

2023

Business Plan

**ENGINEERING & PUBLIC
WORKS**

Public Works

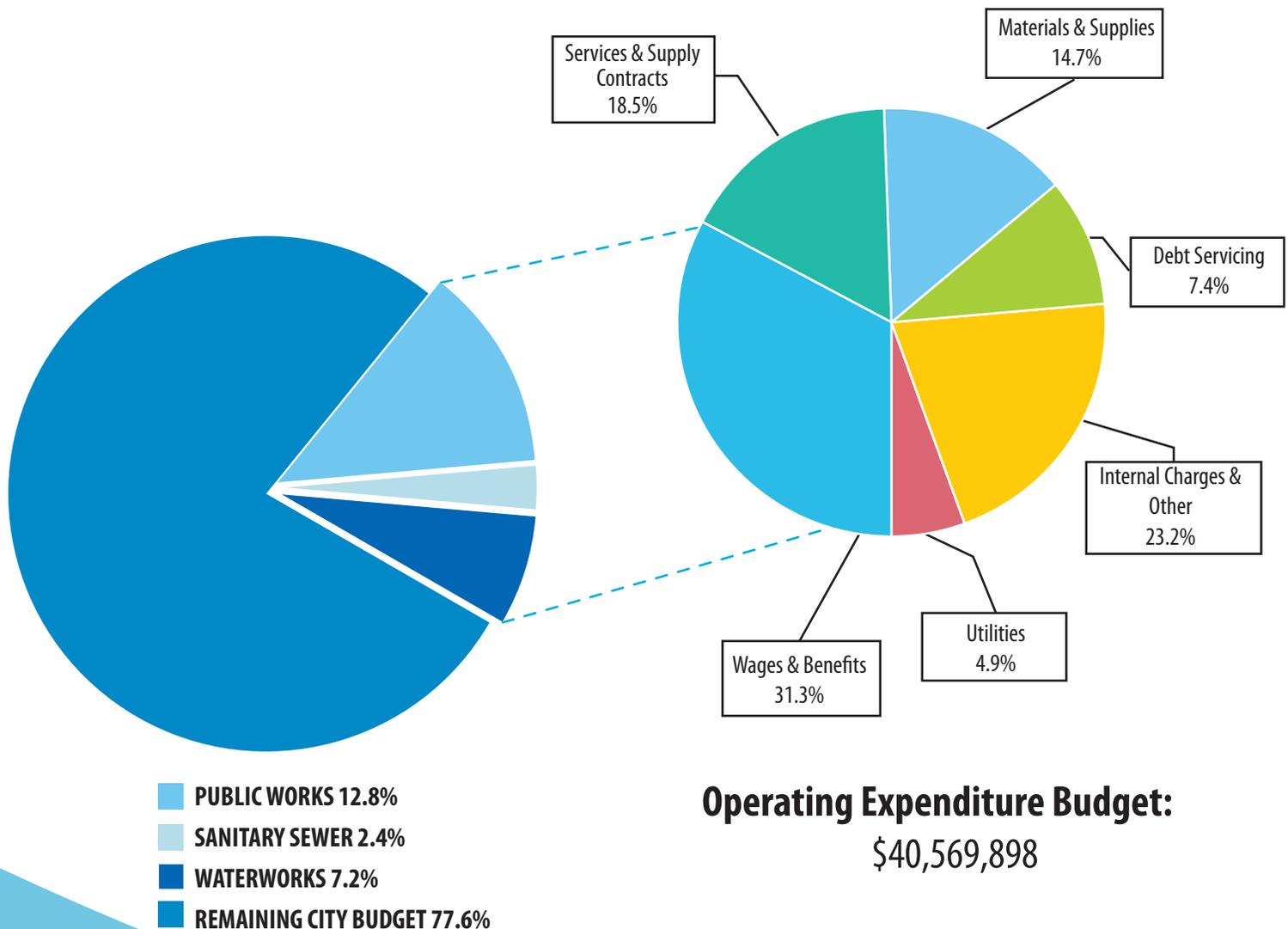
DEPARTMENT OVERVIEW

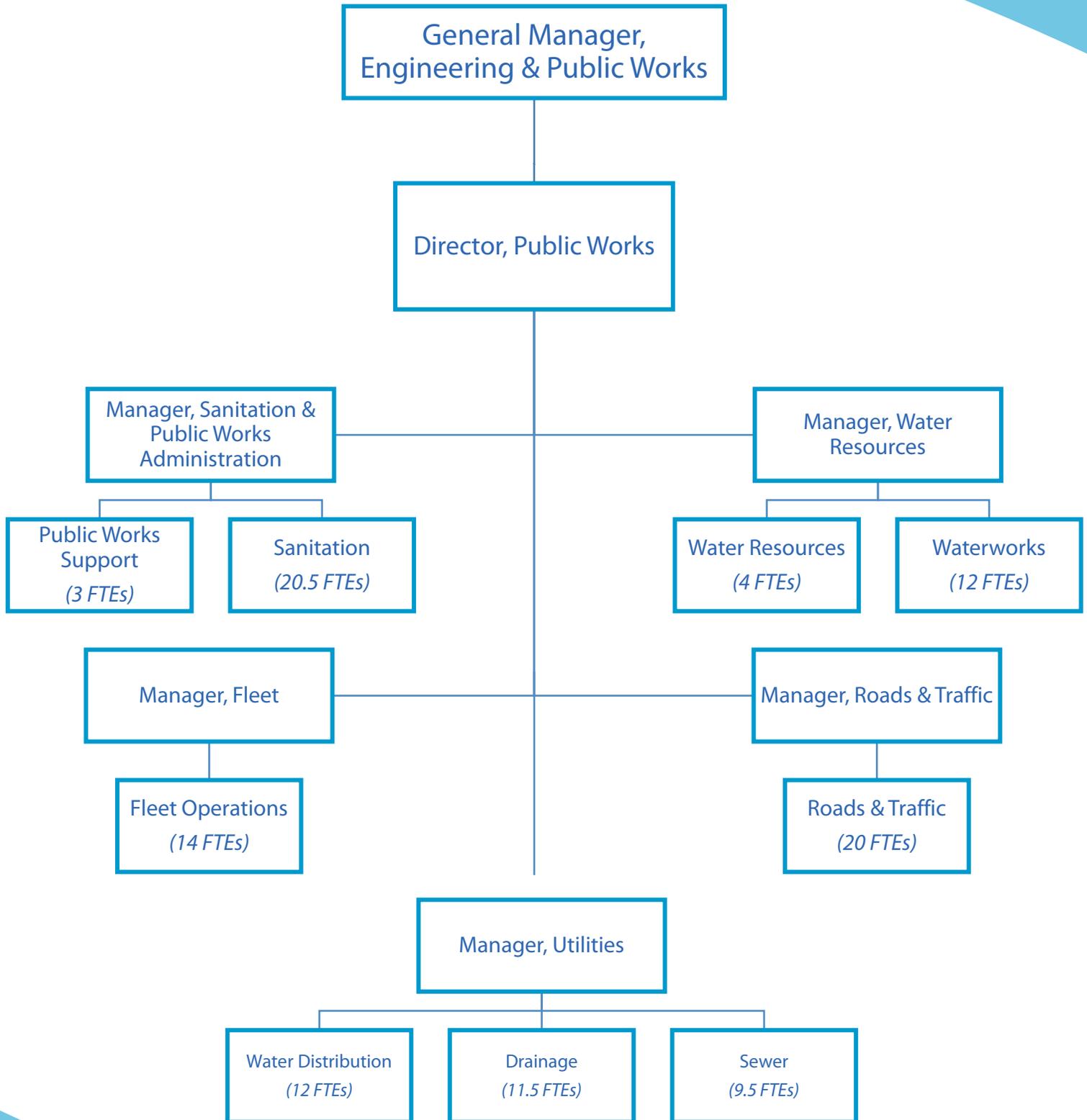
The Public Works Department constructs, operates and maintains critical City owned infrastructure. These include drinking water supply, treatment and distribution, sanitary sewer and storm drainage collection, sanitation, recycling, cemeteries, roads and traffic and corporate fleet services. Public Works and Engineering together plan, design, construct and maintain infrastructure while continually performing condition assessments and feed back to continue the asset management life cycle.

