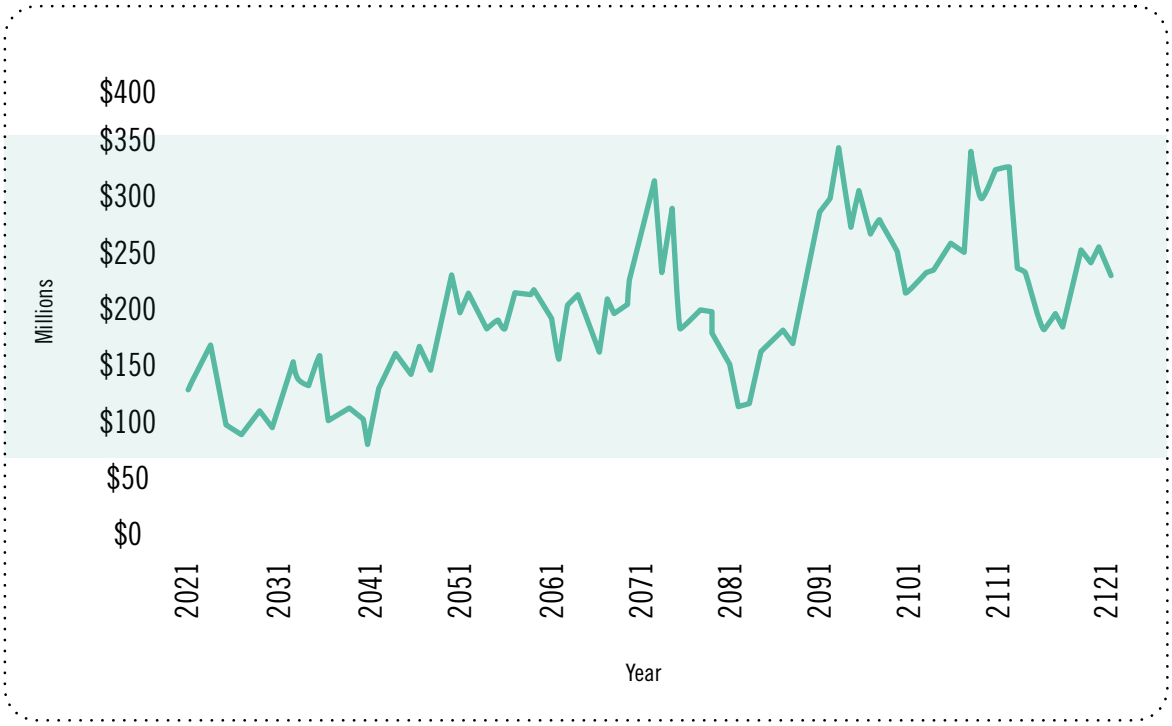


Ten-year rehabilitation and replacement needs are expected to be $1.2 billion, on average, in each of the next two decades. Current estimates are that needs beyond 2040 will total about $2.0 billion on average over each of the following three decades. These estimates are before inflation, which means the current-dollar cost of needs when they fall due will be higher.

Unlike revenues, which grow fairly steadily, rehabilitation and replacement costs fluctuate considerably from year to year. The graph below shows estimated needs for asset rehabilitation and replacement (collectively described as asset renewal) over the next 100 years. The 100-year time frame was chosen because, given the long life of most major water and wastewater assets, it covers at least one expected replacement.

100-Year Estimates Of Annual Rehabilitation And Replacement Needs For Water And Wastewater Assets (2021 Regional Budget)

Note: Dollar amounts are in real terms (i.e., before inflation)



Covering renewal costs year by year would require major annual swings in rates. Contributions to asset management reserves are therefore made from user rate revenue to ensure funding is in place for these investments when needed. This is in line with the Regional fiscal strategy, as discussed below.

Major renewal work in the current 10-year capital plan includes:

- **York Durham Sewage System rehabilitation:** this work will include inspections, condition assessments and, as required, rehabilitation or replacement of components of the existing York Durham Sewage System
- **Duffin Creek incinerators:** incinerators 1 and 2 at the plant will be replaced and auxiliary services will be upgraded

The Region's current 10-year capital plan also includes major growth-related projects, the largest of which is to address forecast population growth in the Region's north. These have an impact on the revenue needed over the forecast period because as they enter service, they will both add to annual operating costs and increase asset management needs.

Fiscal strategy supports use of reserves, reduced debt reliance

The Regional fiscal strategy is the foundation of long-term financial sustainability for York Region. The strategy's principles include using asset management reserves to smooth timing differences between cash inflows from revenues and planned spending on asset management projects.

The fiscal strategy also reflects the Region's commitment to reduce reliance on debt. By law, Ontario municipalities may issue debt only for capital, and the amount of debt issued is limited by provincial statutes. Because of its rapid growth, the Region was granted a higher repayment limit called the "Growth Cost Supplement."

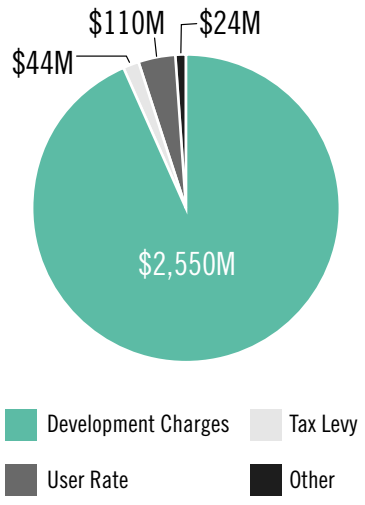
Largely as a result of building infrastructure to serve actual and expected population growth, the Region's debt increased from $498 million to $2.5 billion between 2004 and 2014. The bulk of it was issued to finance water and wastewater projects.

Citing the Region's large growth-related capital spending requirements and a high debt burden, S&P Global Ratings lowered York Region's credit rating from AAA to AA+ in 2014. Lower-rated borrowers typically pay higher interest rates on the debt they issue.

From its initial adoption by Regional Council in 2013, the Regional fiscal strategy has helped reduce reliance on debt by rescheduling some capital projects and building reserves.

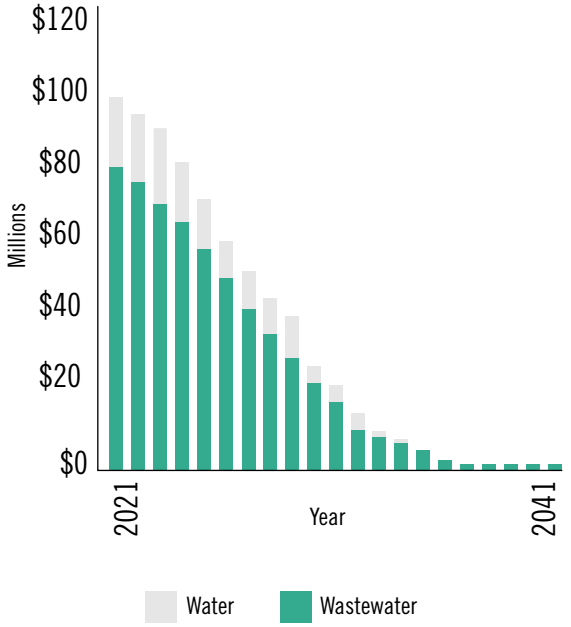
It has also limited new borrowings to those supported by development charges, as opposed to user rates or the tax levy. As the graph below shows, total Regional debt was $2.7 billion at the end of 2020. Of the small share not supported by development charges, $110 million in debt is being repaid from user rate revenues (these borrowings are also called "user-rate debt").

2020 Net Outstanding Debt ($2.7B)



In line with the fiscal strategy, the 2015 rate structure was designed to eliminate new user-rate debt starting in 2016. As the graph below shows, user-rate debt will continue to decline until it is fully paid off by 2040:

Outstanding User Rate Debt Projection



Eliminating user rate debt will provide room for the Region to borrow as needed for important new projects to service growth.

