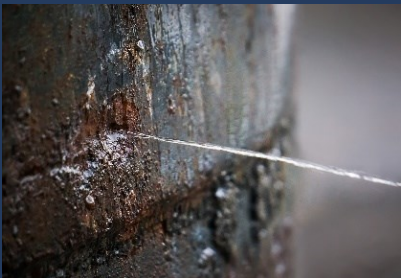
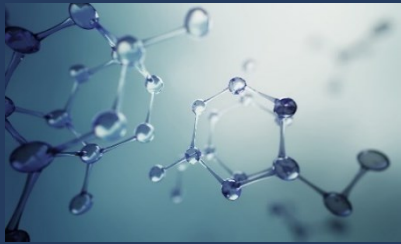




2021 WATER AND WASTEWATER BUDGET SUBMISSION



Cornwall
ONTARIO CANADA

This Page was Intentionally Left Blank

CITY OF CORNWALL – 2021 WATER AND WASTEWATER BUDGET

The City of Cornwall is responsible for water treatment and supply, wastewater collection and treatment, and stormwater management across the city. The Water and Wastewater Budget supports these services.

Each day, clean, safe water travels from the Water Purification Plant (WPP) through the City's watermains for use by residents and businesses. Similarly, wastewater flows through the City's sewer system to the Wastewater Treatment Plant (WWTP) for enhanced secondary treatment before it is released into the St. Lawrence River. Stormwater is conveyed, via storm sewers, directly or indirectly, to the St. Lawrence River.

Safe drinking water and effective wastewater collection and treatment are cornerstones of a sustainable, healthy community and environment. Because of their importance to the health of the public and the environment, these services operate with specific level of service and infrastructure standards, as well as financial frameworks, that are highly regulated by the provincial and federal governments.

The 2021 Water and Wastewater Budget strives to provide funds to support the City's water and wastewater services by continuing to move towards financial sustainability (ie. full cost recovery) in accordance with the *Safe Drinking Water Act (SDWA)*, *Municipal Drinking-Water Licence*, *Water and Wastewater Financial Plan Regulation*, and the *Sustainable Water and Sewage Systems Act*. However, many challenges exist including replacement of aging infrastructure, critical repairs, backlogs, climate change impacts, funding gaps, and public awareness.

The COVID-19 global pandemic presents the greatest financial challenge that families, businesses, communities, and municipalities have seen in generations. Since March, municipal governments have continued to play an essential role in protecting health, safety, and economic security of residents and businesses in our communities.

Water and wastewater are essential services in our community. Ensuring the continuity of these services and support to residents and businesses, the following actions were taken:

- Review ability to implement workforce contingency to sustain operations, which may include modifications to typical shifts, including communication with staff on expected roles and responsibilities.
- Provide financial relief to customers from April through June 2020 by waiving monthly interest and penalty charges for water accounts in arrears.
- Consider alternative payment methods for typical face-to-face transactions with customers.

- Postpone customer shut-offs to ensure access to clean water during the pandemic.
- Coordinate with contractors to ensure safe access to facilities for maintenance and to make necessary repairs.
- Coordinate with contractors to ensure safe protocols for work required to the distribution and collection networks.
- Purchase or obtain any critical products that may be in short supply.
- Communicate frequently with suppliers of essential treatment chemicals and supplies.
- Communicate with customers about the safety of the water supply.
- Remind residents about the safe disposal of sanitation products such as wipes and other product that could impact wastewater operations.

Mission Statement

Water and wastewater services are provided through the supply of quality drinking water and treatment of wastewater as a public service to protect public health, safety and property in an environmentally sustainable and a fiscally responsible manner.

Alignment to Strategic Plan

The Water and Wastewater Budget aligns with the City's Strategic Plan in providing services that enable a financially and environmentally sustainable community which will care and provide for the needs and values of its residents. It continues to invest in modern efficient water and wastewater infrastructure to ensure continuous safe drinking water and wastewater services.

Regulatory Requirements and Oversight

As outlined in a presentation to City Council on July 29, 2019 (by the Walkerton Clean Water Centre), through the *Standard of Care* provisions of Section 19 of the SDWA, Council has a statutory duty as the ultimate decision-making authority over municipal drinking water systems. This does not require technical oversight, but rather to be informed and vigilant. More generally, the water and wastewater industry continues to experience increased legislative and regulatory reform. Water and wastewater are regulated services and must meet legislated requirements. The purpose of the Acts' and Licence are to protect human health through the control and regulation of drinking water systems (a risk-based framework as described in the Drinking Water Quality Management System (DWQMS)), ensuring operator training and certification, and drinking water monitoring. The Acts' and Licence also stipulate the financial viability to finance the full cost of providing these services.

Cornwall's Water and Wastewater Services at a glance

- Serves more than 47,000 residents, as well as business' in Cornwall; approximately 17,300 residential, institutional, commercial and industrial properties.
- Water and wastewater services are funded through the water and wastewater billing revenue from approximately 19,380 flat rate customers and approximately 310 metered accounts.
- No property tax dollars are used to fund water and wastewater operating and capital budgets.
- Operates 24 hours a day, 365 days per year.
- The services provided are grouped into four service areas:
 1. Water Supply and Distribution – The water system provides water for residential, institutional, commercial and industrial customers, as well as for fire protection. The system serves the City's population as well as some customers from outside the city limits. Treatment, storage, and distribution of over 30,700 cubic meters of potable water is delivered daily to industrial, commercial, institutional, and household water users, from over 16,000 service connections.
 2. Wastewater Collection and Treatment – The wastewater system collects wastewater from residential, institutional, commercial and industrial customers in the City and treats wastewater in accordance with the provincial and federal governments' environmental regulations and industry standards. Over 52,000 cubic meters of wastewater are collected and treated per day, from residential and non-residential properties in Cornwall.
 3. Stormwater Collection and Flood Protection - The stormwater drainage system is designed to collect stormwater runoff from private and public properties which is generated from rainfall and melting snow in the City. The stormwater collection system is comprised of a network of storm sewers, culverts, roadside ditches, catch basins, manholes, drains, etc., which convey stormwater to local waterways. Additionally, the City also maintains stormwater management ponds, oil/grit separators, etc., which provide stormwater quantity and/or quality control.
 4. Customer Service – Customer service has two elements:
 - Utility Billing – producing and collecting utility billings in an efficient, accurate and timely manner.
 - Communications – being responsive to customer inquiries and needs.

Financial and Management Framework

The Water and Wastewater Budget represents the component of the City's operations that are supported by user fees. The City charges water and wastewater fees to property owners based on fixtures (residential, small commercial) and water used (non-residential metered). The annual fees are intended to ensure that there is full cost recovery to the City for providing safe drinking water and maintaining the water and sewer infrastructure.

The 2021 budget is based on a financial framework which provides a roadmap, endorsed by City Council, to proactively ensure the long-term integrity of these essential services. The elements of the framework include: Asset Management Plans (2014-Dillon and Watson; 2016-FCapX), the Water and Wastewater Financial Plan (Watson, 2020), and the Long-Term Financial Plan (KPMG, 2016).

The City is completing 10-year Asset Management Plans (AMPs) for the process equipment at the WPP and the WWTP. The AMPs will include the following subplans: Capital Investment Plans, Operations Plan, Maintenance Plans, and Refurbishment Plans. The Environmental Services Division has a long-term vision to be energy neutral for the plants with an achievement of low lifecycle ownership costs. A sub goal is a reduction of greenhouse emissions and to become carbon negative.

Financially Sustainable Water and Wastewater Systems

Water and wastewater services continue to strive towards efficient and effective systems while achieving financial sustainability. Achieving financial sustainability requires long-term planning, securing sufficient revenue to recover system costs, safeguarding against unexpected circumstances, managing service debts, and saving for future capital needs. As experienced in other municipalities, this is challenged by a significant infrastructure backlog.

The 10-year LTFP and the Water and Wastewater Financial Plan established a comprehensive revenue framework which seeks to sustain continued operations and infrastructure investment while ensuring healthy Water and Wastewater Reserve balances. The LTFP is reviewed and updated annually to compare revised key assumptions and to reflect changes to the financial operating environment.

The *Municipal Act, 2001* requires that all municipal user fees be established in a way that there is a transparent and direct relationship between the fees being charged and the full cost accounting of the service being provided. Revenue collected must be utilized to meet the needs of these services - and not other services.

The cost to operate the water and wastewater operations is fully funded through direct fees and service charges from water and wastewater billings. The water and wastewater billings fund both operating and capital expenditures. No amount of the water or wastewater costs is funded from tax levies.

At the October 13, 2020 Council meeting, Council received a presentation from Watson & Associates on the 2020 Water and Wastewater Rate Study being completed. The draft Rate Study has been used as a starting point to prepare the Water Financial Plan. At that time Council directed Administration to complete the Financial Plan using the current flat (fixture) rate structure but indicating that a transition to a volume-based rate structure may be implemented over the next five-year period. In this manner, the Province will have an understanding that a financial transition within the next five-year reporting period may occur should the City opt to move to a volume-based structure.

A detailed Water Financial Plan was endorsed by Council at the November 9, 2020 Council meeting. The Financial Plan is part of the required documentation to be submitted to the Ministry of Environment, Conservation and Parks (MECP) and the Ministry of Municipal Affairs and Housing as part of the City's renewal application for its Municipal Drinking Water Licence to operate the water system. The City's previous Financial Plans were filed with the Province in 2010 and 2015.

The City is also currently undertaking a Water Conservation and Servicing Master Plan to assess the impacts of implementing water demand initiatives such as the implementation of City-wide water meters and rate structure alternatives to promote water conservation. As noted in the Water Financial Plan, depending on the findings of the Water Conservation and Servicing Master Plan, the Financial Plan may be subsequently amended.

At its meeting of November 23, 2020, Council received an update of the 2019-2023 Energy Conservation and Demand Management Plan (ECDMP). A goal of the ECDMP is to continuously reduce the energy requirement of City facilities (including the WPP and the WWTP) in order to reduce our operating costs and our energy consumption. Initiatives of the ECDMP are included in the financial plan and the budget process.

Rate Overview

As a result of COVID-19 and the financial challenges being faced by Cornwall residents and businesses, the 2021 Water and Wastewater operating and capital budgets have been prepared using a combined rate increase of 1.51 per cent, rather than the planned 4.0 per cent rate increase. A financial summary can be found on page 23.

The 1.51 per cent rate increase will not impact service levels. The City will continue to provide services to protect public health, safety and property in a fiscally and environmentally responsible manner.

For a residential property, it is estimated that in 2021 this would reflect an annual average increase of about \$12 (depending on number of water fixtures accounted in the billing).

The following table summarizes a homeowner's cost for the delivery of clean, safe water, as well as the collection and treatment of wastewater and stormwater management for a typical household:

Residential Property	2020	2021
Average Cost per year	\$822	\$834
Average Cost per day	\$2.25	\$2.29

2020 BMA Study

For the past nineteen years, BMA Management Consulting Inc. has annually completed a municipal comparative study on behalf of participating Ontario municipalities. This report brings together a group of indicators to give an overall snapshot for each municipality. Each year, the City of Cornwall participates in this study.

Due to the COVID-19 pandemic, the completion of the 2020 BMA Study is in draft format and currently being reviewed by the participating municipalities. The following information is from the draft 2020 BMA Study.

In 2020, 110 Ontario municipalities participated, representing in excess of 85% of the Province's population.

The 2020 BMA Municipal Study indicates that annual user fees for water and wastewater services in Cornwall are among the lowest when compared to the other participating municipalities:

- Residential - Cornwall: \$813; BMA average \$1,151
- Commercial - Cornwall: \$11,677; BMA average \$37,812
- Industrial - Cornwall: \$35,031; BMA average \$109,553

Further comparative information can be found in Appendix B.

Asset Management Planning for Municipal Infrastructure

The Infrastructure for Jobs and Prosperity Act, 2015 (IIPA) in section 6(2) sets out principles for the provincial government to regulate asset management planning for municipalities. On December 27, 2017, Ontario Regulation 588/17 under the IIPA was released. Effective January 1, 2018, the regulation sets out

requirements for municipal asset management planning and reporting for the 444 municipalities in Ontario.

The phase-in timelines and requirements are as follows:

Phase 1:
July 1, 2019

Municipalities to finalize a strategic asset management policy that promotes best practices and links asset management planning with budgeting, operations, maintenance, and other municipal planning activities.