The Public Works Department is composed of six primary groups:

- Administration
- Sanitation & Cemeteries
- Roads and Traffic
- Utilities
- Water Resources
- Fleet

DEPARTMENT'S SHARE OF THE BUDGET





Two Water Meter Readers are funded from Water and report to Revenue Services in Finance.

ADMINISTRATION

The Administration of Public Works provides essential support to the city's operations and services. These are front-line staff that interact with the public, provide clerical and financial support, records management, organize, and ensure that other staff have the day-to-day resources they need.

Administrative services for the Public Works Department is provided by three staff located at the Public Works yard. Seasonal and temporary staff provide additional support as required.

The strong and diverse knowledge base, and high level of service and public interaction provided the by Administration, deflect calls from supervisors and managers resulting in efficiency and higher operational productivity.

Background and Level of Service:

- Public Works is the primary point of contact for the public for many operational requests, questions or concerns. A front counter is available at Public Works for the public to access and reach staff in Public Works during normal working hours.
- Provide information and generate work orders in a range of areas including: solid waste, street cleaning, roads, and utilities.
- Permit processing and approvals including water use, third party utility construction, etc.
- After Hours call response to emergency inquiries.
- 24/7 remote alarm monitoring of infrastructure throughout the City.
- Records management for the department.
- Assistance for financial transactions and processing of invoices.
- Public Works Administration provides both an interface for residents and a dispatch centre for operations. Fleet Services also has internal administrative functions.

2022 ACHIEVEMENTS

Administration staff created, dispatched and closed more than 4000 work orders so far in 2022. It is estimated that around 50% of the calls are resolved by the admin

staff person providing the information. The rest result in the creation of a work order, for assignment to field personnel.

Administration staff received and responded to the following phone calls and emails:

Received Call	2020	2021	2022 Projection
Number of Calls	46,231	39,713	40,000
Duration of Calls	538:51:06	417:10:01	450:00:00

A majority of the calls are resolved by the admin staff person providing the information. The rest result in the creation of a work order, for assignment to field personnel.

Administration staff created, dispatched and closed:

- 7,667 work orders in 2019,
- 7,418 work orders in 2020,
- 8,826 work orders in 2021, and
- 8,200 by the end of June 2022.

2023 CONSIDERATIONS AND OPPORTUNITIES

The public-facing level of service in this area is high. Each resident who calls is able to speak with a member of the admin team. Residents are accustomed to this service. It is increasingly rare in cities of this size. Many cities have opted to move to an automated answering service. While staff do not feel this is necessary at this time, there are events that make this high level of service hard to maintain. In 2023 staff will continue to use the voicemail box to provide information during periods of high call volumes.

The 24/7 operations of the Public Works yard has become increasingly difficult in 2022 as a result of additional security concerns. Due to frequent break-ins and thefts from the yard, nightly foot patrols have been implemented and continue. These are performed by a contractor who reports to the Commissionaire on duty.

SOLID WASTE MANAGEMENT

The City provides weekly curbside collection of garbage, recycling and comingled kitchen/yard waste organic materials. The service uses standardized carts and automated collection vehicles to 29,900 residential addresses. This service is provided for single-family and multi-family, up to and including four-plexes. Larger multi-family, strata, commercial and industrial solid waste collection is completed by the private sector.

Characteristics of the program are:

- Provide residential solid waste collection including weekly collection of food and garden waste and bi-weekly collection of residential garbage and recyclables.
- Monitors the contamination of the recycling and organic materials.
- Provide public education and promotion for Waste Reduction and Recycling.
- Support waste reduction activities and education for public events.
- Provide public spaces cleaning services.
- Support other departments in clean up of encampment debris.
- Sanitation services support City Plan goals: Green Nanaimo (Resilient & Regenerative Ecosystems), Connected Nanaimo (Equitable Access), Healthy Nanaimo (Community Wellbeing & Livability) and Prosperous Nanaimo (Thriving & Resilient Economy)

Background and Level of Service:

- User fees fully cover the costs of solid waste collection.
- The delivery of curbside collection services is a daily activity that requires a high level of management and effort to match the high degree of complexity.
- Any failure in delivery results in a high level of public interest.
- Servicing of waste receptacles throughout the community.
- Collection of illegally dumped items from public property.
- Collection of dumped hazardous items including needles.
- Clean up littering and other unsightly areas of public property.
- Perform daily homelessness cleaning and sweeping around the downtown area.

In addition to Solid Waste Collection Services, the Sanitation Section also facilitates other initiatives including:

- The Partners in a Cleaner Community Program - Working with local community groups to litter pick city roadsides.
- Reuse Rendezvous - The citywide swap meet.
- The Nanaimo Recycle Trunk Sale- a free event for residents to give used items a new life.



