



ENGINEERING & PUBLIC WORKS
Engineering
2022 Business Plan



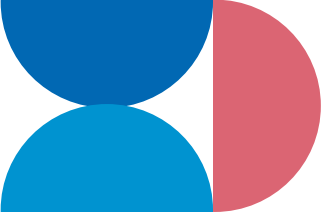
DEPARTMENT OVERVIEW

The Engineering Department provides infrastructure and systems, planning and management to support critical City services, including: transportation, water distribution, sanitary sewer, drainage and facilities. A substantial aspect of the work in Engineering is project management, which often includes projects for other departments.

As a result of the COVID-19 Pandemic, it was necessary to shift to a business continuity mode in the spring of 2020. Since then, Engineering adapted to the new normal and was able to effectively conduct business. Although through 2021, safety protocols limited in person meetings and other types of gatherings. The overall impact on Engineering as a result of the pandemic is considered to be negligible however, there were certain areas that demanded greater attention, such as traffic calming.

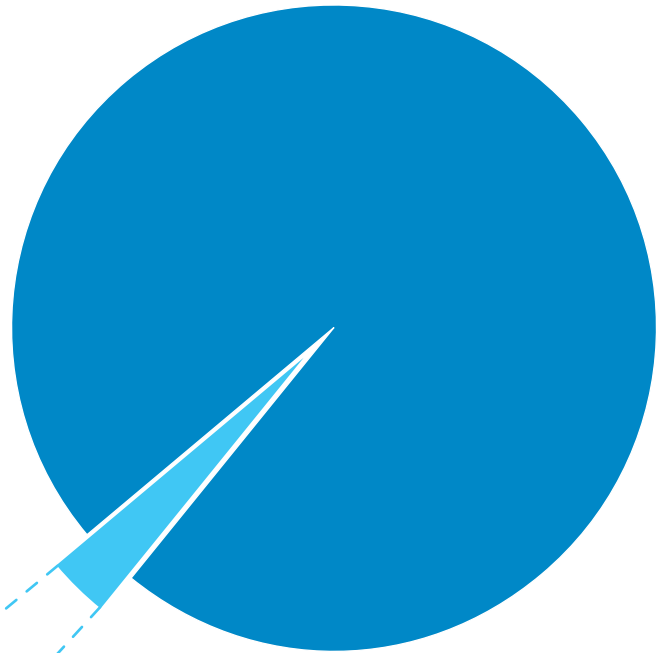
The Engineering Department is currently composed of five primary groups:

- Administration,
- Transportation,
- Facility Asset Planning,
- Infrastructure Planning, and
- Projects.

