

2024

Business Plan

**ENGINEERING & PUBLIC
WORKS**

Public Works

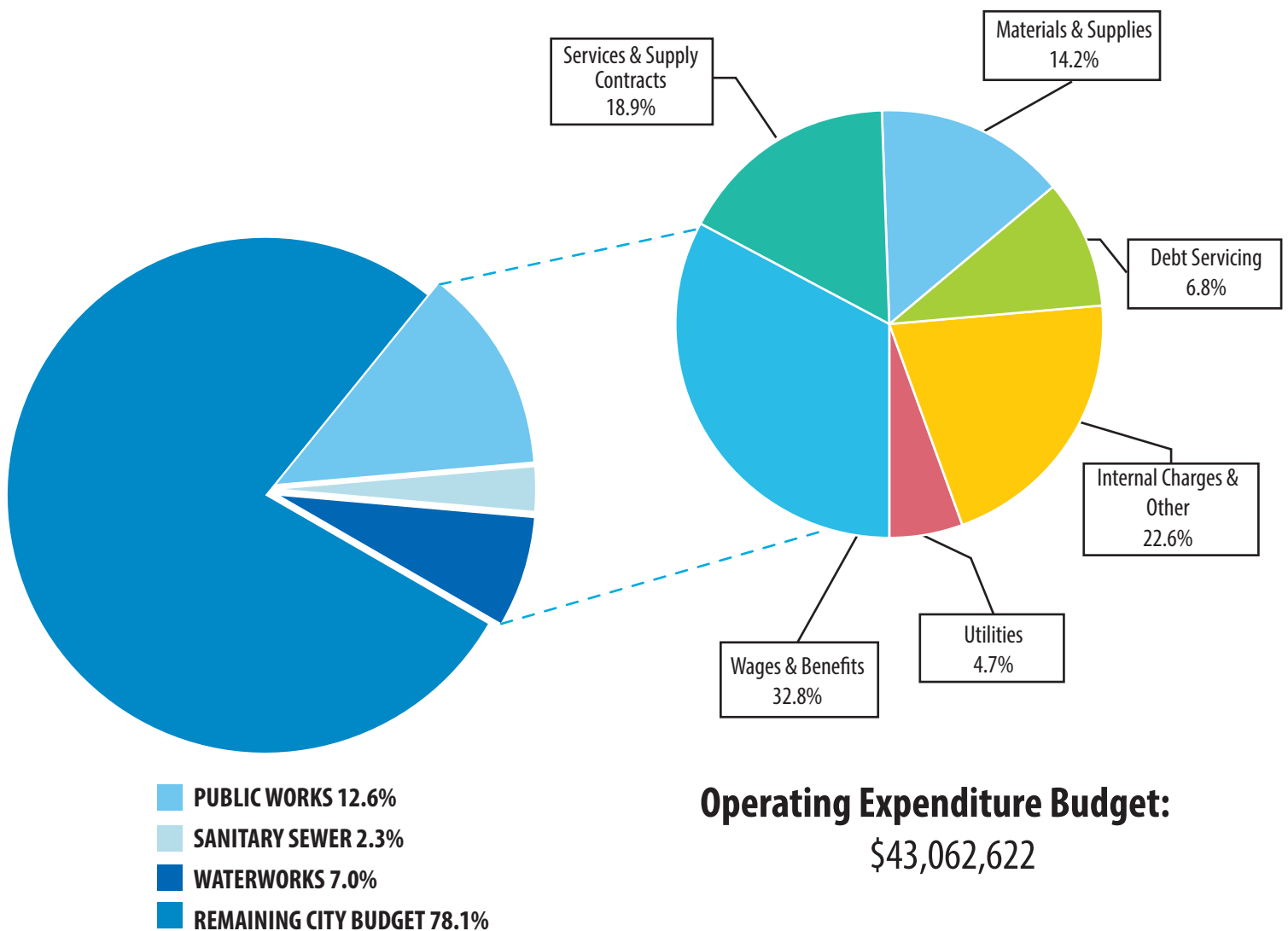
DEPARTMENT OVERVIEW

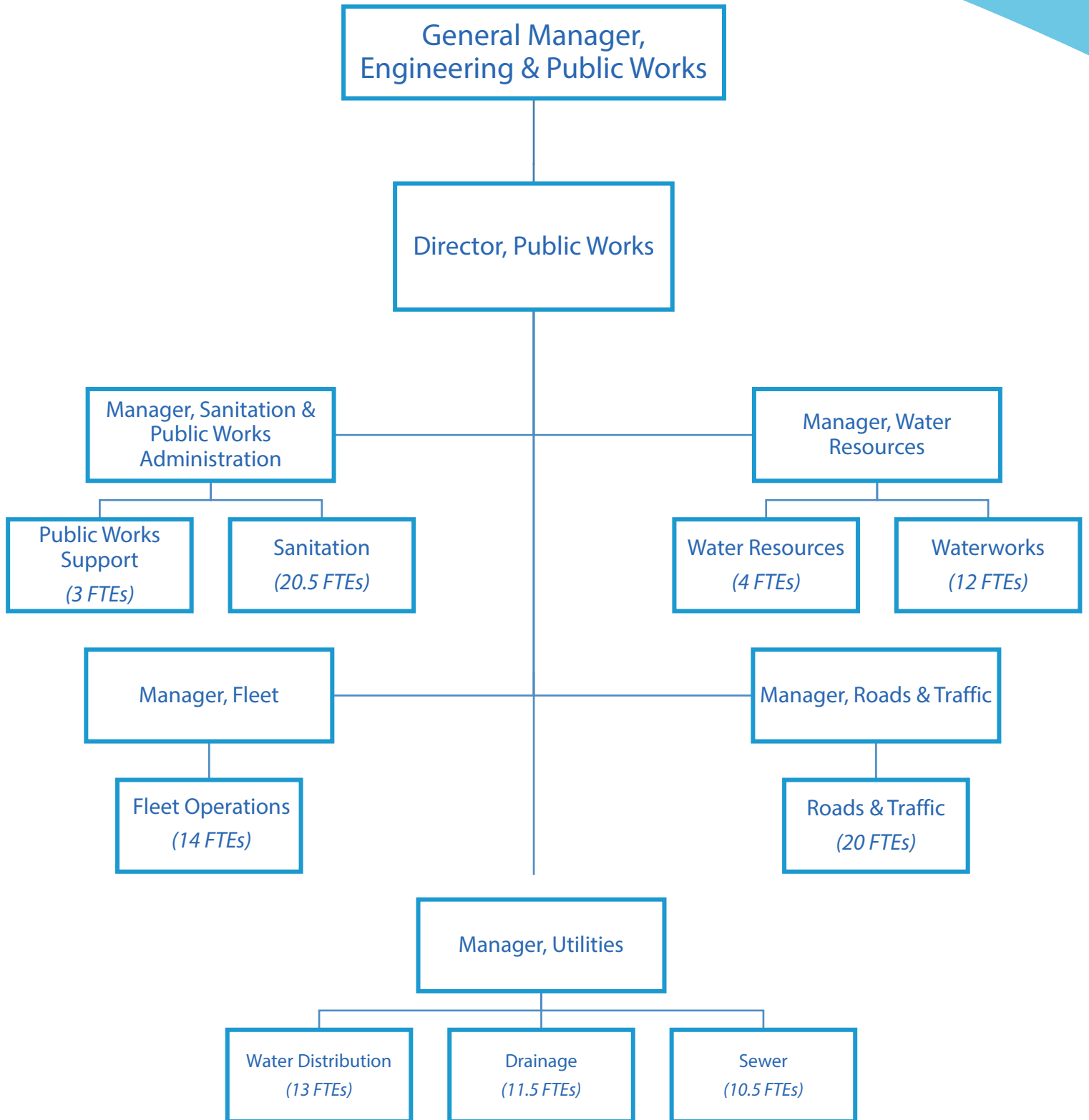
The Public Works Department constructs, operates and maintains critical City-owned infrastructure. These include drinking water supply, treatment and distribution, sanitary sewer and storm drainage collection, sanitation, recycling, cemeteries, roads and traffic and corporate fleet services. Public Works 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.

2023 ACHIEVEMENTS

To date, Administration staff created, dispatched and closed more than 4,000 work orders. 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 created, dispatched and closed:

- 7,418 work orders in 2020,
- 8,826 work orders in 2021,
- 8,560 work orders in 2022, and
- 8,500 projected for 2023

Phone calls to/from the public:

| Received Call | 2021 | 2022 | 2023 Projection |
|-------------------|-----------|-----------|------------------|
| Number of Calls | 39,713 | 21,250 | 20,000 |
| Duration of Calls | 417:10:01 | 628:22:14 | 600:00:00 |

Emails to/from the public:

| Emails | 2021 | 2022 | 2023 Projection |
|---------------------------|---------------|---------------|-----------------|
| Number of Received Emails | 5,382 | 7,699 | 9,000 |
| Number of Sent Emails | 16,084 | 6,767 | 8,000 |
| Total | 21,466 | 14,446 | 17,000 |

2024 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 2024 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 2023 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 collect from 30,000 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.



