

2022

WATER AND WASTEWATER
BUDGET SUBMISSION

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CITY OF CORNWALL – 2022 WATER AND WASTEWATER BUDGET

The Water and Wastewater budget represents the requirement to provide for the operation and maintenance of the Water Purification Plant (WPP) and the water distribution system to ensure the sourcing and delivery of clean, safe, drinking water to the community. It also provides for storm management across the City, the operation and maintenance of the Wastewater Treatment Plant (WWTP), and the sanitary sewer collection system to ensure safe transportation and disposal of sewage.

Each day, clean, safe water travels from the WPP through the City's watermains for use by residents and businesses. Similarly, wastewater flows through the City's sewer collection system to the 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. These services are highly regulated and are provided in accordance with Provincial regulations and guidelines.

The 2022 Water and Wastewater budget strives to provide funds to support the City's water and wastewater services by continuing to move towards financial sustainability (i.e. 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.

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.

The Strategic Plan prioritizes water meters in its statement of “*Being leaders in sustainability and climate change impact*”. At its meeting of September 21, 2021, Council provided direction to proceed with the universal installation of water meters and the implementation of the water conservation program. Conservation of natural resources is increasingly becoming more important. Conservation continuously focuses on the preservation of non-renewable resources and on the proper management of renewable resources.

Regulatory Requirements and Best Practices

Minimum levels of service describe the minimum achievement the City must deliver through its water and wastewater treatment systems as directed by regulations. There are several requirements that steer how the municipality conducts water and wastewater treatment.

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: Drinking Water Systems (Ontario Regulation 170/03); Ontario Drinking Water Quality Standards (Ontario Regulation 169/03); Drinking Water Testing Services (Ontario Regulation 248/03); Drinking Water Quality Management Standards; Ontario Water Resources Act, R.S.O 1990, C.O. 40; Wastewater Systems Effluent Regulations (SOR/2012-139); Ontario Regulation 435/93 Water Works and Sewage Works; Asset Management Planning for Municipal Infrastructure (Ontario Regulation 588/17).

The purpose of the Acts and Licence are to protect human health through regulation to ensure safe drinking water is supplied and delivered to customers. It also regulates how a municipality is to conduct its wastewater treatment. Compliance must always be ensured as the minimum.

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 18,900 flat rate customers and approximately 310 metered accounts.

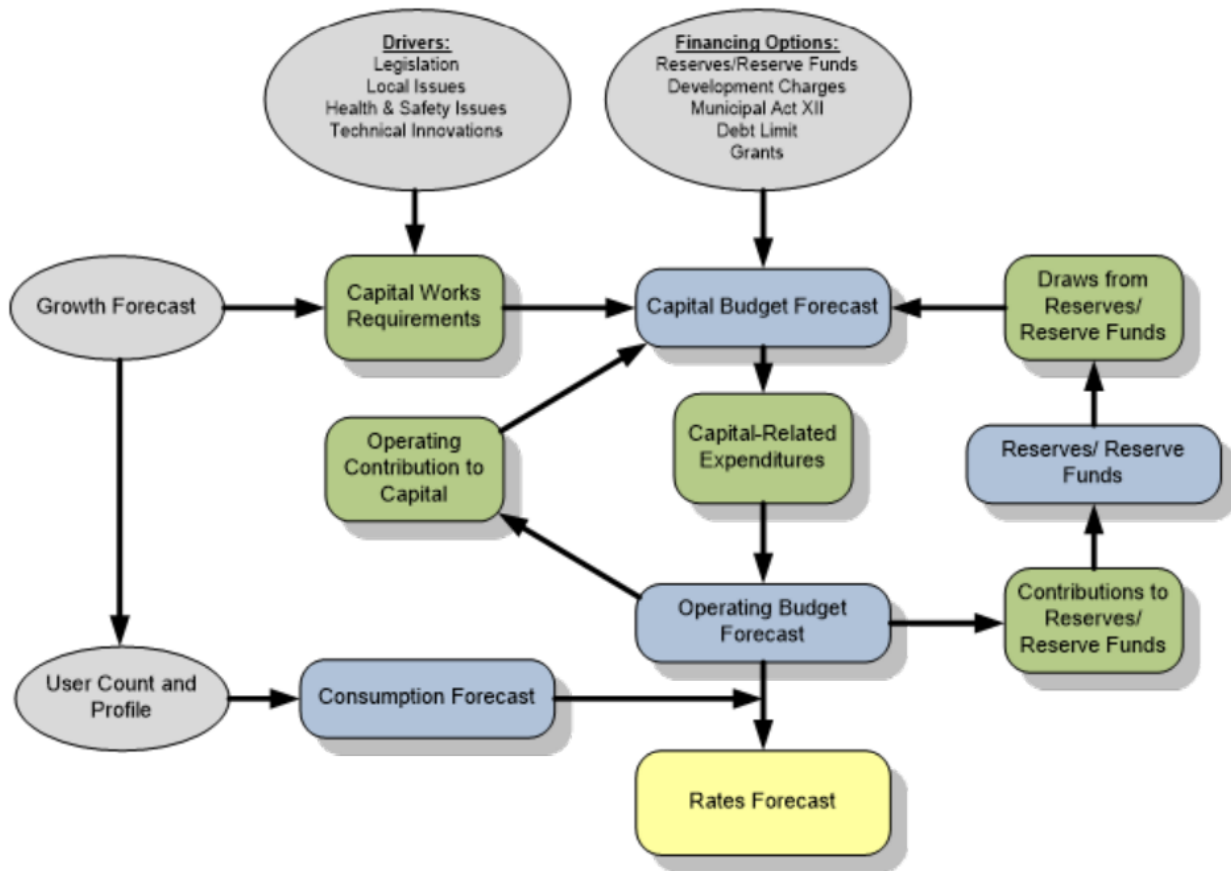
- No property tax dollars are used to fund water and wastewater operating and capital budgets.
- Operates 24 hours a day, 365 days per year.
- The services provided are grouped into four service areas:
 1. Water Supply and Distribution – The water system provides water for residential, institutional, 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, to over 16,000 service connections.

Staff strive to develop, maintain and operate the facilities necessary to provide a plentiful supply of high-quality drinking water for our customers. The Department continually monitors regulatory changes and adapts to ensure compliance.
 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 is collected and treated per day, from both residential and non-residential properties in Cornwall and returned as clean water to the St. Lawrence River.
 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 a 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) as well as water consumption (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 wastewater infrastructure.

The 2022 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 are based on the Asset Management Plans (2014-Dillon and Watson; 2016-FCapX), the Water and Wastewater Financial Plan (Watson, 2020), Water Purification Plant 10-Year Asset Management Plan (AECOM, 2020), Wastewater Treatment Plant 10-Year Asset Management Plan (AECOM, 2020), and the Long-Term Financial Plan (KPMG, 2017).

The process is designed to address full cost principles and reflects the guiding principles toward sustainable financial planning.

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 Long-Term Financial Plan (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.

Water and wastewater operational costs are fully funded through direct fees and service charges from water and wastewater billings. The water and wastewater billings fund both operating and capital expenditures. The City does not fund any costs associated with providing water or wastewater services from tax levies.

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.

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

The water and wastewater rates are based on the recommendations of the Water Conservation and Servicing Master Plan. Through the plan, the water and wastewater rates have been forecasted such that they will be sufficient to fund the long-term capital needs of the systems by 2031, providing for the sustainable replacement of infrastructure and ongoing operation and maintenance of the

systems. The flat (per fixture) rates have been forecasted to increase by 5% annually over the 2022-2024 period, while the metered (consumptive) rates have been forecasted to increase by 10% in 2022 and 2023 and 5.9% in 2024.

Water Conservation and Servicing Master Plan				
Flat Rates (per fixture)				
Sample Property	2021	2022	\$ Inc	% Inc
1 bath, outside tap, no pool	\$680.96	\$715.01	\$34.05	5.00%
1-1/2 bath, outside tap, no pool	\$852.03	\$894.63	\$42.60	5.00%
2 full bath, outside tap, pool	\$970.44	\$1,018.96	\$48.52	5.00%

Aligning the budget with the Water Conservation and Servicing Master Plan will address the existing inequity between the flat (per fixture) customers and the metered (consumptive) customers.

Metered Rates (consumptive)				
Sample Property	2021	2022	\$ Inc	% Inc
5,073 m3	\$6,006.89	\$6,607.58	\$600.69	10.00%
10,000 m3	\$11,840.91	\$13,025.00	\$1,184.09	10.00%
20,000 m3	\$23,681.81	\$26,049.99	\$2,368.18	10.00%

As reported to Council at its meeting on November 22, 2021 through the Third Quarter Financial Report, both the water and wastewater service will have a surplus in 2021. At year end, as per Policy, the surpluses will be transferred to the Water Works Reserve and the Wastewater Works Reserve respectively. With these contributions, it is projected that the Water Works Reserve and the Wastewater Works Reserve will both exceed their targeted balances.

Administration is recommending that the City utilize funds from both reserves to decrease the rate increases planned for 2022. The 2022 budget has been prepared with a contribution of \$200,000 from the Waterworks Reserves and \$400,000 from the Wastewater Works Reserve.

By utilizing the 2021 surplus in water and wastewater, flat (per fixture) customers would see a 1.92% increase. In the sample properties illustrated in this chart, the increase would range between \$13.06 to \$18.60 depending on the number of fixtures. The average cost would increase by 4¢ per day from \$2.29 to \$2.33.

2022 Budget Submission				
Flat Rates (per fixture)				
Sample Property	2021	2022	\$ Inc	% Inc
1 bath, outside tap, no pool	\$680.96	\$694.02	\$13.06	1.92%
1-1/2 bath, outside tap, no pool	\$852.03	\$868.36	\$16.33	1.92%
2 full bath, outside tap, pool	\$970.44	\$989.04	\$18.60	1.92%

In 2022, metered customers would see a 6.77% increase. In the samples properties illustrated in the chart, the increase would range between \$406.66 to \$1,603.25

Metered Rates (consumptive)				
Sample Property	2021	2022	\$ Inc	% Inc
5,073 m3	\$6,006.89	\$6,413.55	\$406.66	6.77%
10,000 m3	\$11,840.91	\$12,642.53	\$801.62	6.77%
20,000 m3	\$23,681.81	\$25,285.06	\$1,603.25	6.77%

depending on volume consumed. Currently, metered customers pay 50.6¢ per cubic meter plus the sewer surcharge at 134.01%. Applying the new rate would increase the charge to 54.0¢ per cubic meter. The sewer surcharge is decreasing to 132.84%.

If Council approves Administration's recommendation, water billings would increase by \$340,276 or 4.02% and wastewater billings would increase by \$237,961 or 2.18%. Overall, the utility billings would increase by \$578,237 or a blended billing of 2.99%.

2021 BMA Study

For the past twenty 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 2021 BMA Study is in draft format and currently being reviewed by the participating municipalities. The following information is from the draft 2021 BMA Study.

In 2021, over 110 Ontario municipalities participated, representing in excess of 85% of the Province's population.

The draft 2021 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: \$824; BMA average \$1,174
- Commercial - Cornwall: \$11,841; BMA average \$38,533
- Industrial - Cornwall: \$35,523; BMA average \$111,207

Further comparative information can be found in Appendix B.

Asset Management Planning for Municipal Infrastructure

The Infrastructure for Jobs and Prosperity Act, 2015 (Act) in section 6(2) sets out principles for the provincial government to regulate asset management planning for municipalities.

The Province of Ontario requires municipalities to prepare Asset Management Plans (AMP) for all infrastructure assets as defined in the Asset Management Planning for Municipal Infrastructure regulation, Ontario Regulation 588/17 (O. Reg. 588/17). The regulation consists of guidelines and minimum requirements for municipal AMP and policies in Ontario.

In accordance with the regulation, a Strategic Asset Management Policy was approved by Council in July 2019. This was the first step in a series of actions

required under O. Reg. 588/17. The Policy outlines the City's corporate commitment to the adoption of the asset management principles defined in the Act. The Policy also illustrates how that in addition to the regulatory requirements, asset management is critical to supporting the City's Mission, Vision, and Values.

As part of this regulation, the Province has mandated phased requirements to ensure that municipalities develop AMP. Following the adoption of the Strategic Asset Management Policy, the next milestone required is the development and approval of an AMP for core assets. This date was originally set for July 1, 2021, however in March 2021, the Minister of Infrastructure announced that in recognition of the challenges facing municipalities in addressing COVID-19 impacts, deadlines would be extended by an additional year. The revised deadlines are as follows:

- Phase 2 (by July 1, 2022): AMP for core infrastructure assets which include water, wastewater and stormwater assets, roads, bridges, and culverts; within this, the plan for core assets must also include current levels of service and costs to maintain these levels.
- Phase 3 (by July 1, 2024): AMP for all municipal assets, including current levels of service and costs to maintain these levels.
- Phase 4 (by July 1, 2025): Builds on phase 3 where plans shift from current levels of service to focus on proposed levels of service and related lifecycle management and financial strategy for all assets, including consultation with the public.
- An Asset Management Policy Update (by July 1, 2025).

In April 2021, the City issued Request for Proposal (RFP) 21-P04-2021 Asset Management Plan Update. The RFP invited proposals from qualified engineering consulting firms who would assist staff in completing the AMP for core infrastructure assets.