The City adopted its Asset Management Policy (FI-2019-06-24-1) on June 24, 2019 that meets the requirements of this section of the legislation. The City is required to review this policy at a minimum of every five (5) years from its effective date in order to continue to meet the legislation.

Phase 2:
July 1, 2021

Municipalities to approve an AMP for core assets that identifies current levels of service and the cost of maintaining those levels of service.

The next upcoming reporting milestone will be due on July 1, 2021: an AMP covering a municipality's core infrastructure.

In order to meet the requirements of the regulation, in 2020 Council approved a project to complete an AMP for the City's core assets.

The AMP will include current service levels, asset performance, condition, age, replacement cost, 10-year lifecycle costs, and funding required to maintain those service levels.

The AMP Request for Proposals (RFP) is currently being developed and will come to Council for approval.

The work will be completed over the next six months and the AMP will be presented to Council prior to the deadline of July 1, 2021.

Phase 3:
July 1, 2023

Municipalities to have an approved AMP for all municipal infrastructure assets that identifies current levels of service and the cost of maintaining those levels of service.

Phase 4:
July 1, 2024

Municipalities to have an approved AMP for all municipal infrastructure assets that builds upon the requirements set out in 2023. This includes the identification of proposed levels of service, the activities required to meet proposed levels of service, and a strategy to fund these activities.

Asset Management Planning

An AMP provides detailed information on the characteristics and current condition of existing infrastructure assets and describes how they should be managed over their lifecycle. The objective of asset management planning is to maximize benefits, manage risk, and provide satisfactory levels of service to the public in a sustainable manner. It also involves strategic financial planning and priority setting to ensure that the lifespan of existing infrastructure assets is maximized, and that long-term capital plans for the rehabilitation and replacement of assets align with projected available financial resources.

The City has always practiced a form of asset management. For many years, staff and consultants have completed separate analysis to address future repair, rehabilitation and/or replacement requirements and the related estimated costs necessary to maintain the City's critical assets.

The first AMP for linear infrastructure assets within the City was created in 2006 and subsequently updated in 2014, and again in 2016 when a more comprehensive plan was prepared that included a review and analysis of City owned fleet and buildings. Both the City's current Asset Management Policy and provincial regulations state that AMPs must be reviewed, at minimum, every five years.

Asset management plans form the cornerstone of an effective asset management system. AMPs enable informed decisions regarding the building, operating, maintaining, renewing, replacing and disposing of infrastructure assets. An AMP incorporates detailed asset inventories, operation and maintenance tasks, and long-term financial planning to ensure that annual revenue, reserves, and reinvestment are sufficient to facilitate the long-term viability of the system.

The five major, generally recognized components of an AMP include:

- Performing an inventory and condition assessment of the system's assets;
- Defining level of service goals;
- Identifying critical assets;
- Establishing lifecycle costs; and
- Developing a long-term funding strategy.

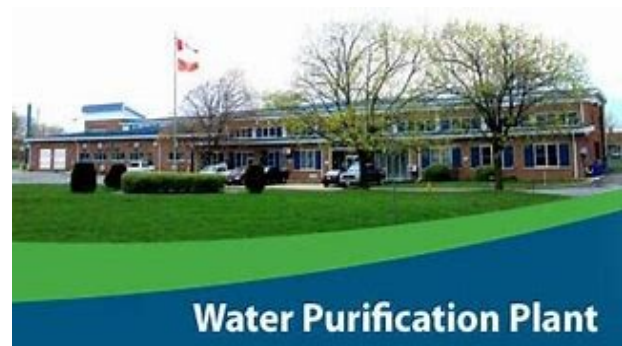
In future AMPs, municipalities will provide the following for each year of the full 10-year period of the AMP: explain why the proposed levels of service are appropriate, analyze lifecycle activities to consider the entire lifecycle and associated costs related to the assets, risks, and the financial viability; as well as, the funding available to support the plan.

Environmental Services – Water

The primary objective in operating the water system is to provide a continuous supply of potable water to the residents and businesses of Cornwall. In doing so, all quality, quantity, and environmental standards put forth by City Council, and provincial and federal agencies must be adhered to.

The WPP draws water from the St. Lawrence River at the Robert Saunders Dam through a 3.7 km, 1,050 mm diameter reinforced concrete pipe running through the Riverdale area of Cornwall. To ensure redundancy of the raw water supply to the WPP, an Environmental Assessment (EA) to identify options for a second raw water intake is currently being completed.

The WPP uses chemically assisted coagulation and flocculation to remove particles suspended in the raw water. These particles clump together and are allowed to settle in tanks that are automatically cleaned at regular intervals. The water is then filtered through anthracite media and treated with UV light and chlorine to trap and disinfect any of the remaining harmful pathogens.



The water distribution system is maintained by the Municipal Works department. The system is a complex network of pipes, storage facilities, valves, fire hydrants, reservoirs, and an elevated storage tank. In order to meet demands, sufficient pressure is maintained throughout the distribution system by pumps at the WPP and the Boundary Road Reservoir as well as static head pressure provided by the elevated water storage tank located on Tollgate Road, East.

The Municipal Works department has addressed an average of 57 watermain breaks per year over the past five years (35 breaks to date in 2020). When a watermain break occurs, a repair can be lengthy and disruptive for the affected water customers, local traffic, and pedestrians. Through proactive asset renewal programs, priority areas can be identified, and steps taken to renew infrastructure to ensure a continued reliable service.

The operations of both the treatment and distributions systems are rigorously inspected annually and, in 2020, earned their twelfth consecutive 100% compliance rating from the MECP.

Environmental Services - Wastewater

The main objective of the wastewater system is the collection, treatment and disposal of effluents without danger to human health or unacceptable damage to the natural environment. The City strives to maintain high standards in

wastewater treatment to ensure there is minimum effect on the environment of the St. Lawrence River.

At the WWTP, primary treatment consists of temporarily holding the sewage in a quiescent basin where heavy solids can settle to the bottom while oil, grease and lighter solids float to the surface. With the assistance of chemicals, solids are separated from water in four settling tanks (clarifiers). The settled and floating materials are removed and the remaining liquid is discharged to secondary treatment. The water leaving the clarifiers is directed to Biological Aerated Filters (BAF) where secondary treatment occurs. The water leaving these filters is disinfected with UV radiation prior to discharge to the St. Lawrence River. The solids portion is sent to a thickening facility prior to digestion, dewatering, and disposal at the City's landfill.



The Municipal Works department is responsible for the operation and maintenance of the sewage collection system (storm, sanitary and combined sewers) including associated appurtenances, such as: catch basins, manholes and sewer laterals. This department is also responsible for lift stations, urban drainage maintenance and flood control.

Municipal Works has addressed an average of 94 sewer lateral repairs per year over the past five years (65 repairs to date in 2020).

The stormwater management system functions to control flooding and help filter out sediments collected by stormwater flow before it reaches waterways.

Combined sewer systems are sewer pipe systems which accept both stormwater and sanitary sewage. Combined sewers are part of the original municipal sewage collection system and are typically found in the oldest sections of the City. When the opportunity arises through street reconstruction, combined sewers are separated by installing a second pipe in order to allow a dedicated pipe for stormwater collection and dedicated pipe for domestic sewage collection.

When combined sewer systems experience higher than normal flows, relief systems cause discharges containing human and industrial waste to flow untreated into the St. Lawrence River. These events are known as Combined Sewer Overflows (CSOs). The City has experienced 13 CSO events to date in 2020 which has resulted in 98,976 cubic meters of diluted wastewater discharged directly to the St. Lawrence River. Combined sewers can cause serious water pollution problems during CSO events when combined sewage and surface runoff flows exceed the treatment capacity of the WWTP. Although it is acknowledged that CSO events are serious concerns which can cause both negative environmental and lifestyle consequences, it must be understood that in

Cornwall, CSOs only occur primarily as a result of heavy rainfall events and/or swift snow melt occurrences when the wastewater collection system reaches storage capacity. As a result, the effluent discharged into the river is heavily diluted with stormwater. As further perspective, the WWTP treats approximately 18,960,800 cubic meters of wastewater annually. The volume of CSO effluent in 2020 would represent approximately 1.4 per cent of the total volume of wastewater treated.

Environmental Initiatives

A significant cost to the operating budget is the amount of energy used at the WWTP and the plant contributes significantly to the total amount of greenhouse gas (GHG) emissions emitted in Cornwall.

The Co-Digestion and Energy Generation Study is exploring opportunities for Cornwall to capture heat energy generated by wastewater effluent so that it can be reused as heat energy on site and potentially through a joint venture with the Nav Centre. In addition, the Co-Digestion Study will look for partners that would purchase the biogas generated at the WWTP site.

In addition, a municipal Organics Study is determining the GHG emissions reduction by diverting organics from landfill to co-digestion and energy production at the WWTP.

The above described programs are part of the Municipal Co-Digestion Initiative that the Ontario Water Consortium (OWC) launched in 2016 through Ontario Clean Water Agency and Ontario Water Canada. The City's initiative is to promote the reduction of GHG emissions and diversion of organics by transforming a WWTP into a net zero resource recovery facility. Going forward, municipal co-digestion is an approach that will help our municipality achieve multiple goals and objectives.

The following capital projects are contributing to the City of Cornwall's initiatives to manage costs, reduce GHG emissions, and achieve net zero goals:

- Organics Feasibility Study, results January 2021
 - Selection of collection method
 - Selection of processing method
- Co-Digestion Feasibility Study, results February 2021
 - Present various scenarios with cost and return on investments (ROIs)
 - Present cost-benefits information on energy savings & GHG reduction
 - Present project delivery models
 - Present available funding program and financing models
 - Identification of priorities for business plan selection

Companion capital projects at the WPP will assist with the net zero initiative at the WWTP through energy reduction projects.

- The Water Conservation and Servicing Master Plan. Completion is scheduled for May 2021.
- 10 Year Asset Management Plans for the plants, December 2020. Will allow incorporation of lifecycle calculations and energy reduction costs into the repair and rehabilitation projects at the plants.
- The Environmental Assessment for a redundant raw water supply will be complete January 2021. This includes a recommended preliminary design.

Reserves

The Water Works Reserve and the Wastewater Works Reserve were established to provide funding to mitigate the impact of significant increases or unforeseen issues in the rates charged to users and to fund any annual deficits. The effective use and management of these reserve funds is a critical aspect of the City's strategic financial plan and continued long-term financial sustainability.

The LTFP included a lifecycle costing model for the reserves in order to fund projects that are not typically funded by long-term financing. The reserves would be managed in such a way in order to ensure positive reserve balances during major capital spending years.

Staff have reviewed fund balances to identify potential applications of these funds to minimize the debenture requirements and mitigate the impacts on user rates. The following schedule shows the planned contributions to and from the Water Works and the Wastewater Works Reserves estimated to December 31, 2021.

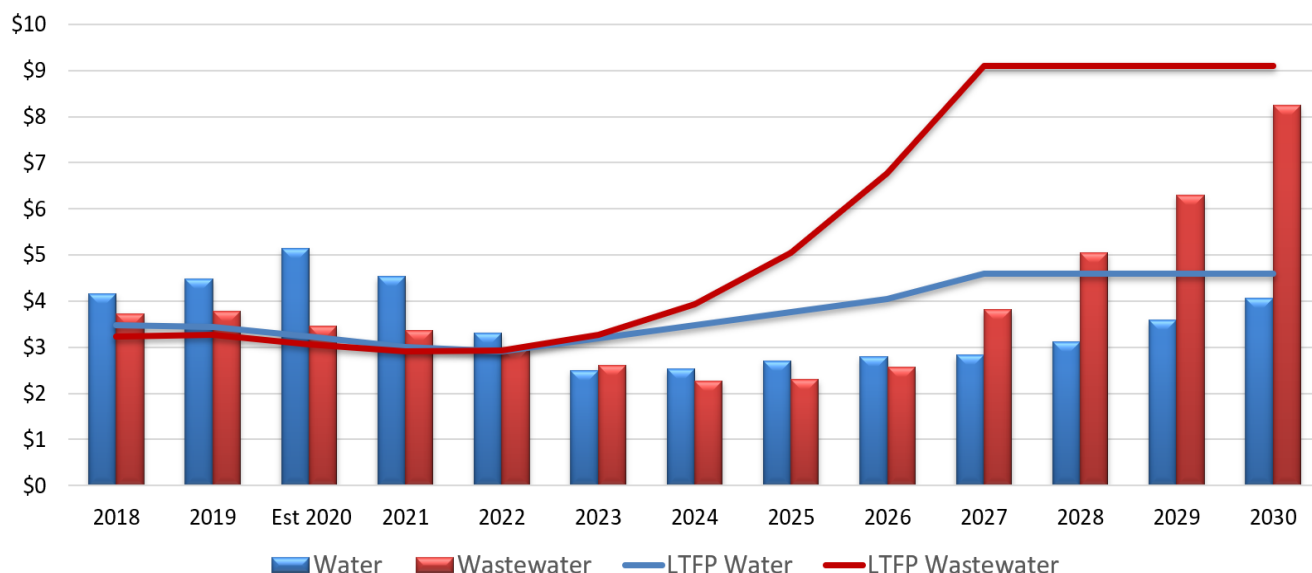
Currently, both the Water Works Reserve and the Waste Waterworks Reserve are trending over the target balance. This funding will support capital works over the next few years.