As a steward of one of the Region's largest asset portfolios, Environmental Services is committed to aligning its Financial Sustainability Plan with the Regional fiscal strategy. Elements of its capital plans were deferred in 2014 and subsequent years to meet more stringent limits on the Region's 10-year capital plan in line with the fiscal strategy. Capital planning will continue to take into account the need to effectively manage debt and phase projects in line with available funding, and the Region continues to look at ways to better align new infrastructure investment with the pace and location of growth.

Another key aspect of the Regional fiscal strategy is ensuring fairness over time to those who fund the Region's activities (a concept also known as intergenerational equity). Details of how this applies to water and wastewater rates are provided in the section that follows.

Asset management contributions are the largest budget item

The forecast of operating costs began with a review of the main operating expenses in the water and wastewater budget. This table shows the share of each major item in the 2021 Regional budget, excluding growth-related debt servicing costs funded by development charges:

Components Of 2021 User Rate Budget

Water and wastewater combined	
Contributions to asset management reserves	50%
Purchased services*	25%
Salaries and benefits	15%
Other (net of fees and charges)**	10%
Total Operating	**100%**

** Water purchased from Toronto and Peel, and wastewater services purchased from Peel and through co-ownership of the Duffin Creek plant with Durham Region*

***General expenses, occupancy and repair and maintenance costs, minor capital, financing costs, professional contracted services, program-specific expenses (less purchased services), fees and charges, stabilization reserve contributions, and allocations and recoveries*

Contributions to asset management reserves

The amount of funding in asset management reserves reflects both the annual contributions made from user rate revenues, the draws used for asset management projects and investment earnings.

While revenues are relatively steady, the draws for projects can vary considerably. This and other factors make determining the annual level of contributions to asset management reserves a complex exercise.

The Region first looks at when major renewal investments will be needed over the next 100 years and what the expected costs will be (which also involves developing a long-term estimate of inflation). This provides an outlook for required annual draws from asset management reserves by year. As noted earlier, significant needs related to the York Durham Sewage System have already been incorporated in the current 10-year capital plan.

To determine annual contributions to the reserves, a population growth forecast is needed. This is because, in line with the principle of intergenerational equity, contributions for current and future customers are equalized over time.

Also for purposes of intergenerational equity, annual contributions reflect user-rate debt servicing costs until remaining debt is eliminated. The forecast also includes long-term estimates of rates of return on invested reserve contributions.

Day-to-day operating expenses

Purchased services represent the largest day-to-day operating item in the water and wastewater budget. This item includes the water services provided under agreements with the Region of Peel and the City of Toronto, a wastewater service agreement with Peel and the co-ownership agreement with Durham Region for the Duffin Creek plant. The forecast of these items is based on details of the agreements, including the treatment of asset renewal costs, historic experience and the flow forecast.

The model assumes that most other costs, including salaries and occupancy, will increase in step with the value of the asset base. An adjustment in the current model is the assumption that increases in these items will occur the year before the addition to the asset base is commissioned.

All of the above increases are expressed in real terms. The model then adds roughly 2% a year to account for inflation, representing the rate of increase in the Consumer Price Index.

Contributions to rate stabilization reserves

The review of reserves carried out for this update concluded that uniform combined contributions of $800,000 a year would be sufficient to maintain required balances in the rate stabilization reserves. The section below titled "Reserves, rebalancing and reserve policy update" provides more details on reserve policies.

Regulatory requirements and delays add to costs and uncertainty

The Region works diligently to keep in step with regulatory changes, which are becoming increasingly stringent and adding to costs. For example:

- The *Lake Simcoe Protection Act, 2008* has had a major impact on the Region's water resource recovery facility in Keswick. In 2014, new membrane technology was installed that removes most of the phosphorus from treated wastewater. This technology has increased operating costs through higher energy use, a need for more intensive operator attention and careful ongoing monitoring and maintenance.
- Under the *Clean Water Act, 2006*, which formalized source water protection in Ontario, Regional staff provide formal conditions on development applications in vulnerable areas to safeguard drinking water. Staff also work cooperatively with land and business owners to mitigate risks. The current costs of source protection, including some activities the Region undertook before the program was provincially mandated, are $1.2 million a year.
- Over the next four years, Environmental Services anticipates undertaking 200 water and wastewater growth-related and rehabilitation capital projects, each of which will entail environmental assessment, planning, engagement, detailed design, construction and commissioning. Rehabilitating an existing water or wastewater system is costly: for example, working on an in-use sewer line requires building a temporary or sometimes permanent bypass to avoid service disruption and address health and safety risks.

Impacts of new standards and delays in regulatory approval are difficult to capture in modelling. If they cause unexpected cost increases, the rate stabilization reserve is available to compensate in the short run. Longer-term impacts would have to be reflected in a future rate study.

Forecasting the demand

The cost side of the equation must be balanced by revenues to ensure full cost recovery.

This section provides an overview of the forecast model for water demand developed in 2015 and updated for this study, including a discussion of the main drivers. For financial sustainability in the future, rates must continue to be set so that they yield needed revenues, given the projected demand each year.

The forecast model combines two elements:

- A "base" forecast that applies winter demand to the entire year. The base component covers such uses as laundry, baths and showers, toilets and dishwashing, along with year-round business uses. It accounts for about 90% of demand.
- An added seasonal component that mainly reflects demand for water use in the warmer months, for example lawn and garden watering, swimming pool filling, water park and splash pad use, outdoor car washing, and building cooling. This component accounts for about 10% of demand.

The forecast model is based on three factors -- population growth, response to prices and average summer weather.

Population and price have an impact on year-round water use, while average summer weather underlies the seasonal component. All of them could be tracked historically with some precision against water demand, which was key to developing the model.

Other factors, such as use of more water-efficient fixtures, also drive demand. Analysis showed, however, that the gains from many water-efficient fixtures were adequately captured over the rate-setting time horizon through the relationships between population and consumption and between price and consumption. This is discussed in more detail below. Some factors, such as attitudes to conservation, are important but proved difficult to measure quantitatively for modelling purposes.

For this update, the Region looked at results from the model based on population growth and price and found a close match between forecast and actual results. Tracking actual against average weather proved useful for identifying sources of annual changes from forecast.

The balance of this section looks in more detail at outcomes since 2015 and implications for the model. It also discusses factors not incorporated at present that will continue to be monitored because they may have longer-term impacts on water demand.

Total Water Demand

Forecast outcomes

The table below shows how the model's projections for financial planning purposes compare to actual flows from 2015 to 2020.

Performance of flow forecast model (2015 to 2020)

Year	Forecast (ML)	Actuals (ML)	Variance (%)
2015	123,449	122,383	-0.9%
2016	121,536	121,909	0.3%
2017	121,415	111,439	-8.2%
2018	121,291	115,688	-4.6%
2019	118,447	118,940	0.4%
2020	118,270	124,107	4.9%