The contract was awarded to GM BluePlan Engineering. Staff are currently working with GM BluePlan to complete the AMP. The scope of work to be completed includes the development of an AMP that meets the legislative requirements outlined in O. Reg 588/17 for core municipal infrastructure assets including the following components: an asset inventory and state of local infrastructure report, current and proposed levels of service, an asset lifecycle management strategy, a risk management strategy, and a financial strategy. In addition, the AMP must illustrate links between capital and operating investments, strategic priorities, and services to residents and local businesses. The AMP will be presented to Council in the Spring of 2022.

The regulation requires municipalities to discuss a process for aligning their asset management planning with their water financial plans prepared under the *Safe Drinking Water Act, 2002*.

Asset Management Planning

Asset management is a process that involves continuous monitoring of assets' condition, costs, risks, age, performance, and estimated useful lives to systematically identify and prioritize the City's investment needs.

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.

Asset management plans form the cornerstone of an effective asset management system. AMP enable informed decisions regarding the building, operating, maintaining, renewing, replacing, and disposing of infrastructure assets.

The basic building blocks of the step-by-step methodology are founded upon the Water Environment Research Foundation (WERF) SIMPLE (Sustainable Infrastructure Management Program Learning Environment) process. The objective of SIMPLE is *“to drive a broad range of benefits to the industry by providing a systematic rationalization for determining where the most cost-effective investment in the asset portfolio is, over the lifecycle of the asset portfolio (that is, directing limited dollars toward the optimal application in any given budget cycle)”*.

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

- Current State of Assts (perform an inventory and condition assessment of the system's assets);
- Defining level of service;
- Establishing lifecycle costs
- Developing long-term funding strategies; and
- Implementation plan.

In future AMP, 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.

Improved municipal asset management planning is a vital step in Ontario's Municipal Infrastructure Strategy. Municipalities have been required to demonstrate a progressively greater commitment to asset management in order to request infrastructure funding and to guide municipalities in making appropriate infrastructure investment decisions now and into the future.

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. A presentation was made to Council on November 1, 2021, which outlined the Preferred Alternatives for providing redundancy to the City's raw water supply.

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 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 54 watermain breaks per year over the past five years (35 breaks to date in 2021). 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 2021, earned their thirteenth consecutive 100% compliance rating from the MECP.

Environmental Services - Wastewater

The main objective of the wastewater system is to collect, treat, and dispose 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 91 sewer lateral repairs per year over the past five years (64 repairs to date in 2021).

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 provide 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 10 CSO events to date in 2021 which has resulted in 38,251 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 rapid 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 treated 16,854,978 cubic meters of wastewater in 2020. During 2020, the WWTP experienced 14 CSO events comprised of a total volume of 100,035 cubic meters of effluent which represents approximately 0.59 per cent of the total volume of wastewater treated.

Environmental Initiatives

Co-Digestion and Energy Generation Study

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

The Co-Digestion and Energy Generation Study analyzed the feasibility to transform the WWTP into a Net Zero Resource Recovery Facility. Such a transformation is achieved by a combination of energy conservation, energy generation and resource recovery. A successful Co-Digestion program would see the existing anaerobic digesters at the WWTP intake source separated organics (SSO) and achieve Net Zero energy by promoting organics diversion, production of carbon negative clean fuel such as Renewable Natural Gas (RNG) and Hydrogen.

Source Separated Organics (SSO) Study

Ontario regulations will require that organics generated by residential, industrial, commercial, and institutional sources as well as biosolids be diverted from landfill disposal by 2025. The SSO study analyzed the feasibility to implement a collection and processing program for source separated organics from Cornwall's residential waste stream. Such a program could divert in excess of 40% of residential waste from the landfill. The SSO study also reviewed GHG emissions reduction by diverting organics from landfill to co-digestion and energy production at the WWTP.

Biosolids are currently transported from the WWTP and disposed at the City's landfill. Staff are currently evaluating the construction of a processing facility which would convert the biosolids into a fertilizer product which can be utilized in agricultural applications while generating additional revenue for the City. Preliminary cost projections for the design and construction of such a facility is estimated to be \$5,000,000. It is anticipated that government subsidies could provide up to 70% of estimated costs. It should be noted that

if grants are not to be available, the City will need to implement a biosolids diversion plan commencing 2025.



The above-described programs are part of the Municipal Co-Digestion Initiative that the Ontario Water Consortium launched in 2016 through Ontario Clean Water Agency (OCWA) 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.

The two studies have a common regulatory driver. Ontario's Circular Economy Regulation states that municipalities will have to transition to divert organic waste from landfills. For Cornwall, this means separating the organics from the residential waste picked up at curbside and finding a new disposal method for the biosolids which are generated by anaerobic digesters at the WWTP. Currently, biosolids are disposed in the City landfill. Next steps for this initiative include:

- Enter into Memorandum of Understanding (MOU) with OCWA to continue developing the business case and complete the 30% preliminary engineering design for the co-digestion project
- Apply and secure funding from federal and provincial funding programs for the next stages of the project which include design, engineering and construction
- Explore partnerships with potential project financiers and developers for long-term financing and project development
- Explore partnerships with potential technology partners, organic suppliers, gas utilities and off-takers
- Engage and consult with regulatory stakeholders for necessary environmental approvals
- Implement other WWTP projects already identified and planned that will compliment proposed co-digestion project

Water Conservation and Servicing Master Plan

In 2021, the City completed a Water Conservation and Servicing Master Plan (WCSMP). The WCSMP assessed the impacts of utilizing water demand initiatives such as the implementation of City-wide water meters, rate structure alternatives, and rebate programs to promote water conservation. Council approved the recommendations set forth in the WCSMP at its September 21, 2021 meeting. Next steps to 2025 include:

- Commissioning of a qualified consulting firm to provide project management services
- Continue outreach to promote and educate the community about the benefits of water conservation
- Finalize water conservation programs
- Installation of universal water meters in the community
- Implementation in 2025

Water Purification Plant Secondary Raw Water Intake Environmental Assessment

In 2021, the City completed an Environmental Assessment (EA) for a redundant raw water supply. The EA identified solutions to address the risks associated with the City's single raw water intake infrastructure. Council received the report at its November 1, 2021 meeting. The next steps over the next three years are as follows:

- Complete EA study process
- Complete supplementary studies for preferred sites (geotechnical, natural environmental inventory, archaeological investigation, etc.)
- Confirm preferred solution and update construction cost estimate
- Prepare financial plan to support project and obtain Council approval
- Acquire property

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 a manner to ensure positive reserve balances during major capital spending years.

Staff have reviewed fund balances to identify potential applications of these funds to minimize debenture requirements and mitigate impacts on user rates. The following schedule illustrates the planned contributions to and from the Water Works and the Wastewater Works Reserves estimated to December 31, 2022.

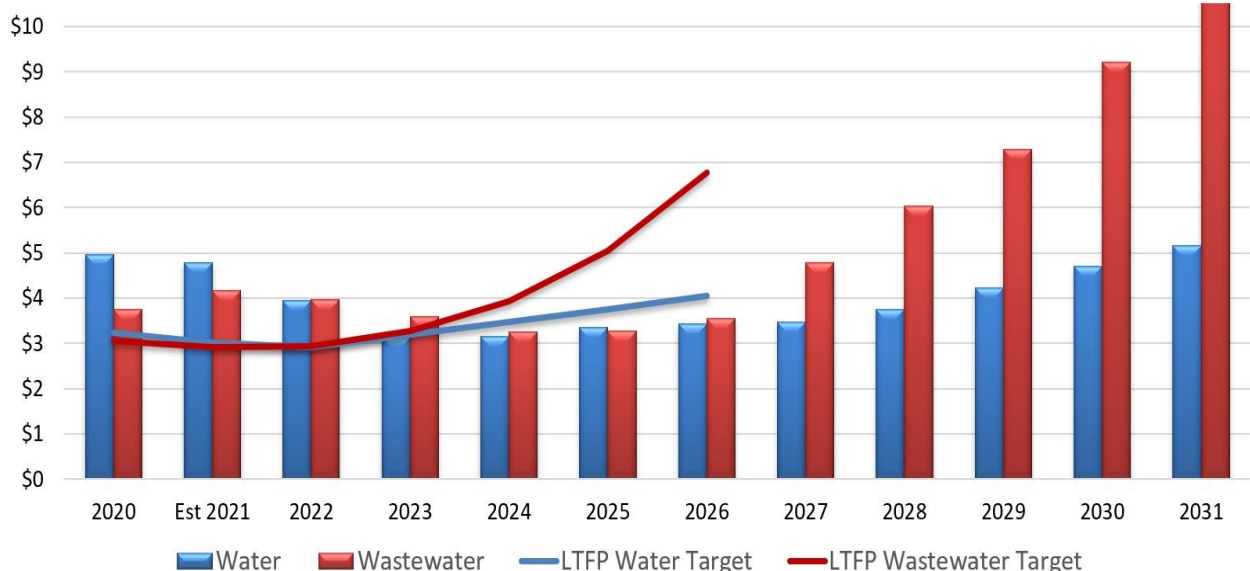
Currently, both the Water Works Reserve and the Wastewater Works Reserve are trending over the target balance. This funding will support capital works over the next few years.

2022 Detail of Reserves Estimated December 31, 2022

	Opening Balance	Withdrawals	Additions	Balance	Target Balance at Dec 31/22
Water Works Reserve	\$4,777,123				
Budgeted Contribution			\$3,448,807		
Estimated Interest			\$24,900		
Fund Water Works Capital		(\$4,300,000)		\$3,950,830	\$3,538,237
Wastewater Works Reserve	\$4,174,104				
Budgeted Contribution			\$2,774,836		
Estimated Interest			\$20,450		
Fund Wastewater Works Capital		(\$3,005,600)		\$3,963,790	\$3,748,189

The following chart shows the ten-year (2021-2031) 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 2021-2031)



(shown in the millions)

The lines on the chart illustrate the targeted reserve balances from the LTFP compared to the historic reserve balances from 2020 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

Borrowing allows the City to spread out a capital cost over an asset's useful life and allows infrastructure costs to be paid not just by today's ratepayer, but by future users of the asset as well.

The City's LTFP recommends the types of projects the City should borrow for. One of the principles in the LTFP states that debt financing should be used where appropriate. More specifically, debt financing should only be considered for new, non-recurring infrastructure requirements, programs and facilities which are self-supporting and projects where the cost of deferring expenses exceeds debt servicing costs. The LTFP recommends that the City only borrow for assets where costs are greater than \$2.5 million and have a useful life of more than 20 years.

Debt is an important part of the City's strategy for investment in assets. It is important to note that while debt is a funding source for capital, debt charges (principal and interest) have an impact on future operating budgets.

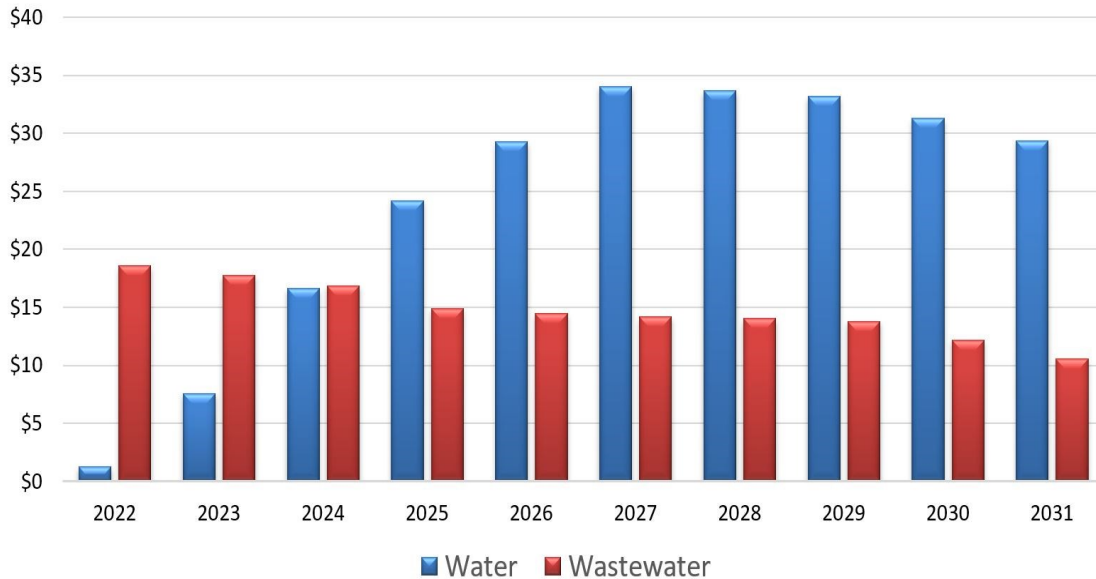
To support wastewater infrastructure needs, the City has borrowed for flood reduction initiatives, the Brookdale North Channel Bridge project, road reconstruction projects, and the Secondary WWTP.

The outstanding debt at the beginning of the 2022 fiscal year is estimated at \$17.8 million, with an additional \$3.8 million of approved financing not yet borrowed for infrastructure projects.

In the 2022 Water and Wastewater budget, it is proposed that reconstruction of Sydney Street from Seventh St. E. to Ninth St. E. be financed at \$2.1 million and the project management services for the implementation of water meters be financed at \$1.3 million.

The 10-year financial plan includes borrowing for various infrastructure projects. The following chart shows the ten-year (2022-2031) forecasted balance (shown in the millions) of long-term debt.

Long-Term Debt Balances (estimated 2022-2031)



(shown in the millions)

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 \$6 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.

Both watermain projects are for the rehabilitation of large diameter trunk watermains 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, \$3 million and \$5 million respectively, and Pitt Street was originally planned for 2023, \$5 million. 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.