2021 Detail Of Reserves Estimated December 31, 2021

	Opening Balance	Withdrawals	Additions	Balance	LTFP Balance at Dec 31/21
Water Works Reserve	\$5,140,943				
Budgeted Contribution			\$250,000		
Estimated Interest			\$38,437		
Fund Water Plant Capital		(\$900,000)		\$4,529,380	\$3,006,725
Wastewater Works Reserve	\$3,649,112				
Estimated Interest			\$27,850		
Asset Management Plan		(\$120,000)		\$3,556,962	\$2,908,945

The following chart shows the ten-year (2021-2030) forecasted balance (shown in the millions) for the Water Works and the Wastewater Works Reserves based on the City's LTFP and updated requirements of the 10-year capital plan.

Reserve Balances (estimated 2020-2030)



(shown in the millions)

The lines on this chart illustrate the targeted reserve balances from the LTFP compared to the historic reserve balances from 2018 and the ten-year forecasted balances for the Water Works Reserve and the Wastewater Works Reserve. Based on the 10-year capital plan, it is expected that both the Water Works and the Wastewater Works Reserves will fall below targeted balances over the next few years.

As the City moves forward, financial sustainability must continue as one of the City's key priorities. Reserves are a critical component of the City's LTFP. Continued infrastructure renewal investment will ensure that water and wastewater services are sustainable in the future and meet the citizen's level of service expectations. Adequate reserves will position the City to be able to meet these future infrastructure requirements.

Long Term Debt

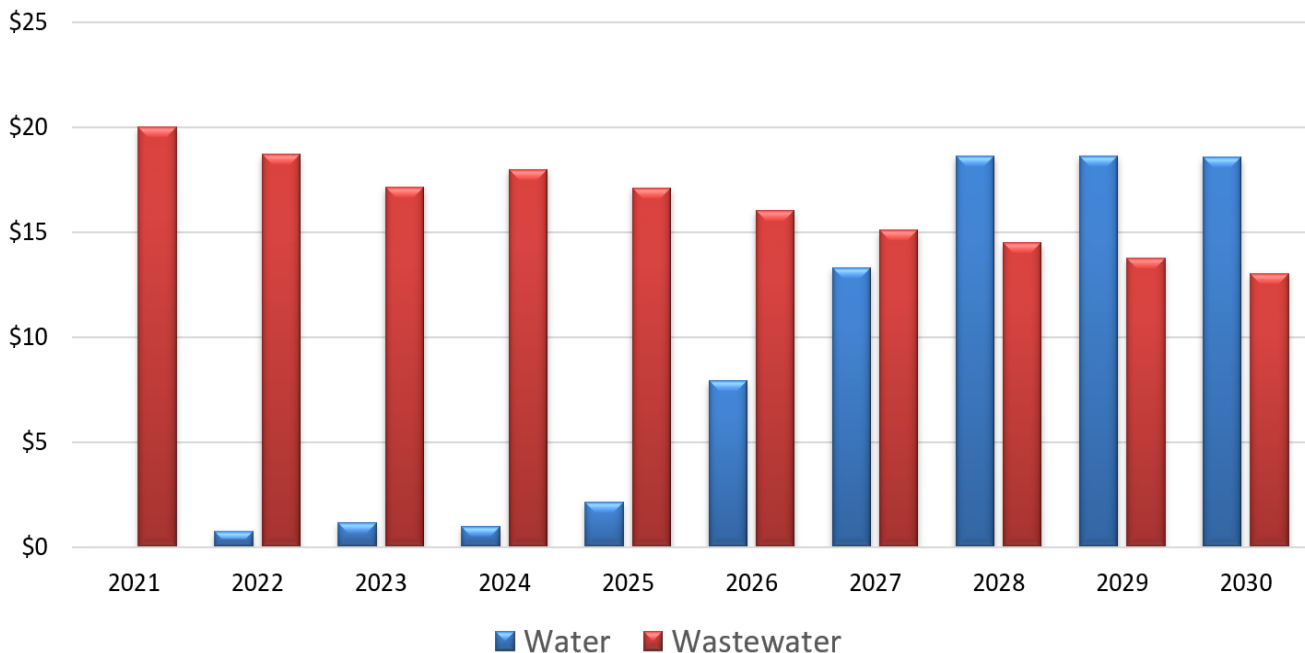
The City has not incurred any debt charges related to its Water service at this time. Through the Wastewater budget, the City has borrowed for Flood Reduction Initiatives, the Brookdale North Channel Bridge project, and the Secondary WWTP. The outstanding debt at the beginning of the 2021 fiscal year is estimated at \$13.9 million, with an additional \$9.0 million of approved borrowing for water and wastewater infrastructure.

In the 2021 Water and Wastewater Budget, it is proposed that the remaining capital works for York St. be financed at \$1.1 million.

The 10-year financial plan for wastewater includes borrowing for various projects at the WWTP as well as the 2024 to 2030 joint water and wastewater infrastructure projects.

The following chart shows the ten-year (2021-2030) forecasted balance (shown in the millions) of long-term debt.

Long-Term Debt Balances (estimated 2021-2030)



The 10-year capital plan includes two large water distribution projects. The estimated cost of the Pitt Street – Tollgate Road to Cornwall Centre Road project is \$5 million, currently planned for 2023 and 2024. The estimated cost of Vincent Massey Drive – Tollgate Road to City Limits project is estimated at \$10 million, currently planned for 2025 and 2026. These two projects represent most of the forecasted debt illustrated in the chart beginning in year 2025.

Both watermain projects are for the rehabilitation of large diameter trunk watermain which have been failing prematurely. Due to the size of the watermain, pipe material, etc., the cost to repair each break is very high.

Vincent Massey Drive was originally planned for 2021 and 2022, \$3M and \$5M respectively, and Pitt Street was originally planned for 2023, \$5M. Although we would like to complete both projects soon, projects will require senior levels of government funding or financing in order to proceed. It is hoped that the City will receive grant funding to support both projects, but until funding is approved we have included funding from debt financing in LTFP.

2021 Operating Budget

The total expenditures for the 2021 operating budget increased by \$358,735 or 3.67%.

The increase in salaries and benefits of \$132,215 or 2.94% is related to incremental and contractual increases for staff. Also included in the budget is a new Project Supervisor position. This employee will be primarily stationed at the WWTP and provide project management for both WPP and WWTP capital works as well as support to the WWTP Supervisor. This staffing need is in response and preparation for the changing technical and equipment needs at the plant. There is a requirement for technical design knowledge with a functional ability to create drawings for small process and equipment modifications at the plant. In addition, as the plant transitions to a Wastewater Resource Recovery Facility there will be equipment additions. The workload associated with research, preparation of specifications, drawings, tender documents, contract administration and supervision has been increasing as process equipment and infrastructure, installed as part of the 2016 plant upgrades, transitions to the maintenance phase. In addition, it is likely that the landfill site will include a processing facility for organic pre-processing before being added to the WWTP anaerobic digester for Renewable Natural Gas (RNG) production. This position would cover the technical components of that project as well. As well, equipment modification at the WPP where required could be completed by this position. In summary, this position would be primarily technical in need.

In 2020, the Environmental Services division also removed a WWTP clerk (part time position) and replaced it with a full time Environmental Analyst for the WWTP and the WPP.

The increase in Purchase of Goods of \$137,979 or 5.03% is related to increases in chemicals (liquid aluminium sulfate, coagulant, polymer), building materials, and utilities (electricity, natural gas, water).

Services and Rents increased \$80,385 or 3.94% and includes \$60,000 for flow monitoring maintenance. Once budgeted through capital, this service will be part of the annual operating budget.

The increase in Financial of \$8,156 or 3.53%, for the most part, is related to property taxes.

The City continues to contribute \$250,000 to the Water Works Reserve to support watermain rehabilitation projects.

Revenue has increased by \$111,000 or 41.37% as one customer is paying to use the City's sanitary sewer and wastewater treatment system, until a private treatment system is in place.

The City's financing costs for principal and interest charges, related to financing capital projects, have increased by \$44,801 or 2.48%. This change is the net of taking on more debt and of debt maturing.

Insurance costs across the City will increase by approximately 15%. This is a correction in the insurance industry. The increase for insurance for Water and Wastewater is \$18,361 or 9.8%.

Overall, the net operating budget has increased by \$363,427 or 2.91%.

2021 Capital Budget and Plan

The 2021-2030 10-year capital plan, updated annually, outlines the future capital requirements of the City based on existing infrastructure maintenance requirements, the condition of the asset, and the service levels expected of them.

The City's long-term infrastructure requirements have been planned through a fully funded 10-year capital plan. The proposed funding is a combination of contributions through water and wastewater billings, financing, development charges, and reserve contributions. The City is not budgeting for grant funding as this funding is not guaranteed to be received.

Costs are based on estimated costs for 2021. Inflation is not factored into future year's expenditures. Construction cost inflation is normally more than double the consumer price inflation (CPI). Over the past couple of years, the City has seen increases that far exceed this. Architectural and engineering services, material, labour, transportation and other factors affecting the construction industry has had and continues to have an impact on tender pricing.

The City's water and wastewater services has a stewardship of an inventory of capital assets valued at \$679 million (based on the City's 2016 AMP – replacement value).

WATER - \$183 million	WASTEWATER - \$496 million
<ul style="list-style-type: none">• Water Purification Plant• 2 reservoirs and 1 elevated storage tank• 272 km of distribution watermains• 1,903 valves• 1,322 hydrants• More than 16,000 water laterals	<ul style="list-style-type: none">• Wastewater Treatment Plant• 440 km of sewer mains (storm, sanitary and combined)• 4,622 catch basins• 5,044 sewer access points• 5 lift stations• Approximately 15,000 sewer laterals

The City will be undertaking an AMP for core assets (roads, bridges and culverts, water, wastewater and stormwater management systems) as described in the 'Asset Management Planning for Municipal Infrastructure' section of this budget book.

Capital works projects at the WPP and the WWTP are managed by the Environmental Services department and are determined by:

- A preventative maintenance program;
- Regulatory requirements for the Drinking Water Works Permit for the Treatment Section of the Cornwall Drinking Water System;
- Regulatory requirements for the Environmental Certificate of Approval at the WWTP;
- Maintaining effluent quality below Provincial effluent limits;
- Maintaining drinking water quality requirements of the Safe Drinking Water Act;
- Combined Sewer Overflow volume and time;
- Risk management through the DWQMS;
- Project management for capital improvement projects.

Linear capital works projects are managed by the Infrastructure Planning department and are determined by:

- Detailed designs for municipal infrastructure projects including road, streetscaping, watermain, sanitary and storm sewers, culverts, and bridges;
- Pre-engineering surveying services for detailed design projects;
- Project management and inspection services for the construction of approved capital projects;
- Cost estimates;
- Liaison with regulatory agencies and utilities to obtain permits and approvals and to coordinate design and construction activities;
- Review services for Ministry of the Environment approvals relating to the design and construction of watermains, sanitary sewers, and storm sewers.

As in prior years, the 2021 capital budget is focused on the maintenance and replacement of current infrastructure and addressing the backlog. Major capital projects in 2021 include regular on-going watermain rehabilitation improvements, WPP upgrades, sewer network improvements, combined sewer separation, and WWTP system upgrades.

The 2021 capital budget includes the continuation of two joint infrastructure projects: Sydney St., from Fifth to Seventh (2020 - Fourth to Fifth, 2019 - Second to Fourth) and York St. from Fourth to Fifth (2020 - Seventh to Ninth, 2019 – Fifth to Seventh). Joint infrastructure projects are typically the complete reconstruction of sewer, water and roadway infrastructure.

A new watermain is planned for Power Dam Dr., from Riverdale to Tollgate. To date, the City has set aside \$1.2 million in previous budget years. The watermain will be funded by Development Charges as this project is related to growth.