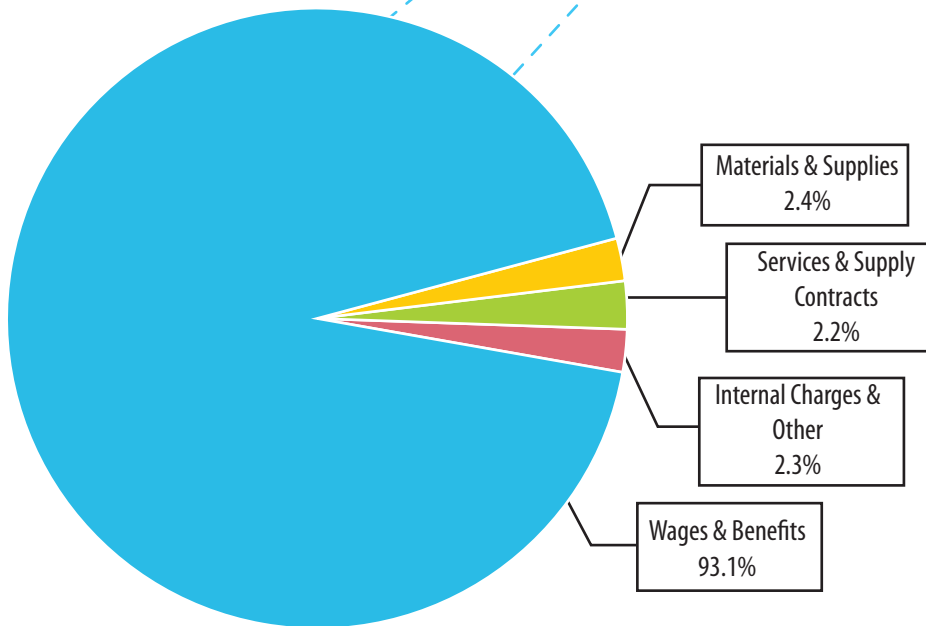


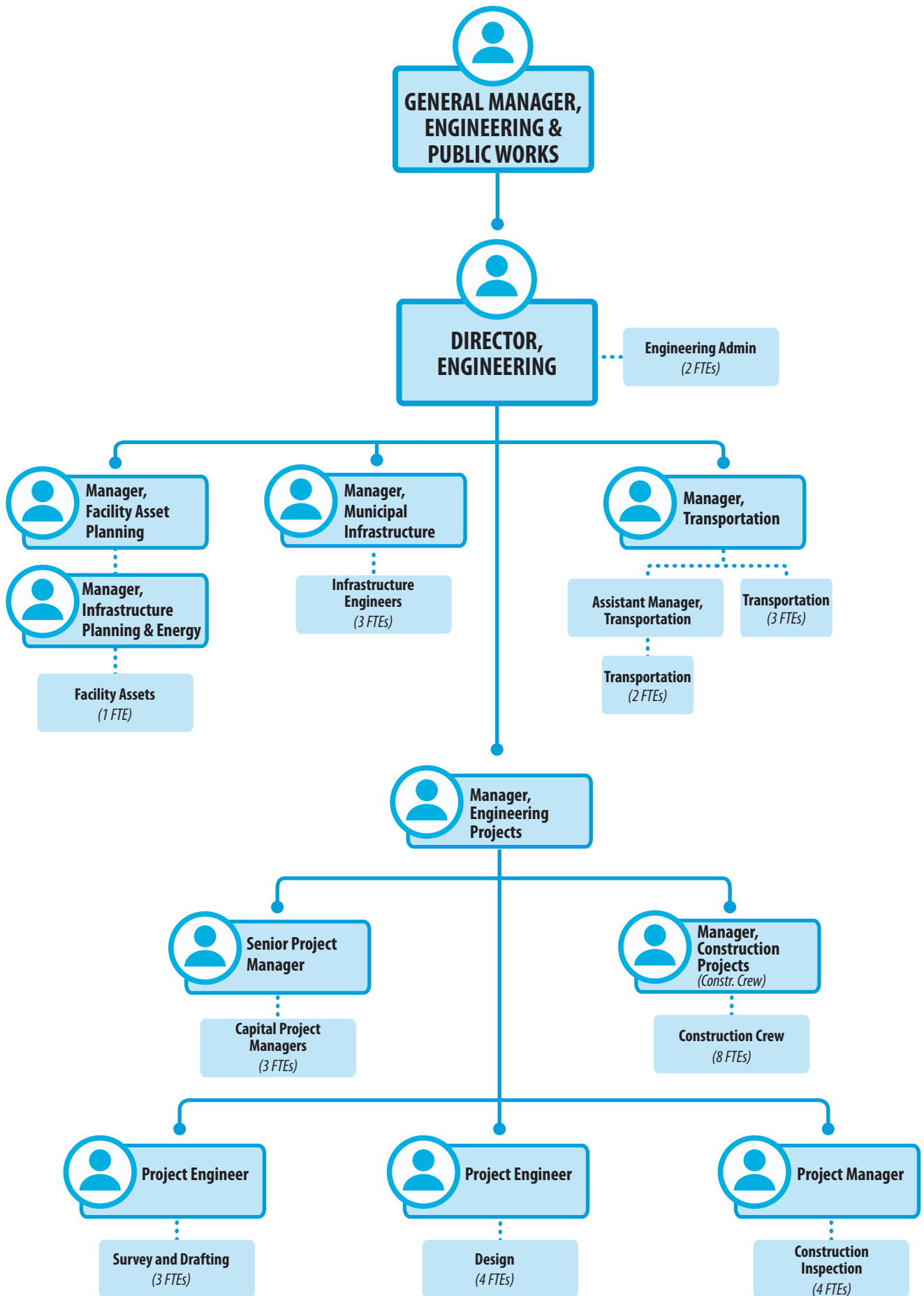
DEPARTMENT'S SHARE OF THE BUDGET

Operating Expenditure Budget:
\$ 4,912,324



ENGINEERING 3.0%
REMAINING CITY BUDGET 97.0%





ADMINISTRATION

The Administration of Engineering provides essential support to the department. These are front line staff that interact with the public, provide financial and clerical support, records management, organize, and ensure that other staff have the day-to-day resources they need.