2022 ACHIEVEMENTS

- Nanaimo has one of the few services that pick up three different types of waste with a single vehicle – many others use multiple vehicles.
- Injuries in the sanitation section have fallen by over 90% since the implementation of the program, in summer 2018.
- Implemented optimized collection program, dividing the collection into two categories of Recycling/Organics and Garbage/Organics supporting Green Nanaimo (Resilient & Regenerative Ecosystems).
- Continued optimization reducing service delays.
- Work orders relating to missed collections and other operational issues have reduced significantly.
- In the first 6 months (Jan-Jun) 2022, 120 new accounts are being added to existing refuse collection routes. An ongoing increase of service users is expected:

Service User (HH)	2020	2021	2022 Projection
Total	29,276	29,670	29,950

- No significant changes in the collection of materials per household from residential curbside collection services:

Kilograms per Household	2020	2021	2022 Projection
Landfill	227	220	225
Recycling	129	125	130
Organics	293	279	280
Total	648	624	635

- Gradual increase in total collection due to population increase:

Total Volume (tonne)	2020	2021	2022 Projection
Landfill	6,593	6,492	6,760
Recycling	3,739	3,687	3,680
Organics	8,515	8,242	8,450
Total	18,847	18,421	18,890

2023 CONSIDERATIONS AND OPPORTUNITIES

- The Sanitation fleet consists of ten full-time and no spare trucks. Three new trucks were ordered with the estimated delivery time of winter/spring of 2023.
- Disposal cost (tipping fees) continue to increase.

Stream	2021	2022	2023 Projection
Landfill Waste	\$130.00	\$140.00	\$144.20
Organic Materials	\$105.53	\$107.96	\$114.98

- To ensure that residential curbside collection program remains efficient and sustainable in the face of ongoing urban growth, the City is conducting an optimization of the fleet equipment lifecycle and spare equipment ratio. As a result the lifecycle of collection trucks was reduced from 10 years to 8 years, supporting City Plan’s goals around Community Wellbeing and Livability.
- Due to change in the recycling receiving facility from Nanaimo to Chemainus by Recycle BC, Waste Connections Canada, a private hauler consolidates and transports recycling materials to the new receiving facility.
- A Recycling Self-Consolidation Enhancement Study will be launched in 2023 to enhance the consolidation and transportation of recycling materials, supporting Green Nanaimo and Prosperous Nanaimo goals of City Plan.

- Recycling contamination increased to 8% by the end of 2021. Recycle BC has formally requested from the city to develop and implement a “Contamination Remediation Plan”.
- The “Contamination Remediation Plan” was developed and implemented in September 2021, and is effectively reducing contamination.
- Illegally dumped waste, needles and littering problems in the downtown core continue to swamp the Sanitation Clean Team and the Bylaw Departments. Two permanent community Clean Teams will significantly increase sanitation capacity in the public spaces once implemented, supporting Community Wellbeing and Livability.
- Demand for public space waste receptacles and cleaning services continue to increase.
- A Public Space Sanitation Enhancement study will be performed in 2023 to address the needs and service level requirements in public spaces.
- A multi-year waste receptacles purchase is proposed for 2023-2025 to increase the number of waste receptacles in public spaces.
- To support Green Nanaimo goals, Staff will continue to observe and review the potential implementation of Public Space Zero Waste and street scene initiatives including street waste source separation and cigarette butt recycling.



CEMETERIES

The City owns, operates and maintains three cemeteries:

Location	Status	Total Interments
Townsite/Chinese Cemetery	Open for sales of new plots.	967 Interments
Bowen Cemetery	Closed for sales of new plots. Open to burials in existing plots.	14,742 interments
Wellington Cemetery	Closed for sales of new plots. Open to burials in existing plots (very uncommon).	125 interments

Public Works operates these sites under the Cremation, Interment and Funeral Services Act and City of Nanaimo “Cemetery Bylaw 2009 No. 7084”. A contractor maintains the cemetery grounds. As a public service, the cemeteries are operated as an alternative to private burial services. The Revenue Services Section (Finance Department) receives and administers requests for plot purchase, burials, and genealogy research requests. The trend appears to be an increasing preference for cremation burials.

2022 ACCOMPLISHMENTS

- In 2020, 69 interments were conducted, including 18 full burials and 51 cremation burials.
- In 2021, 95 interments were conducted, including 13 full burials and 82 cremation burials.
- Year to date (June 30) in 2022, there have been 40 interments conducted, including 8 full burials and 32 cremation burials.
- To modernize record keeping, Public Works, IT and Finance Departments collaborated to scan Cemetery paper documents and historical data and their digital copies saved.

2023 CONSIDERATIONS AND OPPORTUNITIES

There are currently no dedicated cemetery staff. This means that opportunities may be missed to develop and expand service offerings, revenue potential, and cultural significance of the sites. Burial work is carried out by the sanitation section which can put undue pressure on the department who is primarily focused on delivering daily waste collection services.

The public interest in these sites can be tied to emotional reactions, so a high level of empathy and emotional intelligence is required for employees who come into contact with interested members of the public or family members of those interred.

Townsite/Chinese Cemetery is the only site with remaining capacity for new plots. To continue offering burial services, alternative memorials could be explored, including columbarium, ash gardens, etc.

Considering the limited space available for expansion, and in order to provide a long term business model and service plan, staff have scheduled a business model review for 2023. This supports City Plan’s goals of a Thriving and Resilient Economy and Equitable Access and Mobility.



2023 KEY INITIATIVES - SANITATION AND CEMETERIES

City Plan

Initiative	Connected Goal
Public Space Sanitation Enhancement study	   
Recycling Self-Consolidation Enhancement Study	 
Public Space Waste Receptacles	   
Cemetery Services - Business Model Study	  

City Plan: Nanaimo Reimagined Five City Goals



- 
A GREEN NANAIMO:
Resilient & Regenerative Ecosystems
- 
A HEALTHY NANAIMO:
Community Wellbeing & Livability
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A CONNECTED NANAIMO:
Equitable Access & Mobility
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AN EMPOWERED NANAIMO:
Reconciliation, Representation & Inclusion
- 
A PROSPEROUS NANAIMO:
Thriving & Resilient Economy



ROADS AND TRAFFIC

Apart from Provincial Highway 19 and Trans-Canada Highway 1, the City owns and maintains its road network, including pavement management, winter clearing, signage, and pedestrian and cycling facilities.