2023 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) 2023, 130 new accounts are being added to existing refuse collection routes. An ongoing increase of service users is expected:

| Service User (HH) | 2021 | 2022 | 2023 Projection |
|-------------------|---------------|---------------|-----------------|
| Total | 29,670 | 29,933 | 30,200 |

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

| Kilograms per Household | 2021 | 2022 | 2023 Projection |
|-------------------------|------|------|-----------------|
| Landfill | 220 | 225 | 230 |
| Recycling | 125 | 125 | 120 |
| Organics | 279 | 275 | 260 |
| Total | 624 | 625 | 610 |

- Gradual increase in total collection due to population increase:

| Total Volume (tonne) | 2021 | 2022 | 2023 Projection |
|----------------------|--------|--------|-----------------|
| Landfill | 6,492 | 6,694 | 6,800 |
| Recycling | 3,687 | 3,720 | 3,500 |
| Organics | 8,242 | 8,206 | 7,250 |
| Total | 18,421 | 18,620 | 17,550 |

2024 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 | 2022 | 2022 | 2023 Projection |
|--------------------------|----------|----------|-----------------|
| Landfill Waste | 140.00 | \$145.00 | \$150.00 |
| Organic Materials | \$107.96 | \$114.87 | \$119.87 |

- To ensure that residential curbside collection remains efficient and sustainable in the face of urban growth, the City conducted 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.

2024 CONSIDERATIONS AND OPPORTUNITIES

- To ensure that residential curbside collection remains efficient and sustainable in the face of urban growth, the City conducted 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 has been 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. The contamination rate was reduced to 7.7% by end of 2022, but did not meet the target of 25% improvement.
- RecycleBC extended the “Contamination Remediation Plan” for one more year in 2023. To meet the target, a new plan was developed and launched in 2023, including carts inspection.
- 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 have increased 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 multi-year waste receptacles purchase is proposed for 2023-2025 to increase the number of waste receptacles in public spaces. Design and procurement of new types of public space waste receptacles has been launched in 2023.
- A Public Space Sanitation Enhancement has been started in 2023 to address the needs and service level requirements 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. | 1,011 Interments |
| Bowen Cemetery | Closed for sales of new plots. Open to burials in existing plots. | 14,786 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.

2023 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.
- In 2022, there have been 88 interments conducted, including 12 full burials and 76 cremation burials.

- Public Works, IT and Finance Departments collaborated to modernize record keeping and scanned Cemetery paper documents and historical data and their digital copies saved.

2024 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 and sustainable business model and service plan, staff have launched a business model review in 2023. This supports City Plan's goals of a Thriving and Resilient Economy and Equitable Access and Mobility.



ROADS AND TRAFFIC

Apart from Highways 1 and 19, the City owns and maintains its road network, including pavement management, winter clearing, signage, and pedestrian and cycling facilities.