Administrative services for the Engineering Department is provided by 2 staff members located at the Service and Resource Center (SARC).

Level of Service

- A front counter is available at SARC for the public to access and reach staff in Engineering during normal working hours.
- Permit processing and approvals including trucking, film, street use, third party utility construction, etc.
- Clerical support for Council and Committee reports.
- Records management for the department is maintained.
- Assistance for financial transactions and processing of invoices.

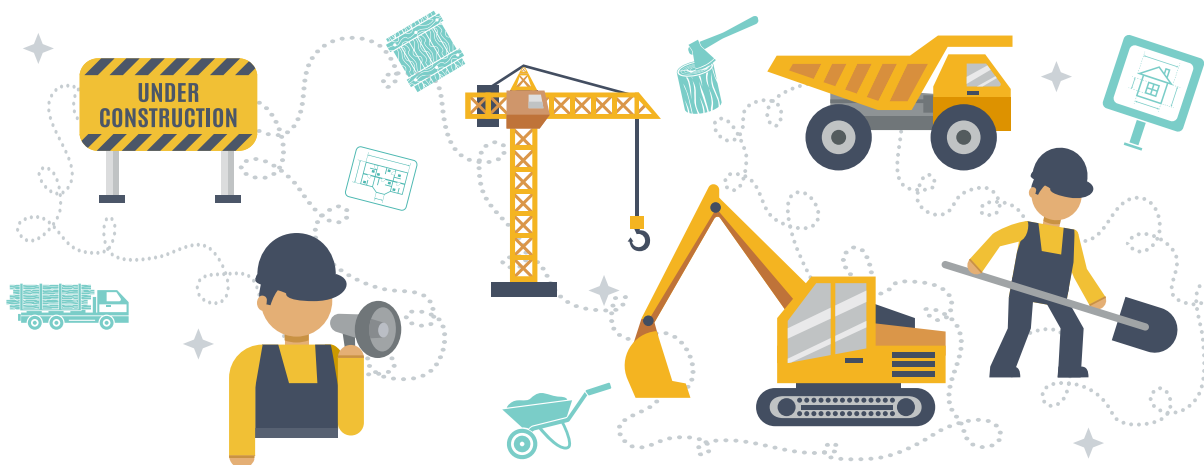
Administration for Engineering is primarily internally focused and supports matters relating to infrastructure planning, technical and project standards, capital project design and construction.

2021 Accomplishments

- Over 300 permits processed in 2021.
- Brought a coop student on board for 8 months of the year.

2022 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. In 2022, staff will continue with this level of service; however, use the voicemail box to provide information during periods of high call volumes.



TRANSPORTATION

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. For the past five years, using the Transportation Master Plan as a guide, efforts are being made to reduce reliance on the automobile and increase the number of trips taken by transit, bicycle or on foot.

In 2021, there were:

- 645 km of roads, 453 km of sidewalks, 103 km of bicycle lanes/cycle tracks.
- 53 signalized intersections, four roundabouts, 26,114 traffic signs.
- 1,576 pay parking spaces (285 on street and 1291 off street).
- 18 bridges, 28 railroad crossings.
- 4,504 City owned streetlights, and 4,258 lights leased from BC Hydro.
- 1,318 marked crosswalks, and 56 pedestrian activated crosswalk-warning beacons.

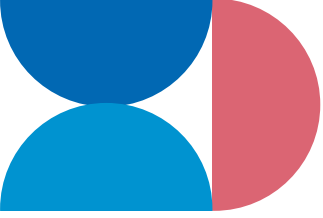
Level of Service:

- In an effort to efficiently manage the City's Transportation infrastructure, two models are maintained; one to monitor travel demand, the other to monitor condition of the infrastructure. Each of these models play an instrumental role in guiding, planning and maintaining the City's over \$300 Million Transportation assets.
- Safety, accessibility, efficiency, and sustainability are key goals of the transportation system. In order to achieve or maintain these goals, the City is constantly gathering data and analysing the system.