In 2022, there were:

- 540 km of roads, 450 km of sidewalks, and 119 km of bicycle lanes/cycle tracks,
- 53 signalized intersections, 4 roundabouts, and 26,107 traffic signs,
- 1,576 pay parking spaces (285 on-street and 1291 off-street),
- 18 bridges and 28 railroad crossings,
- 4,639 City owned streetlights and 4,286 lights leased from BC Hydro,
- 1,399 marked crosswalks and 66 pedestrian activated crosswalk-warning beacons

Background and Level of Service:

- Snow and Ice Control (SNIC) reduces risk and maintains functionality of the transportation network during adverse weather. Routes are prioritized with the goal of clearing major routes first, particularly emergency and transit routes. Local streets are the lowest priority and are cleared once higher priority routes have been completed. No service is provided to laneways.
- Potholes – roads crews respond to complaints from the public and reports from staff, and repair as identified.
- Traffic Signals – 50% of the system is inspected once per year, and conflict monitors are tested every year.

- Street Sweeping – Major roads are swept once per month, other streets once per year.
- Sidewalk Sweeping – downtown sidewalks are swept twice per week.
- Sidewalk Cleaning – downtown pressure washing completed every second year.
- Street garbage receptacles are provided and maintained. Currently there are over 100 streetside receptacles in the City that are emptied at least weekly.
- Sidewalk settlements greater than 25mm vertical displacement are repaired.
- Boulevard and roadside vegetation control is completed once per year during the summer.
- Centreline road markings are repainted every year. Stop signs and yield signs are inspected annually; other signs are replaced as needed.
- Crosswalks are inspected annually (including pedestrian flashers).
- Traffic Safety – respond to traffic concerns and provide technical data collection and analysis.
- Provide and maintain transit amenities including bus shelters, benches, garbage cans and signs.
- Crack Sealing – roughly 60,000 lineal metres of roadway is crack sealed every year.
- Asphalt Rehabilitation and Patching – There are programs in place to patch and renew asphalt with the aim to maintain the travel and driving surfaces.

2022 ACCOMPLISHMENTS

- Renewed asphalt road surface, including patching on Jingle Pot Rd., East Wellington Rd., Hammond Bay Rd., Departure Bay, Dorman Rd, Mildmay Rd.
- Full road rehabilitation of Holyrood Drive
- Completed upgrade of rail crossing at Dorman Rd. in partnership with Southern Railway.
- Major repairs to Wellcox Trestle completed.
- Promptly and effectively responded to pothole and sidewalk repair requests
- Provided a high level of service in supporting other City Utility operations with sidewalk reinstatement and paving repairs following underground utility work.
- Supported Culture and Events Section in completing the street banner program
- Supported Downtown Nanaimo Business Improvement Area and Old City Quarter in their local promotions (banners, custom street name signs, etc.)
- Public consultation for Asphalt Condition Level of Service undertaken
- Pavement quality survey undertaken and asset class conditions updated
- installation of new and upgraded traffic signals and pedestrian accessibility improvements
- Reviewed and updated Pothole, sidewalk trip and fall and snow and ice policies with Municipal Insurance Agency of BC (MIABC)
- Coordinated efforts with Parks to clear Active Transportation corridors
- Improved service to culs-de-sac with the addition of contract equipment
- Negotiated improved road salt supply contract with supplier

2023 CONSIDERATIONS AND OPPORTUNITIES

- There is a steady rise in expectation for levels of service. This ranges from concerns with congestion or lack of sidewalk connectivity, to feelings of inadequate parking. Balancing resources to meet these expectations is a major challenge for staff.
- Staff retention and succession planning is critical, as most of the entry level positions within the department are temporary or casual. This prevents junior staff from acquiring the full range of skills necessary to qualify for more senior positions.
- With implementation of new Complete Street Standards, operation and maintenance requirements are increasing as well.
- Road Rehabilitation Asset Management – The asphalt in the City's roads is deteriorating faster than it is being rehabilitated. The City typically has funding for several million dollars per year of asphalt renewal, unchanged significantly for years. A detailed evaluation of the City's asphalt asset, indicate an annual investment of about \$5 million per year is needed to keep the current pavement quality. Funding pressures are likely to continue to limit the ability to maintain the existing level of asphalt quality. As part of the capital plan, staff include a consideration for additional spending towards asphalt rehabilitation.
- Rail Crossings and Cost – There are 28 rail crossings in the City for either roads or trails. There are annual costs attributed to maintaining these crossings and considerable costs anytime road or trail improvements are undertaken near the crossing. Significant changes to Federal rail standards mean these crossings have created a financial and regulatory barrier to undertaking road and trail improvements along the entire length of the tracks in the City.
- Traffic Medians and Boulevard Maintenance – increase in assets continues to cause challenges for operations and maintenance. The level of service demanded by the public is higher than what the City is currently able to provide (financially and personnel).

2023 KEY INITIATIVES - ROADS AND TRAFFIC

City Plan

Initiative	Connected Goal
Improvements to snow and ice response (salt supply resilience, equipment mobilization)	 
Review boulevard mowing scope of work and service levels. Issue new contract	 
Conduct annual maintenance on 50% of traffic signals	 
Installation of three (3) ETV pre-emption systems (2 replacement, 1 new)	 
Upgrades to three (3) traffic signals	 
Complete two (2) railway crossing upgrades in partnership with SRY	 
Implement new maintenance management system (CAMS)	  

City Plan: Nanaimo Reimagined Five City Goals



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WATER UTILITIES AND RESOURCES

The City operates and manages a water supply and distribution system for consumption and fire protection to the residents and businesses of Nanaimo, South West Extension, Snuneymuxw First Nation and the District of Lantzville. This infrastructure includes dams, reservoirs, pump stations, pressure reducing stations, supply mains, distribution mains, services and water meters.

The City's drinking water supply originates from the protected South Nanaimo River Watershed, consisting of over 230 square kilometers of privately managed forest land. The City owns and operates two dams within the watershed to ensure consistency of supply throughout the year and release of water to maintain the environmental health of the river. Two parallel pipelines run from the South Fork dam in the watershed to the South Fork Water Treatment Plant.

The South Fork Water Treatment Plant filters and conditions the water to a quality exceeding Canadian Drinking Water Guidelines. Following treatment, drinking water is distributed through approximately 30km of transmission main to 9 balancing reservoirs with a combined storage of 59 million liters. Water is then conveyed to customers, primarily by gravity, through approximately 600km of supply and distribution piping.

Characteristics of the system include:

- 2 Water Supply Dams, 8 Recreational Dams.
- 647 km of distribution watermain.
- 93 km of transmission watermain.
- 9 reservoirs (storage tanks).
- 3,283 Fire Hydrants.
- 12,000 valves.
- Jump Lake Dam Reservoir.
- South Fork Dam Intake.
- South Fork Water Treatment Plant.
- 8 pump stations.
- 26,550 + service connections.
- Energy Recovery Facility.
- 14.8 billion Litres of treated water supplied per year.
- 2 Water Filling Stations.
- 1 Emergency Pump Station.