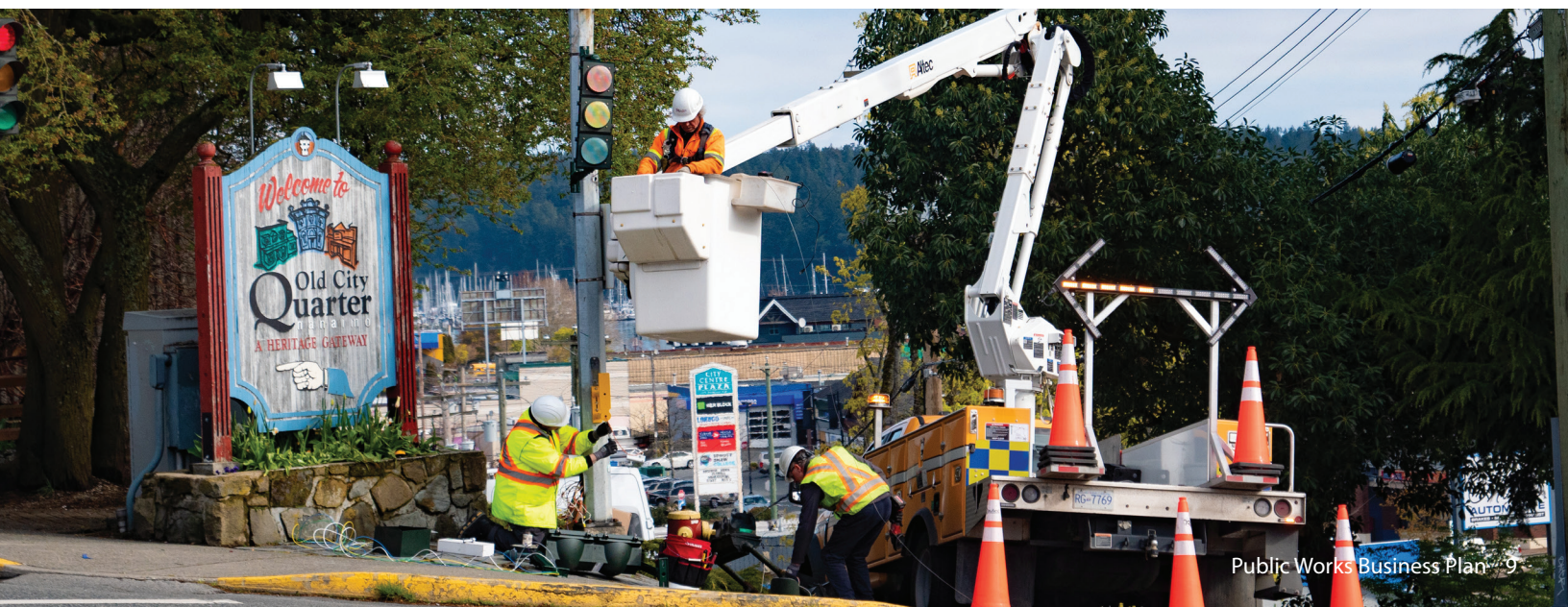
In 2023, there were:

- 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, and
- 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.





2023 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
- Council updated Pothole, Sidewalk Trip and fall and snow and ice policies.
- Coordinated efforts with Parks to clear Active Transportation corridors
- Improved service to cul-de-sacs with the addition of contract equipment
- Negotiated improved road salt supply contract with supplier

2024 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. 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 any time road or trail improvements are undertaken near the crossing. Significant changes to Federal rail standards mean these crossings are 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).
- Continuing increases in asphalt pricing and sole supplier may result in reduced quantity of work if budgets remain unchanged.

UTILITIES AND WATER 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 209 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 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 mains 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
- 647 km of distribution watermain (as of 2022)
- 93 km of transmission watermain
- 8 reservoirs (storage tanks)
- 3,283 Fire Hydrants (as of Dec 2022)
- 12,000 valves (as of Dec 2022)
- Jump Lake Dam Reservoir
- South Fork Dam Intake
- South Fork Water Treatment Plant
- 6 pump stations
- 27,486 + service connections
- Energy Recovery Facility
- 13.2 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).
- 50 new fire hydrants added to distribution system, 6 hydrant repairs due to motor vehicle accidents.
- 500 hydrants flushed during annual flushing program.

2023 ACCOMPLISHMENTS

- Completed the Water Supply Strategy update as a supporting document for City Plan – Nanaimo ReImagine.
- Decrease of 11.4% on daily consumption in the past decade, with a population increase of 24%. The average daily consumption of water for all users in Nanaimo during 2022, was approximately 342 liters per person per day. The average daily consumption of water for residential users in 2022, was approximately 189 liters per person per day.
- Completion of the South Fork Water Treatment Plant storage building.
- Disaster Mitigation and Adaption Fund grant application for South Fork Dam upgrade.



- Engaged dam engineering consultant for hydraulic analysis and dam safety review assessment for Middle Chase River Dam.
- Water conservation initiatives to date include staged watering restrictions, public education, tiered billing rates, toilet and appliance rebates. Increased to Stage 3 on July 5 Watering Restrictions in an effort to avoid going to Stage 4 – total outdoor watering ban. These efforts have resulted in historical low water demands well below Provincial and Federal levels. We are well below our 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 updated 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.
- Continued with electrical service upgrades at the South Fork Water Treatment Plant and procured contract for the supply and installation of two load sharing redundant emergency back-up generators.
- Continued with 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 1,200 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.
- Revenue from the sale of electricity to BC Hydro Reservoir No. 1 Energy Recovery Facility for 2022 was \$ 85,102.
- 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 2023 Formal Annual Dam Safety inspections.
- Continued valve maintenance on supply and distribution systems.
- Completed the 2023 flushing program, maintaining high quality of potable water.
- Continued with communication and security upgrades at the Jump Creek and South Fork Reservoirs.
- Continued with the construction of Phase 1 Midtown Water Supply project and established a value design working group with the engineer, owner and contractor resulting in over \$5 million in cost savings.
- Implemented Water Supply Strategy recommendations, goals and objectives as part of the City Plan. This 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.