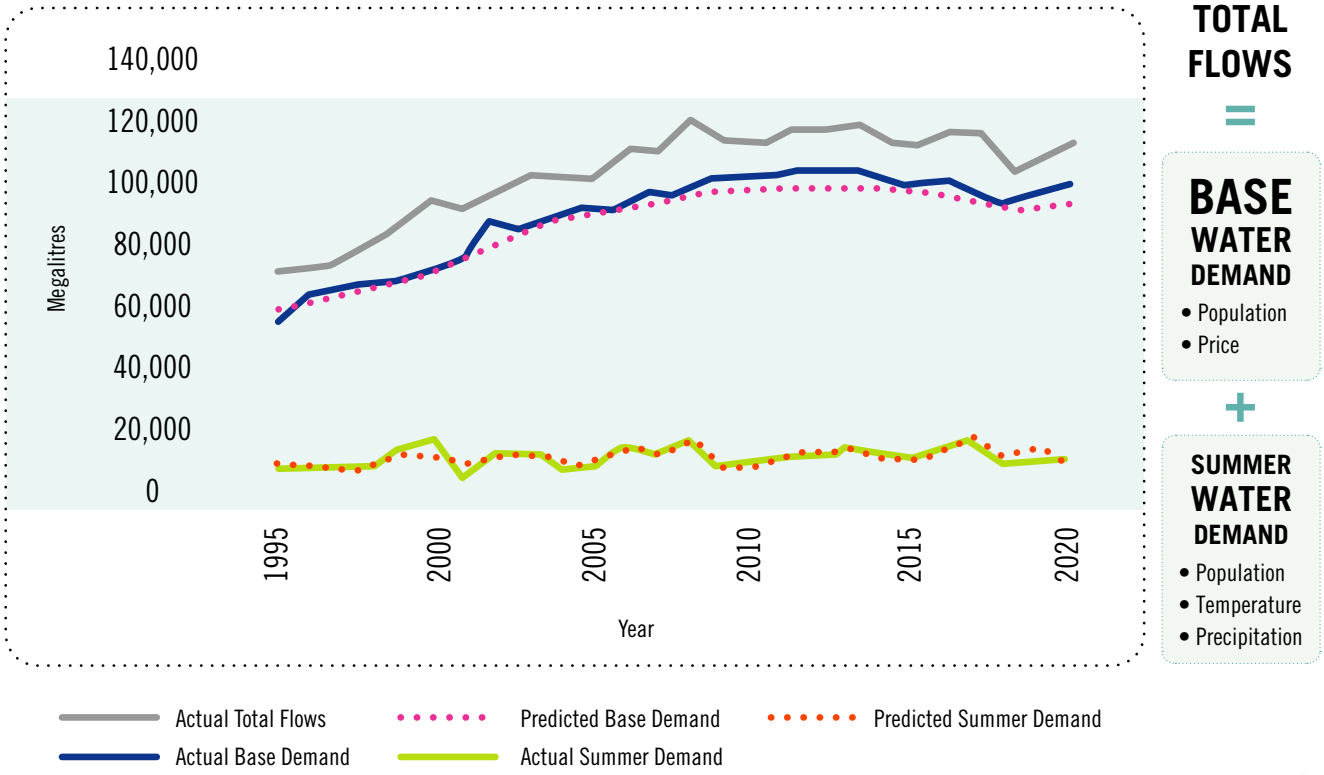
**1 ML= 1 megalitre or 1,000,000 litres*

Results varied significantly from the forecast model in 2017 and 2018 mainly because of an infrastructure issue that was corrected by replacing a large boundary meter. An adjustment to the model that was made to account for lower-than-expected population growth is discussed in more detail below.

The model is less accurate in predicting seasonal demand because the seasonal component is based on average summer weather (as measured by temperature and rainfall from May to October). Actual weather is inherently difficult to predict beyond the short term, which can lead to swings in seasonal consumption from the average. For example, seasonal consumption in 2016 — with a hot, dry summer — was more than 50% higher than that of wet, cool 2019. The unpredictability of year-to-year weather fluctuations was a key reason for creating a rate stabilization reserve for water and wastewater when the rate model was adopted in 2015.

Revenue changes arising from seasonal weather fluctuations are generally not a major concern because seasonal demand accounts for only about 10% of the total. In 2020, however, weather turned out to be a key factor in results for the year. The "Update and Outlook" section below provides more details.

Model Estimation Of Historic Water Flows



Population and consumption

The demand for water in the Region increases with population growth, but at a slower rate: historically, an increase of 1% in population results in an increase in water demand of slightly less than 0.8%.

This is because, as mentioned above, the relationship between population and consumption captures other trends that affect water consumption.

Over time, all residents are likely responding to continued messaging about conservation and to the availability of more water-efficient technology and equipment. In addition, population growth results in new housing, which tends to be more water-efficient because of building code changes requiring water-efficient fixtures and smaller (or no) yards.

As a result, demand for water per capita is falling in the Region and has been doing so for some time. The section below titled "Demand per-capita will likely continue to fall, but at a slower rate" discusses long-term trends in per-capita consumption in more detail.

In addition to setting out the relationship between population and consumption, the model incorporates a projection for population growth. Like any projection, population forecasts tend to become less accurate as they look further into the future.

The Region's population forecast when planning infrastructure must consider provincial targets set out in A Place to Grow, the current growth plan for Toronto and surrounding areas, which goes out to 2051. The forecast used in the 2015 model was also based on growth plan targets.

The Region has noted in its budgets and other documents that its population has been growing more slowly than projected in the growth plan for the past several years.

To avoid overestimating projected revenues in the short run, the water demand model underlying the annual budget used a lower provincial population forecast starting in 2018.

For this update, the population projection considers near-term realities in York Region as well as longer-term provincial targets.

The master plan for infrastructure will continue to reflect long-term growth plan targets both to align with provincial requirements and to provide greater certainty that adequate servicing will be in place when needed.

Response to prices is relatively small

Results of the Region's rate model suggest that price has a small but measurable impact on demand for base consumption, with a 1% increase in price (before inflation) resulting in an estimated 0.2% decrease in demand. This is consistent with earlier studies that suggested the same general response to price going back as far as 2001. It is also consistent with the experience of other Ontario municipalities.

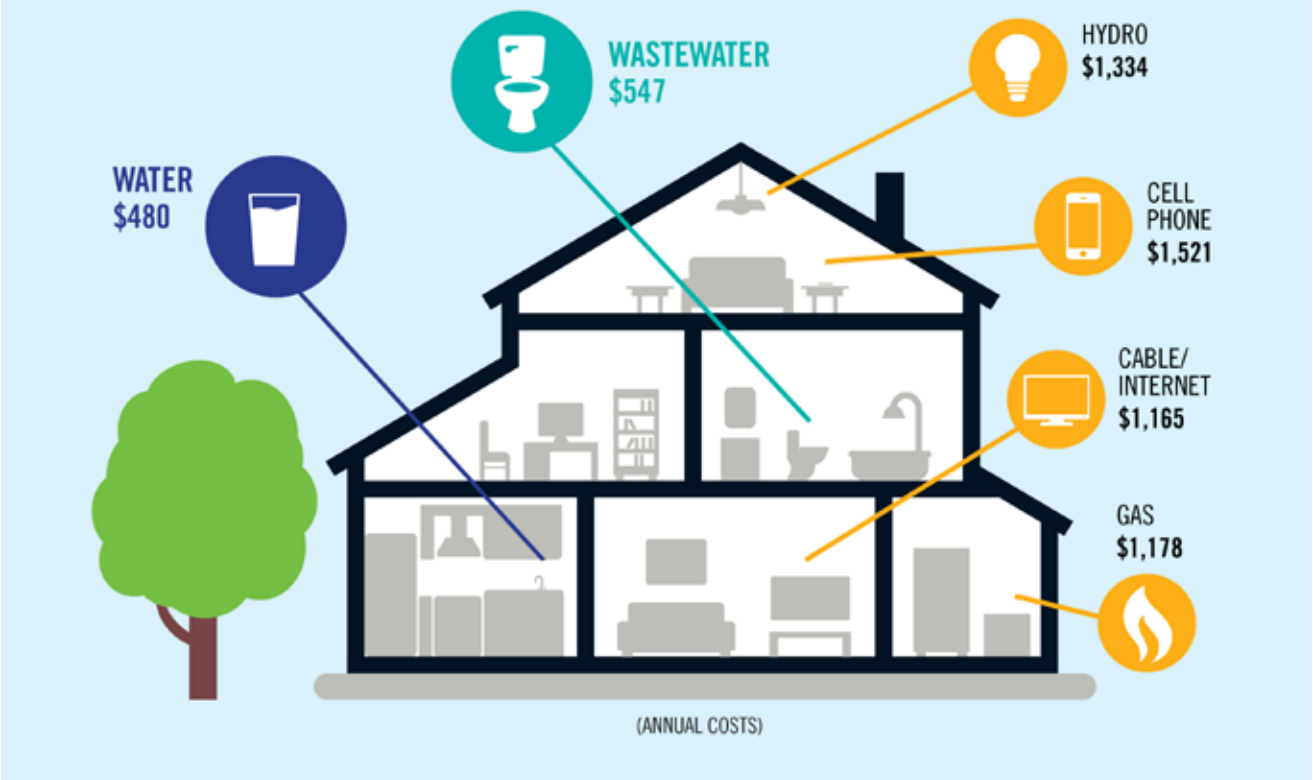
In general, the less that an item costs in relation to household income and other expenses, the less consumers respond to changes in its price. As the graphic shows, water is typically the lowest utility cost for an average household in the Region, lower than telephone, electricity, gas or oil. Average Regional household income, at $122,446 a year in 2015, is among the highest in Canada. These factors may explain much of the low response to price changes in most households.