Also included in the 10-year financial plan in the years 2022 through 2024 is \$17.1 million for the purchase and installation of water meters. As per the Water Conservation and Servicing Master Plan, an annual charge of \$80 would be imposed on existing connections to the water and wastewater system over a seven-year period from 2025 to 2031 to recover the costs of the meter installation.

2022 Operating Budget

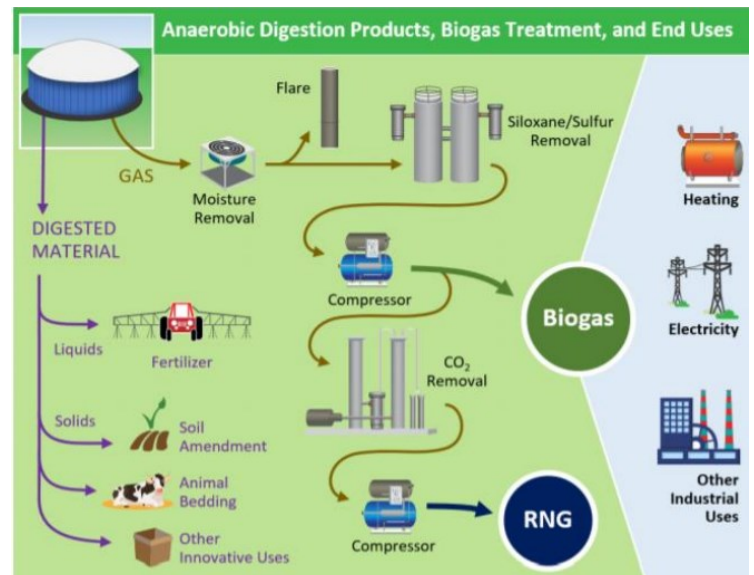
The 2022 operating expenditures was prepared with management's projections and cost estimates to deliver existing service levels to the ratepayers. The Operating and Capital Financial Summary can be found on page 30.

Salaries and Benefits: The increase in salaries and benefits of \$158,083 or 3.41% is related to incremental and contractual increases for staff. A Water Meter Technician was reallocated from Water Financial to Water Distribution, a vacant wastewater operator position was removed, and 60% of the salary for the Sustainable Project Coordinator is now budgeted in Environmental Services.

Purchase of Goods: The increase in purchase of goods of \$116,242 or 4.04% is related to the increase costs in chemicals (liquid aluminium sulfate, coagulant). The budget also includes an increase of \$29,500 for the replacement of UV lights at the WWTP.

Services and Rents: The increase in services and rents of \$146,515 or 6.91% includes an increase of \$54,000 for disposal costs. The budget includes \$60,000 for flow monitoring maintenance. Once budgeted through capital, this service will be part of the annual operating budget. Also included in the 2022 budget is \$25,000 to continue developing the business case to convert the WWTP to a water resource recovery facility. This project involves Co-Digestion, Renewable Natural Gas /Green Hydrogen and bio-solids conversion to fertilizer. Ontario Clean Water Agency (OWCA) with City staff will:

1. Apply and secure funding from Federal and provincial funding programs for project development including design, engineering and construction.
2. Explore partnerships with organic suppliers, gas utilities and off-takers.
3. Engage and consult with regulatory stakeholders for necessary environmental approvals
4. Implement other WWTP projects already identified and planned that will compliment the proposed co-digestion project.



Financial: The increase in Financial is \$112,475 or 47.07%. The 2022 budget includes \$100,000 to support the incentive program in the City's Water Conservation and Servicing Master Plan, presented to Council at its September 21, 2021 meeting.

Toilet Rebate Program

The City will offer rebates of \$50 towards the replacement of high-water-use toilets with high-efficiency WaterSense® labeled units (4.8 litres per flush or less). Rebates will only be available for the installation of qualifying toilets in homes and businesses built prior to 1997. There would also be a limit on the number of rebates per customer (i.e. two per customer). To help gauge demand for the toilet rebate program, the City is proposing allocating \$50,000 towards the toilet rebate program (i.e., replacement of 1,000 toilets per year). Initially rebates would be available on a first-come, first-served basis. There are approximately 13,500 homes and businesses within the City that were constructed prior to 1997 and would qualify for the toilet rebate program.

Residential Home Water Audits

The City and/or a third party will offer free water audits of residential and business customers to identify water saving opportunities and specific retrofit opportunities to reduce water use. Audits will address indoor and outdoor water use. It is recommended that the City track the metered water consumption of customers after receiving a water audit to measure the effectiveness of the program in terms of the consumers' willingness to change behavior or install water-saving equipment and appliances. The City is proposing to allocate \$50,000 towards residential and business water audits.



Contributions to Reserves: The increase in contributions to reserves of \$5,973,643 or 2,389.46% is related to the City's continued journey in lifecycle costing for its assets. Year 2022 is the first year that the City is not funding its capital projects from water and wastewater billings, but from other

revenue sources, including reserves. Using reserves to support the proper management of tangible capital assets and addressing depreciation over the course of an asset's useful life is done by setting aside funds for their maintenance and continued operation as the asset is amortized. This approach will assist the City in being prepared for the inevitable repair or replacement of assets at end-of-life through the use of reserves. The practice of planning through reserves will ensure that the City does not find itself in a situation in which it has limited funds available to address infrastructure requirements and is forced to borrow, increase billings, or reduce service levels.

Revenue: Revenue has decreased by \$92,000 or 24.26% as a customer optimized their outflow process, as required, to meet the City's use by-law.

Financing LTD Principal & Interest: The City's financing costs for principal and interest charges, related to the financing of capital projects, has increased by \$375,688 or 20.31%. This change is the net of taking on more debt and of debt maturing. In 2022, the City will borrow for its 2021 York Street joint infrastructure project and the Brookdale North Sewer project which will be complete.

Insurance Premiums: Insurance costs across the City will increase by approximately 25%. This is a further correction in the insurance industry. The increase for insurance for water and wastewater is \$56,766 or 27.59%.

Overall, the net operating budget has increased by \$7,078,237 or 55.03%. This is, for the most part, because of contributing funds to reserves and funding capital from reserves. The net capital budget decreased by \$6,500,000.

Together, the Water and Wastewater budget increased by \$578,237 or 2.99%.

2022 Capital Budget and Plan

The 2022 capital budget includes the cost to purchase, construct, repair and renew assets that support service delivery. The 2022 gross capital budget is \$11,085,000 (2021 - \$9,120,000). The 2022 capital budgeted is funded from reserves (\$7,305,600), financing (\$3,400,000), grants (\$350,000), and development charges (\$29,400).

The City's long-term infrastructure requirements have been planned through a fully funded 10-year capital plan. The 2022-2031 10-year capital plan, updated annually, has been developed for the water and wastewater systems to address capital maintenance, replacement, and expansionary needs across the systems.

The forecasts are based on the City's 10-year capital budget and forecast supplemented with needs identified in the City's 2017 D.C. Background Study and 2020 Area-Specific D.C. Background Study. The capital needs forecasts include the costs of installing water meters City-wide. The costs of undertaking the water meter project are estimated at \$15.8 million over the 2023 to 2024

period with a further \$1.3 million being anticipated for project management costs to oversee the installation and rate structure transition process.

The proposed funding sources that are anticipated for water and wastewater capital needs include transfers from reserves (growth and non-growth) and debt funding. The City has budgeted grant funding as a revenue source for its Resource Recovery Facility Design project. This funding is not guaranteed to be received.

The capital forecasts, which are summarized in the Water Conservation and Servicing Master Plan, include total costs of \$152.2 million (\$96.4 million for water and \$55.8 million for wastewater), inclusive of 3% annual capital cost inflation. Construction cost inflation is normally more than double the consumer price index (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 following table summarizes the water and wastewater capital financing sources over the 10-year period and the impacts on the City’s debt capacity utilization.

Water and Wastewater Capital Financing Plan

Capital Funding (\$ millions)			
Description	Water	Wastewater	Total
Development Charges Reserve Fund	-	0.1	0.1
Non-Growth Related Debenture Requirements	37.8	5.6	43.4
Growth Related Debenture Requirements	5.7	0.3	6.0
Reserves	52.9	49.8	102.7
Total	96.4	55.8	152.2
Debt Capacity Utilization (% of Own-Source Revenue)	2020 Estimate		5.0%
	Peak (2027)		7.9%
	2030		6.9%

The capital funding plan developed to fund long-term annual needs of water and wastewater systems took into consideration the anticipated debt assessed against the Provincial and City borrowing limits (25% and 10% of own-source revenues, respectively).

In 2020, AECOM Canada Ltd. completed 10-Year Asset Management Plans for both the WPP and the WWTP.

The total replacement value of each asset category is outlined in the following tables. The values assume assets will be replaced “like-for-like”. They do not account for upgrades and improvements in level of service.

Water Purification Plant

Asset Category	Total Replacement Value
Electrical	6,801,000
Instrumentation	1,035,000
Process Mechanical	18,174,000
Structural	48,259,000
Total	74,269,000

Wastewater Treatment Plant

Asset Category	Total Replacement Value
Electrical	16,960,000
Instrumentation	1,170,000
Process Mechanical	17,450,000
Structural	94,216,000
Total	129,796,000

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 • 2,044 valves • 1,323 hydrants • More than 16,000 water laterals 	<ul style="list-style-type: none"> • Wastewater Treatment Plant • 444 km of sewer mains (storm, sanitary and combined) • 5,068 catch basins • 5,338 sewer access points • 6 lift stations • Approximately 15,000 sewer laterals

Please note that the table includes assets added to the inventory following the development of the 2016 AMP.

As noted, the City is 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 2022 capital budget is focused on the maintenance and replacement of current infrastructure and addressing the backlog. Major capital projects in 2022 include regular on-going watermain rehabilitation improvements, WPP upgrades, sewer network improvements, combined sewer separation, and WWTP system upgrades.

New watermains are planned for Baldwin Ave., from Fifth St. E. to the existing watermain and on Lemay St. from the East Limits of the Municipal Works Yard to the existing watermain. Watermain network extensions provide the necessary

system reliability and redundancy so that water can be supplied from two separate directions. Water network looping is beneficial for fire protection as it provides greater water supply and pressure as well as ensuring that an adequate water supply can be provided in the event of a watermain break.

Included in the 2022 budget is an internal inspection of the raw water intake. The City has only one water intake which supplies raw water to the WPP. The raw water intake is 65 years old. The inspection will evaluate the integrity of the metal components of the pipe and identify areas of corrosion and other damage to the pipe.

Staff have identified risks associated with the existing raw water intake; it being the only source that supplies water to the City and the age of the infrastructure. Included in the 2022 is the next phase of identifying a specific site for the secondary raw water intake. EVB Engineering (EVB) and Jacobs Engineering Group (Jacobs) completed an Environmental Assessment (EA) for the development of a secondary raw water intake and transmission pipe to the WPP. As outlined in a report presented by EVB and Jacobs to Council at its November 1, 2021 meeting, the EA identified two preferred site solutions. It is recommended that site-specific studies be undertaken to further evaluate the suitability of each location. The purpose of a secondary raw water intake would be to provide the necessary water system redundancy to protect the City's water supply should a failure of the existing raw water intake and/or transmission main occur. Furthermore, a secondary intake will allow the City to rehabilitate the existing raw water intake/transmission main as the end of its useful service life approaches.

At the September 21, 2021 Council meeting, Council approved the Water Conservation and Serving Master Plan (WCSMP) which included the implementation of water meters at all service connections within the City. Due to the overall magnitude, complicated scope, and consultation/coordination requirements for the metering project, the WCSMP recommends that the City engage a project management firm. Included in the 2022 budget is project management services for the implementation of water meters across the City.

Also included in the 2022 capital budget is the preliminary design of the proposed resource recovery infrastructure at the WWTP. This project is the next step following a presentation by Ontario Clean Water Agency (OCWA) to Council at its May 10, 2021 meeting. OCWA presented a study titled "Cornwall Net Zero Project – Co-digestion, Energy Generation and Biosolids". The study analyzed the feasibility to transform the WWTP into a net zero resource recovery facility. The City is hoping to secure grant funding at 70% of the total cost for this project

The 2022 capital budget includes the continuation of Sydney St., from Seventh St. to Ninth St. E (2021 - Fifth to Seventh, 2020 - Fourth to Fifth, 2019 - Second to Fourth). The reconstruction of Aberdeen Ave. from Marlborough St. to Gloucester St. is also recommended as a joint infrastructure project in 2022. Joint infrastructure projects are typically the complete reconstruction of sewer, water, and roadway infrastructure. Project candidates are selected based on the state of

underground infrastructure; locations where sewer separation is required and watermain improvements are necessary are considered priorities. Project candidates are further narrowed based on locations where the road corridor is also in poor condition, as the roadway will be rehabilitated as part of the restoration works following the replacement of all buried infrastructure.

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 considerable backlog.