Background and Level of Service:

- Operate and maintain water storage and distribution infrastructure including main flushing, water testing, air valve & valve maintenance and inspection in compliance with the Drinking Water Protection Regulation.
- Complete dam inspections and reporting for 10 dams (2 for potable water and 8 for recreation/conservation), in accordance with the British Columbia Dam Safety Regulations and Canadian Dam Association Guidelines.
- Operate telemetry system to monitor water system 24/7 in real time.
- Operation of a membrane water filtration plant to supply the entire City and neighbouring communities, max capacity 116 million litres per day.
- Rigorous raw and treated water sampling and testing program
 - 49 raw water tests in the watershed,
 - 1,379 treated water tests at the WTP,
 - 99 treated water tests at in town reservoirs and
 - 1,200 treated water tests throughout the water distribution system,
- Provide water for fire suppression
- Watermain Breaks – Provide 24/7 response by certified water operators.
- Current Water Audit revealed a very low level of real losses of 1,139 million litres, corresponding to an Infrastructure Leakage Index (ILI) of 1.13, (the lowest level of losses that can be achieved).
- 120 New Fire Hydrants added to distribution system, 7 Hydrant repairs due to motor vehicle accidents.
- 500 Hydrants flushed during annual flushing program.

2022 ACCOMPLISHMENTS

- Completed the draft Water Supply Strategy update as a supporting document for City Plan - Nanaimo ReImagined.
- Decrease of 7% on daily consumption in the past decade, with a population increase of 24%. The average daily production of water for all users in Nanaimo during 2021, was approximately 406 liters per person per day. The average daily consumption of water for residential users in 2021, was approximately 216 liters per person per day.
- Water conservation initiatives include; staged watering restrictions, public education, tiered billing rates, toilet and appliance rebates. These efforts resulted in water demands well below Provincial and Federal levels and below 10% reduction per decade targets outlined in the City of Nanaimo 2014 Water Conservation Strategy and exceed the 2035 target average water production of 426 liters per capita per day. The new water conservation target is a 5% reduction in average annual per capita water demand per decade. This effort and recent modeling through the Water Supply Strategy has confirmed that the Jump Creek reservoir stores enough water to meet the City's water demands past 2060.
- Completed electrical upgrades at the South Fork Water Treatment plant combing non-essential and essential power into full emergency power backup. Created a new separate primary power supply for the critical remote communications and electrical control systems, providing greater resilience to inclement weather.
- Continued implementation of the Cross Connection Control (CCC) Bylaw program which improves the level of protection to the water supply system and reduces the risk of contamination. Over 980 registered accounts are currently active and administered through the Cross Connection Control Program.
- Provided 24/7 emergency response for watermain breaks and all water supply and distribution emergencies by certified water operators.
- Updated Business Continuity Plans for pandemic for the South Fork Water Treatment Plant and maintained essential operations during COVID-19, with reduced staffing.
- Revenue from the sale of electricity to BC Hydro Reservoir No. 1 Energy Recovery Facility for 2021 was \$87,239.
- Continued with the four year membrane age study with University of British Columbia for the South Fork Water Treatment Plant.
- Continued the Water Supply Cathodic Protection review and installation of 4 cathodic protection sites to extend the life of steel water supply mains.
- Completed the 2021 Formal Annual Dam Safety inspections.
- Continued supply and distribution systems valve maintenance.
- Commissioned the Emergency Pump Station at Duke Point.
- Completed the 2022 flushing program, maintaining high quality of potable water.
- Mitigated the flooding and water supply risk at the Duke Point Water Supply Main crossing York Creek.
- Identified and mitigated the seismic risk to the Rock City Road water supply main.
- Upgraded communication and security at the Jump Creek Reservoir.
- Successfully procured a contractor for the Mid-Town Water Supply project and established a value design working group with the engineer, owner and contractor resulting in over \$5 million in cost savings.
- Addressed an Order from WorkSafe BC requiring the installation of automatic shut off valves in the Chlorine injection system.
- Received ownership of the Linley Valley Dam through development.

2023 CONSIDERATIONS AND OPPORTUNITIES

- Implementation of the draft Water Supply Strategy recommendations, goals and objectives as part of the City Plan will develop further understanding of climate change impacts to drinking water supply and resilient infrastructure upgrades needed to support the future population of the region.
- Continue with construction of the first phases of the Mid-Town Water Supply project while working with other City Departments on future trail networking opportunities, permits and engaging residents and businesses of the construction activities and road closures.
- Install an enhanced and redundant emergency generator backup at the South Fork Water Treatment Plant and the College Park Station.
- Aging Watermain Infrastructure – The City has a mixture of pipes and other components ranging from very new, to very old, that form the Water Distribution System. Infrastructure such as pipes, have a limited lifespan and eventually require renewal to remain reliable. Approximately 6% of the infrastructure, with a value of about \$60 million, is near the end of the typical useful life and requires heightened monitoring and eventual replacement.
- Watermain Breaks – The most breaks are on pipes made from Asbestos Cement that were installed in the 1960's and 1970's. Typically, the City experiences several breaks a year on this type of pipe. Significant progress made replacing AC watermain older than 40 years with pressure of 80 psi or higher, whenever repaving, and if adjacent to a capital project.
- Individual service connection piping to each property has reached the end of its lifespan and causing water leaks throughout the City; while not major, these create nuisance and expense for property owners and the City.
- WorkSafe BC regulation changes such as asbestos pipe and confined spaces enhance the safety of workers; however, they often have an impact on efficiency and increase costs.
- The growth in population and corresponding increase in infrastructure, such as more pipes, valves, pump stations, reservoirs, etc., requires additional staff resources and operational funding. Over the past 10 years, the City has seen population growth of about 23% without a corresponding increase in staffing. Over this 10 year time period, an additional \$6 million in water distribution infrastructure has been added to the City through transfer from development. A business case has been put forward for an additional water operator.





2023 KEY INITIATIVES - WATER RESOURCES

City Plan

Initiative	Connected Goal
Water Supply Strategy	  
Mid-Town Water Supply Project (Phase 1-2)	   
South Fork Water Treatment Plant - Emergency Generator Upgrade	 
College Park Station - Emergency Generator	 
Annual flushing - strategic hydrants	

City Plan: Nanaimo Reimagined Five City Goals



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SANITARY SEWER

The City provides and maintains a safe and healthy sanitary sewer collection system for residential, multi-family, commercial and industrial properties. The City works closely with the RDN who operate the Greater Nanaimo Pollution Control Centre, treating sewage to a secondary level before discharge to the ocean.