That said, overall water demand reflects necessary uses, including drinking water, showers, toilets, laundry and so on, and these uses are difficult to curtail in the short run. The cumulative effect of the Region's rate increases over recent years, combined with messaging about conservation, may have prompted some residents to invest in water-saving fixtures. In this way, the relationship between price and consumption may embed other factors like availability of more water-efficient technology.

Households in the Region with low income may not have the option of reducing water use below the threshold set by necessary uses, or the ability to invest in water-saving technology. The possible impact on those households is discussed in more detail below in the section titled "Affordability."

In general, the less that an item costs in relation to household income and other expenses, the less consumers respond to changes in its price.

Comparison of Annual Average Household Utility Bills



Other factors with potential long-term impacts

The 2015 modelling and this update concluded that impacts of a range of factors that might affect consumption are adequately embedded in the forecast model through the relationships between population growth and consumption and between price and consumption.

As discussed below, however, the model might require adjustment if these relationships were to change over time.

Changes in capital stock

Changes to building codes and shifts in technology have been driving lower consumption of water for many years. In 1996, the Ontario Building Code changed to require lower-flow fixtures in new homes. Since then, more code changes and technological innovations — mainly the introduction of increasingly lower-flow toilets, washing machines, showerheads and dishwashers — have further increased the water efficiency of homes and other buildings.

Impacts of these changes are significant. For example, it is estimated that if 13-litre-per-flush toilets had not been replaced with more efficient toilets, annual water consumption from residential toilet use would have been higher by 50%, or roughly 10,000 megalitres (ML), by 2015 (1 ML = 1,000,000 litres). This would have boosted total flows in the Region from the current level of roughly 120,000 ML to about 130,000 ML a year.

The Region's Long Term Water Conservation Strategy, which was updated in 2021, notes that there is a lower limit on water savings that can be achieved through appliance and building standards, codes, and market transformation, and these savings are expected to plateau over time.

Awareness of this limitation, as well as attention to new water-related technologies and their rate of adoption, is essential for future modelling exercises.

Demand by industry, commerce and institutions

In addition to residential customers, the Region's ultimate users of water and wastewater include industrial, commercial and institutional customers, which make up what is called the ICI sector.

For flow forecasting purposes, using population as the sole growth-related driver of demand has returned good results to date. Increases in ICI water use in the Region appear to closely track residential consumption growth, so that the split between residential and ICI consumption can be considered fairly constant over time. This assumption continues over the current forecast period.

As discussed below in "Results in 2020 and outlook for 2021," working from home during the pandemic shifted the usual consumption pattern between ICI and residential, but without a discernible impact on total water use. This may reflect the nature of consumption in the ICI sector, where use is split into several components: process water used for industrial purposes; water for landscaping and/or building cooling; and consumption that reflects having workers and/or customers on site, such as toilet flushing, hand-washing and kitchen use. Future analysis may confirm how each of these components contributed to the shift in consumption.

The Region has worked to improve the water efficiency of the ICI sector through its Long Term Water Conservation Strategy, which provides a variety of programs, including audits and financial incentives.

Results of the Region's programs, as well as impacts of any lasting changes in ICI sector consumption patterns, will be taken into consideration as future rate modelling is carried out.

The Region has worked to improve the water efficiency of the ICI sector through its Long Term Water Conservation Strategy

Urban density and housing types

Over time, the Region's housing stock is shifting to more intense forms of development such as townhomes, which have lower outdoor watering needs, and multi-residential buildings with no individual yards. This trend, which helps to reduce per-capita consumption, is assumed to be captured in the relationship between population growth and total consumption.

One higher-intensity type of development that might offset this trend to some extent is a multi-residential unit which does not meter water use but instead embeds the cost in a condo fee or rent. Numerous surveys have shown that, all other things being equal, consumption is higher without metering.

The Region will continue to monitor trends in housing types and consumption to determine whether the impacts are significant enough to require refining the model.

Attitudes towards conservation

The impact of changing attitudes towards conservation — as opposed to pure price signals — is difficult to factor into a forecast. The experience of the Region, as measured through a 2020 water and wastewater survey, is while that a large majority of residents feel it is important to conserve water, close to 60% feel that they already conserve enough or as much as they can.

The survey also identified a slightly greater commitment to conserving water inside as opposed to outside the home, which is likely related to the finding that almost one-quarter of respondents cited the need for adequate water for gardening and maintaining lawns and landscaping.

As a 2018 article in *Municipal World* magazine notes, using data and analytics such as survey results can help tailor messages to specific segments of the population, which is more likely to achieve measurable changes in behaviour. The article highlights the Region's initiatives to reduce water use in the highest-consumption neighbourhoods through programs focusing mainly on innovative ways of keeping landscaping and gardens looking lush and verdant.

Updated survey results will continue to be used to help refine the forecast model. For example, if surveys signal greater awareness of the need for conservation and better understanding of how this can be accomplished, the modeling work might focus on how this affects base and/or seasonal demand.

Non-revenue water

As the term suggests, "non-revenue water" is water a utility supplies to its distribution system that does not generate revenue at the individual customer level. It includes water needed to fight fires and to flush out watermains to maintain water quality, as well as system leakage, storage tank overflows and unauthorized use. Non-revenue water also reflects customer meter inaccuracies that result in billings below actual consumption, and systematic data handling errors.

Like many municipalities, the Region and its local municipalities continually work towards reducing all sources of non-revenue water through distribution system optimization, asset management and metering programs. The Region and local municipalities are currently updating metrics to assess non-revenue water according to new industry best practices. Historical data from the Region's local municipalities, however, indicate a low level of distribution system leaks.

The modelling took into account the current share of non-revenue water in total flows and made no assumptions about future changes.

Climate change

Underlying year-to-year swings in seasonal consumption is a long-term trend of general decline in summer use. This is likely related to such factors as the shift in housing types towards smaller lots and multi-residential units and changes in attitudes.

A long-term factor that might work in the opposite direction is climate change, especially a warming trend.

Both the modelling done in 2015 and this update consider potential impacts of climate change on water demand. A changing climate could increase water demand in York Region in several ways: more drought, more extreme heat days and a longer growing season.

Climate change is also likely to increase operating and asset management costs, as weather is expected to become more extreme, requiring infrastructure to handle much heavier storm water flows than it was designed for. As a result, the overall cost impacts are likely to be equal to or even greater than the revenue impacts of higher demand.

A water and wastewater climate change study was completed in 2019 to identify opportunities to mitigate the impacts of climate change and to support actions through the master plan. In addition, the Energy Conservation and Demand Management Plan outlines actions for the Region to reduce greenhouse gas emissions.

Demand per-capita will likely continue to fall, but at a slower rate

For more than a decade, total demand for water as measured by volume has remained relatively flat in the Region. The population and hence the user base has grown, but this has been offset by decreases in demand per capita, reflecting several of the factors outlined above.

A key question is how long the consistent decline in per-capita use will continue:

- Once full cost pricing is realized, it is likely that rate increases will be smaller. Customers do not typically respond as strongly to a small price increase as they do to a larger one.
- Another factor is the extent to which further water savings can be realized through additional changes to the building code, provincial regulations and new technology.
- Given water's many necessary uses, there is a limit to how low consumption can fall. The Region's Long-Term Water Conservation Strategy has set 150 litres a day per resident as an aspirational goal. Projections based on current demand suggest per capita daily consumption will be between 155 and 164 litres by 2051, down from the current level of 184 to 194 litres, and not far above the 150-litre-a-day goal.