2024 CONSIDERATIONS AND OPPORTUNITIES

- Continue with construction and completion of Phase 2 Midtown 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.
- Install a new emergency backup generator at the College Drive Pump Station.
- Development of an Operations and Maintenance Manual for Water Supply.
- Update Emergency Water Supply Dam to include drought. And climate change initiatives.
- Formal Dam Safety Reviews for all water supply and recreational dams.
- 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%. Over this 10 year time period, an additional \$6 million in water distribution infrastructure has been added to the City through transfer from development. Moving forward, additional staffing in water distribution and supply needs to be considered to operate and maintain water infrastructure.

SANITARY SEWER

The City provides and maintains a safe, 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).
- 26,714 lateral sewer service lines totalling 287 km to individual properties.
- 9,098 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.

2023 ACCOMPLISHMENTS

- Maintain yearly sewer flow and rainfall monitoring program for city wide sewer model calibration.
- Implemented Cartegraph Asset Management Software.
- Video inspection and condition assessment of 27.6 km of sewer pipe completed by City forces and contractor.
- Manhole inspections for public safety, infiltration and inflow issues.
- Infiltration and inflow maintenance in easements and rights-of-ways.
- Responded to 206 Work orders to date (Aug 16, 2023).
- 35 service repairs/ upgrades.
- 49.5 kms flushed (Aug 3, 2022).
- Cleared 12 plugged services, 4 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.

2024 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.
- 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.
- Integration of new CCTV van allowing next generation analysis of underground assets.
- Continue to work closely with RDN on source control issues and monitoring.
- 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:

- 600 km of storm drainage mains.
- 558 km of ditches.
- 16,449 storm lateral services totalling 157km.
- 7,385 manholes.
- 13,714 catchbasins.
- 41 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.

2023 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.
- Implementation of Cartegraph Asset Management Software for sewer.
- 7,857 catchbasins cleaned to prevent sediment and heavy

metal contaminants from entering storm system, as of Aug 16, 2023.

- Coordination of Road Rehab and Traffic Calming programs to improve and safety.
- Cleaned and rehabilitated portion of Cottle Creek in conjunction with DFO.
- Completed City wide storm drain infrastructure inventory for SD model.
- Replaced & upgraded 192 m of failed corrugated steel pipe and responded to 317 work orders to date.
- Installed 10 new SD services, upgraded 15 existing services.
- Conducted seasonal water sampling program for faecal coliform on local area beaches. May- Sept.
- Installed Stormceptor at bottom of PW Yard to prevent pollution of Northfield Ck.

2024 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.

FLEET

The Fleet Section provides support, oversight and maintenance of the City's transportation and mobile equipment inventory. The group includes 14 permanent staff and a manager.

Characteristics of the system include:

- Maintains over 160 light, medium, and heavy duty vehicles including 4 electric ice resurfacers, 12 electric cars, and 13 tractors/backhoes/loaders/ excavators.
- Maintains over 450 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 several fleet maintenance shifts from 6 am - 8:00 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 and pieces of equipment per year.

2023 ACCOMPLISHMENTS

- Continued to implement City's Green Fleet Strategy in order to reduce Green House Gas (GHG) emissions and fuel consumption.
- Continued active participation in province-wide fleet management group.
- Generated 3,155 work orders for vehicle maintenance and repair.
- Completed 54 commercial vehicle inspections.
- Implemented GPS/AVL system on entire fleet.

- Procured two Ford F-150 Lightning trucks, which are the City's first fully electric light-duty trucks.
- Recruiting a Fleet Sustainability Coordinator position that aligns with the City's Green Fleet Strategy and will enhance driver training, route planning, and reduce GHG emissions.
- Implementing fuel management system upgrade at Public Works yard.
- Implementing fleet management system upgrade that integrates with the City's Corporate Asset Management System.
- Collaborating with a contractor to conduct an Fleet EV Ready Study, which is roadmap for future vehicle electrification and GHG emission reduction strategies. The study also includes future infrastructure and facility upgrade requirements.

2024 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.
- 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.
- 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.

2024 KEY INITIATIVES

Initiatives

Strategic Priority: Implementing City Plan



IAP Priority Action #6 City Fleet Electrification – Conduct a City fleet electrification study.



IAP Priority Action #14 Chase River Hydrology Study - Develop and update a hydrology model for the Chase River watershed to account for extreme weather events and climate change and determine flood flows. Use results to complete floodplain modeling for Chase River.