Also included in the 2021 capital budget is the replacement of the Supervisory Control and Data Acquisition (SCADA) system. This computer system is used to gather and analyze data in real time in order to monitor operations at WWTP.

The gross capital requirement for Water and Wastewater is \$9,120,000, net \$6,500,000. The gross capital approved in 2020 was \$8,825,000, net \$6,575,000. The net capital decrease year over year to water and wastewater billings is \$75,000 or 1.14%.

The 10-year capital plan supports the City's Water and Wastewater objectives by balancing infrastructure renewal needs with new service improvement projects, while providing capacity for the community, and ensuring the delivery of water supply and wastewater treatment within an increasingly stringent regulatory framework.

Watermain Rehabilitation Improvements (addressing the backlog)

The 2016 AMP identified that the City had a considerable watermain renewal backlog of \$41.2 million which consisted of 72km of watermain in need of rehabilitation or reconstruction. In order to address the backlog and to achieve the level of service target (from 50 to 70) for water distribution network related assets, the 2016 AMP recommended that the current backlog be addressed over the next 20 years.

The City has made considerable progress since the 2016 AMP was completed in increasing watermain renewal related funding in order to address both the water distribution network assets coming due each year as well as the backlog.

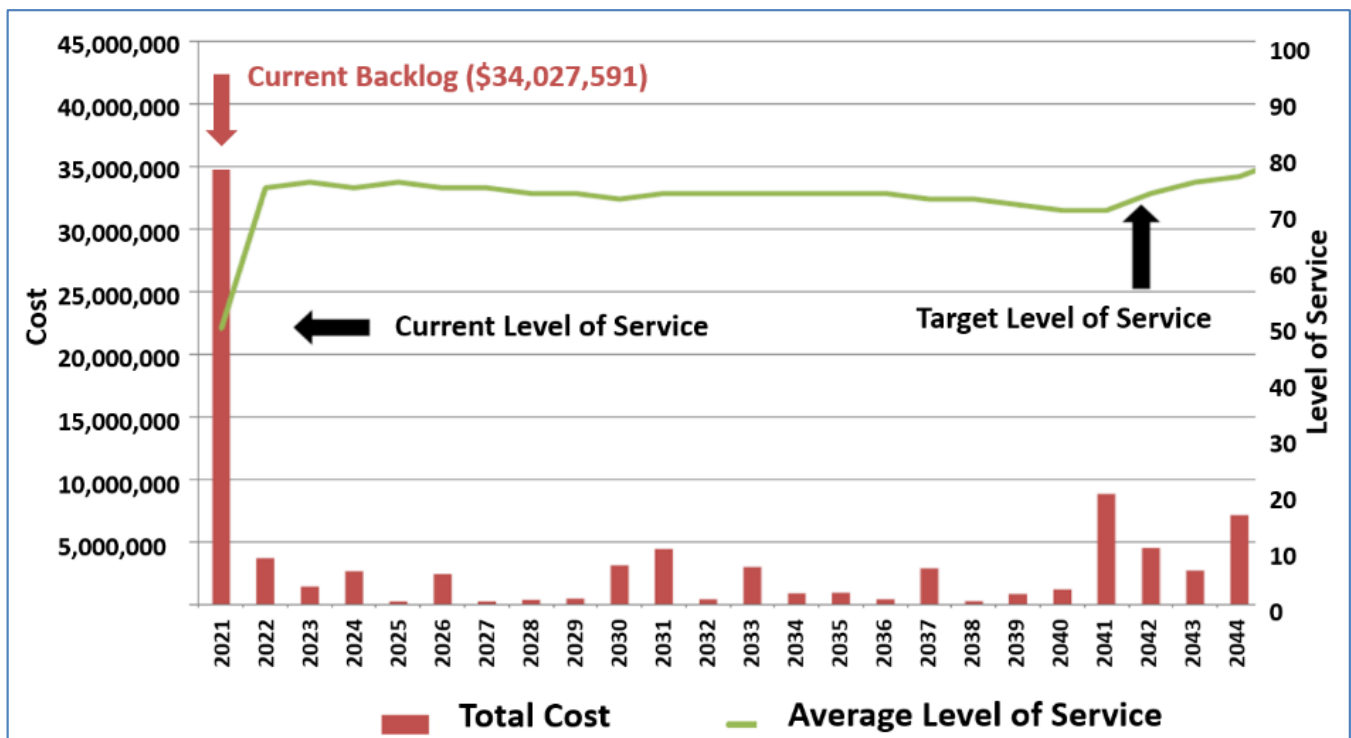
Following the completion of the 2016 AMP, the City has incrementally increased the watermain renewal funding in each budget year for both Watermain Rehabilitation and Joint Infrastructure (Water and Sewer) projects in order to reach the recommended annual allocation for watermain renewal projects from the AMP which would address the backlog over 20 years.

In 2017, the City was also successful in receiving \$2.53M of additional funding from the provincial and federal governments for watermain renewal projects through the Clean Water and Wastewater Fund (CWWF) program which further contributed to the reduction of the City's watermain backlog.

Although the City has made considerable progress in funding the renewal of watermain related assets, the City has not yet reached the recommended annual allocation from the AMP in order to achieve the desired level of service target (70) and to address the backlog over 20 years.

Although the recommended annual allocation has not been reached, considerable progress has been made and the current backlog as of the end of 2020 has been reduced to \$34 million as shown in the following chart.

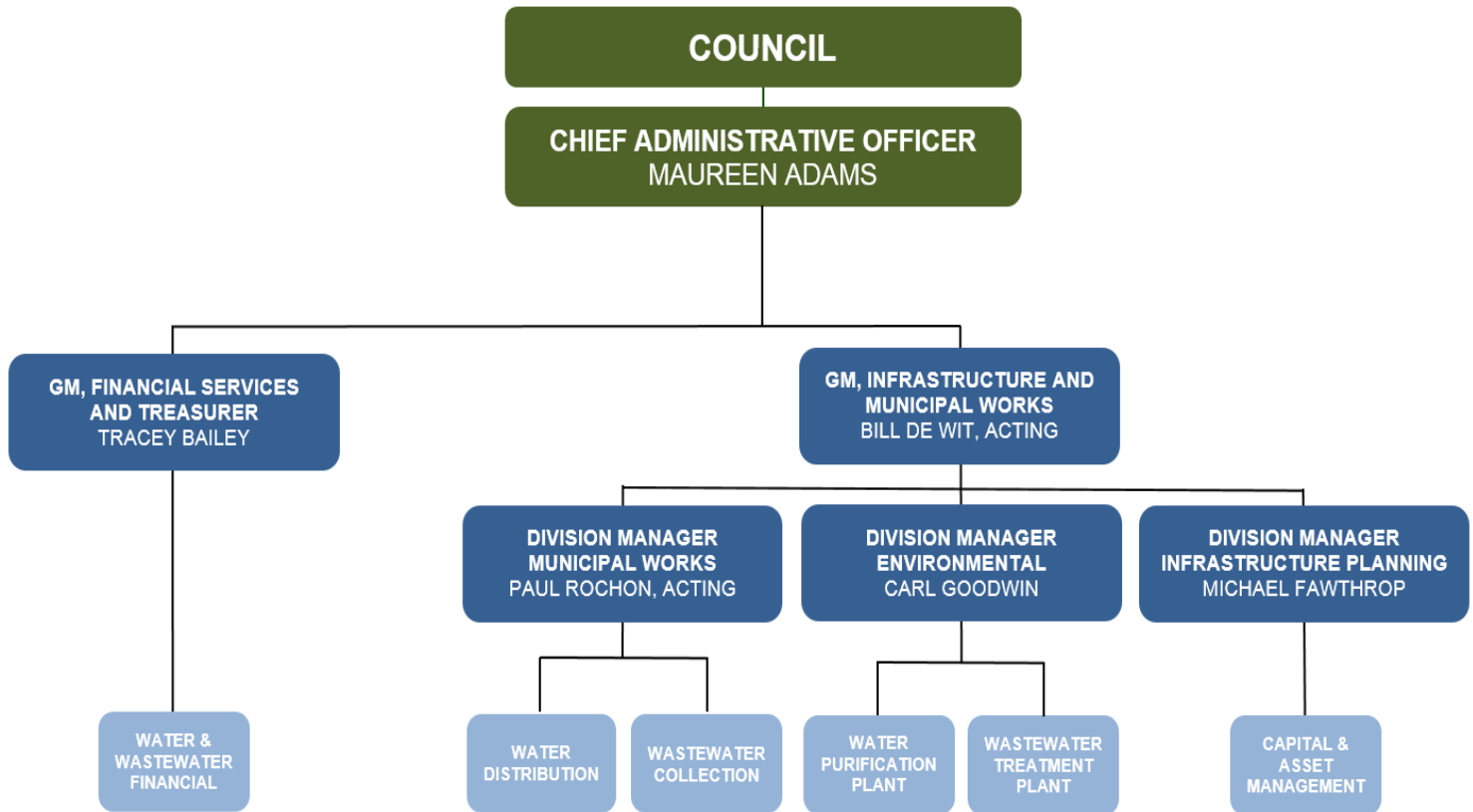
Watermain Rehabilitation Water Network Budget and Level of Service



- 2020 Watermain relining projects reflected only
- Next database update to be completed following conclusion of 2020 construction season
- Chart originally generated for 2014 Asset Management Plan Report and subsequently adjusted to reflect status of current watermain backlog

As previously noted, O. Reg. 588/17 requires that municipalities have an updated AMP for core assets by July 1, 2021. In order to be compliant with O. Reg. 588/17, the City included an AMP Update in the 2020 Water and Wastewater Budgets for linear infrastructure assets (roads, structures, sewers, watermains, etc.). Similar to the 2016 AMP, the 2021 AMP Update will include a review of the City's water distribution network assets and will develop a recommended plan to continue to address the current backlog and to reach the desired level of service.

Organizational Chart - Leadership



Staffing Complement

	Water Financial		Municipal Works			Environmental Services		
	Full Time		Full Time	Part Time	Student	Full Time	Part Time	Student
2020	3.0		25.0	6,463	1.0	20.0	728	3.0
2021	3.0		25.5	4,400	0.0	22.0	0	0.0
Change	0.0		0.5	(2,063)	(1.0)	2.0	(728)	(3.0)

Operating and Capital Financial Summary

	2020 Budget	2021 Submission	\$ Variance	% Variance	Plan 2022	2023	2024
EXPENDITURES							
Salaries and Benefits	\$4,502,376	\$4,634,591	\$132,215	2.94%	\$4,803,501	\$4,923,588	\$5,046,678
Purchase of Goods	\$2,741,972	\$2,879,951	\$137,979	5.03%	\$2,908,751	\$2,937,838	\$2,967,216
Services & Rent	\$2,039,922	\$2,120,307	\$80,385	3.94%	\$2,183,916	\$2,249,434	\$2,316,917
Financial	\$230,810	\$238,966	\$8,156	3.53%	\$244,701	\$250,574	\$256,588
Contribution to Reserves	<u>\$250,000</u>	<u>\$250,000</u>	<u>\$0</u>	<u>0.00%</u>	<u>\$250,000</u>	<u>\$850,000</u>	<u>\$875,000</u>
Total Expenditures	\$9,765,080	\$10,123,815	\$358,735	3.67%	\$10,390,869	\$11,211,434	\$11,462,399
REVENUE							
User Fees & Misc Revenue	<u>\$268,300</u>	<u>\$379,300</u>	<u>\$111,000</u>	<u>41.37%</u>	<u>\$386,886</u>	<u>\$344,624</u>	<u>\$301,516</u>
Net Operating Expenditures	\$9,496,780	\$9,744,515	\$247,735	2.61%	\$10,003,983	\$10,866,810	\$11,160,883
Financing LTD Principal & Interest	1,805,138	1,849,939	\$44,801	2.48%	2,689,997	2,847,160	2,846,985
Corporate Costs	\$1,010,789	\$1,063,319	\$52,530	5.20%	\$1,084,585	\$1,106,277	\$1,128,403
Insurance Premiums	<u>\$187,402</u>	<u>\$205,763</u>	<u>\$18,361</u>	<u>9.80%</u>	<u>\$209,878</u>	<u>\$214,076</u>	<u>\$218,357</u>
Operating Water & Wastewater Billings	<u>\$12,500,109</u>	<u>\$12,863,536</u>	<u>\$363,427</u>	<u>2.91%</u>	<u>\$13,988,443</u>	<u>\$15,034,323</u>	<u>\$15,354,628</u>
Gross Capital	\$8,825,000	\$9,120,000	\$295,000	3.34%	\$9,670,000	\$12,300,000	\$12,515,000
Capital Funding							
Government Grants	\$0	\$0	\$0	0.00%	\$0	\$0	\$0
Financing	\$1,600,000	\$1,100,000	(\$500,000)	(31.25%)	\$1,500,000	\$4,050,000	\$4,500,000
Development Charges	\$550,000	\$500,000	(\$50,000)	(9.09%)	\$0	\$0	\$0
Water Works Reserve	\$50,000	\$900,000	\$850,000	1,700.00%	\$1,500,000	\$1,100,000	\$250,000
Wastewater Works Reserve	<u>\$50,000</u>	<u>\$120,000</u>	<u>\$70,000</u>	<u>140.00%</u>	<u>\$400,000</u>	<u>\$1,000,000</u>	<u>\$1,000,000</u>
Capital Water & Wastewater Billings	<u>\$6,575,000</u>	<u>\$6,500,000</u>	<u>(\$75,000)</u>	<u>(1.14%)</u>	<u>\$6,270,000</u>	<u>\$6,150,000</u>	<u>\$6,765,000</u>
WATER AND WASTEWATER BILLINGS	<u>\$19,075,109</u>	<u>\$19,363,536</u>	<u>\$288,427</u>	<u>1.51%</u>	<u>\$20,258,443</u>	<u>\$21,184,323</u>	<u>\$22,119,628</u>