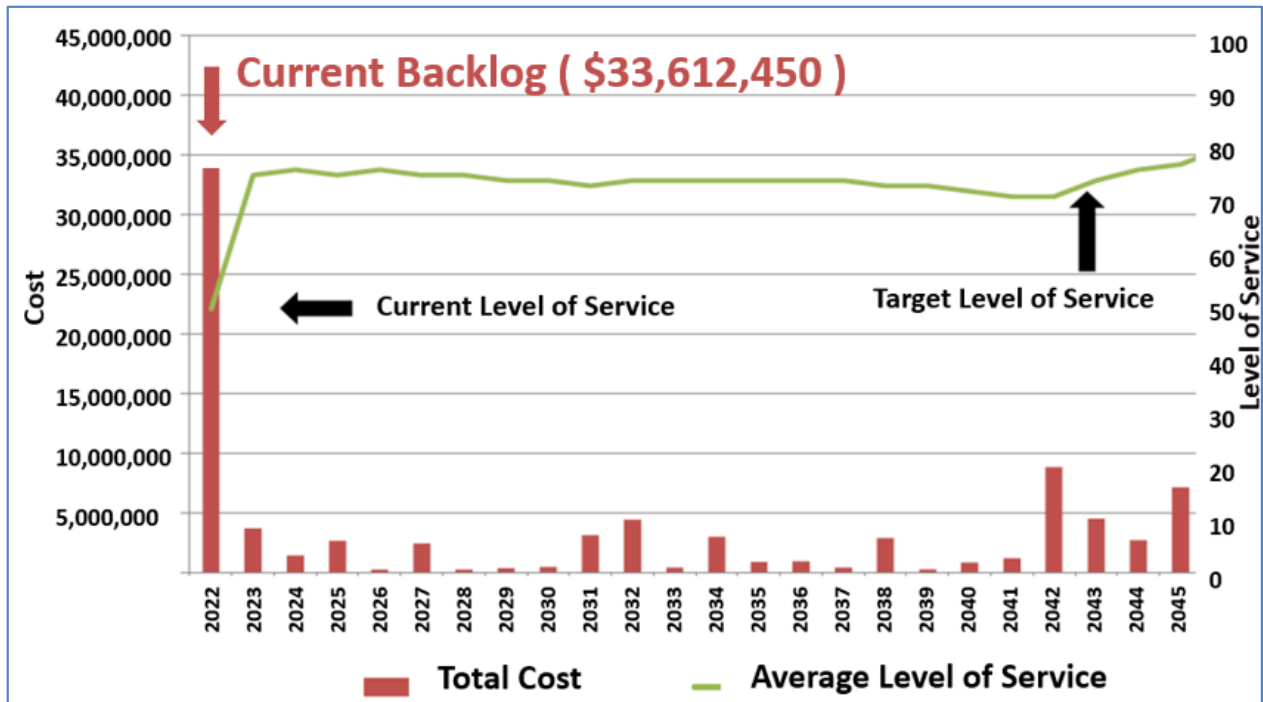
Following the completion of the 2016 AMP, the City has incrementally increased the watermain renewal funding in each budget year for both Watermain Rehabilitation and Joint Infrastructure (Water and Sewer) projects in order to reach the recommended annual allocation for watermain renewal projects from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

In 2017, the City was also successful in receiving \$2.53 million 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 2021 has been reduced to \$33.6 million as shown in the following chart.

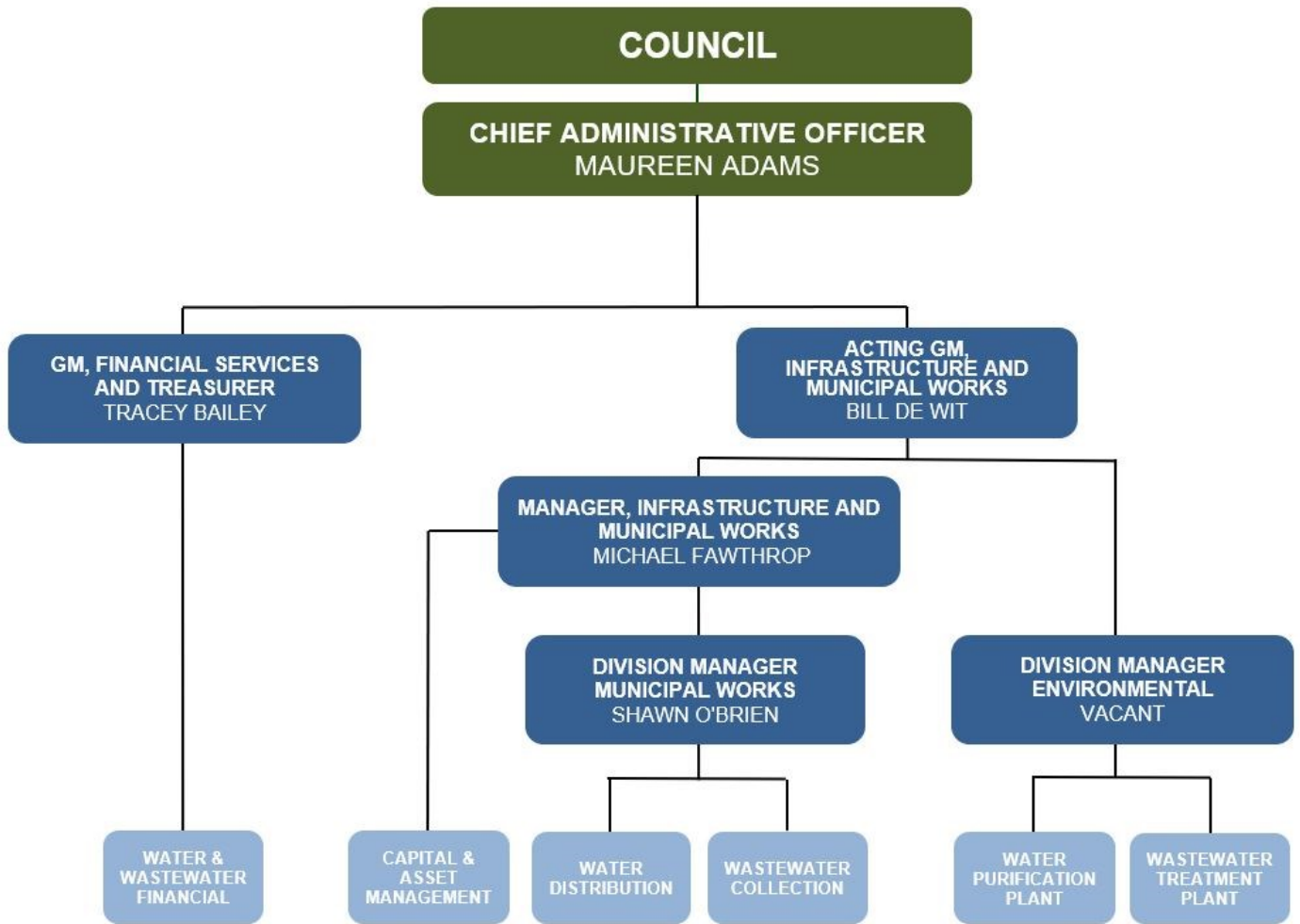
Watermain Rehabilitation Water Network Budget and Level of Service



- 2021 Watermain relining projects reflected only
- Next database update to be completed following conclusion of 2021 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, 2022. 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 2022 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	Full Time	Part Time
2021	3.0	25.5	4,400	22.0	0
2022	2.0	25.5	4,400	22.6	0
Change	(1.0)	0.0	0	0.6	0

Operating and Capital Financial Summary

	2021	2022	\$	%	Plan		
	Budget	Submission	Variance	Variance	2023	2024	2025
EXPENDITURES							
Salaries and Benefits	\$4,634,591	\$4,792,674	\$158,083	3.41%	\$4,912,491	\$5,035,303	\$5,161,186
Purchase of Goods	\$2,879,951	\$2,996,193	\$116,242	4.04%	\$3,026,155	\$3,056,416	\$3,086,981
Services & Rent	\$2,120,307	\$2,266,822	\$146,515	6.91%	\$2,334,827	\$2,404,871	\$2,477,018
Financial	\$238,966	\$351,441	\$112,475	47.07%	\$361,984	\$372,844	\$384,029
Contribution to Reserves	<u>\$250,000</u>	<u>\$6,223,643</u>	<u>\$5,973,643</u>	<u>2,389.46%</u>	<u>\$7,475,194</u>	<u>\$7,906,112</u>	<u>\$8,071,792</u>
Total Expenditures	\$10,123,815	\$16,630,773	\$6,506,958	64.27%	\$18,110,651	\$18,775,547	\$19,181,005
REVENUE							
User Fees & Misc Revenue	<u>\$379,300</u>	<u>\$287,300</u>	<u>(\$92,000)</u>	<u>(24.26%)</u>	<u>\$287,300</u>	<u>\$287,300</u>	<u>\$287,300</u>
Net Operating Expenditures	\$9,744,515	\$16,343,473	\$6,598,958	67.72%	\$17,823,351	\$18,488,247	\$18,893,705
Financing LTD Principal & Interest	1,849,939	2,225,627	\$375,688	20.31%	2,585,100	3,189,300	3,882,000
Corporate Costs	\$1,063,319	\$1,110,144	\$46,825	4.40%	\$1,143,448	\$1,177,752	\$1,213,084
Insurance Premiums	<u>\$205,763</u>	<u>\$262,529</u>	<u>\$56,766</u>	<u>27.59%</u>	<u>\$288,782</u>	<u>\$317,660</u>	<u>\$349,426</u>
Operating Water & Wastewater Billings	<u>\$12,863,536</u>	<u>\$19,941,773</u>	<u>\$7,078,237</u>	<u>55.03%</u>	<u>\$21,840,681</u>	<u>\$23,172,959</u>	<u>\$24,338,215</u>
Gross Capital	\$9,120,000	\$11,085,000	\$1,965,000	21.55%	\$21,465,000	\$21,325,000	\$16,475,000
Capital Funding							
Government Grants	\$0	\$350,000	\$350,000	100.00%	\$0	\$0	\$0
Financing	\$1,100,000	\$3,400,000	\$2,300,000	209.09%	\$13,000,000	\$13,550,000	\$7,675,000
Development Charges	\$500,000	\$29,400	(\$470,600)	(94.12%)	\$0	\$0	\$0
Water Works Reserve	\$900,000	\$3,005,600	\$2,105,600	233.96%	\$4,650,000	\$4,300,000	\$4,350,000
Wastewater Works Reserve	<u>\$120,000</u>	<u>\$4,300,000</u>	<u>\$4,180,000</u>	<u>3,483.33%</u>	<u>\$3,815,000</u>	<u>\$3,475,000</u>	<u>\$4,450,000</u>
Capital Water & Wastewater Billings	<u>\$6,500,000</u>	<u>\$0</u>	<u>(\$6,500,000)</u>	<u>(100.00%)</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
WATER AND WASTEWATER BILLINGS	<u>\$19,363,536</u>	<u>\$19,941,773</u>	<u>\$578,237</u>	<u>2.99%</u>	<u>\$21,840,681</u>	<u>\$23,172,959</u>	<u>\$24,338,215</u>

* 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 2023 – 2025.

2022 CAPITAL BUDGET SUBMISSION SUMMARY

*Please note all figures are in 000s of dollars

DESCRIPTION	2021 GROSS BUDGET	2022 GROSS BUDGET	EXTERNAL FUNDING		RESERVES			
			GRANTS	FINANCING	DEV. CHARGES	SPECIFIC RESERVE	WASTE WATER	WATER
<u>WATER CAPITAL</u>								
Water Distribution								
Watermain Rehabilitation	2,200.0	2,350.0						2,350.0
System Growth - New Watermain	500.0	500.0						500.0
Water Purification Plant								
Raw Water Intake Pipe Wall Condition Assessment	150.0	300.0						300.0
Raw Water Intake Redundancy Technical Studies		100.0						100.0
Backwash Pump Replacement	150.0	350.0						350.0
Concrete Storage Tank Condition Assessment	50.0	50.0						50.0
High Lift Pump Replacement		250.0						250.0
Water Meter Implementation - Project Management Services		1,300.0		1,300.0				
Intake Screen Frazil Ice Mitigation & Emergency Isolation Device	250.0							
Chlorine Injection System Replacement	150.0							
Filter Inlet and Drain Sluice Gates Replacement	150.0							
<u>WASTEWATER CAPITAL</u>								
Sewer Collection Program								
Sewer Network Improvements	1,050.0	1,050.0					1,050.0	
Combined Sewer Separation								
<u>2022 Projects</u>	700.0	700.0			29.4		670.6	
Fifth St. West from York St. to Bedford St. (\$60K)								
Race St. from Water St. East to Marlborough St. (\$300K)								
Walton St. from Alice St. to Guy St. (\$120K)								
First St. East from Marlborough St. to Lawrence Ave. (\$120K)								
Guy St. from Easton Ave. to Walton St (\$100K)								
<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)								
Wastewater Treatment Plant								
Odour Control System for Dewatering Facility		400.0					400.0	
Supply and Installation of Lifting Beams		75.0					75.0	
Waste Gas Compressor Lubrication System Replacement		60.0					60.0	
Security Fence for Future WWTP Expansion Area & Pump Station		250.0					250.0	
Resource Recovery Facility Design		500.0	350.0				150.0	
Design Work for Pumphouse Headworks	120.0							
SCADA Replacement	500.0							
<u>JOINT INFRASTRUCTURE CAPITAL</u>								
<u>2022 Projects</u>								
Sydney St. Reconstruction from Seventh St. E. to Ninth St. E.		2,100.0		2,100.0				
Aberdeen Ave. from Marlborough St. to Gloucester St.		750.0					350.0	400.0
<u>2021 Projects</u>								
Sydney St. Reconstruction from Fifth St. to Seventh St.	2,050.0							
York St. Reconstruction from Fourth St. to Fifth St.	1,100.0							
Water, Wastewater, and Joint Infrastructure Capital	9,120.0	11,085.0	350.0	3,400.0	29.4	-	3,005.6	4,300.0