Based on these considerations, flows are expected to increase over the forecast horizon and beyond as per-capital use moderates and ultimately plateaus.

Guidance in setting rates and designing a rate structure

Once the full revenue need is known, the next step is deciding how rates will be designed. Providing water and wastewater is a natural monopoly: having one provider is the lowest-cost option. As a result, rate-setting needs to consider a balance between customers' interests and those of the supplier.

Much work has been done on this in regulated industries, such as gas and electricity distribution. As a result, rate-setting principles are well-established:

- **Rates should be efficient.** They should promote the best use of the service.
- **Rates should be effective.** They should yield the revenue needed by the service provider.
- **Rates should be fair to users and predictable.** They should apportion costs properly among users while avoiding undue discrimination and should not change unexpectedly.
- **Rate structures should be practical.** They should be simple, easy to understand and interpret, acceptable to the customer and feasible to apply.

Uniform rate per cubic metre will be maintained

York Region's 2015 Financial Sustainability Plan applied a uniform per-cubic-metre rate to water and wastewater. (Water and wastewater volumes are assumed to be equal, with a few exceptions such as homes that are connected to a municipal drinking water service but use septic systems for wastewater.)

This pricing approach struck a balance between two alternative rate structures that can be used for water and wastewater services:

- **Declining cost** per cubic metre with increasing customer consumption or a combination of **fixed and variable rates**. Either option better matches the needs of the service provider, who has high fixed costs, but concerns include unfairness to smaller consumers and failure to encourage conservation.
- **Increasing cost** per cubic metre with increasing customer consumption. This option encourages conservation and is fairer to small consumers but does not provide revenues that align with the water service's cost structure.

In its role as wholesale supplier to the local municipalities, which set the retail rates customers ultimately pay, the Region discussed options with water and finance officials in local municipalities for both the original modelling and this update. These discussions made it clear that changing the existing rate structure would require careful coordination to avoid administrative burden and customer confusion. Another key concern with a fixed/variable rate model is determining the fixed amount each municipality would pay.

Given these concerns, the Region will continue to use the current rate structure.

Affordability

The affordability of water and wastewater rates took on greater concern as this update was being prepared, owing to the global COVID-19 pandemic that began in early 2020.

Response to the pandemic included closing or curtailing the hours of most workplaces. Where possible, employees shifted to working from home while others were laid off or had reduced hours.

In response to concerns about the pandemic's impact on residents, Regional Council voted to forego scheduled rate increases of 9.0% for the year starting April 1, 2020 and 2.9% for the following year.

As more information became available, a complex picture of the pandemic's economic impacts emerged.

For some of those whose work was curtailed, federal support programs may have more than offset lost income. Work done by Statistics Canada for the country as a whole found that over the first three quarters of 2020, disposable income for the lowest-income households increased 36.8%, more than for any other households. This was attributed to federal support programs exceeding losses in wages and salaries and self-employment income.

In addition, many of the Region's residents, especially in the financial and professional service sectors, were able to work through the pandemic, with reduced commuting and travel costs. There were fewer opportunities for travel, dining out, shopping and other discretionary activities for all households.

An April 2021 report by the Conference Board of Canada estimated that overall, disposable income in the Region rose by an average of 7.8% in 2020. The Conference Board also cited federal support programs as the major driver of income gains.
This underscores consistent advice and guidance on rate-setting: trying to address the unaffordability of rates for some consumers by giving all consumers a break on rates is not efficient. For water and wastewater services, impacts of setting rates too low can include shortfalls in revenue and over-consumption of water.

An April 2021 report by the Conference Board of Canada estimated that overall, disposable income in the Region rose by an average of 7.8% in 2020.

Work done for the original financial sustainability plan and this update looked at concerns around water and wastewater affordability. Rates are said to be affordable when households can pay them without sacrificing other essential goods and services.

The 2015 analysis found that water and wastewater bills in the Region appeared affordable overall, although it noted that some households might struggle to pay their bills. For the update, recent literature was reviewed and additional affordability measures identified.

Typical affordability benchmarks take a community approach, setting the benchmark as the share of income of a median household (that is, a household in the middle of the income distribution) going to water and wastewater.

In York Region, 2015 median household income as measured in the 2016 census was $95,766, the second-highest in the Greater Toronto Area and among the highest in Canada. Staff estimate that the average bill in the Region is currently about 0.9% of the median household's total income. This is well within affordability limits defined by a range of authorities.

This approach, however, overlooks the concerns of households below the median, where the costs of other necessities make up a bigger share of income and where paying for the minimum essential volume of water might be difficult.

Analysis of households across the income distribution showed that by this measure, bills are affordable except for those with total income below around $20,000, even after accounting for varying levels consumption with income. This is in line with 2015 findings.

However, this analysis may not fully account for other essential costs of living faced by York Region households, including rent and food. These costs reduce the income available to pay water and wastewater bills. Once they are included in the analysis, more households may struggle than suggested above.

One measure of households' essential costs is Statistics Canada's Market Basket Measure, which the federal government has designated Canada's official poverty line. For a four-person household in the Region in 2019, after-tax income of roughly $50,000 or less fell below the poverty line. These households may find it a challenge to cover basic needs, including water and wastewater.

Using data from the last census, staff estimate that around 23% of households in the Region fall below this threshold. The share is in line with other municipalities in Ontario, including Toronto, Peel, Hamilton and Ottawa.

This suggests total essential costs, not just water and wastewater bills, are creating the bulk of affordability concerns for the Region's households. The difficulty of finding affordable housing in the Region is certainly well-documented: as the Region's 2020 Housing Matters report noted, housing costs have outpaced income growth in the Region, creating challenges for many residents to afford housing and make ends meet.

There are potentially mitigating factors where water and wastewater costs are concerned. Households with low income are more likely to live in multi-residential buildings and to rent rather than own, and in these situations the costs are often included in shelter costs instead of being billed separately. Nonetheless, higher water rates might be felt through increases in the general shelter cost.

Integrating relief for households with low income is a best practice recommended by Canada's Ecofiscal Commission in its report on water pricing. As the report notes, "Ensuring that water remains affordable for low-income households is a key challenge. To some extent, these concerns can be addressed through a volumetric fee because households influence some control over their bill for water and wastewater by consuming less. But for many households, this relief may not be enough."

Rates are said to be affordable when households can pay them without sacrificing other essential goods and services.

One way to gain insight into whether and how water and wastewater bills trigger financial hardship is to look at requests for help with water bills and other shelter costs. The Region manages the following support programs for residents with low income who are at risk of losing their housing for financial reasons and meet eligibility criteria:

- The Housing Stability Program is for residents who are already receiving Ontario Works or Ontario Disability Support Program benefits.
- The Homelessness Prevention program is for residents who are not receiving these benefits.
- In response to the COVID-19 pandemic, a temporary York Region Arrears Benefits program helped Ontario Works and Ontario Disability Support recipients struggling with rental and utility arrears.

Except in certain situations, these programs provide residents with one-time assistance with costs and can be accessed once in a three-year period. (Details on these programs can be found on www.york.ca)

Between 2018 and 2020, the Region received an average of around 1,200 applications a year to the Housing Stability Program, of which 10.3% were for help paying off utility arrears. Across 2019 and 2020, the average for the Homelessness Prevention program was 240, of which 18% related to utility bills. While utility bills include water and wastewater, there is no way to determine how many residents needed help specifically for this.

In addition, water-specific supports are available in two of the Region's local municipalities for those who qualify for the Ontario Disability Support Program, Ontario Works or the federal Guaranteed Income Supplement. In Newmarket, an annual rebate is available to qualifying homeowners or tenants, while East Gwillimbury's program allows qualifying homeowners to defer a portion of their bill, with repayment required when the property is sold. Several other Canadian cities, including Toronto and Kingston, also offer specific water and wastewater relief as well as general help with accommodation costs.