Estimated Billing Increase Based on Sample Residential Properties

Residential Billing		2020 Billing	2021			2022	2023	2024
			Billing	\$ inc	% inc	% inc	% inc	% inc
Sample 1	1 Bath Outside Tap No Pool	\$670.82	\$680.96	\$10.14	1.51%	4.62%	4.57%	4.42%
Sample 2	1-1/2 Bath Outside Tap No Pool	\$839.34	\$852.03	\$12.69	1.51%	4.62%	4.57%	4.42%
Sample 3	2 Full Bath Outside Tap Pool	\$955.98	\$970.43	\$14.45	1.51%	4.62%	4.57%	4.42%
Average Water And Wastewater Bill		\$822.05	\$834.48	\$12.43	1.51%	4.62%	4.57%	4.42%

* The City currently budgets on an annual basis. However, over the past several years, the City has adopted several long-term strategic plans. The annual budgeting process may no longer be sufficient for the City to achieve its long-term strategic priorities. Thus, a fully integrated multi-year budget may be an optimal way to better link longer-term plans and resources. Appendix A provides keys assumptions for years 2022 – 2024.

2021 CAPITAL BUDGET SUBMISSION SUMMARY

*Please note all figures are in 000s of dollars

DESCRIPTION	2020	2021	EXTERNAL FUNDING		RESERVES		BILLINGS	
	GROSS BUDGET	GROSS BUDGET	GRANTS	FINANCING	DEV. CHARGES	SPECIFIC RESERVE	WASTE WATER	WATER
<u>WATER CAPITAL</u>								
Water Distribution								
Watermain Rehabilitation	2,000	2,200						2,200
System Growth - New Watermain	550	500			500			
Water Purification Plant								
Intake Screen Frazil Ice Mitigation & Emergency Isolation Device		250				250		
Raw Water Intake Main Inspection/X-Ray		150				150		
Chlorine Injection System Replacement		150				150		
Concrete Water Storage Tanks Condition Assessment		50				50		
Filter Inlet and Drain Sluice Gates Replacement		150				150		
Backwash Pump Replacement		150				150		
WPP Building Renovations	225							
Supervisory Control and Data Acquisition (SCADA) Upgrades	400							
Raw Water Intake Redundancy Environmental Assessment	125							
<u>WASTEWATER CAPITAL</u>								
Sewer Collection Program								
Sewer Network Improvements	1,050	1,050					1,050	
Combined Sewer Separation	700	700					700	
<u>2021 Projects</u>								
Fifth St. W from Pitt St. to York St. (\$275K)								
Fifth St. E from Marlborough St. to McConnell Ave. (250K)								
Third St. E from Marlborough St. to Gloucester St. (\$175K)								
<u>2020 Projects</u>								
Water St. from Adolphus St. to Marlborough St (\$500K)								
Alice St. from Montreal Rd to First St. (\$200K)								
Wastewater Treatment Plant								
Design Work for Pumphouse Headworks		120				120		
SCADA Replacement		500					500	
Sludge Collector Replacement - Clarifiers 3 & 4	500							
Pumphouse Wall Brick Replacement	80							
HVAC Upgrade	170							
Insulation in Digester Area	65							
Piping and Control for Using Excess Blower Capacity	100							
Energy Generation	60							
<u>JOINT INFRASTRUCTURE CAPITAL</u>								
Asset Management Plan - Linear Infrastructure	100							
<u>2021 Projects</u>								
Sydney St. Reconstruction - Fifth St. to Seventh St.		2,050					950	1,100
York St. Reconstruction - Fourth St. to Fifth St.		1,100		1,100				
<u>2020 Projects</u>								
York St. Reconstruction - Seventh St. to Ninth St.	1,600							
Sydney St. Reconstruction - Fourth St. to Fifth St.	1,100							
Water, Wastewater, and Joint Infrastructure Capital	8,825	9,120	0	1,100	500	1,020	3,200	3,300

COUNCIL APPROVED CAPITAL BUDGETS FROM PRIOR YEARS

DESCRIPTION	GROSS BUDGET	EXTERNAL FUNDING		RESERVES		BILLINGS	
		GRANTS	FINANCING	DEV. CHARGES	SPECIFIC RESERVE	WASTE WATER	WATER
2020 Council Approved Capital	8,825		1,600	550	100	3,275	3,300
2019 Council Approved Capital	8,547		1,384	250	704	2,964	3,245
2018 Council Approved Capital	6,511	40			1,010	2,355	3,106

Environmental Services - Water

Project Name: Watermain Rehabilitation

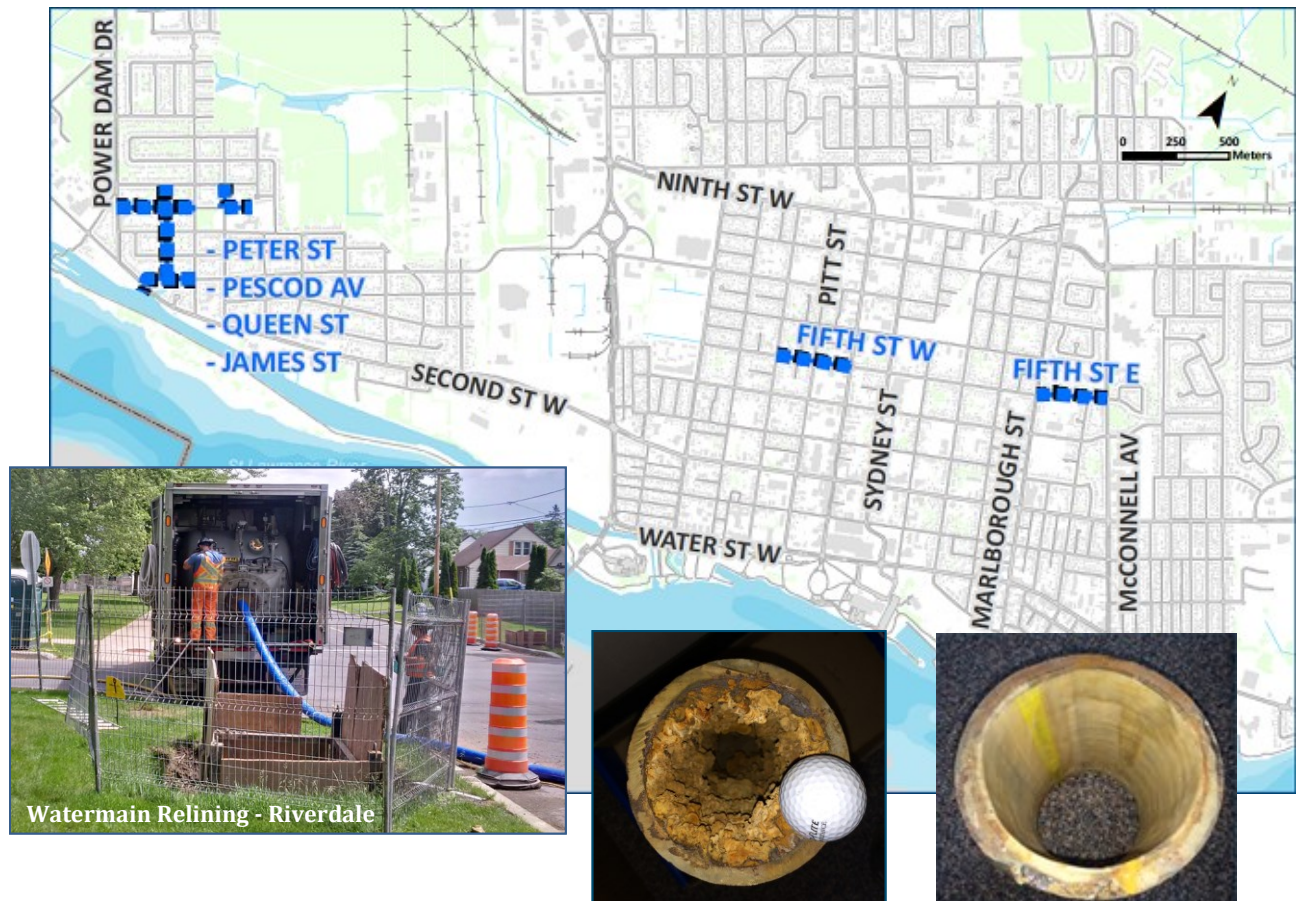
Funding: \$2,200,000 Water Billings

The objectives of the watermain rehabilitation program are to improve water quality and system reliability. Numerous cast iron unlined watermains throughout the City require improvements in order to maximize water quality in the distribution system. Tuberculation build-up on the inside of these pipes creates problems in maintaining minimum chlorine residual levels. It also reduces available fire flow because the inside diameter is reduced and has a rough texture which increases energy loss. In addition, some portions of the system are prone to leakage and breaks which, if reduced, will decrease operational costs.

The annual watermain rehabilitation program is aligned with the City's ongoing Infrastructure Strategy and linear Asset Management Plan.

Watermain Rehabilitation is an ongoing annual capital program. The proposed Watermain Rehabilitation projects for 2021 are as follows:

- Peter St. from Power Dam Dr. to Riverdale Ave. – Relining (\$300K)
- Peter St. from Pescod Ave. to East Limits – Relining (\$100K)
- James St. from Queen St. to Jane St. – Relining (\$375K)
- Queen St. from Riverdale Ave. to Second St. West – Relining (\$225K)
- Pescod Ave. from Jane St. to Peter St. – Relining (\$100K)
- Fifth St. West from Pitt St. to York St. – Replacement (\$700K)
- Fifth St. East from Marlborough St. to McConnell Ave. – Replacement (\$400K)