**COUNCIL APPROVED CAPITAL BUDGETS
FROM PRIOR YEARS**

DESCRIPTION	GROSS BUDGET	EXTERNAL FUNDING		RESERVES		BILLINGS	
		GRANTS	FINANCING	DEV. CHARGES	SPECIFIC RESERVE	WASTE WATER	WATER
2021 Council Approved Capital	9,120.0		1,100.0	500.0	1,020.0	3,200.0	3,300.0
2020 Council Approved Capital	8,825.0		1,600.0	550.0	100.0	3,275.0	3,300.0
2019 Council Approved Capital	8,547.0		1,384.0	250.0	704.0	2,964.0	3,245.0

Environmental Services - Water

Project Name: Watermain Rehabilitation

Funding: \$2,350,000 Water Works Reserve

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 2022 are as follows:

- Fifth St. West from York St. to Bedford Ave. – Replacement (\$460K)
- First St. East from Marlborough St. to Lawrence Ave. – Replacement (\$150K)
- Race St. from Water St. East to Marlborough St. – Replacement (\$150K)
- Surgenor St. from Charles St. to Boyd St. – Relining (\$250K)
- Boyd St. from Surgenor St. to Joyce St. – Relining (\$90K)
- Riverdale Ave. from Charles St. to Stephen St. – Relining (\$260K)
- Stephen St. from Riverdale Ave. to East Limits – Relining (\$110K)
- Catherine St. from Riverdale Ave. to East Limits – Relining (\$110K)
- Grant Ave. from Riverdale Ave. to East Limits – Relining (\$110K)
- McConnell Ave. from Second St. East to Fifth St. East – Relining (\$550K)
- First St. East from Pitt St. to Sydney St. – Relining (\$110K)



Cast Iron Watermain Before Relining

Cast Iron Watermain - After Relining

Environmental Services - Water

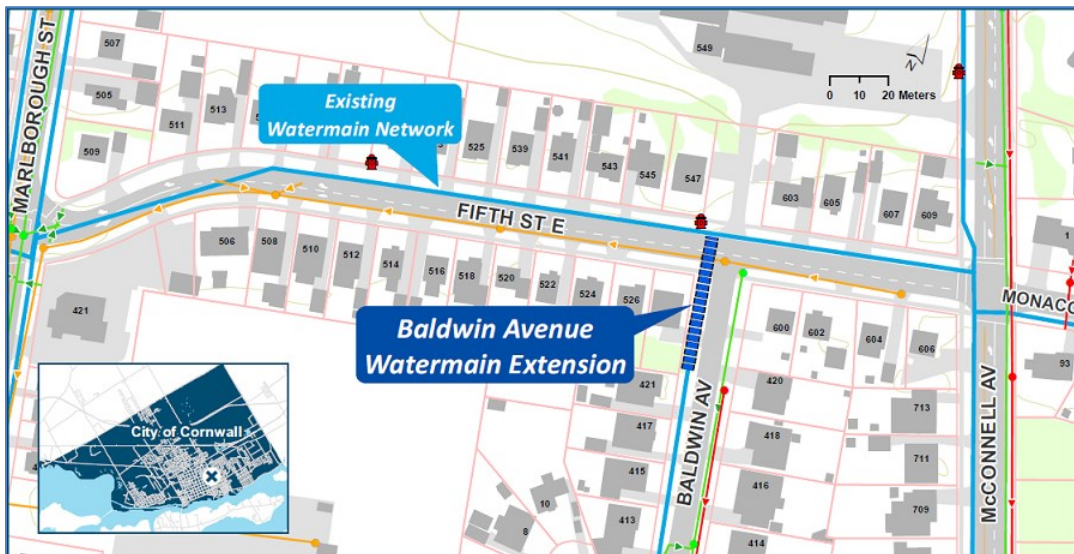
Project Name: System Growth – New Watermain

Funding: \$500,000 Water Works Reserve

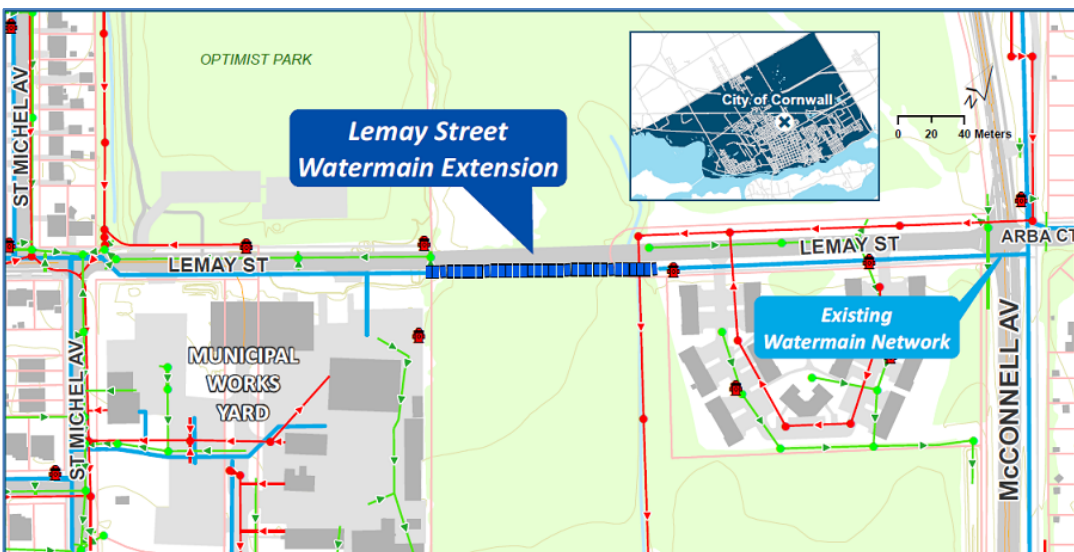
In order to provide the necessary system reliability and redundancy, all major watermains are required to be looped such that water can be supplied from two separate directions. In addition to increasing the flow rate, water network looping also ensures a reliable system by providing redundancy in the 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 candidates for 2022 are as follows:

- Baldwin Ave. from Fifth St. East to Existing Watermain (\$150K)



- Lemay St. from the East Limits of the Municipal Works Yard to Existing Watermain (\$350K)



Environmental Services - Water

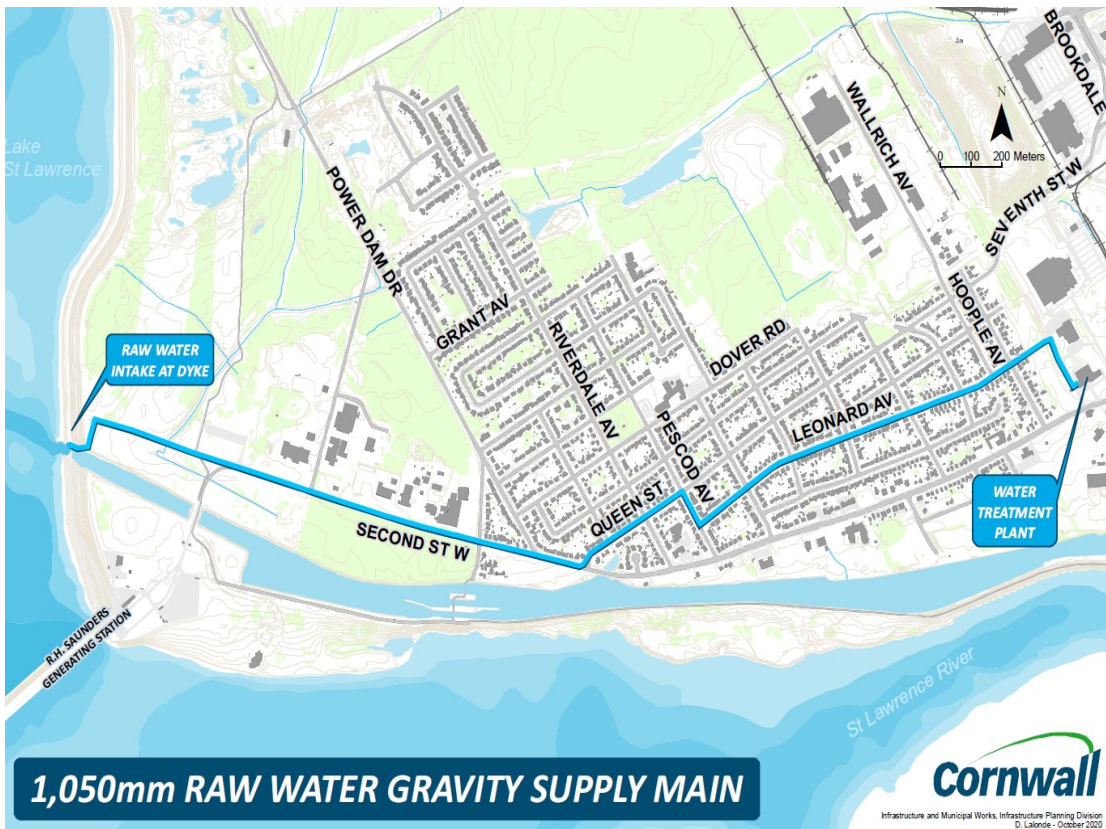
Project Name: Raw Water Intake Pipe Wall Condition Assessment

Funding: \$300,000 Water Works Reserve
\$150,000 was budgeted in 2021. Project total is \$450,000

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. The project is 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.

The department budgeted \$150,000 in 2021 for this project. An additional \$300,000 is required to complete this project.



Environmental Services - Water

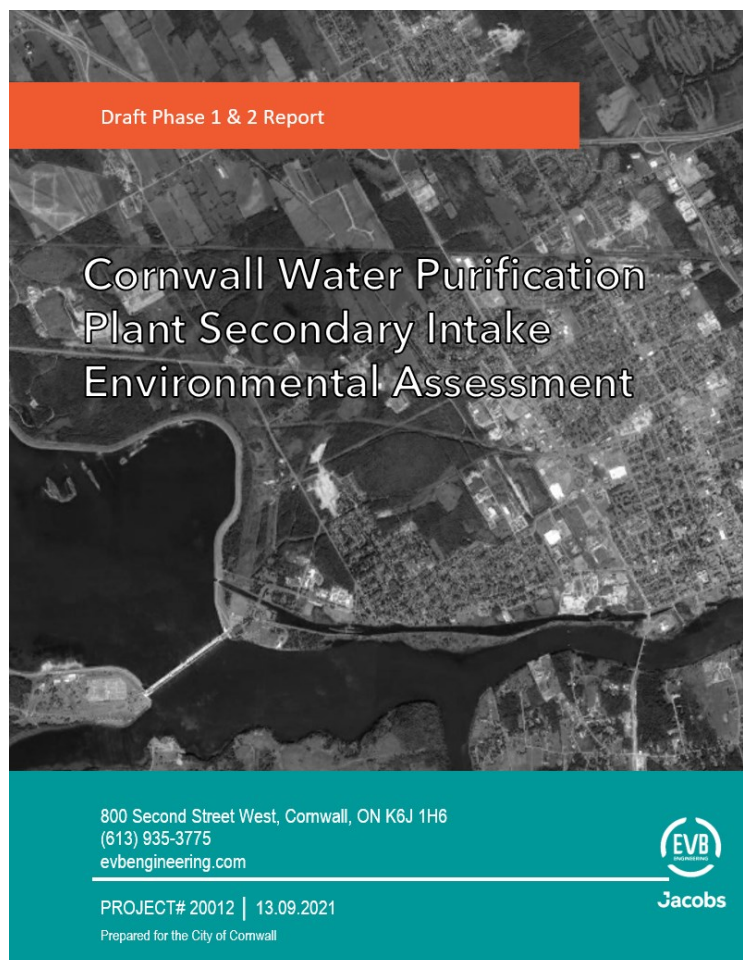
Project Name: Raw Water Intake Redundancy Technical Studies

Funding: \$100,000 Water Works Reserve

Currently, the City has only one water intake gravity main which supplies raw water to the Water Purification Plant. 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. The City identified risks associated with this existing aging infrastructure which could lead to a catastrophic failure leaving the City without water.

EVB Engineering was retained in 2020 to complete the Cornwall Water Purification Plant Secondary Intake Environmental Assessment (EA). The Environmental Assessment process evaluated alternative solutions and identified two preferred locations for providing a secondary water intake to ensure the safe, continuous supply of water for the residents of the City.

In 2022, it is proposed that site specific technical studies, such as a geotechnical investigation of the two preferred locations, be undertaken before commencing with the design phase of this project.



Environmental Services - Water

Project Name: Backwash Pump Replacement

Funding: \$350,000 Water Works Reserve
\$150,000 was budgeted in 2021. Project total is \$500,000

The Water Purification Plant has two backwash pumps used for filter cleaning. 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. It is necessary to ensure adequate redundancy for the backwash treatment process. The original backwash pump is well beyond its life expectancy and requires replacement.

In 2021, an RFP was created in order to commission an engineering firm to provide design and installation specifications necessary to replace the backwash pump. In 2022, it is proposed that the replacement pump and associated electrical equipment be purchased and installed through a tender process.



Environmental Services - Water

Project Name: Concrete Storage Tank Condition Assessment

Funding: \$50,000 Water Works Reserve
\$50,000 was budgeted in 2021. Project total is \$100,000

The Water Purification Plant is comprised of various concrete storage tanks. These tanks have been in service since 1956 and range in applications from raw water mixing, settling tanks to filtration tanks and underground treated water storage facilities.

Over time concrete can deteriorate causing a multitude of issues and potential costly repairs. To determine deteriorated or damaged areas a concrete assessment is required. This detailed structural engineering assessment will involve entry into all the areas and identify the impacted areas. This report will be used to coordinate a repair and rehabilitation plan.