IAP Priority Action #15 Departure Creek Enhancement – Continue to work with the Pacific Salmon Foundation, Departure Creek Streamkeepers, and Snuneymuxw First Nation partners to enhance the Departure Creek intake and side channel project with riparian restoration and consider creating wetland habitat and flood management at Departure Bay Centennial Park on Departure Creek.



IAP Priority Action #20 - Water Supply Strategy – Implement Water Supply Strategy which applies current climate science to estimate water supply storage and distribution infrastructure required to meet future growth and build resilience.



IAP Priority Action #21 Drinking Water and Watershed Protection Plan - Continue to support the Regional District of Nanaimo's Drinking Water and Watershed Protection Technical Advisory Committee.



IAP Priority Action #21 Chase River Hydrology Study - Continue to support the Regional District of Nanaimo's Drinking Water and Watershed Protection Technical Advisory Committee.



IAP Priority Action #22 Water Conservation - Continue the City's Water Saving Rebate Programs to reduce water consumption.



IAP Priority Action #23 Sewer Inflow and Infiltration – Continue to work with the Regional District of Nanaimo towards reducing infiltration and inflow from the City's sewer system in support of the Regional District of Nanaimo's Liquid Waste Management Plan.



IAP Priority Action #27 Stormwater Utility - Investigate and pursue a stormwater utility to support viability and resilience of the City's grey and green stormwater system.



IAP Priority Action #28 Midtown Water Supply - Complete the Mid-Town Water Supply upgrade to provide redundancy and resilience in the water supply. Phase 1 | Pryde Avenue to Labieux Road. Phase 2 | College Drive to Pryde Avenue. Phase 3 | Labieux Rd to Vanderneuk Road.



IAP Priority Action #29 Vanderneuk Water Reservoir – Construct a new reservoir at Vanderneuk to support future growth and resilience.

2024 KEY INITIATIVES

Initiatives

Strategic Priority: Implementing City Plan



IAP Priority Action #30 Solid Waste Governance – Develop and implement a construction recycling, deconstruction, and demolition bylaw. The bylaw will include measures to reduce the amount of waste that goes to landfill from construction and demolition activities and promote re-use of construction materials in Nanaimo.



IAP Priority Action #31 Zero Waste - Develop public events program as part of a waste reduction effort and experiential community education program.



IAP Priority Action #33 Zero Waste – Continue with Zero Waste education campaigns such as Waste Reduction Week, Single Use Item Reduction, and Green Giving.



IAP Priority Action #34 Zero Waste – Expand City services such as Reuse Rendezvous and Trunk Sale to promote Zero Waste.



IAP Priority Action #49 Midtown Connector – Beban Park Link – in collaboration with the Mid-Town Water Supply infrastructure upgrades which includes a trail connection between the E&N Trail and Parkway Trail, complete an urban hard surface trail connection through Beban Park in accordance with the Beban Park Master Plan.



IAP Priority Action #112 – Explore partnering opportunities in areas related to skill development and training with Snuneymuxw First Nation.

Strategic Priority: Maintaining and Growing Current Services

Complete update to Asphalt Maintenance Plan, incorporating Level of Service study and latest condition assessment data

Assess and implement maintenance requirements for Complete Streets Standards

Continue the curbside collection program for single family dwellings and eligible multi-family dwellings (duplexes, triplexes, and fourplexes), conduct collection analysis and perform optimization.

Strategic Priority: Capital Projects

Coordinate asphalt rehabilitation and patching with capital projects to optimize necessary expenditures

Strategic Priority: Communicating with the Community

Upgrade to a new refuse collector trucks onboard computer system, and continue use of ReCollect App, Waste Wizard, and other communication channels.

Continue Zero Waste education campaigns such as waste reduction week, public events educational booth, recycling contamination reduction campaign and Single-Use item reduction.

Strategic Priority: Governance and Corporate Excellence

Implement Council Policies for Winter Maintenance, Pothole Repairs and Sidewalk Repairs

Develop Green Event policy to ensure waste created in public events are [properly diverted, recovered, and disposed of.