- In addition to the hard infrastructure the City plans and maintains, Transportation also provides support for strategic initiatives to promote, educate, empower, and encourage our residents to find ways to move through our City. These include, Go By Bike, Commuter Challenge and Active Routes to School events.

2021 Accomplishments

- Renewed over 49,087 m² of asphalt road surface.
- Added 4.0 kms of bike lanes/cycle tracks.
- Added 2.2 kms of sidewalks.
- City of Nanaimo received the prestigious 2021 Institute of Transportation Engineers (ITE) Transportation Achievement Award - Complete Streets.
- Completed review and update of Pedestrian Prioritization Planning process.
- Plan implementation of City wide Centralized Traffic Signal Management System (TSMS).
- Launched new web based traffic data and analysis platform (internal use).
- Constructed several major projects including Metral Drive Phase 1 and Front Street Cycle Track.
- An additional \$700,000 from Council directed toward pedestrian mobility enhancements. These funds will enhance eight pedestrian crossings within the City and addressed accessibility barriers at 10 Traffic Signals and 20 Transit Stops.
- Intersection upgrades included:
 1. Bruce Street at Albion Street
 2. Departure Bay Road at Departure Bay School
 3. Hammond Bay Road at Tiki Way
 4. Bruce Street and Sixth Street



TRANSPORTATION

5. Dufferin Crescent at Seafield Crescent
 6. Labieux Road at Shenton Road
 7. East Wellington Road at Westwood Road
 8. Uplands Drive at Mexicana Road
- Advanced multiple Traffic Calming projects:
 1. Departure Bay Road – Loat Street to Bay Street
 2. Bay Street – Departure Bay Road to Glenayr Drive
 3. Lost Lake Road – Rutherford Road to Laguna Way
 4. Extension Road – City limits to Cranberry Avenue
 - Staff will be embarking on an intersection safety analysis pilot project at select intersections. This process will include the use of the predictive Artificial Intelligence (AI) to identify “near misses” instead of the historical approach of collision analysis.
 - Completed 100+ Development reviews by mid-year, to assess impacts of proposed development on the transportation networks.
 - Engaged in multiple large scale land redevelopment master plan reviews:
 1. Sandstone
 2. Green Thumb
 3. Woodgrove
 4. Nanaimo North Town Centre
 5. Oceanview

2022 Considerations and Opportunities

- REIMAGINE and the suite of visioning and supporting documents associated with it have been a focus for Transportation staff through the latter

part of 2020, 2021, and into 2022. The majority of the discussions have revolved around Active Transportation; however, the breadth of this process has touched on all facets of mobility. It is envisioned that implementation strategies and action plans will be finalized in 2022.

- Through REIMAGINE, road safety has been identified as a priority for the community. To support Vision Zero Policy and Goals, staff expect to embark on a systematic review to identify and prioritize specific projects or locations throughout the City. Opportunities to advance this work will be limited by staff capacity.
- With the expected emergence from a global pandemic, staff are unsure as to what to expect, - business as usual or dramatic changes in travel patterns? It is unlikely this, the new equilibrium will clear until well beyond 2022, so staff will need to remain adaptable and vigilant in monitoring emerging trends.
- Transportation Engineering staff are collaborating with Public Works Roads staff on a road condition level of service study in 2021. This process, coupled with a pavement condition survey in 2022 will reflect the community’s wants and needs for the future and will inform future financial plans. This process may highlight a need for greater investment in asset renewal which could compete with funds for strategic expansion of walking, biking, or transit infrastructure.



INFRASTRUCTURE GROUP

The Infrastructure Group completes the planning necessary to provide a safe and efficient water distribution, sanitary sewer collection, and storm drainage infrastructure to support existing needs and future growth. The group also assembles the 10 year Capital Plan, coordinating across departments. The group includes three technical staff and one manager.