Environmental Services - Water

Project Name: High Lift Pump Replacement

Funding: \$250,000 Water Works Reserve

Once potable water has gone through the filtration and disinfection processes, the last step is pumping treated water to residents and businesses throughout the City via the Water Distribution System. Pumping of the treated water is conducted by one or more of the Water Purification Plant's five (5) high lift pumps.

The pumped water exits the Water Purification Plant Via the 600mm east and 600mm south discharge mains where individual flows are monitored and recorded as water enters the distribution system. In 2020, an average of 30,700 cubic meters per day of treated water was distributed through the system.

In 2017, the first high lift pump was replaced. The new vertical turbine high lift pump shown on the left below is equipped with a Variable Frequency Drive (VFD) and the department has noticed considerable energy savings since it has been placed into service.

The Water Purification Plant asset management plan has reviewed the condition of these pumps and is forecasting replacement of the four remaining pumps over the next ten years. In 2022, it is proposed to commission a qualified engineering firm to provide complete design drawings and contract specifications in preparation of pump replacement in subsequent years.



Environmental Services - Water

Project Name: Water Meter Implementation - Project Management Services

Funding: \$1,300,000 Financing

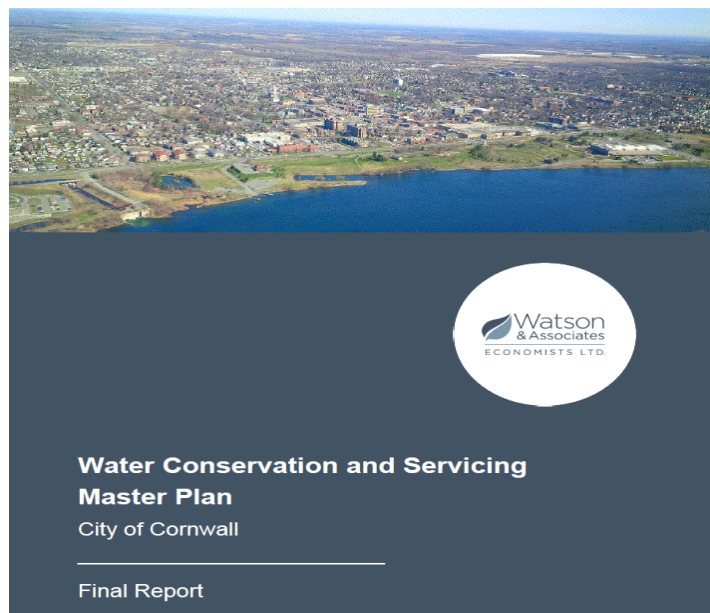
At the September 21, 2021 Council Meeting, Council approved the Water Conservation and Servicing Master Plan which included the implementation of water meters at all service connections within the City of Cornwall. Given the extent and complicated scope of the proposed universal metering project, it is recommended that the City commission a project management consulting firm with expertise in the review of municipal water meter technology. The project management firm would provide project recommendations for universal installation of water meters complete with application of a state-of-the-art metering program which would include:

Advanced Metering Infrastructure (AMI) - A network of fixed base equipment that captures detailed consumption information from the metering population that is retrieved by data collection software on at least a daily basis.

Customer Information System (CIS) - The CIS automates the meter-to-cash flow process. It is the system of record for utility customer information and handles order processing, rate design, billing, credit collection, accounts receivable, statement preparation, and payment.

Meter Data Management (MDM) - Software application that helps manage and ensure the accuracy and completeness of the volumes of data provided by a fixed network for billing, analysis, reporting and presentment.

Meter Installation Software (MIS) - Software that captures the details of the installation including meter serial number, transmitter identification number, account information of where the equipment was installed.



Additionally, the successful project management firm would oversee preparation of specifications and procurement documents, contract administration and implementation oversight and support. Effective consulting engagement for universal metering and AMI water projects are typically broken down into three key stages as follows: design; procurement; and management.

Environmental Services - Wastewater

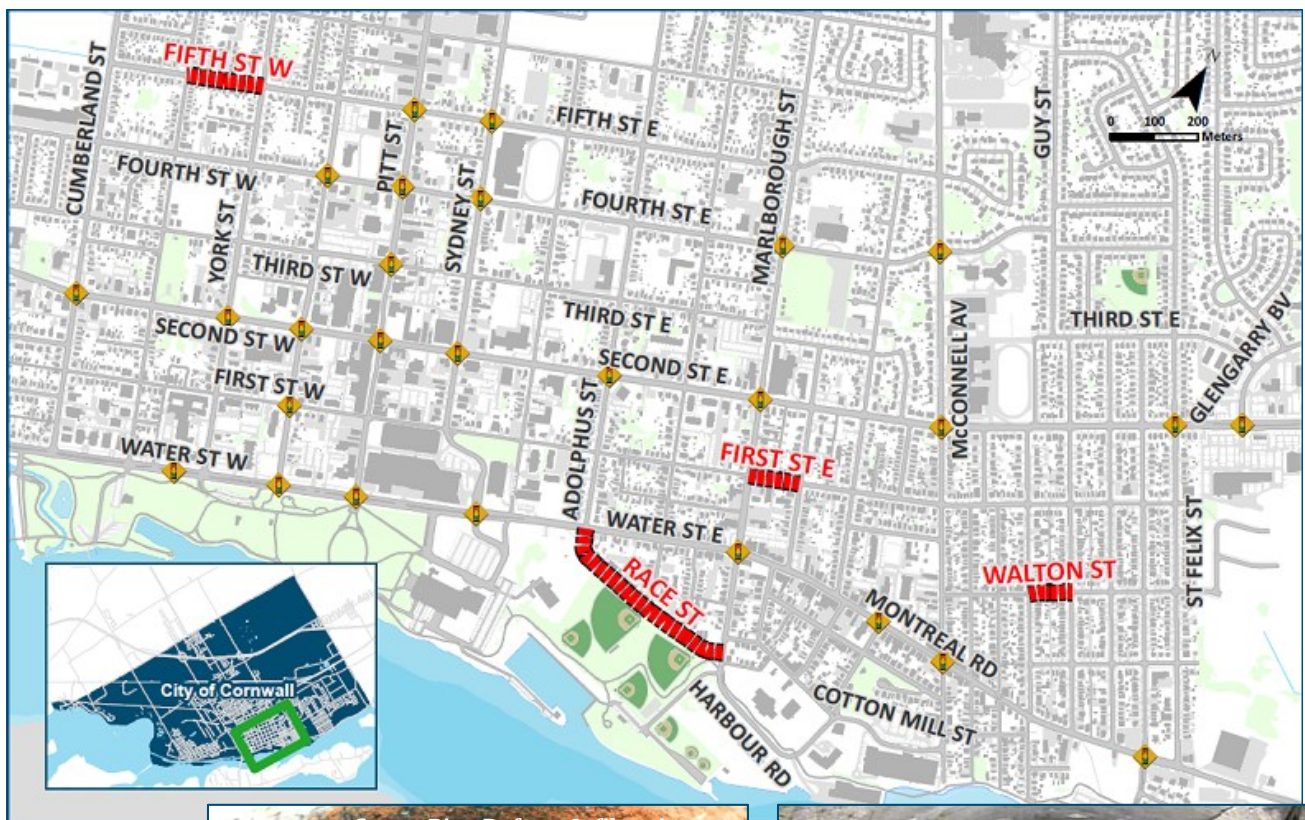
Project Name: Sewer Network Improvements

Funding: \$1,050,000 Wastewater Works Reserve

The objectives of the annual Sanitary Sewer Network Improvements program are 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 2022:

- 1) Fifth St. West from York St. to Bedford St. – New Sanitary Sewer (\$220K)
- 2) Race St. from Water St. East to Marlborough St. – New Sanitary Sewer (\$480K)
- 3) Walton St. from Alice St. to Guy St. – New Sanitary Sewer (\$120K)
- 4) First St. East from Marlborough St. to Lawrence Ave. – New Sanitary Sewer (\$130K)
- 5) Various Locations – Sewer Spot Repairs (\$100K)



Environmental Services - Wastewater

Project Name: Combined Sewer Separation

Funding: \$670,600 Wastewater Works Reserve
\$ 29,400 Development Charges
\$700,000

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 homes 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 2022:

- 1) Fifth St. West from York St. to Bedford St. – New Storm Sewer (\$60K)
- 2) Race St. from Water St. East to Marlborough St. – New Storm Sewer (\$300K)
- 3) Walton St. from Alice St. to Guy St. – New Storm Sewer (\$120K)
- 4) First St. East from Marlborough St. to Lawrence Ave. – New Storm Sewer (\$120K)
- 5) Guy St. from Easton Ave. to Walton St. – New Storm Sewer (\$100K)



Environmental Services - Wastewater

Project Name: Odour Control System for Dewatering Facility

Funding: \$400,000 Wastewater Works Reserve
\$200,000 was budgeted in 2019. Project total is \$600,000

Under certain atmospheric conditions, residents in Sunrise Acres have identified an odour which appears to be originating from the Wastewater Treatment Plant (WWTP). All complaints are investigated with the complainant and are logged with the Ministry of Environment, Conservation and Parks (MECP). All odour complaints are tracked and recorded for reference in the annual WWTP report which is submitted to the MECP.

A new subdivision is being constructed immediately to the east of the plant. This will place residential homes in closer proximity, minimizing the buffer zone between the WWTP and the new subdivision.

It is the responsibility of the WWTP to mitigate odours and comply with the MECP guidelines. Accordingly, it is proposed that an odour control system be designed and installed at the WWTP dewatering facility to mitigate any potential odours that may be generated from this area. In 2019, the department budgeted \$200,000 for this project. An additional \$400,000 is required to complete this project.



Environmental Services - Wastewater

Project Name: Supply and Installation of Lifting Beams

Funding: \$75,000 Wastewater Works Reserve

The Wastewater Treatment Plant houses a multitude of heavy equipment such as pumps, motors and large valves that need to be removed and serviced regularly. Many of these pieces of equipment are in areas such as basements and confined spaces limiting the options for safely rigging the equipment. In these circumstances, lifting beams are an optimal solution to complete the work safely.

In 2021, a structural engineering study was completed detailing locations for the required lifting beams. As part of the study, fully engineered drawings and structural specifications were prepared for seven (7) locations where lifting beams would need to be installed.

As part of the 2022 capital plan, it is proposed to commission the supply and installation of the described lifting beams.



Environmental Services - Wastewater

Project Name: Waste Gas Compressor Lubrication System Replacement

Funding: \$60,000 Wastewater Works Reserve

The Wastewater Treatment Plant has two compressors that compress and circulate digester waste gas. These compressors run continuously and circulate the waste gas through the digesters creating a mixing effect. Due to the high speed, high friction nature of the compressors, lubrication is vitally important to ensure adequate cooling thus prolonging the equipment's life.

Each compressor has its own associated lubrication system. These lubricators run continuously and as such experience increased wear. The worn systems have experienced a higher frequency of breakdowns prompting the need to replace the lubrication systems.



Environmental Services - Wastewater

Project Name: Security Fence for Future WWTP Expansion Area and Pump Station

Funding: \$250,000 Wastewater Works Reserve

The land to the north-east and east of the Wastewater Treatment Plant (WWTP) is currently being developed into a residential subdivision. The large vacant parcel of land adjacent to the new development is owned by the City for any necessary future expansion of the WWTP. Currently, there is no security fence which would separate the WWTP property from the residential subdivisions. In an effort to mitigate the risk and liability associated with potential trespassers on WWTP property, it is proposed to construct a security fence which would border the WWTP property on the north and east sides.

The raw sewage pumping station is not currently protected by a security fence. The City's insurance company has suggested that a fence be erected around the perimeter of the building.