UPDATE & OUTLOOK

The rate model has performed well

As noted, actual consumption of water has been close to the predictions of the forecast model for flows.

Between 2016 and 2020, as the graph below shows, this provided revenues in line with the full forecast model, which converts consumption into revenue using the appropriate rate for the year.

The Financial Sustainability Plan includes a provision for the Region to regularly monitor actual flows against forecast and report annually on results. As mentioned above, an adjustment to the flow forecast had to be made midway through the six-year plan to account for lower-than-expected population growth. This is partly responsible for total revenues coming in below the initial 2015 projections.

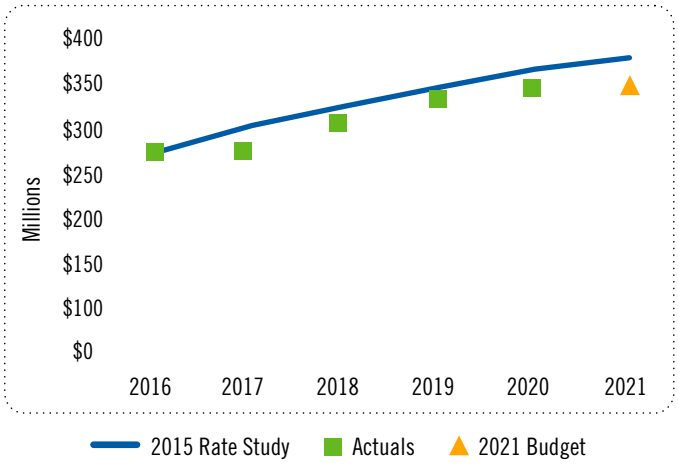
On the cost side, the forecast and actuals have generally tracked closely for the major cost items, as the graph below indicates.

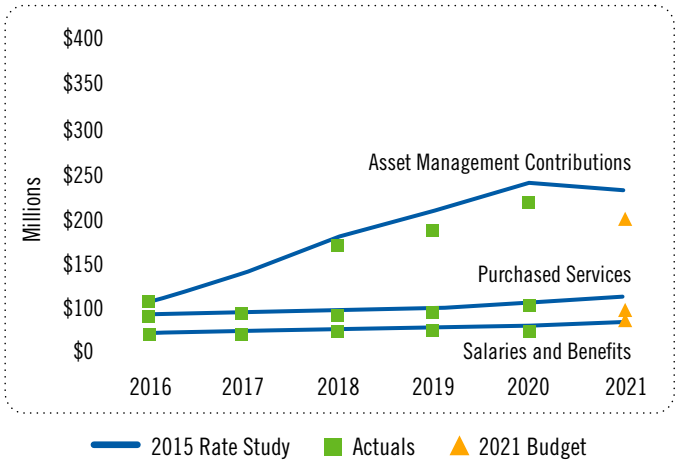
The three cost categories in the graph above represent 90% of user-rate-funded expenses.

As the graph shows, operating costs have generally come in slightly below expectation. This is largely as a result of the department working continuously to find efficiencies in its operations. For example, repair and maintenance costs have come in under plan in part due to improved work management planning and procurement practices. In addition, contributions to asset management reserves were reduced in 2019 and 2020 in line with the downward revision in the population forecast discussed in the section above entitled "Population and Consumption."

Overall, net costs have run about 3% less than expected, resulting in surpluses in most years that were contributed to the rate stabilization reserve.

Comparison of forecast revenue in 2015 plan to actuals/budget





Results in 2020 and outlook for 2021

In 2020, as a result of the COVID-19 pandemic, the Region maintained 2019 rates instead of implementing a planned 9% rate increase on April 1, 2020 (the date that annual rate changes are normally implemented) because of concerns about the financial impacts of the pandemic on households and businesses.

The expected consumption in 2020 was 118,270 ML, based on the forecast for population growth, the planned 9% rate increase and average summer weather. Freezing the rate was expected to result in a revenue decline of $25 million for 2020 and a further $7.5 million for the first three months of 2021 from what was budgeted.

As it turned out, weather in the summer of 2020 was unusually hot and dry, which was a major factor in consumption that was 4.9% higher than forecast. As well, the consumption forecast was based on a rate increase of 9%, which would typically reduce usage slightly. Not going ahead with that increase also contributed to higher-than-forecast consumption. As a result of both factors, user-rate revenues were only $9.1 million short of budget, which was covered by internal savings. This allowed for asset management reserve contributions of $202.7 million, bringing the balance to $549.7 million at the end of 2020 after draws for renewal projects.

There were questions about whether the shift to working from home might have contributed to the increase in consumption, but analysis of available data does not support that conclusion. The increase in aggregate flows, which drives the Region's revenue, tracked closely to what the model would predict based on the temperatures and rainfall between May and October of the year.

While total annual consumption does not appear to have been affected by working from home and temporary business closures, the split between residential and ICI consumption was affected. Compared to 2017-19 average volumes, ICI consumption fell by 24% and residential consumption rose by 9% in 2020.

In December 2020, Regional Council voted to maintain rates at 2019 levels for another year instead of implementing the planned 2.9% increase in the final year of the current rate structure. Again, in a year of average weather, this would give a shortfall of $43.8 million against the original 2015 rate approval, in which rates would have been roughly 12% higher than they actually are for 2021.

The shortfall was budgeted to be covered by operating efficiencies and reducing planned contributions to the asset management reserves by $28.24 million in 2021. This would put the reserves at 95% of full funding at the end of 2021, instead of the 100% level projected in the 2015 rate structure.

Closing the asset management gap with water and wastewater revenues in 2022 and beyond would have required significant annual rate increases, so a rebalancing of reserves is recommended instead. At the end of 2020, the combined balance in the rate stabilization reserves was $73 million, which was higher than projected owing to the annual savings from plan discussed above. Transferring a total of $28.24 million from rate stabilization reserves to asset management reserves would eliminate the shortfall while still providing adequate funding in the rate stabilization reserves. Details appear below in the section entitled "Reserves, rebalancing and reserve policy update."

Analysis of the 2015-2021 experience also led to a recommended adjustment in the reserve policy. The policy change and reserve rebalancing are discussed in more detail below.

Annual 2.9% increases would likely maintain full cost recovery

The 2015 study concluded that once the Region reached full cost recovery, a consistent annual rate increase of 2.9% would likely maintain that goal over the long term, an expectation which this update confirmed.

Offsetting the full impact of the annual increase is the continuing decline in per-capita water use across all customers. This means that, on average, lower consumption will reduce the average household water bill increase from 2.9% to 2.6%.

While the average bill is expected to increase by 2.6% on average, there is an expectation that costs related to current operations will only increase at an average annual rate of 2.1%. The additional 0.5% represents operating costs that relate to the continued expansion of the water and wastewater system that are not recouped from new customers. Because new customers generally consume less water per capita than existing ones -- owing to high density housing forms and

increasing water efficiency in newer housing -- the existing customer base absorbs a share of growth-related operating costs and this is reflected in the rate that all customers pay.

More residents understand the value of water

A telephone survey of residents carried out in 2020 as part of the update of the Region's Long Term Conservation Strategy underscored growing recognition of the need to conserve water. Almost 90% of those surveyed said it was important or very important to conserve water indoors, and the score for outdoor conservation was almost as high, at 78%.

This would appear to reflect a trend evident in earlier surveys. The earlier question was slightly different: respondents were asked how strongly they agreed with the statement "I am always careful to use water wisely." Between 2013 and 2015, the share of those agreeing strongly with the statement rose sharply, from 58% to 65%. This increasing awareness may underlie the almost-unanimous agreement in 2020 with the importance of water conservation.

The drivers of conservation attitudes also appear to be changing. In earlier surveys, when asked for possible reasons for conserving water, roughly half of respondents chose "to save money," with environmental and social/ethical reasons given less prominence. In the 2020 survey, however, only 35% of respondents cited saving money as the main driver of the need to conserve, even though rates had increased by 41% between 2015 and 2020. When asked for their top three reasons, about two-thirds chose non-financial reasons only: "it's the right thing to do," "to protect the environment" and "ensure water is available for future generations."