Watermain Relining - Riverdale

Cast Iron Watermain - Before Relining

Cast Iron Watermain - After Relining

Environmental Services - Water

Project Name: System Growth – New Watermain

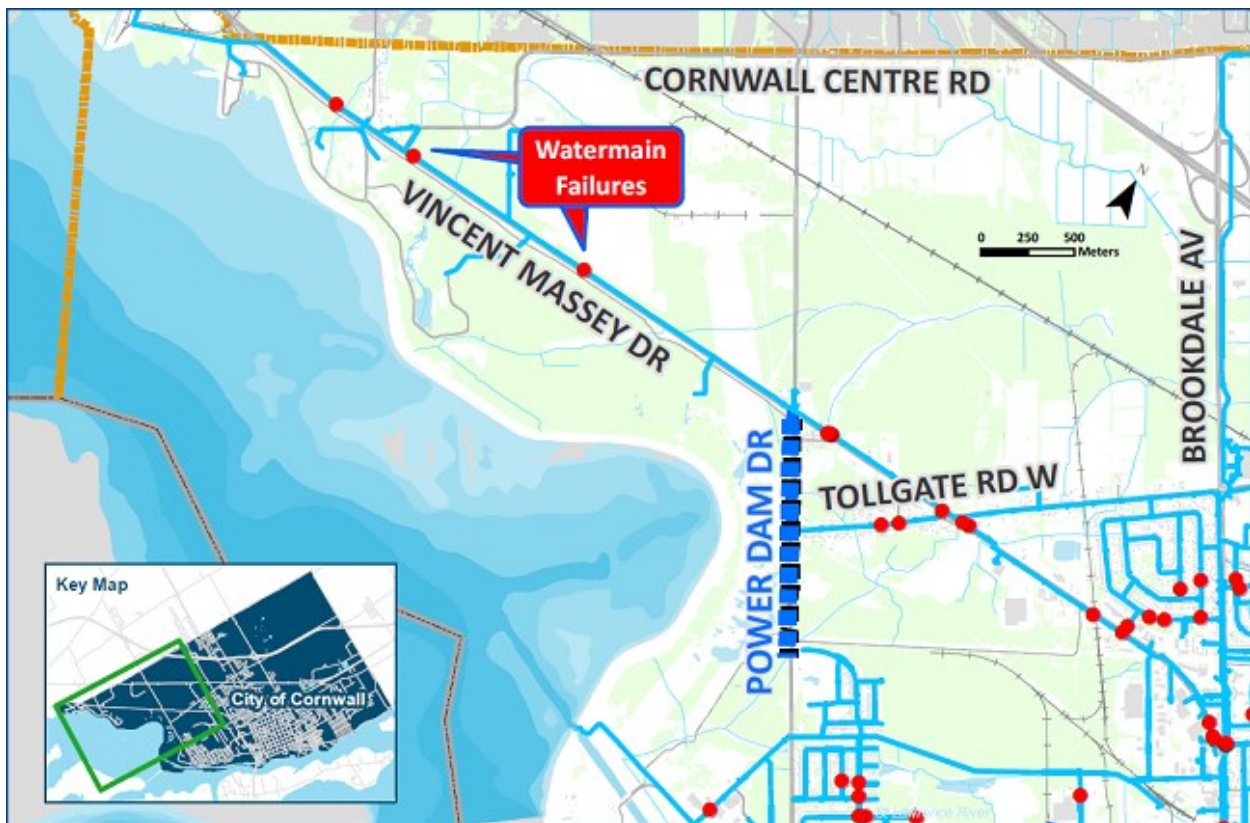
Funding: \$500,000 Development Charges
Total Project Estimated Cost is \$1.7M
\$1.2M has been set aside in previous budget years to begin the work in 2021.

In order to provide the necessary system reliability and redundancy, all major watermains are required to be looped such that water can be supplied from two separate directions. In addition to increasing the flow rate, water network looping also ensures a reliable system by providing redundancy in the event of a watermain break or another problem. In the event of a break, a section of the watermain can be isolated for repair without interrupting the water supply and service for the majority of the service area. Additionally, water network looping is beneficial for fire protection as it provides greater water supply and pressure as well as ensures an adequate water supply can be provided in the event of a break.

Watermain network extensions for water system growth and security is an ongoing capital program. The watermain extension candidate for 2021 is as follows:

- Power Dam Dr. from Riverdale Ave. to Tollgate Rd. (\$500K)

The City has budgeted \$1.2M in previous budget years for this project which will proceed to construction in 2021. The City will continue to budget \$500K in each subsequent budget year to be funded from Development Charges for watermain network extension projects which will provide water system growth and security. Any remaining funds within the project account will contribute to future watermain growth projects to be included in subsequent budget years.



Environmental Services - Water

Project Name: Intake Screen Frazil Ice Mitigation and Emergency Isolation Device

Funding: \$250,000 Water Works Reserve

The City is in the process of completing an Environmental Assessment (EA) for the identification of a preferred solution to address the risks associated with the single raw water intake servicing the Cornwall Water Purification Plant.

Frazil ice is a collection of suspended ice crystals formed in supercooled turbulent water. Frazil ice usually forms in open water of rivers where the heat exchange between the air and the water is such that the water temperature can drop below its freezing point. Such conditions generally occur on cold and clear nights. Frazil ice is known for blocking water intakes during the winter months as ice crystals accumulate and build up on the intake screens. The City's existing intake at Lake St. Lawrence has experienced two frazil ice incidents. A complete blockage in 1988 and a partial blockage in 2008. A complete blockage of the raw water intake main by frazil ice will result in serious consequences for the municipal drinking water system.

It is proposed to commission an experienced engineering firm to design, construct and install mitigation measures that would deter the potential build-up of frazil ice on the intake screen. Options to be explored include but not limited to heat tracing, a high pressurized steam connection or a pressurized air connection. Also included, would be the design of an emergency isolation device which could be installed at the intake mouth which would allow maintenance to be completed on the intake main upstream of the current isolation valve or in event of a failure of the isolation valve itself.



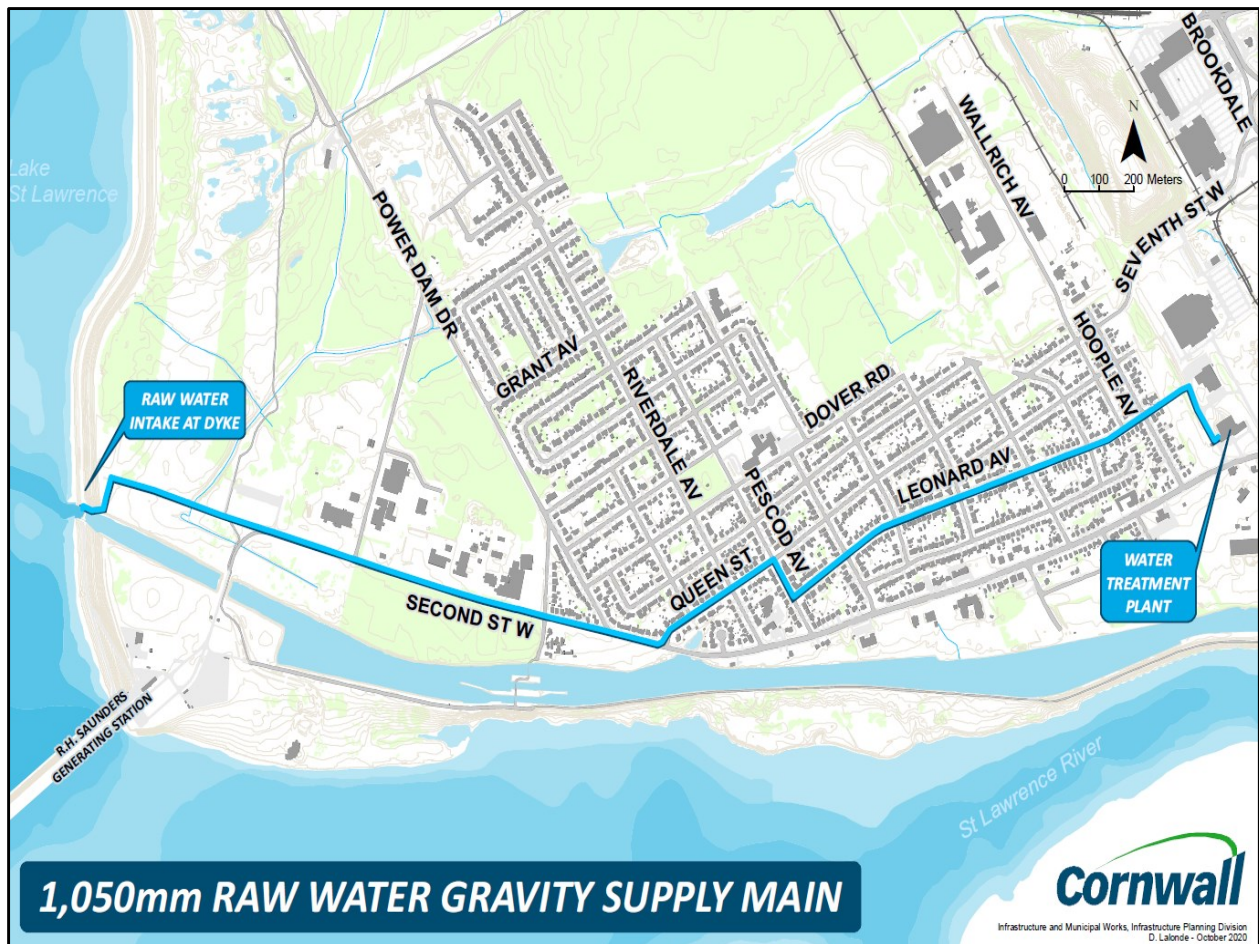
Environmental Services - Water

Project Name: Raw Water Intake Main Inspection / X-Ray

Funding: \$150,000 Water Works Reserve

The City of Cornwall has only one water intake gravity main which supplies raw water to the Water Purification Plant. The City is in the process of completing an Environmental Assessment (EA) for the identification of a preferred solution to address the risks associated with the single raw water intake servicing the City of Cornwall. The existing 1,050mm (42 inch) diameter raw water intake main is 65 years old and is constructed of concrete pressure pipe (CPP). Lined CPP consists of a welded steel cylinder, steel joint rings, a centrifugally placed concrete lining, high tensile steel wire and a dense cement mortar coating over the prestressing wire and core.

An internal inspection of the raw water intake main was last completed in 2011. A Remote Operated Vehicle (ROV) equipped with sonar capabilities was used to inspect the internal concrete liner and joints. It is extremely imperative that the City regularly conduct inspections of the raw water intake in effort to prevent failure. Failure of the raw water intake main will result in serious consequences for the municipal drinking water system. It is therefore proposed to conduct an x-ray inspection to evaluate the integrity of the metal components of the CPP as the steel components provide the pipe its strength and durability. The x-ray inspection would identify areas of corrosion due to moisture penetration, potential impacts of corrosive soils surrounding the pipe or other damage to the pipe.



Environmental Services - Water

Project Name: Chlorine Injection System Replacement

Funding: \$150,000 Water Works Reserve

The Water Purification Plant has a sodium hypochlorite (chlorine) injection system for secondary disinfection of treated water. The chlorine injection system dates back to the upgrade project at the Water Purification Plant completed in 2005.

Due to the corrosive nature of sodium hypochlorite, the existing pipework has become brittle and leaks have become a more frequent occurrence. This equipment has been identified for replacement in the Asset Management Plan (AMP) completed by AECOM Engineering Group as the system has reached the end of its lifecycle.



Environmental Services - Water

Project Name: Concrete Water Storage Tanks Condition Assessment

Funding: \$50,000 Water Works Reserve

The Water Purification Plant and Water Distribution System have several concrete water storage tanks as listed below.

- Water Purification Plant Pre-Mix Chamber
- Water Purification Plant Settling Tank 1 & 2
- Water Purification Plant Clearwell and high lift pump suction tunnel
- Water Purification Plant Reservoir and high lift pump suction tunnel
- Boundary Road Reservoir Cells 1 & 2

It has been recommended as part of the asset management plan developed by AECOM Engineering Group that, due to the age of these concrete tanks, a detailed on-site internal condition assessment be completed by a Licensed Engineer and provide recommendations to address identified deficiencies.



Environmental Services - Water

Project Name: Filter Inlet and Drain Sluice Gate Replacement

Funding: \$150,000 Water Works Reserve

One of the first treatment processes at the Water Purification Plant (WPP) is coagulation, flocculation, sedimentation followed by filtration. These processes remove the dirt particles prior to disinfection. The WPP has four conventional filters. Each filter is equipped with inlet and drain sluice gates. These gates date back to original plant construction in 1956 and have exceeded life expectancy.

Recently the gates have caused maintenance issues and water loss is occurring from the improper seating of these valves. The replacement of these gates will result in a reduction of water entering the wastewater collection system. This in turn will result in treatment cost savings at the wastewater treatment plant and will reduce the environmental impact caused by water loss.



Environmental Services - Water

Project Name: Backwash Pump Replacement

Funding: \$150,000 Water Works Reserve

The Water Purification Plant has two backwash pumps for filter cleanings. The newest backwash pump was added during the 2005 plant upgrade project while the original backwash pump was installed as part of the initial plant construction in 1956.

The original backwash pump is well beyond its life expectancy and requires replacement. It is necessary to ensure adequate redundancy for the backwash treatment process.



Environmental Services - Wastewater

Project Name: Sewer Network Improvements

Funding: \$1,050,000 Wastewater Billings

The objectives of the annual Sanitary Sewer Network Improvements program is to replace/repair deficient storm and sanitary sewers in various locations throughout the City, which have been identified through closed circuit television (CCTV) sewer inspections, to have broken, collapsed or have other structural deficiencies.