Environmental Services - Wastewater

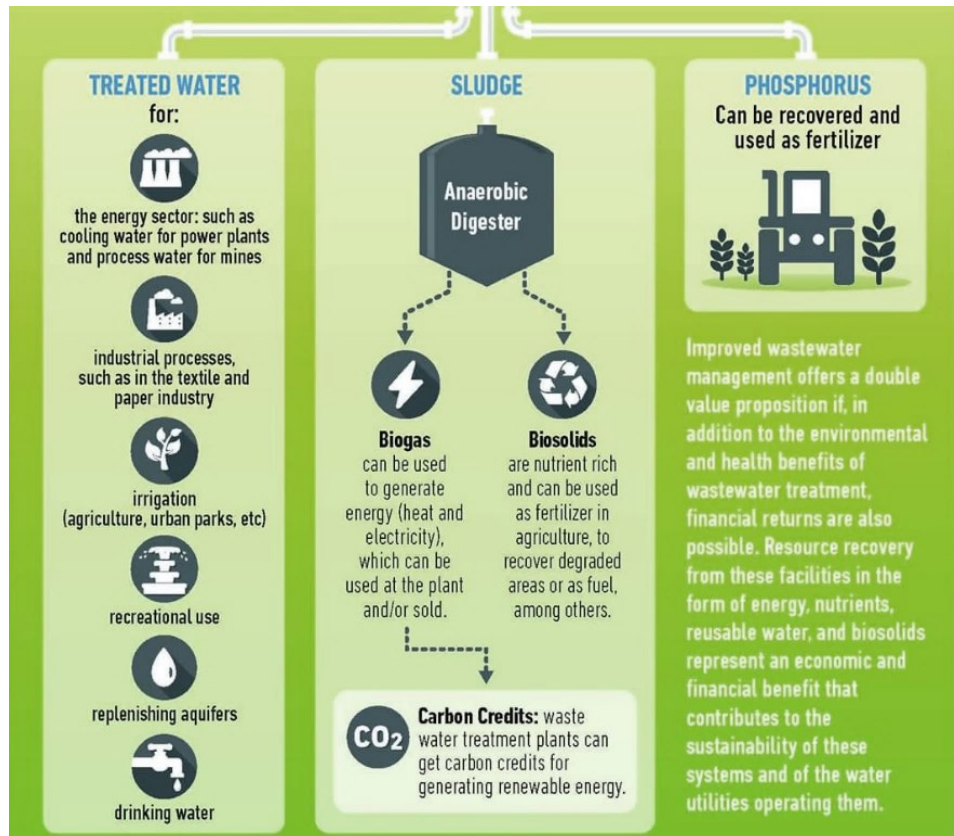
Project Name: Resource Recovery Facility Design

Funding: \$150,000 Wastewater Works Reserve
 \$350,000 Grant Funding
 \$500,000

At their regular meeting of May 10, 2021, Council received a presentation from Ontario Clean Water Agency (OCWA) titled ‘Cornwall Net Zero Project – Co-digestion, Energy Generation and Biosolids Study’. The study analyzed the feasibility to transform the Wastewater Treatment Plant (WWTP) into a Net Zero Resource Recovery Facility. Such a transformation is achieved by a combination of energy conservation, energy generation and resource recovery. A successful Co-Digestion program would see the existing anaerobic digesters at the WWTP intake Source Separated Organics (SSO) and achieve Net Zero energy by promoting organics diversion, production of carbon negative clean fuel such as Renewable Natural Gas (RNG) and Hydrogen. Implementation of the co-digestion approach uses digestion of municipal sewage sludge and SSO by using the existing WWTP digesters to produce digestate (which are the biosolids remaining after the anaerobic digestion of a biodegradable feedstock) and biogas. The biogas can be upgraded to compressed natural gas (CNG) to fuel vehicle fleets, for the production of electricity through a combined heat and power (CHP) process, or carbon negative RNG/Hydrogen that can be injected into a natural gas pipeline. The digestate can be processed into nutrient rich fertilizer product upon further processing.

It is proposed to prepare 30% design of the proposed resource recovery infrastructure at the WWTP based on existing technologies available to achieve Net Zero. This project will build on the conceptual layout from the feasibility study, supported by undertaking of a number of assessments and investigations. The resultant design will provide base information and preliminary costing of the proposed resource recovery transformation of the WWTP as well as providing the foundation towards full design of the proposed facility.

The total cost of the design project is estimated to be \$500,000. In order to potentially secure 70% of government funding for this project, it is necessary for the City to demonstrate its commitment to the remaining 30% of project cost by allocating \$150,000. Utilization of the allocated funds is subject to securing government subsidies.



Environmental Services - Joint Infrastructure

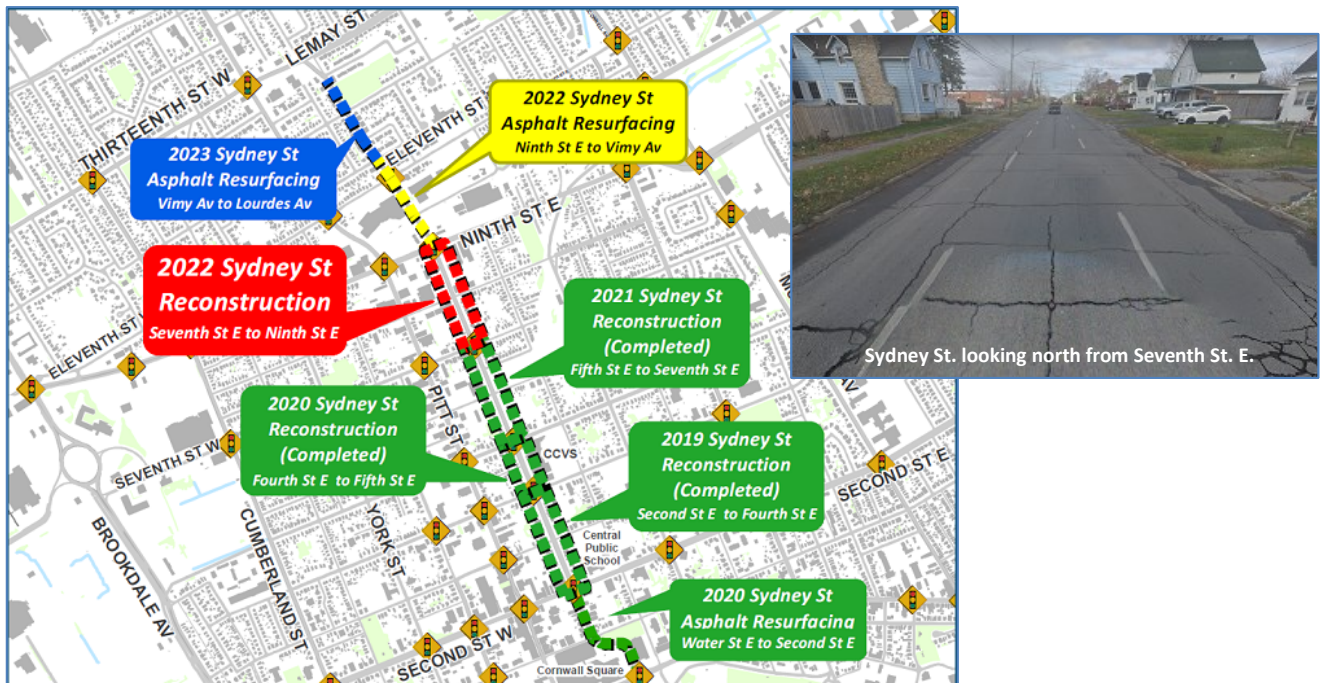
Project Name: Joint Infrastructure – Sydney St. Reconstruction from Seventh St. E. to Ninth St. E.

Funding: \$1,100,000 Water Works Financing
\$1,000,000 Wastewater Works Financing
\$2,100,000

Joint infrastructure projects typically include the rehabilitation of sewer, water and roadway infrastructure. Project candidates are selected based on the state of underground infrastructure; locations where sewer separation is required and watermain improvements are necessary are considered priorities. Project candidates are further narrowed based on locations where the road corridor is also in poor condition, as the roadway will be rehabilitated as part of the restoration works following the replacement of all buried infrastructure.

In 2019, the first phase of the multi-year Sydney St. rehabilitation project was completed; the first phase consisted of the reconstruction of Sydney St. from Second St. to Fourth St. The second and third phases of the project were completed in 2020/2021 and consisted of the reconstruction of Sydney St. from Fourth St. to Fifth St. and Fifth St. to Seventh St. The fourth phase of the project consists of the reconstruction of Sydney St. from Seventh St. to Ninth St. The fourth phase will be the final phase of the full reconstruction (road, watermain, sanitary and storm sewer) portion of the project. The Sydney St. Reconstruction project from Seventh St. to Ninth St. will also be coordinated with the resurfacing of Sydney St. from Ninth St. to Vimy Ave. and the replacement of the traffic signals at the intersection of Sydney St. and Eleventh St. which are included in the 2022 Capital Budget. The construction activity on Sydney St. will conclude for the foreseeable future in 2023 following the resurfacing of Sydney St. from Vimy Ave. to Lourdes Ave.

The reconstruction of Sydney St. from Seventh St. to Ninth St. is recommended as a joint infrastructure project as the underground infrastructure has reached the end of its service life and is in poor condition – both sewer separation and the replacement of the watermain are required. In addition, the road corridor and existing sidewalks are also in poor condition and in need of replacement.



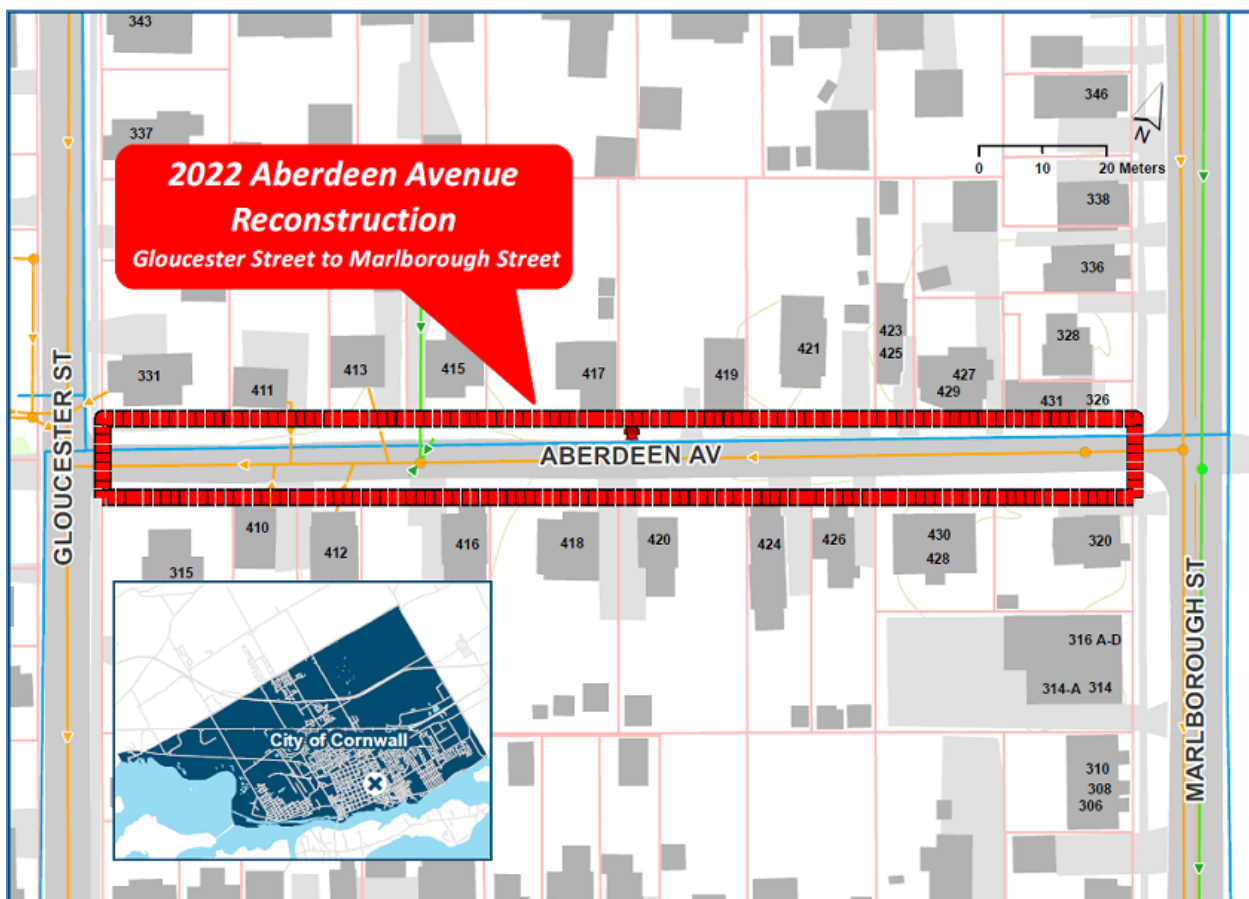
Environmental Services - Joint Infrastructure

Project Name: Joint Infrastructure – Aberdeen Ave. from Marlborough St. to Gloucester St.

Funding: \$400,000 Water Works Reserve
\$350,000 Wastewater Works Reserve
\$750,000

Joint infrastructure projects typically include the rehabilitation of sewer, water, and roadway infrastructure. Project candidates are selected based on the state of underground infrastructure; locations where sewer separation is required and watermain improvements are necessary are considered priorities. Project candidates are further narrowed based on locations where the road corridor is also in poor condition, as the roadway will be rehabilitated as part of the restoration works following the replacement of all buried infrastructure.

The reconstruction of Aberdeen Ave. from Marlborough St. to Gloucester St. is recommended as a joint infrastructure project as the underground infrastructure has reached the end of its service life and is in poor condition. The existing watermain was constructed in 1925 and is in need of replacement. The street is currently serviced with a combined sewer which requires separation and the installation of new dedicated storm and sanitary sewers as part of the City's long-term sewer separation plan. In addition, the road corridor has a pavement condition rating of 57 or 'Marginal' and requires rehabilitation.