Characteristics of the system include:

- 593 km of gravity sewer mains and 31 km of forcemains (pressure pipes from pump stations).
- 26,549 lateral sewer service lines totalling 284.3 km to individual properties.
- 8,896 manholes and 15 pump stations.
- 4 low-pressure sewer systems in specific neighborhoods.
- 13 flow monitor stations.
- 3 chemical injection sites to control fat buildup or odours.

Background and Level of Service:

- Ongoing maintenance and upgrades of sewer services to properties in the city.
- Conduct routine sewer main flushing of certain pipes. There are pipes on 3, 6 and 12 month flushing programs to ensure they remain operational.
- Ongoing maintenance and cleaning of sewer pump stations.

- Provide 24/7 emergency response for all sewer related emergencies by certified wastewater operators.
- Video inspections of sewers to monitor and evaluate physical condition. Maintain annual Pipe Condition Assessment program.
- Conduct inflow and infiltration monitoring and remediation program.

2022 ACCOMPLISHMENTS

- Maintain yearly sewer flow and rainfall monitoring program for city wide sewer model calibration.
- Implementation of Cartegraph Asset Management Software for sewer.
- Video inspection and condition assessment of 24 km of sewer pipe completed by City forces and contractor.
- Manhole inspections for public safety and infiltration and inflow issues.
- Infiltration and inflow maintenance in easements and rights-of-ways.
- Responded to 227 Work orders to date. (Aug 3, 2022)
- 51 service repairs/ upgrades.
- 49.5 kms flushed (Aug 3, 2022).
- Cleared 11 plugged SS services, 2 plugged mains.



- Upgrade remote data acquisition and recording of pump station maintenance information.
- Conducted condition assessment of Sanitary pump stations to prioritize upgrades of stations.
- Fielding Road Step system partial upgrade.
- Commissioned new CCTV vehicle, replacing the previous 13-year old vehicle.

2023 CONSIDERATIONS AND OPPORTUNITIES

- The City has a mixture of pipes, manholes and other components ranging from very new to very old that form the sewer system. Infrastructure, such as pipes, have a limited lifespan and eventually require renewal to remain reliable. Approximately 4% of the sewer infrastructure, with a value of about \$25 million, is near the end of the typical useful life and requires heightened monitoring and near term replacement.
- Continued reduction of infiltration and inflows into sanitary sewer system, reducing the costs of treatment, through manhole grouting and smoke testing of the sewer system.
- Continue to work closely with RDN on source control issues and monitoring.
- Pipes in poor condition introduce unnecessary flow from rainfall and groundwater infiltration in the system causing system capacity reduction and treatment issues.
- Some of the major trunk sewers have greater volume than the Provincial requirements allow and monitoring stations have been installed to better understand the risks. Revenue from user fees and development cost charges are not keeping up with the need to expand sewers, creating financial pinch points.
- Climate change impacts capacity and inflow and infiltration. With increasing storm intensity and rainfall events, the peak flows the system is required to handle increase.
- Population growth and corresponding increase in infrastructure will need staff resources and operational funding. Over the past 10 years, the City has seen population growth of about 15% without a corresponding increase in staffing. Additional pipes require flushing, inspection and maintenance. As growth continues, without additional funding and staff, the condition and reliability of the sanitary sewer system infrastructure will decline. Over this 10 year time period, an additional \$5.5 million in sanitary sewer infrastructure has been added to the City through transfer from development. A business case has been put forward for an additional sewer operator.
- Integration of new CCTV van allowing next generation analysis of underground assets.
- Update CCTV Management Software – Software system needed to allow Engineering and Public Works to analyze the extensive library of pipe inspection videos.



DRAINAGE (RAINWATER)

Drainage infrastructure, such as pipes, ditches, culverts, catchbasins, and detention ponds conveys rainwater to natural water bodies. The overall goals are to convey water away from roads, properties and buildings in a safe and sustainable way, while mitigating adverse impacts on natural watercourses, and contribute to the health of natural areas.

Characteristics of the system include:

- 598 km of storm drainage mains.
- 560 km of ditches.
- 16,202 storm lateral services totalling 155km.
- 7069 manholes.
- 13,163 catchbasins.
- 40 detention or pond facilities.

Background and Level of Service:

- Catchbasins (Road and Boulevard) are cleaned annually to prevent harmful sediments entering waterways and ensure environmental sustainability.
- Inlets and outlets inspected regularly before and during major rainfall events to ensure storm drainage working correctly, mitigating flooding.

- Monitoring and maintenance of natural watercourse to ensure flow of water and to prevent flooding.
- Ongoing monitoring of the North Slope erosion area during King tides and major rainfall.
- Flushing and video inspection of storm pipe and culvert infrastructure.
- Annual vegetation control maintenance around storm infrastructure such as inlets, outlets, and detention ponds to ensure free flow and access.
- Inspections of storm water infrastructure in new subdivisions.
- Water Quality Control program sampling for City of Nanaimo Parks and Recreation swimming beach areas to ensure safe recreational swimming and published on City of Nanaimo website to ensure public access.

2022 ACCOMPLISHMENTS

- Video inspection and condition assessment of 8.8km of drainage pipe to date.
- Maintain yearly storm drainage monitoring program for 2 flow stations and 9 level stations.
- 7,245 catchbasins cleaned to prevent sediment and heavy metal contaminants from entering storm system.
- Coordination of Road Rehab and Traffic Calming programs to improve drainage and safety.
- Cleaned and rehabilitated portion of Departure Creek in conjunction with DFO, Friends of the Stream and Departure Bay Neighbourhood Association.
- Completed City wide storm drain infrastructure inventory for SD model.
- Replaced & upgraded 140 m of failed corrugated steel pipe and responded to 430 work orders to date.
- Installed 15 new SD services, upgraded 10 existing services.
- Conducted seasonal water sampling program for faecal coliform on local area beaches. May- Sept.
- Flow improvement works at York Creek in Cedar at City Supply main crossing.

2023 CONSIDERATIONS AND OPPORTUNITIES

- Climate change has increased the intensity and strength of storm events. Drainage infrastructure may not be able to handle events especially the short duration, high intensity events. Increased flooding of low lying areas and properties may result due to more frequent storm events.
- Sea level rise is expected to restrict the amount of storm water runoff and increase erosion on shorelines.
- Staff turnover due to retirement decreases historic knowledge, increasing the importance of training and asset management systems.
- Managing growth of storm infrastructure with competing priorities for General Revenue funding and staffing needs.
- Increased focus on Cottle Creek, Departure Creek and Wexford Creek for sediment removal to prevent flooding of properties during heavy winter and spring flows.
- The City will need to upgrade funding model to budget for an aging drainage infrastructure, and consider the benefits of a storm water utility.
- There are increasing amounts of private drainage infrastructure that play an important environmental role in both quantity and quality of storm water. These systems require maintenance to prevent contamination and continued operation. Education and messaging to property owners will be important as these systems age and need attention.