The following Sewer Network Improvement projects are proposed for 2021:

- 1) Fifth St. West from Pitt St. to York St. – Sanitary Sewer Replacement (\$250K)
- 2) Fifth St. East from Marlborough St. to McConnell Ave. – Sanitary Sewer Replacement (\$350K)
- 3) Wellington St. East from Pitt St. to 120m East – Storm Sewer Replacement (\$100K)
- 4) Thirteenth St. East from Sydney St. to 100m West – Sanitary Sewer Replacement (\$100K)
- 5) Thirteenth St. West from Pitt St. to Aubin Ave. – Sanitary Sewer Replacement (\$100K)
- 6) Third St. East from Marlborough St. to Gloucester St. – Sanitary Sewer Replacement (\$150K)



Environmental Services - Wastewater

Project Name: Combined Sewer Separation

Funding: \$700,000 Wastewater Billings

The separation of combined sewers has the objective of reducing wet weather flows in the sewage system and to the Wastewater Treatment Plant. It reduces the potential for basement flooding because flows are lowered in the pipe that houses are directly connected to. Sewer separation also reduces Combined Sewer Overflow (CSO) volumes and the potential for bypasses from the Wastewater Treatment Plant to the St. Lawrence River. It is achieved by constructing new storm sewers so that the combined sewer can be converted into a sanitary sewer. Projects are prioritized based on the roadway surface condition so that the sewer works can be completed before resurfacing the roadway.

The following Combined Sewer Separation projects are proposed for 2021:

- 1) Fifth St. West from Pitt St. to York St. – New Storm Sewer (\$275K)
- 2) Fifth St. East from Marlborough St. to McConnell Ave. – New Storm Sewer (\$250K)
- 3) Third St. East from Marlborough St. to Gloucester St. – New Storm Sewer (\$175K)



Environmental Services - Wastewater

Project Name: Design Work for Pumphouse Headworks

Funding: \$120,000 Wastewater Works Reserve

Raw sewage generated within the entire wastewater collection of the City of Cornwall eventually discharges into the wet well of the raw sewage pump station which is housed in the building located at the foot of the Wastewater Treatment Plant driveway on the south side of Montreal Road and immediately adjacent to the St. Lawrence river.

The single inlet to the raw water pump station headworks proposes a risk during an event where the inlet's operation is impaired. The failure of the travelling bar screen at the raw sewage pump station this year has identified the need to commission a professional engineering firm to evaluate various aspects of the pump station structure and equipment.

The purpose of the evaluation is to obtain recommendations regarding three major concerns:

1. Options to bypass the current single inlet channel to the pump station headworks.
2. Structural condition of the force main from the pump station head works to the primary plant (on the north side of Montreal Rd).
3. The flow characteristics of the sewage through the pumps.



Environmental Services - Wastewater

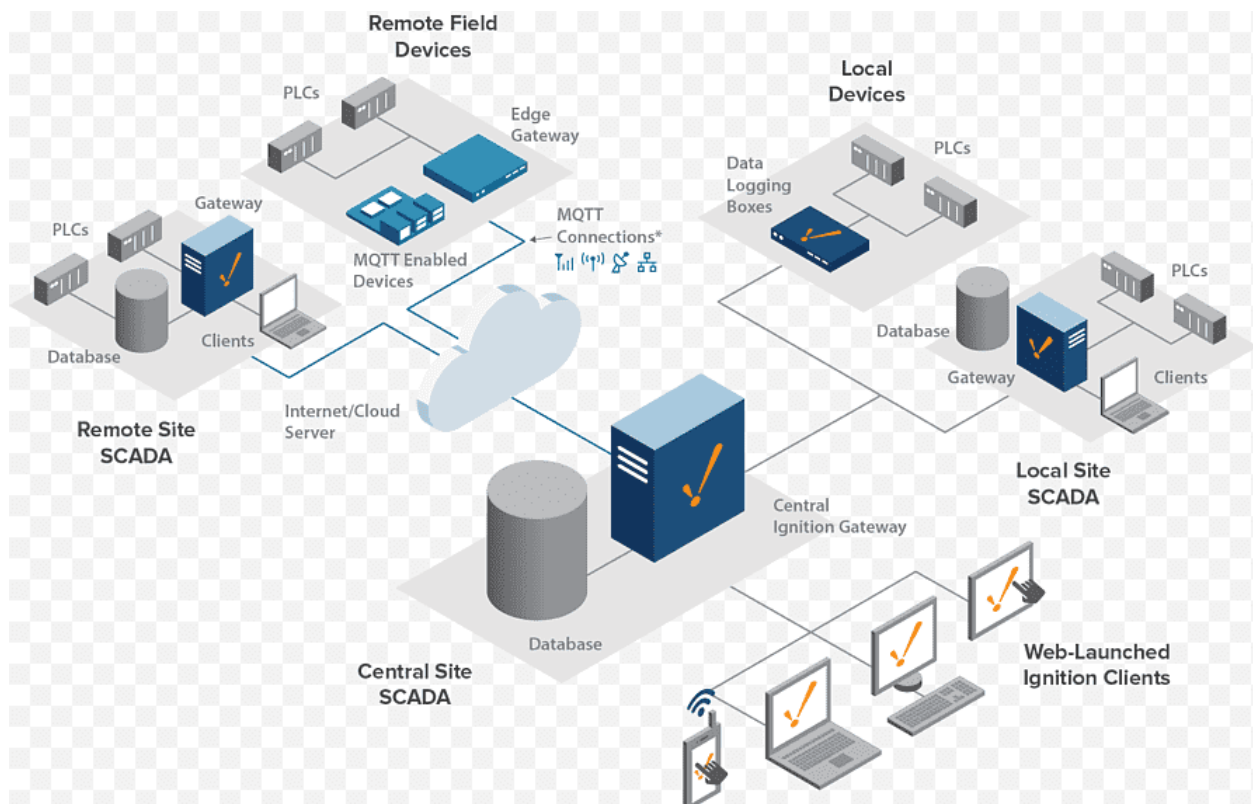
Project Name: SCADA Replacement

Funding: \$500,000 Wastewater Billings

The Wastewater Treatment Plant (WWTP) is a complex primary and secondary treatment operation. Operations of the plant are monitored and treatment control adjustments are made through an electronic Supervisory Control and Data Acquisition (SCADA) system. This system maintains data storage for process history and trouble shooting. The computerized data is also used for various legislated reporting requirements including the annual report submitted to the Ministry of Environment Conservation and Parks (MECP) as part of the conditions of the Certificate of Approval (CoFA).

The SCADA system consists of desktop computers, data servers, data storage servers and various ethernet switches and hardware needed to maintain communication with the control functions of all the equipment at the plant.

This type of equipment has a relatively short lifecycle due to various factors like changing technology requirements for the firmware that is provided by the manufacturers to improve the operation of the technology. In addition, the nature of the signal energy passing data at the speed of milliseconds throughout the SCADA network breaks down the connections in the switches that direct the signal energy to the control components, computer operating systems and the data collection modules. The expected lifecycle of SCADA systems is 5 years. Our system is over 7 years old. The system has had a condition assessment completed by the City of Cornwall system integrator and verified by the WWTP's SCADA Technologist. The assessment has recommended replacement in 2021.



Environmental Services - Joint Infrastructure

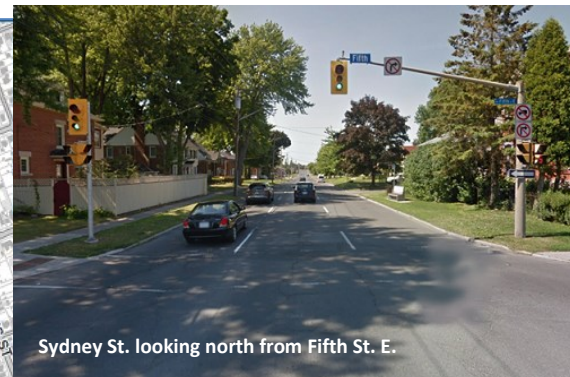
Project Name: Joint Infrastructure – Sydney St. Reconstruction – Fifth St. E. to Seventh St. E.

Funding: \$1,100,000 Water Billings
\$ 950,000 Wastewater Billings
\$2,050,000

Joint infrastructure projects are typically the complete reconstruction of sewer, water and roadway infrastructure. Projects selected require underground facility upgrades, such as sewer separation, watermain replacement, etc. Since the road must be reinstated as part of the underground work, candidates where the road is in poor condition are good joint infrastructure projects in order to maximize the life of the roadway.

In 2019, the first phase of the Sydney St. Reconstruction project was completed from Second St. to Fourth St. The second phase of the project from Fourth St. to Fifth St. was completed in 2020. In 2021, the third phase of the Sydney St. Reconstruction project is proposed from Fifth St. to Seventh St. The reconstruction of Sydney St. will continue north two blocks at a time in subsequent years. The Sydney St. Reconstruction project from Fifth St. to Seventh St. will be coordinated with the replacement of the traffic signals at the intersection of Sydney St. and Seventh St. which is included in the 2021 Capital Budget. Both capital projects proposed for 2021 will be issued in the same tender and completed by the same contractor.

The reconstruction of Sydney St. from Fifth St. to Seventh St. is recommended as a joint infrastructure project for 2021 because the underground infrastructure (water and sewer) is in poor condition and reaching the end of service life, sewer separation is required, and the road and sidewalks are in poor condition.



Environmental Services - Joint Infrastructure

Project Name: Joint Infrastructure – York St. Reconstruction – Fourth St. W. to Fifth St. W.

Funding: \$1,100,000 Financing

Joint infrastructure projects are typically the complete reconstruction of sewer, water and roadway infrastructure. Projects selected require underground facility upgrades, such as sewer separation, watermain replacement, etc. Since the road must be reinstated as part of the underground work, candidates where the road is in poor condition are good joint infrastructure projects in order to maximize the life of the roadway.

In 2019, the first phase of the York St. Reconstruction project was completed from Fifth St. to Seventh St. The second phase of the project from Seventh St. to Ninth St. was completed in 2020. In 2021, the last phase of the York St. Reconstruction project is proposed from Fourth St. to Fifth St. Once the last phase of the York St. Reconstruction project is completed, York St. will have been entirely reconstructed from Water St. to Ninth St. and no further work will be required along the corridor for the foreseeable future.

The reconstruction of York St. from Fourth St. to Fifth St. is recommended as a joint infrastructure project for 2021 because both the sewer and watermain are in poor condition and nearing the end of service life, sewer separation is required, and the road and sidewalks are in poor condition.



2021 TEN YEAR CAPITAL FORECAST

CAPITAL FORECAST FOR THE YEARS 2021 - 2030

WATER DISTRIBUTION

LOCATION	FROM	TO	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
WATER DISTRIBUTION												
Watermain Rehabilitation Improvements to system throughout the City			2,200	2,250	2,300	2,350	2,400	2,450	2,500	2,550	2,600	2,650
Pitt Street Vincent Massey Drive	Tollgate Road Tollgate Road	Cornwall Centre Road City Limits			2,500	2,500	5,000	5,000				
System Growth - New Watermain - Other System Growth/Projection Projects			500	500	500	500	500	500	500	500	500	500
WATER DISTRIBUTION			2,700	2,750	5,300	5,350	7,900	7,950	3,000	3,050	3,100	3,150

2021 TEN YEAR CAPITAL FORECAST

CAPITAL FORECAST FOR THE YEARS 2021 - 2030 WATER PURIFICATION PLANT

LOCATION	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Intake Screen Frazil Ice Mitigation & Emergency Isolation Device	250									
Raw Water Intake Main Inspection/X-Ray	150									
Chlorine Injection System Replacement	150									
Concrete Storage Tanks Condition Assessment	50	50		50		50				
Filter Inlet and Drain Sluice Gates Replacement	150									
Backwash Pump Replacement	150									
High Lift Pump Replacement		400			400		400			400
UV Reactors 1 & 2 Replacement			500							
UV Reactors 3 & 4 Replacement				500						
Design and Construction Wetlands for Backwash Water		100	400							
Replacement of Chemical Storage Tanks		150								
Removal of Hydrogen Peroxide System		200								
Clearwell Sluice Gate Replacement							150			
Boundary Road Booster Pump Replacements					100	100	100			
Submersible Filter Backwash Pump and Valve Replacement					200					
Filter 3 & 4 Media Replacements				500		500				
Filter 1 & 2 Media Replacements						50		300	500	
SCADA Equipment								400		
Tower Coating Rehabilitation							150			
Instrumentation (Flow Meters/Actuators/Pressure Transmitters)		50	100		200	100			800	
Building Exterior Brickwork										
Expansion Joint Repairs								350		
Valve Replacement Program					200		200			250
Concrete Rehabilitation/Renewal						200	200	200		200
Roof Repairs						150				500
WATER PURIFICATION PLANT	900	950	1,000	1,050	1,100	1,150	1,200	1,250	1,300	1,350