2022 TEN YEAR CAPITAL FORECAST

**CAPITAL FORECAST
FOR THE YEARS 2022 - 2031**

WATER DISTRIBUTION

LOCATION	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
WATER DISTRIBUTION										
Watermain Rehabilitation Improvements to system throughout the City	2,350	2,400	2,450	2,500	2,550	2,600	2,650	2,700	2,750	2,800
Pitt St. - Tollgate Rd. to Cornwall Centre Rd. Vincent Massey Dr. - Tollgate Rd. to City Limits		3,000	3,000	5,000	5,000					
System Growth - New Watermain - Other System Growth/Projection Projects	500	500	500	500	500	500	500	500	500	500
Total Capital	2,850	5,900	5,950	8,000	8,050	3,100	3,150	3,200	3,250	3,300

2022 TEN YEAR CAPITAL FORECAST

**CAPITAL FORECAST
FOR THE YEARS 2022 - 2031**

WATER PURIFICATION PLANT

LOCATION	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Intake Screen Frazil Ice Mitigation & Emergency Isolation Device		250								
Raw Water Intake Pipe Wall Condition Assessment	300									
Raw Water Intake Redundancy Technical Studies	100									
Backwash Pump Replacement	350									
Water Meter Installation Program		7,900	7,900							
Concrete Storage Tanks Condition Assessment	50		50		50					150
High Lift Pump Replacement	250	400		400		400			400	
Water Meter Implementation - Project Management Services	1,300									
UV Reactors 1 & 2 Replacement		700								
UV Reactors 3 & 4 Replacement			700							
Replacement of Chemical Storage Tanks										150
Removal of Hydrogen Peroxide System										300
Clearwell Sluice Gate Replacement							150			
Boundary Road Booster Pump Replacements				150	150	150				
Submersible Filter Backwash Pump and Valve Replacement				400						
Filter 3 & 4 Media Replacements			600							
Filter 1 & 2 Media Replacements					600					
SCADA Equipment					100		300	500		150
Tower Coating Rehabilitation							400			250
Instrumentation (Flow Meters/Actuators/Pressure Transmitters)				200	100	150				150
Building Exterior Brickwork								800		
Expansion Joint Repairs							400			
Valve Replacement Program				200		250			250	250
Concrete Rehabilitation/Renewal					200	200	200		200	
Roof Repairs					150				500	
Total Capital	2,350	9,250	9,250	1,350	1,350	1,300	1,300	1,300	1,350	1,400

2022 TEN YEAR CAPITAL FORECAST

**CAPITAL FORECAST
FOR THE YEARS 2022 - 2031**

WASTEWATER COLLECTION

LOCATION	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Wastewater Collection Program - Sewer Network Improvements Fifth St. W - York St. to Bedford St. Race St. - Water St. to Marlborough St. Walton St. - Alice St. to Guy St. First St. - Marlborough St. to Lawrence Ave. Thirteenth St. W. - Pitt St. to Aubin St. Wellington St. - Pitt St. to 100m East	1,050	1,100	1,125	1,150	1,175	1,200	1,225	1,250	1,275	1,275
Storm & Combined Sewer Separation See APPENDIX C	700	725	750	750	770	790	810	830	850	850
Total Capital	1,750	1,825	1,875	1,900	1,945	1,990	2,035	2,080	2,125	2,125

2022 TEN YEAR CAPITAL FORECAST

**CAPITAL FORECAST
FOR THE YEARS 2022 - 2031**

WASTEWATER COLLECTION - APPENDIX C

LOCATION										
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Storm and Combined Sewer Separation at Various Locations										
Fifth St. West - York St. to Bedford Ave.	60									
Race St. - Water St. to Marlborough St	300									
Walton St. - Alice St. to Guy St.	120									
First St - Marlborough St. to Lawrence Ave.	120									
Guy - Easton Av to Walton	100									
Rosemount Ave. - Brookdale Ave. to Vincent Massey Dr.		250								
Augustus St. - Fifth St. to Sixth St.		475								
Bedford St. - Water St. to Second St.			750							
Anthony St. - Montreal Rd. to Walton St.				400						
Adolphus St. - Fourth St. to Fifth St.				350						
Eighth St. - Augustus St. to York St.					150					
Bedford St. - Fourth St. to Fifth St.					200					
Bedford St. - Eighth St. to Ninth St.					230					
Eighth St. - York St. to Cumberland St.					190					
First St. - Marlborough St. to Baldwin Ave.						790				
First St. - McConnell Ave. to Baldwin Ave.							300			
Timothy Ave. - Bedford St. to Cumberland St.							230			
Sixth St. - Adolphus St. to Gloucester St.							280			
Bedford St. - Fifth St. to Sixth St.								400		
Danis Ave. - First St. to Easton Ave.								430		
Bergin Ave. - Race St. to Water St.									650	
Hawkshaw Ave. - Amelia St. to RailRd. Tracks									200	
TBD										850
Total Capital	700	725	750	750	770	790	810	830	850	850

2022 TEN YEAR CAPITAL FORECAST

**CAPITAL FORECAST
FOR THE YEARS 2022 - 2031**

WASTEWATER TREATMENT PLANT

LOCATION	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Odour Control System for Dewatering Facility	400									
Supply and Installation of Lifting Beams	75									
Waste Gas Compressor Lubrication System Replacement	60									
Security Fence for Future WWTP Expansion Area & Pump Station	250									
Resource Recovery Facility Design	500									
Pumphouse Vault		400								
Primary Header Expansion Joint Repair and Engineering		390								
Digester #1 Relining		800								
Digester #2 Relining			800							
Engineering and Construction Drawings for the Pumphouse Force Main			200							
BAF Cells Conversion to Duostyr			600							
Biosolids Conversion to Fertilizer				1,000						
Pumphouse Spare Forcemain to Main Plant and Engineering				1,550						
Outfall repairs or new and Engineering					1,650					
Primary Clarifiers 1&2, Header Rehabilitation, & Engineering						1,700				
Primary Clarifiers 3&4, Header Rehabilitation, & Engineering							1,750			
Pumphouse Suction, Discharge Header Rehabilitation, & Engineering								1,800		
Brookdale Gate Replacement and Engineering									1,800	
Roof Replacement for all Buildings										1,100
Exterior Building Rehabilitation and Engineering										750
Total Capital	1,285	1,590	1,600	2,550	1,650	1,700	1,750	1,800	1,800	1,850

2022 TEN YEAR CAPITAL FORECAST

**CAPITAL FORECAST
FOR THE YEARS 2022 - 2031**

JOINT INFRASTRUCTURE PROJECTS - (WATER / WASTEWATER)

LOCATION	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Sydney St. - Seventh St. E to Ninth St. E	2,100									
Aberdeen Ave. - Marlborough St. to Gloucester St.	750									
Lauber Ave. - Bedford St. to Cumberland St.		800								
Third St. - York St. to Bedford St.		1,050								
Third St. - Bedford St. to Cumberland St.		1,050								
Gloucester St - Water St. to First St.			1,325							
Lawrence St. - Montreal Rd. to Second St.			1,325							
Bedford St. - Fourth St. to Sixth St.				2,675						
Eighth St. - Sydney St. to Adolphus St.					2,675					
Eighth St. - Adolphus St. to Marlborough St.						2,700				
Sixth St. - Augustus St. to Sydney St.							2,725			
Gloucester St. - Second St. to Aberdeen Ave.								1,300		
Future Projects								1,450	2,750	2,750
Total Capital	2,850	2,900	2,650	2,675	2,675	2,700	2,725	2,750	2,750	2,750

Key Assumptions

Following the key assumptions outlined for the City's LTFFP, the financial forecast for the years 2023-2025 (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.

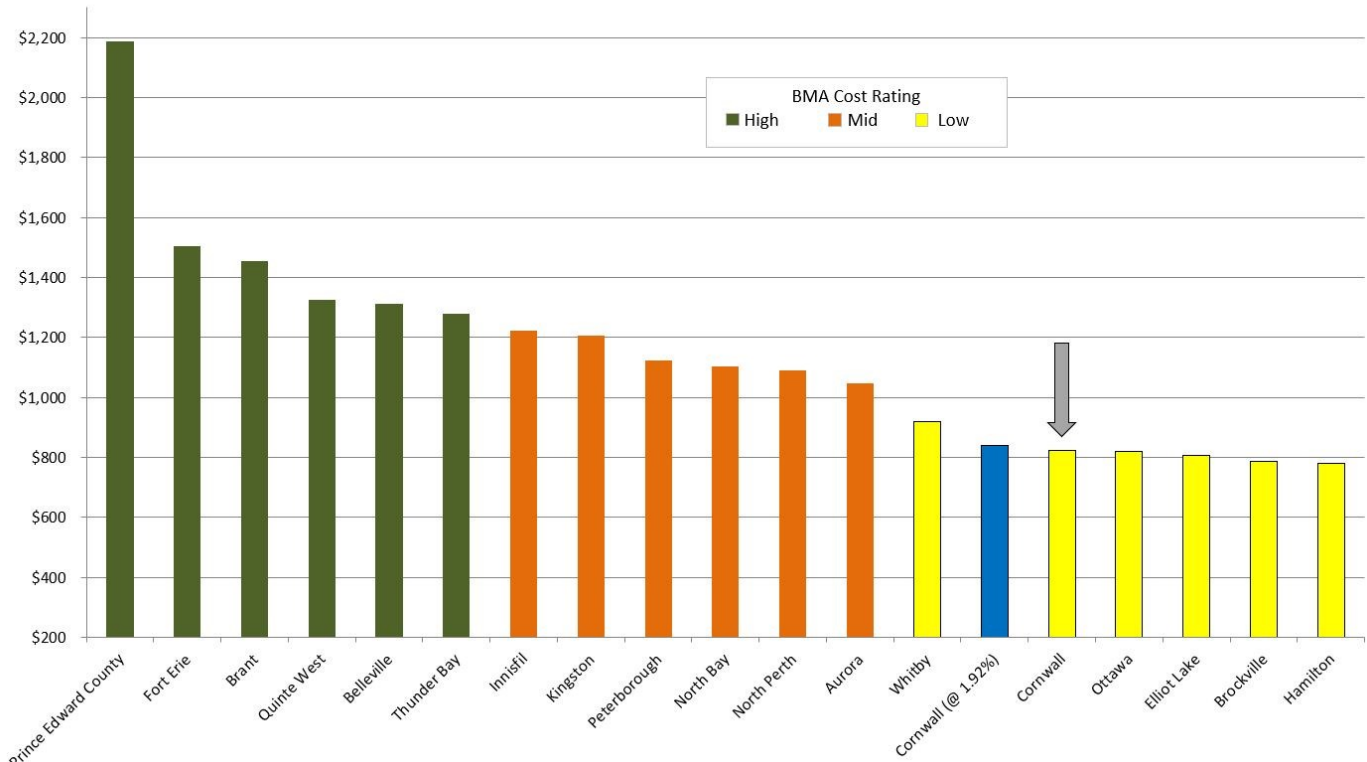
Insurance is projected to increase by 10% per year.

Capital

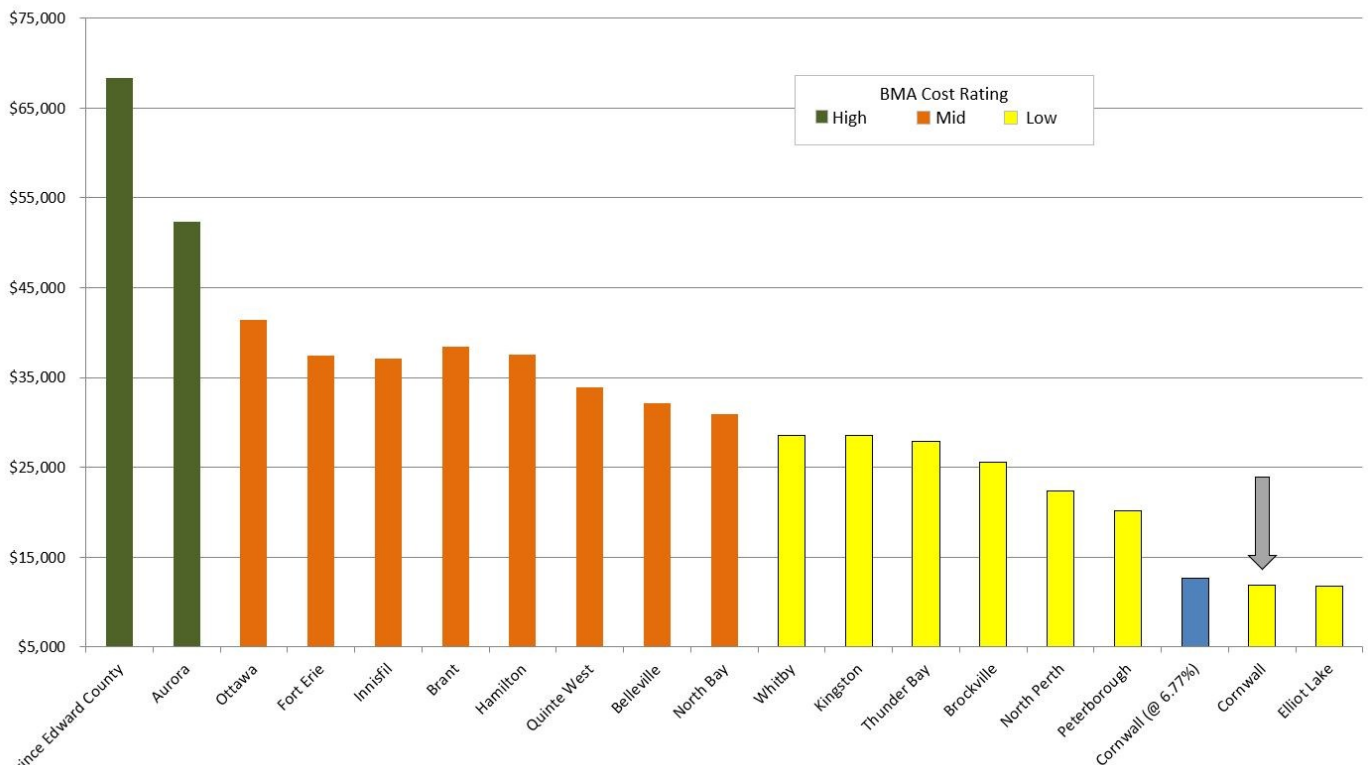
Projected capital expenditures and associated funding (based on financial policy recommendations) for the years 2023 to 2031 are based on the City's AMP, which is reviewed annually.

Municipal Comparators

Residential Water / Wastewater Costs per 200m³



Commercial Water / Wastewater Costs per 10,000m³



Source: 2021 Draft BMA Study