2023 KEY INITIATIVES - UTILITIES (DRAINAGE)

City Plan

Initiative	Connected Goal
Annual Catchbasin cleaning and inspections	
Sediment removed from Departure, Cottle and Wexford creeks	 
Seasonal Water sampling at area beaches	 
Upgrade of single axle truck to tandem axle truck	  
Implement new maintenance management system (CAMS)	  

City Plan: Nanaimo Reimagined Five City Goals



A GREEN NANAIMO:
Resilient & Regenerative Ecosystems



A HEALTHY NANAIMO:
Community Wellbeing & Livability



A CONNECTED NANAIMO:
Equitable Access & Mobility



AN EMPOWERED NANAIMO:
Reconciliation, Representation & Inclusion



A PROSPEROUS NANAIMO:
Thriving & Resilient Economy



2023 KEY INITIATIVES - UTILITIES (SEWER)

City Plan

Initiative	Connected Goal
Sewer Right of Way cleaning	
I&I reduction - manhole grouting and smoke testing	
Implement new maintenance management system (CAMS)	  

City Plan: Nanaimo Relimagined Five City Goals



- 
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FLEET

The Fleet Section provides support, oversight and maintenance of the City's transportation and mobile equipment inventory. The group includes 13 permanent staff and a manager.

Characteristics of the system include:

- Maintains over 150 light, medium, and heavy duty vehicles including 4 electric ice resurfacers, 10 electric cars, and 13 tractors/backhoes/loaders/ excavators.
- Maintains over 400 pieces of equipment including generators, mowers, compressors, trailers, attachments, etc.
- Generates over 3,000 work orders per year for vehicle maintenance and repair.
- Maintenance facility includes 6 service bays, 1 welding bay, and 1 small equipment shop

Background and Level of Service:

- Operates three fleet maintenance shifts from 6:00 am - 5:30 pm to ensure adequate coverage and avoid equipment downtime.
- Maintains a government certified Designated Inspection Facility Licence. Preventative maintenance work and commercial vehicle inspections are completed to government standards and timelines. Annual audits from Commercial Vehicle Safety and Enforcement are conducted for compliance.

- Maintains fuel management system and provides monthly fuel consumption statistics for all departments.
- Works with ICBC and service providers to maintain insurance on the fleet.
- Provides oversight and advisory services for purchases or new additions to the fleet.
- Procures and deploys 15 - 25 new vehicles per year.

2022 ACCOMPLISHMENTS

- Continued to implement City's Green Fleet Strategy in order to reduce Green House Gas (GHG) emissions and fuel consumption.
- Completed a business case for a new Road Safety & Performance Coordinator position that aligns with the City's Green Fleet Strategy and will enhance driver training, route planning, and reduce GHG emissions.
- Completed approximately 59 commercial vehicle inspections.
- Planned fuel management system upgrade at Public Works yard.
- Planned GPS/AVL system upgrade on entire fleet
- Planned fleet management system upgrade that integrates with the City's Corporate Asset Management System.

- Continued active participation in province-wide fleet management group.
- Procured the following vehicles and equipment:
 - 1 - Electric Ice Resurfacer
 - 1 - Electric Car
 - 2 - High-Roof Vans
 - 10 - Light-Duty Trucks
 - 5 - Medium-Duty Trucks
 - 2 - Compressed Natural Gas (CNG) Refuse Trucks

2023 CONSIDERATIONS AND OPPORTUNITIES

- The Fleet Services facility is not adequately meeting the needs of the diverse fleet that the City maintains. A number of units within the City's fleet are unable to be serviced inside the facility due to the length of the units being greater than the building. In order to meet the growing needs of the community, and to continue to provide a high-level of maintenance to the City's fleet and small equipment, further advancement of a new fleet facility is required.
- As the City continues to grow, the size and complexity of the City's fleet and equipment is also increasing. Staffing levels and operational funding will need to increase to accommodate this growth.

- Staff have prepared a Business Case for a permanent Road Safety and Performance Coordinator. Vehicle accidents and incidents continue to affect insurance premiums and vehicle downtime. A coordinator position would be beneficial in reducing these expenditures and mitigating risks to the City, and taking advantage of rich data for better decision making and GHG reduction.
- As advancement in green technologies continue, fleet services continues to pursue the corporate Green Fleet Strategy by exploring alternative fuel solutions in order to reduce GHG emissions and decrease fuel consumption. Electric vehicles are becoming more accessible, however they are still not prevalent in the medium and heavy duty vehicle class.
- Continue to work with various departments and consultants to conduct a fleet electrification study which would include future infrastructure and facility upgrades.
- Conduct a fleet utilization study to guide the informed decision-making process on fleet retention and procurement.
- Continue to build strong relationships with other municipalities and local governments. The sharing of technical specifications and procurement solutions is highly beneficial amongst agencies.





2023 KEY INITIATIVES

City Plan

Initiative	Connected Goal
Fleet Services Facility	  
Fleet Electrification Study	  
Green Fleet Procurement	  
Fleet Utilization Study	 

City Plan: Nanaimo Reimagined Five City Goals



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PROPOSED OPERATING BUDGET - PUBLIC WORKS

	2022	2023	2024	2025	2026	2027
	Approved Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget
Revenues						
Cemetery Operations	\$ 76,000	\$ 76,000	\$ 76,760	\$ 77,528	\$ 78,303	\$ 79,086
Drainage	41,205	41,385	41,813	42,245	42,682	43,123
Fleet Operations	-	-	-	-	-	-
Public Works Support Services	469,500	791,000	806,710	822,733	839,075	855,744
Solid Waste Management	7,669,177	8,019,870	8,191,266	8,334,596	8,262,983	8,251,700
Transportation	73,384	69,436	70,130	70,831	71,540	72,255
Annual Operating Revenues	\$ 8,329,266	\$ 8,997,691	\$ 9,186,679	\$ 9,347,933	\$ 9,294,583	\$ 9,301,908
Expenditures						
Cemetery Operations	\$ 273,601	\$ 286,585	\$ 292,317	\$ 298,158	\$ 304,124	\$ 310,207
Drainage	2,277,694	2,360,144	2,407,315	2,455,424	2,504,508	2,554,558
Fleet Operations	2,781,567	3,072,785	3,134,227	3,196,901	3,260,826	3,326,034
Public Works Support Services	1,902,425	2,240,213	2,284,868	2,330,417	2,376,872	2,424,262
Solid Waste Management	8,852,466	8,571,708	8,471,926	8,514,208	8,424,756	8,421,990
Transportation	6,584,817	6,698,570	6,821,317	6,957,731	7,096,888	7,238,832
Annual Operating Expenditures	\$ 22,672,570	\$ 23,230,005	\$ 23,411,970	\$ 23,752,839	\$ 23,967,974	\$ 24,275,883
Net Annual Operating Expenditures	\$ 14,343,304	\$ 14,232,314	\$ 14,225,291	\$ 14,404,906	\$ 14,673,391	\$ 14,973,975
Staffing (FTEs) - Budgeted	73.2	73.2	73.2	73.2	73.2	73.2