2021 TEN YEAR CAPITAL FORECAST

CAPITAL FORECAST FOR THE YEARS 2021 - 2030

WASTEWATER COLLECTION

LOCATION	FROM	TO	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Sewer Collection Program - Sewer Network Improvements Third Street East Fifth Street West Fifth Street East Thirteenth Street East Thirteenth Street West Wellington Street	Marlborough	Gloucester	1,050	1,075	1,100	1,125	1,150	1,175	1,200	1,225	1,250	1,275
	Pitt	York										
	Marlborough	McConnell										
	Sydney	100m West										
	Pitt	Aubin										
	Pitt	100m East										
Storm & Combined Sewer Separation See APPENDIX C			700	725	750	750	770	790	810	830	850	850
WASTEWATER COLLECTION			1,750	1,800	1,850	1,875	1,920	1,965	2,010	2,055	2,100	2,125

2021 TEN YEAR CAPITAL FORECAST

CAPITAL FORECAST FOR THE YEARS 2021 - 2030

WASTEWATER COLLECTION APPENDIX C

LOCATION	FROM	TO	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Storm and Combined Sewer Separation at Various Locations												
Fifth St.	Pitt St.	York St.	275									
Fifth St.	McConnell Ave.	Marlborough St.	250									
Third St.	Marlborough St.	Gloucester St.	175									
Rosemount Ave.	Brookdale Ave.	Vincent Massey Dr.		225								
Augustus St.	Fifth St.	Sixth St.		500								
Bedford St.	Water St.	Second St.			750							
Anthony St.	Montreal Rd.	Walton St.				400						
Adolphus St.	Fourth St.	Fifth St.				350						
Eighth St.	Augustus St.	York St.					150					
Bedford St.	Fourth St.	Fifth St.					200					
Bedford St.	Eighth St.	Ninth St.					230					
Eighth St.	York St.	Cumberland St.					190					
First St.	Marlborough St.	Baldwin Ave.						790				
First St.	McConnell Ave.	Baldwin Ave.							300			
Timothy Ave.	Bedford St.	Cumberland St.							230			
Sixth St.	Adolphus St.	Gloucester St.							280			
Bedford St.	Fifth St.	Sixth St.								400		
Danis Ave.	First St.	Easton Ave.								430		
Bergin Ave.	Race St.	Water St.									650	
Hawkshaw Ave.	Amelia St.	RailRd. Tracks									200	
TBD												850
WASTEWATER COLLECTION			700	725	750	750	770	790	810	830	850	850

2021 TEN YEAR CAPITAL FORECAST

CAPITAL FORECAST FOR THE YEARS 2021 - 2030

WASTEWATER TREATMENT PLANT

LOCATION	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Design Work for Pumphouse Headworks	120									
SCADA Replacement	500									
Property Fence Replacement		120								
Pumphouse Inlet Modification		1,500								
Pumphouse Spare Forcemain to Main Plant			1,550							
Primary Header Expansion Joint Repair				790						
Digester #1 Relining				800						
Digester #2 Relining					800					
BAF Cells Conversion						1,650				
Outfall repairs							1,700			
Primary Clarifiers 1&2 and Header Rehabilitation								1,750		
Primary Clarifiers 3&4 and Header Rehabilitation									1800	
Brookdale Gate Replacement										1,100
Roof Replacement										750
Exterior Building Rehabilitation										
WASTEWATER TREATMENT PLANT	620	1,620	1,550	1,590	1,600	1,650	1,700	1,750	1,800	1,850

2021 TEN YEAR CAPITAL FORECAST

CAPITAL FORECAST FOR THE YEARS 2021 - 2030

JOINT INFRASTRUCTURE PROJECTS - (WATER / WASTEWATER)

LOCATION	FROM	TO	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
JOINT INFRASTRUCTURE												
York St.	Fourth St.	Fifth St.	1,100									
Sydney St.	Fifth St.	Seventh St.	2,050									
Sydney St.	Seventh St.	Ninth St.		2,550								
Third St.	York St.	Bedford St.			1,300							
Third St.	Bedford St.	Cumberland			1,300							
Gloucester St	Water	First				1,325						
Lawrence	Montreal Rd.	Second				1,325						
Bedford Street	Fourth	Sixth					2,675					
Eighth St.	Sydney	Adolphus						2,675				
Eighth St.	Adolphus	Marlborough							2,700			
Sixth	Augustus	Sydney								2,725		
Gloucester St.	Second	Aberdeen									1,300	
Future Projects											1,450	2,750
JOINT INFRASTRUCTURE			3,150	2,550	2,600	2,650	2,675	2,675	2,700	2,725	2,750	2,750

Key Assumptions

Following the key assumptions outlined for the City's LTFP, the financial forecast for the years 2022-2024 (multi-year budget) encompasses a number of key assumptions that are used to project the City's anticipated financial performance, including the following:

Operating expenses

Salary and benefit related costs are projected to increase at an average rate of 2.5% per year based upon our financial model. This reflects settlements under the City's collective bargaining agreements, corresponding increases for non-union personnel, and increases in benefit costs and other staffing adjustments.

Costs for materials and goods are projected to increase at a rate of 1.0% per year, which represents the assumed general increase in energy costs due to inflation and the impact of saving initiatives undertaken by the City.

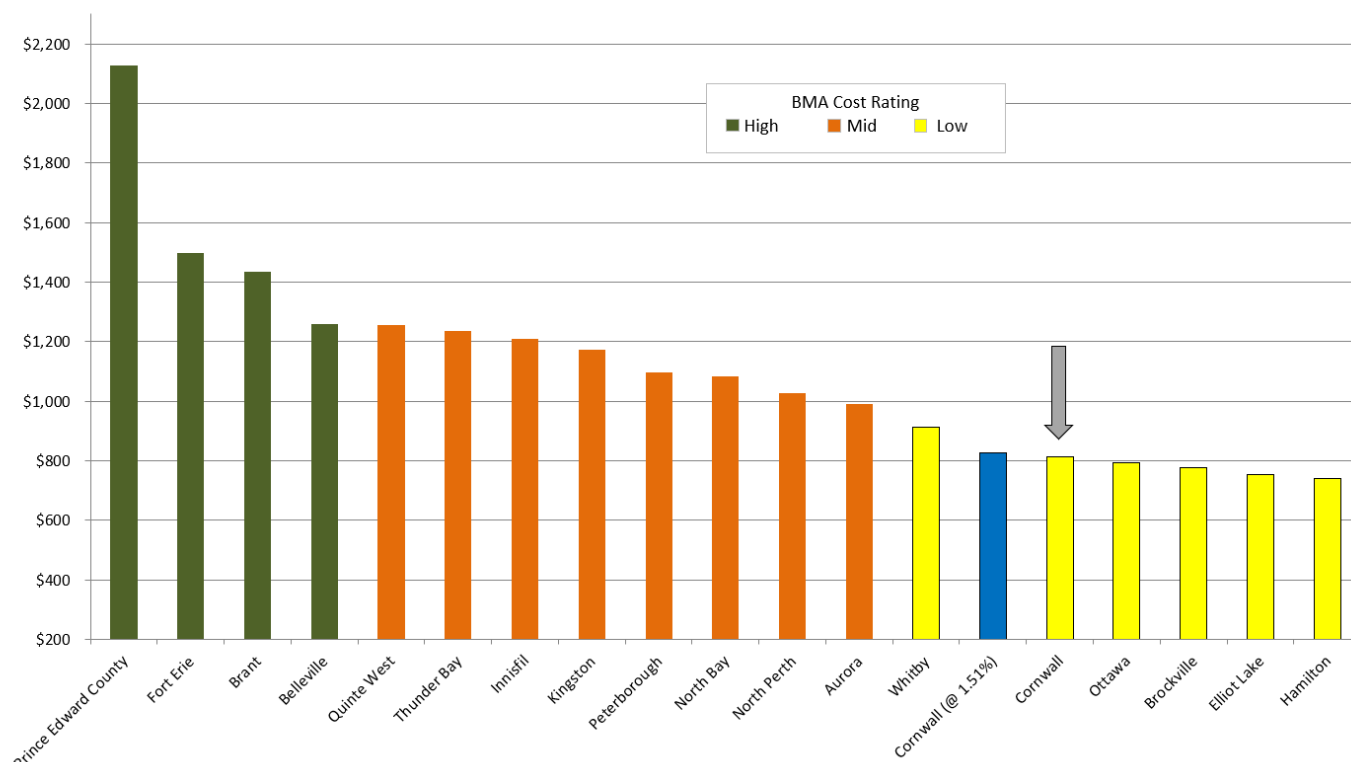
Other operating expenses are projected to increase at a rate of 3.0% per year, which represents the assumed general rate of increase in operating costs due to inflation and the impact of regulatory changes.

Capital

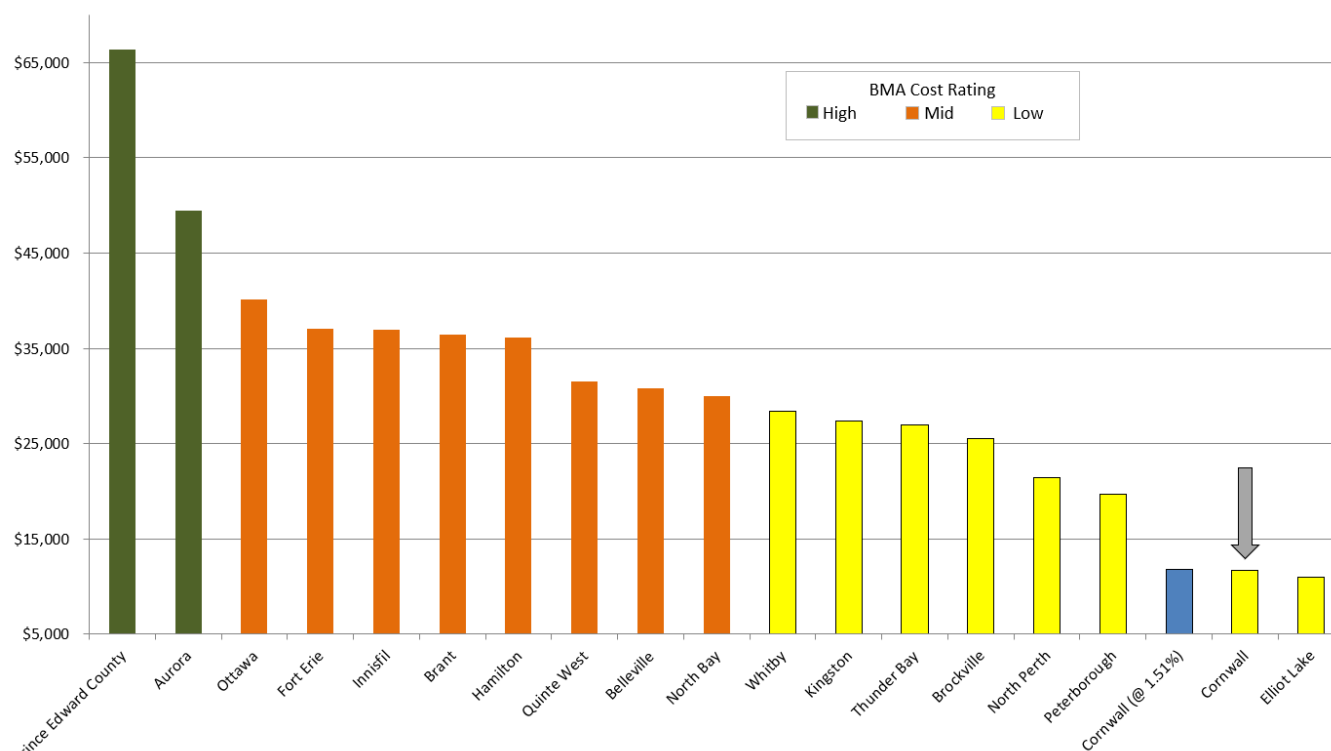
Projected capital expenditures and associated funding (based on financial policy recommendations) for the years 2021 to 2030 are based on the City's AMP, which is reviewed annually.

Municipal Comparators

Residential Water / Wastewater Costs per 200m³



Commercial Water / Wastewater Costs per 10,000m³



Source: 2020 BMA Study