PROPOSED OPERATING BUDGET - PUBLIC WORKS

| | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Approved Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget |
| Revenues | | | | | | |
| Cemetery Operations | \$ 76,000 | \$ 87,000 | \$ 87,870 | \$ 88,750 | \$ 89,637 | \$ 90,532 |
| Drainage | 41,385 | 14,585 | 8,079 | 4,807 | 1,470 | 1,499 |
| Fleet Operations | - | - | - | - | - | - |
| Public Works Support Services | 791,000 | 1,230,000 | 1,257,275 | 1,282,320 | 1,307,864 | 1,333,919 |
| Solid Waste Management | 8,110,125 | 8,444,613 | 8,743,824 | 8,707,464 | 8,669,480 | 8,756,220 |
| Transportation | 69,436 | 69,436 | 70,130 | 70,831 | 71,540 | 72,255 |
| Annual Operating Revenues | \$ 9,087,946 | \$ 9,845,634 | \$ 10,167,178 | \$ 10,154,172 | \$ 10,139,991 | \$ 10,254,425 |
| Expenditures | | | | | | |
| Cemetery Operations | \$ 286,693 | \$ 287,310 | \$ 293,840 | \$ 299,709 | \$ 305,708 | \$ 311,726 |
| Drainage | 2,358,004 | 2,482,887 | 2,529,422 | 2,568,443 | 2,608,039 | 2,659,985 |
| Fleet Operations | 3,168,029 | 3,585,966 | 3,674,513 | 3,747,901 | 3,822,945 | 3,897,663 |
| Public Works Support Services | 2,239,646 | 2,748,698 | 2,815,775 | 2,871,830 | 2,929,123 | 2,985,299 |
| Solid Waste Management | 8,752,616 | 8,591,133 | 8,622,091 | 8,514,021 | 8,517,827 | 8,596,151 |
| Transportation | 6,696,501 | 7,153,766 | 7,340,575 | 7,482,062 | 7,636,915 | 7,782,594 |
| Annual Operating Expenditures | \$ 23,501,489 | \$ 24,849,760 | \$ 25,276,216 | \$ 25,483,966 | \$ 25,820,557 | \$ 26,233,418 |
| Net Annual Operating Expenditures | \$ 14,413,543 | \$ 15,004,126 | \$ 15,109,038 | \$ 15,329,794 | \$ 15,680,566 | \$ 15,978,993 |
| Staffing (FTEs) - Budgeted | 74.2 | 74.2 | 74.2 | 74.2 | 74.2 | 74.2 |

Includes 1 custodian who reports to Facility Maintenance in PRC but is budgeted in Public Works



PROPOSED OPERATING BUDGET - PUBLIC WORKS

| | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Approved Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget |
| Expenditure Summary | | | | | | |
| Wages & Benefits | \$ 8,094,106 | \$ 8,845,850 | \$ 9,084,098 | \$ 9,261,663 | \$ 9,443,578 | \$ 9,619,134 |
| Services & Supply Contracts | 6,185,414 | 6,681,552 | 6,765,285 | 6,909,207 | 7,030,714 | 7,184,319 |
| Materials & Supplies | 3,134,802 | 3,375,316 | 3,425,921 | 3,503,275 | 3,542,184 | 3,630,243 |
| Utilities | 1,694,500 | 1,729,300 | 1,763,886 | 1,799,163 | 1,835,147 | 1,871,851 |
| Internal Charges & Other | 3,640,363 | 3,835,220 | 3,862,997 | 3,712,485 | 3,670,708 | 3,697,469 |
| Debt Servicing | 749,804 | 380,022 | 371,479 | 295,572 | 295,573 | 227,696 |
| Grants & Subsidies | 2,500 | 2,500 | 2,550 | 2,601 | 2,653 | 2,706 |
| Annual Operating Expenditures | \$ 23,501,489 | \$ 24,849,760 | \$ 25,276,216 | \$ 25,483,966 | \$ 25,820,557 | \$ 26,233,418 |

2023 wages & benefits reflect 2022 wage rates as contract negotiations were completed after adoption of 2023 - 2027 Financial Plan

PROPOSED OPERATING BUDGET - SANITARY SEWER

| | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Approved Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget |
| Revenues | | | | | | |
| Sanitary Sewer | \$ 9,243,016 | \$ 9,689,022 | \$ 10,164,715 | \$ 10,664,360 | \$ 11,089,441 | \$ 11,531,511 |
| Annual Operating Revenues | \$ 9,243,016 | \$ 9,689,022 | \$ 10,164,715 | \$ 10,664,360 | \$ 11,089,441 | \$ 11,531,511 |
| Expenditures | | | | | | |
| Sanitary Sewer | \$ 4,432,830 | \$ 4,421,503 | \$ 4,575,198 | \$ 4,636,434 | \$ 4,715,397 | \$ 4,796,240 |
| Annual Operating Expenditures | \$ 4,432,830 | \$ 4,421,503 | \$ 4,575,198 | \$ 4,636,434 | \$ 4,715,397 | \$ 4,796,240 |
| Net Annual Operating Revenues | \$ 4,810,186 | \$ 5,267,519 | \$ 5,589,517 | \$ 6,027,926 | \$ 6,374,044 | \$ 6,735,271 |
| Staffing (FTEs) - Budgeted | 10.8 | 10.8 | 10.8 | 10.8 | 10.8 | 10.8 |

| | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Approved Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget |
| Expenditure Summary | | | | | | |
| Wages & Benefits | \$ 1,127,808 | \$ 1,197,759 | \$ 1,232,447 | \$ 1,250,129 | \$ 1,275,170 | \$ 1,300,505 |
| Services & Supply Contracts | 290,826 | 324,990 | 324,861 | 324,590 | 331,085 | 337,700 |
| Materials & Supplies | 649,045 | 606,270 | 625,838 | 646,290 | 667,681 | 689,832 |
| Utilities | 45,850 | 46,950 | 47,889 | 48,848 | 49,824 | 50,819 |
| Internal Charges & Other | 1,850,481 | 1,704,477 | 1,735,332 | 1,766,763 | 1,800,839 | 1,835,599 |
| Debt Servicing | 464,820 | 537,057 | 604,751 | 595,652 | 586,553 | 577,455 |
| Grants & Subsidies | 4,000 | 4,000 | 4,080 | 4,162 | 4,245 | 4,330 |
| Annual Operating Expenditures | \$ 4,432,830 | \$ 4,421,503 | \$ 4,575,198 | \$ 4,636,434 | \$ 4,715,397 | \$ 4,796,240 |

2023 wages & benefits reflect 2022 wage rates as contract negotiations were completed after adoption of 2023 - 2027 Financial Plan

PROPOSED OPERATING BUDGET - WATERWORKS

| | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Approved Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget |
| Revenues | | | | | | |
| Water | \$ 25,233,869 | \$ 26,693,552 | \$ 28,046,968 | \$ 29,467,467 | \$ 30,669,359 | \$ 31,618,571 |
| Annual Operating Revenues | \$ 25,233,869 | \$ 26,693,552 | \$ 28,046,968 | \$ 29,467,467 | \$ 30,669,359 | \$ 31,618,571 |
| Expenditures | | | | | | |
| Water | \$ 13,160,107 | \$ 13,791,359 | \$ 14,135,604 | \$ 14,432,975 | \$ 14,731,168 | \$ 15,020,536 |
| Annual Operating Expenditures | \$ 13,160,107 | \$ 13,791,359 | \$ 14,135,604 | \$ 14,432,975 | \$ 14,731,168 | \$ 15,020,536 |
| Net Annual Operating Revenues | \$ 12,073,762 | \$ 12,902,193 | \$ 13,911,364 | \$ 15,034,492 | \$ 15,938,191 | \$ 16,598,035 |
| Staffing (FTEs) - Budgeted | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |

| | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Approved Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget | Draft Budget |
| Expenditure Summary | | | | | | |
| Wages & Benefits | \$ 3,728,280 | \$ 4,094,844 | \$ 4,230,888 | \$ 4,315,247 | \$ 4,401,673 | \$ 4,483,813 |
| Services & Supply Contracts | 958,941 | 1,110,417 | 1,128,546 | 1,145,909 | 1,168,827 | 1,192,204 |
| Materials & Supplies | 2,163,835 | 2,137,502 | 2,211,560 | 2,288,037 | 2,354,731 | 2,413,237 |
| Utilities | 233,920 | 244,300 | 249,186 | 254,169 | 259,254 | 264,437 |
| Internal Charges & Other | 4,194,955 | 4,177,187 | 4,247,044 | 4,318,430 | 4,391,107 | 4,465,227 |
| Debt Servicing | 1,874,176 | 2,021,109 | 2,062,380 | 2,105,183 | 2,149,576 | 2,195,618 |
| Grants & Subsidies | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 |
| Annual Operating Expenditures | \$ 13,160,107 | \$ 13,791,359 | \$ 14,135,604 | \$ 14,432,975 | \$ 14,731,168 | \$ 15,020,536 |

2023 wages & benefits reflect 2022 wage rates as contract negotiations were completed after adoption of 2023 - 2027 Financial Plan

Proposed Changes

Two business cases have been prepared for Council's consideration for inclusion in the 2024 – 2028 Financial Plan, one for a Mechanic, Emergency Vehicle Technician and one for a Mechanic Fleet Generator Technician.