PROPOSED OPERATING BUDGET - PUBLIC WORKS

	2022	2023	2024	2025	2026	2027
	Approved Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget
Expenditure Summary						
Wages & Benefits	\$ 7,770,976	\$ 7,965,821	\$ 8,123,615	\$ 8,286,078	\$ 8,451,805	\$ 8,620,832
Services & Supply Contracts	5,637,007	6,236,183	6,182,673	6,291,753	6,432,448	6,545,937
Materials & Supplies	2,902,035	3,159,788	3,144,044	3,187,717	3,261,405	3,300,447
Utilities	1,725,980	1,694,500	1,728,390	1,762,959	1,798,216	1,834,181
Internal Charges & Other	3,342,025	3,500,604	3,843,548	3,855,738	3,718,747	3,669,080
Debt Servicing	1,292,047	670,609	387,150	365,993	302,700	302,700
Grants & Subsidies	2,500	2,500	2,550	2,601	2,653	2,706
Annual Operating Expenditures	\$ 22,672,570	\$ 23,230,005	\$ 23,411,970	\$ 23,752,839	\$ 23,967,974	\$ 24,275,883

Proposed Changes

Two business cases have been prepared for Council's consideration for inclusion in the 2023 – 2027 Financial Plan they are:

- EV Ready Fleet Plan Study
- Road Safety & Performance Coordinator Position (in conjunction with Human Resources department)

PROPOSED OPERATING BUDGET - SANITARY SEWER

	2022	2023	2024	2025	2026	2027
	Approved Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget
Revenues						
Sanitary Sewer	\$ 9,118,440	\$ 9,240,112	\$ 9,686,693	\$ 10,168,704	\$ 10,661,915	\$ 11,087,000
Annual Operating Revenues	\$ 9,118,440	\$ 9,240,112	\$ 9,686,693	\$ 10,168,704	\$ 10,661,915	\$ 11,087,000
Expenditures						
Sanitary Sewer	4,429,817	4,359,122	4,424,869	4,595,656	4,637,146	4,715,543
Annual Operating Expenditures	\$ 4,429,817	\$ 4,359,122	\$ 4,424,869	\$ 4,595,656	\$ 4,637,146	\$ 4,715,543
Net Annual Operating Revenues	\$ 4,688,623	\$ 4,880,990	\$ 5,261,824	\$ 5,573,048	\$ 6,024,769	\$ 6,371,457
Staffing (FTEs) - Budgeted	9.8	9.8	9.8	9.8	9.8	9.8

	2022	2023	2024	2025	2026	2027
	Approved Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget
Expenditure Summary						
Wages & Benefits	\$ 1,097,048	\$ 1,064,232	\$ 1,072,895	\$ 1,094,351	\$ 1,103,105	\$ 1,125,169
Services & Supply Contracts	285,881	290,826	280,323	283,845	275,730	281,239
Materials & Supplies	601,538	651,670	598,818	620,235	636,251	657,437
Utilities	41,875	45,850	46,767	47,704	48,657	49,629
Internal Charges & Other	1,934,378	1,833,583	1,875,888	1,923,325	1,956,473	1,994,403
Debt Servicing	465,097	468,961	546,098	622,034	612,685	603,336
Grants & Subsidies	4,000	4,000	4,080	4,162	4,245	4,330
Annual Operating Expenditures	\$ 4,429,817	\$ 4,359,122	\$ 4,424,869	\$ 4,595,656	\$ 4,637,146	\$ 4,715,543

Proposed Changes

A business case for a Sewer Operator in Training position has been prepared for Council's consideration for inclusion in the 2023 – 2027 Financial Plan

PROPOSED OPERATING BUDGET - WATERWORKS

	2022	2023	2024	2025	2026	2027
	Approved Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget
Revenues						
Water	\$ 25,001,963	\$ 25,233,869	\$ 26,514,556	\$ 27,599,101	\$ 28,726,976	\$ 29,619,035
Annual Operating Revenues	\$ 25,001,963	\$ 25,233,869	\$ 26,514,556	\$ 27,599,101	\$ 28,726,976	\$ 29,619,035
Expenditures						
Water	11,414,325	12,980,771	13,167,630	13,483,582	13,768,922	14,050,474
Annual Operating Expenditures	\$ 11,414,325	\$ 12,980,771	\$ 13,167,630	\$ 13,483,582	\$ 13,768,922	\$ 14,050,474
Net Annual Operating Revenues	\$ 13,587,638	\$ 12,253,098	\$ 13,346,926	\$ 14,115,519	\$ 14,958,054	\$ 15,568,561
Staffing (FTEs) - Budgeted	31.5	31.5	31.5	31.5	31.5	31.5

	2022	2023	2024	2025	2026	2027
	Approved Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget
Expenditure Summary						
Wages & Benefits	\$ 3,662,177	\$ 3,670,598	\$ 3,744,010	\$ 3,818,890	\$ 3,895,267	\$ 3,973,171
Services & Supply Contracts	874,302	958,941	978,120	997,671	1,017,628	1,037,983
Materials & Supplies	1,889,644	2,163,460	2,103,766	2,166,243	2,230,805	2,286,373
Utilities	234,884	233,920	238,598	243,370	248,238	253,203
Internal Charges & Other	2,913,854	4,073,676	4,180,619	4,290,856	4,364,636	4,439,768
Debt Servicing	1,833,464	1,874,176	1,916,517	1,960,552	2,006,348	2,053,976
Grants & Subsidies	6,000	6,000	6,000	6,000	6,000	6,000
Annual Operating Expenditures	\$ 11,414,325	\$ 12,980,771	\$ 13,167,630	\$ 13,483,582	\$ 13,768,922	\$ 14,050,474

Proposed Changes

A business case for a Water Operator in Training position has been prepared for Council's consideration for inclusion in the 2023 – 2027 Financial Plan