Another trend evident since the earlier surveys appears to be a much stronger commitment to conservation: in 2013, 14% of respondents said they made no effort to conserve water, with this share decreasing only slightly to 13% by 2015. In 2020, in contrast, only 2% said they do not try to conserve water.

A 2021 Regional survey looked at residents' attitudes toward pricing of water and wastewater services. About half of respondents felt that water rates were fair, roughly the same share as when the question was asked in a 2015 survey. This proportion is in line with findings from previous surveys on attitudes across Canada to the cost of services.

A telephone survey of residents carried out in 2020 as part of the update of the Region's Long Term Conservation Strategy underscored growing recognition of the need to conserve water. Almost 90% of those surveyed said it was important or very important to conserve water indoors, and the score for outdoor conservation was almost as high, at 78%.


York Region
WATER

PRINCIPLES & RECOMMENDATIONS

Key principles

In developing the proposed rate structure, York Region applied the following principles, which also provided the foundation for the 2015 Plan:

- Rates should be efficient, effective, predictable and fair to users now and over time.
- Affordability should be addressed through support for struggling customers, not a general subsidy to all users.
- Once full cost recovery pricing is achieved, rates should be as stable as possible.
- The rate structure should recognize and be able to manage both year-to-year and longer-term deviations from forecast.
- The rate structure should be transparent and any change in structure should be made in coordination with its local municipalities.

Based on these principles, the review of performance to date of the model and reserve policies and balances, and the outlook for factors that might change, the Region recommends a reserve rebalancing to compensate for the $28.24 million asset management gap discussed in the previous section, updates to the reserve policies to reflect experience to date, and a proposed option for rates to run from April 1, 2022 to March 31, 2028.

Reserves, rebalancing and reserve policy update

The impacts of the COVID-19 pandemic are a reminder of the potential for major unexpected changes to disrupt plans.

The 2015 Plan introduced a rate stabilization reserve to help deal with impacts of an unexpected event in the year in which it occurs. For example, the rate stabilization reserve would have been used in 2020 if higher consumption and cost savings not fully offset the impacts of the rate freeze.

In addition, annual Council consideration of the planned rate increase for the coming year, as well as the annual Regional budget process, provides an opportunity to review the plan and adjust if necessary. To support Council deliberation, staff provide information on actual results compared to plan and an outlook for upcoming years.

This update also recognizes the role of innovation and greater operating efficiency in managing the water and wastewater budget.

As discussed above, operating costs have generally run slightly below forecast, mainly as a result of achieving greater efficiency. As well, the Region was able to use internal savings, instead of the rate stabilization reserve, to cover the smaller-than-expected revenue shortfall resulting from the rate freeze in 2020.

This suggests that ongoing efforts on both the innovation and efficiency fronts might help to keep rate increases at a reasonable level over time, and potentially to reduce costs when short-term relief from unexpected events is needed.

The impacts of the COVID-19 pandemic are a reminder of the potential for major unexpected changes to disrupt plans.

Using the experience from 2016 to 2020, this update therefore took a more nuanced approach to determining how best to build, maintain and use water and wastewater reserves.

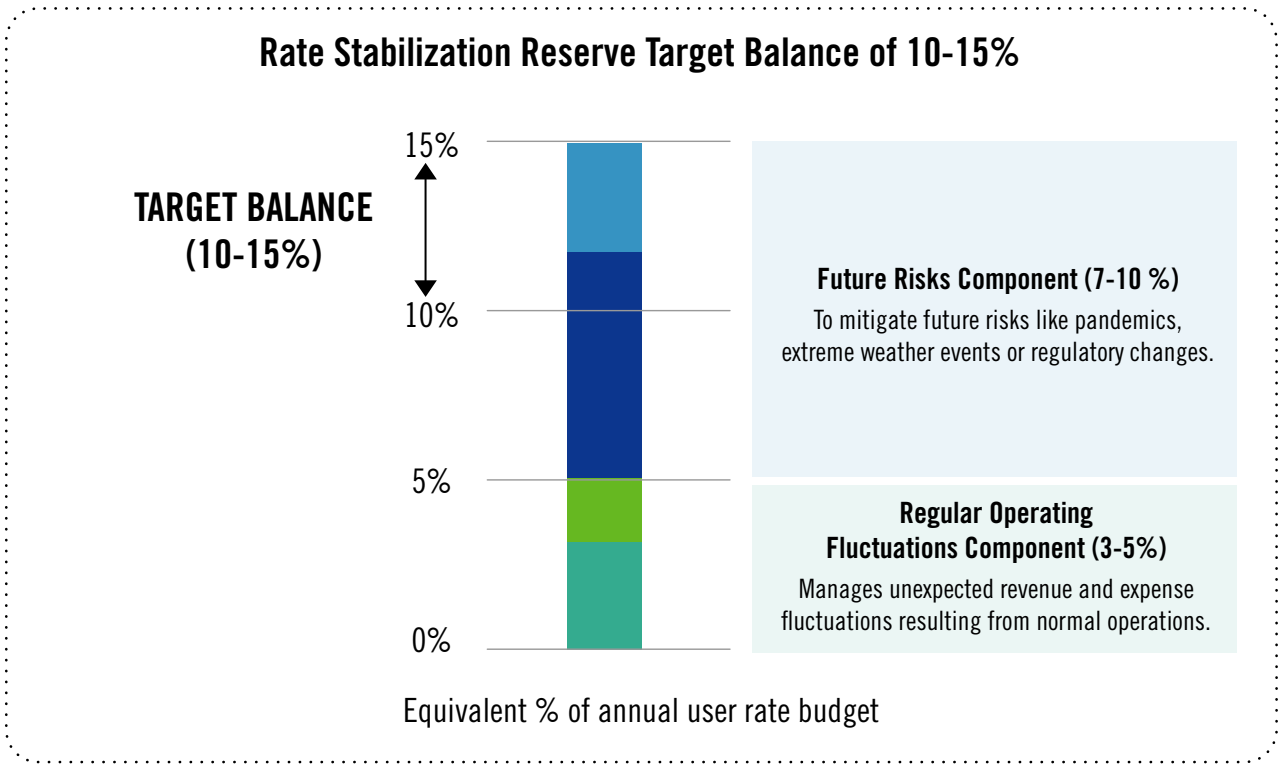
Specifically, this update identified two distinct components to the rate stabilization reserve, reflecting the potential need to address both in-year and longer-term risks. It determined that the target level for the reserve should be between 10% and 15% of the annual user-rate budget and the balance should reflect both normal annual fluctuations and highly unpredictable events, as the graphic below shows.

The review suggested that current reserve balances more than met this threshold and should be rebalanced for the start of 2022. This would be achieved by transfers of $13.95 million from the water rate stabilization reserve to the water asset management reserve and $14.29 million from the wastewater rate stabilization reserve to the wastewater asset management reserve, for a total of $28.24 million.

The proposed transfers would eliminate the gap in the asset management reserves and ensure they were at the required level at the beginning of 2022. After the transfers, rate stabilization reserves would remain within their target range.

A medium-term concern is the possible need to increase asset management reserve contributions following the 2022 update to the corporate asset management plan. The experience to date has been that projected needs have grown as the Region has collected more detailed information about asset condition. In addition, construction

Target balance for rate stabilization reserve



costs are rising faster than general inflation. These risks will be monitored, and any resulting pressures would be addressed through subsequent rate approvals.

The funding model for the rate stabilization reserve would likely allow any unexpected pressure from this source to be managed within the proposed rate structure until the next rate study could incorporate the costs into future rates.

Recommended rate structure

This update confirmed that long-term uncertainty about operating costs, including asset management, calls for a degree of flexibility. While the rate stabilization reserve helps deal with most ongoing operating risk in the short term, defining full cost recovery as being reached when asset management reserves are within a small range of the target provides an additional cushion.

Given two years of rate deferrals, rates are below the level needed to cover costs in the medium term. Approval of the reserve transfers outlined above would address the gap in asset management reserves resulting from rate deferrals, but a small gap would remain in the operating budget. If not addressed, this gap would widen over time and trigger higher rate increases in future.

Analysis determined that annual rate increases of 3.3% for the next six years would close the gap and maintain full cost recovery.

An alternative would be a one-time rate increase of 4.9% in 2022, which would allow for expected annual increases of 2.9% starting April 1, 2023, to maintain full cost recovery.

Either option would achieve the following crucial goals:

- Covering day-to-day operating costs
- Making required asset management contributions based on current estimated needs
- Servicing existing user-rate debt and eliminating new debt issuance
- Following established rate-setting and rate-design principles
- Aligning with the Region's fiscal strategy

With either option, modelling suggests that annual increases of 2.9%, outlined in the 2015 study and confirmed by the 2021 study, should be sufficient to maintain full cost recovery beyond 2027.

The **3.3%-a-year increase to 2027** was recommended because it is based on uniform annual increases that are only slightly above the "steady state" of 2.9%.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APPENDICES

Appendix A.

A provincial regulation, O. Reg. 453/07, requires a financial plan for every municipal water system to be approved by the municipal council and submitted to the Ministry of the Environment, Conservation and Parks and the Ministry of Municipal Affairs and Housing. Similar plans are encouraged, although not mandatory, for wastewater systems.

The financial plan must show, for at least the following six years, the proposed or projected:

- Financial position of the drinking water system, including total assets and liabilities
- Financial operations of the drinking water system, including expected revenues and expenses
- Cash flows related to such activities as issuing debt, selling or acquiring tangible capital assets, and investing

In addition, the regulation requires that all new systems be financially viable. Although the term is not defined, the wording and a separate guidance document from the ministry suggest this means they must recover their full costs. The guidance also encourages municipalities to introduce full cost pricing for existing systems.

York Region submitted its most recent six-year water financial plan, as approved by Regional Council, to the ministries in 2019. The plan was informed by the Council-approved 2019 operating budget, 2019-2028 capital plan and the 2015 user rate study.

While the water financial plan and this updated financial sustainability plan draw on the same research and analysis, they differ slightly in purpose and design.

The financial plan submitted to the ministries follows the same basis of accounting as the Regional financial statements, which is called full accrual. A major difference is that under full accrual, the cost of assets is recorded annually over each asset's expected years of service using accounting methodology. In setting full cost recovery rates, asset management projections look at a 100-year time horizon and are based on condition reports, engineering estimates and other technical information.

Appendix B.

The steps involved in creating the 2015 water and wastewater user rate model are outlined below, along with an explanation of any adjustments made for this update.

Information on updates is italicized at the end of each section.

1. **Set out the goals of the water and wastewater service that affect its operational and financial direction. For York Region, these included:**
   - Aligning with Vision 2051, the long-term plan for the Region, and the 2015-19 strategic plan
   - Supporting two other corporate initiatives: asset management planning and the Regional fiscal strategy
   - Meeting specific service levels and the needs of growth and intensification
   - Supporting sustainable development
   - Complying with current and expected regulations and operating standards
   - Conserving and protecting water and other resources
   - Operating and building as efficiently as possible, including reducing inflow and infiltration.

From this starting point, two major sets of projections were developed, as steps 2 and 3 below indicate. Although they are labelled separately, in practice they took place simultaneously. Along the way, staff collaborated closely to ensure each set of results reflected and incorporated the other.

The asset management work was largely carried out by technical experts in Environmental Services. Economic forecasting experts in the Finance department, with the support of water conservation experts in Environmental Services, created the forecast model for water demand and revenues.

This update ensured alignment with the Region's 2019-23 Strategic Plan. Environmental Services is now responsible for the flow forecast and rate model, with support from Finance on broader economic issues.

2. **Identify the full costs involved in achieving the long-term goals, including the management of the required assets. For York Region, the costs that have an impact on user rates comprise:**

- Capital: enhancements, upgrades, rehabilitation and replacement; funding for conservation authorities; and growth-related new assets and expansions funded by development charges. This plan focuses on the revenues generated by user rates and the costs they cover. Growth-related projects, although not funded upfront by user rates, have an impact on financing decisions, incremental operating costs and long-term asset management. For this reason, such projects and their expected funding sources are included in the modelling.
- Regulation: operator training and licensing, source water protection, environmental assessments, Environmental Compliance Approvals, Supervisory Control Data Acquisition (SCADA) monitoring and an Integrated Management System.
- Operations, maintenance and administration: labour costs, water purchases, sample collection and analysis (the Region collects and tests about 35,000 samples each year), chemicals, power, parts and repairs, and the supporting information technology, finance and accounting and human resource functions.
- Research and development: pilot projects and technical reviews to support continuous improvement in compliance and/or operating efficiency.
- Financing: interest expense and debt repayment.

3. **An asset management plan is central to estimating full costs, because most spending will be on capital investments, repairs, rehabilitation and replacements. This involves:**

- Developing an inventory of existing assets and their condition, which together provide an asset condition report
- Using the asset condition report to develop an asset management plan and forecast that
    - Covers a long enough time period to match the cycle of asset investment and replacement
    - Ensures the right spending at the right points to optimize asset condition, synchronize with growth-related capital projects and minimize life cycle costs
    - Brings together capital investments, operations and maintenance, and reflects such cost drivers as greater urbanization and increasingly stringent regulation.

Estimating full costs also depends on projecting the other costs outlined above — operations, financing, administration and so on. Because many of these costs are driven by demand, the size of the asset portfolio and the financing strategy, this step takes place as part of developing the full forecasting model (Step 4).

This update used new information and projected financial needs developed through the Region's Corporate Asset Management Plan, approved by Regional Council in 2018.

4. **Develop projections of future demand:**

This step looked at impacts on demand arising from such factors as population and business growth, new technologies, weather and climate expectations, building code changes, building densities, shifts in housing preferences, shifts in behaviour and changes in water rates.

The section entitled "Demand forecast model" in the body of this report provides more detail on how York Region developed its initial demand projections, and how this was updated through the current rate study.

5. **Integrate the two previous steps with a projection of operating costs to create a full forecasting model that includes both revenues and full costs. This included only revenues generated for water and wastewater services: that is, revenues from user rates, fees and charges and, for growth-related capital projects, development charges.**

6. **Identify any gaps between projected funds and projected costs, and when these occur over time. Looking at the timing of gaps is critical. Asset management costs can vary hugely from year to year, while user-rate revenues tend to be more stable, and managing this mismatch is a key element of the plan.**

7. **Decide on how to smooth those timing mismatches — building reserves, borrowing or both — while recognizing that all funds must ultimately come from user-rate revenues.**

8. **Develop principles for setting rates and designing a rate structure. As part of this step, the Region discussed possible rate structures with the local municipalities as its customers, sampled end users' attitudes towards rates, looked at experience elsewhere and reviewed the literature.**

9. **Develop and test options for rates and a rate structure that would:**

   - Rely ultimately on user rates to match projected cash inflows to funding needs over time;
   - Align with the Region's fiscal strategy; and
   - Be consistent with the principles underlying rates and rate structure design.

With the update, this step resulted in the recommended options outlined in this plan.

10. **Once an option is chosen, the final step is to review revenues, costs, cash flows and other results each year, and adjust the plan as needed.**

    - This step recognizes the challenge of predicting future behaviour and other drivers of outcome. In particular, as rates rise, users may cut back on consumption. The exact response over time will depend on many factors, however, and some of these are impossible to model with certainty at present. As well, weather — a major factor in demand for water and hence revenues — is impossible to forecast in any detail beyond a few days. New technologies and further changes in the Ontario Building Code may also reduce water consumption.
    - These inherent uncertainties underline that moving to full cost recovery will require close monitoring and the flexibility to respond to actual outcomes.

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1-866-665-6752 | September 2021