Level of Service:

- Oversee the development and implementation of the City's Infrastructure Modeling programs for water distribution, sanitary sewer and storm drainage systems.
- Oversee the Sanitary Sewer Flow, Storm Drainage Flow and Rainfall Monitoring programs.
- Manage annual program that employs Closed Circuit Television (CCTV) inspection of critical sanitary sewers and storm drainage.
- Manage yearly inspection program of critical watermains.
- Complete master plans and studies for water distribution, sanitary sewer collection, and storm drainage infrastructure.
- Develop scope of projects to renew infrastructure based on network models, condition assessments, operational input and studies.
- Coordinates the capital works program on behalf of the Engineering and Public Works (E&PW) group for inclusion into the City's Five-Year Financial Plan.
- Coordinates the review and issue of the City's MoESS.
- Engage with RDN, through participation in Liquid Waste Monitoring Committee.
- Develops policy and approach to climate change, storm water management, and asset management.

2021 Accomplishments

- Completed major update of the city-wide water model which was calibrated with fire hydrant testing and reservoir and pump station data.

- Completed one utility master plan and two drainage studies and one sewer study.
- Started two new utility master plans
- Maintained yearly Sewer Flow, Storm Drainage Flow and Rainfall Monitoring program for city wide sewer and storm drainage model calibration.
- Completed construction of sewer monitoring station to monitor flows from the Linley Valley sewer catchment.
- Oversaw video inspection and condition assessment of 33.2 km of sewer pipe and of 12.6 km of drainage pipe.
- Conducted a review of establishing Storm Water Utility as a means of more fairly allocating the service costs.
- Continued major review of water meter products for inclusion in Approved Products List (APL).
- Provided technical support for Asset Management 2022 Update.
- Prepared water and storm drainage servicing agreements with neighboring jurisdiction.
- Completed 100+ Development reviews by mid year, to assess impacts of proposed development on underground utilities.

2022 Considerations and Opportunities

- Continue development of city-wide water master plan with updated model.
- Construction of additional priority sewer monitoring station to monitor flows within the sanitary sewer system.
- To complete a Sanitary Sewer Master Plan of Brechin catchment.
- To complete a Drainage Master Plan of Departure Bay catchment including Departure Creek.
- To further develop a Storm Water Utility funding model.



CAPITAL PROJECTS

The planning, design and construction of the City's infrastructure is a major aspect of the Asset Management program.

Each project has a dedicated project manager who takes the project through the design, procurement, construction and closeout stages. Projects are designed by the City's professional engineers or by external engineering consultants, in accordance with Nanaimo's robust Project Management Framework (PMF) and Organizational Quality Management System.

The City's in-house construction crew completes several million dollars' worth of projects each year, and primarily focuses on projects that would be difficult to tender, such as smaller projects, short notice projects or projects that require a high degree of engagement with the public during construction. The construction crew is also tasked with emergency work.

The remainder of the projects are tendered and completed by external contractors. Tendering, construction management and inspection is overseen by the project manager and is completed by staff inspectors and contract administrators or by external engineering consultants.

The timing of projects is driven by a number of factors including:

- Staff capacity
- Market capacity (contractors)
- Environmental consultation
- Seasonal efficiencies.

These factors often do not align with the fiscal calendar resulting in a considerable number of projects that span multiple financial budgets. This approach allows the City to extract better value out of the projects.

Level of Service:

- Project governance is undertaken in alignment with the Project Management Framework and Project Management Policy.
- Projects are generally underway in the year they are budgeted.
- Budgets are set with high quality cost estimates prepared by professionals.
- The Public is well informed about work that may affect them or their neighbourhood.
- Project risks are identified early in the project and appropriate risk mitigation measures are put into place.
- Engineering work is completed within the City's Organization Quality Management Guidelines.

2021 Accomplishments

Overall, 63 projects with a value of \$57 million are expected to be completed or under construction by the end of 2021. An additional 30 projects with a value of \$50 million are being prepared for construction in 2022.

Major projects that were started in 2020 and completed in 2021 include:

- Metral Drive Phase 1;
- Millstone Trunk Sewer Replacement (Pryde Golf Course and Comox Road Sections); and
- Service and Resource Centre (SARC) Renovations.

Major projects that got started in 2021 and will be completed or underway by the end of the year include:

- Metral Drive Complete Streets Phase 2;
- Bowen Park Trailway and Utility Upgrades;
- Front Street Complete Streets; and
- Fourth Street Complete Streets - Harewood Road to Pine Street.

CAPITAL PROJECTS



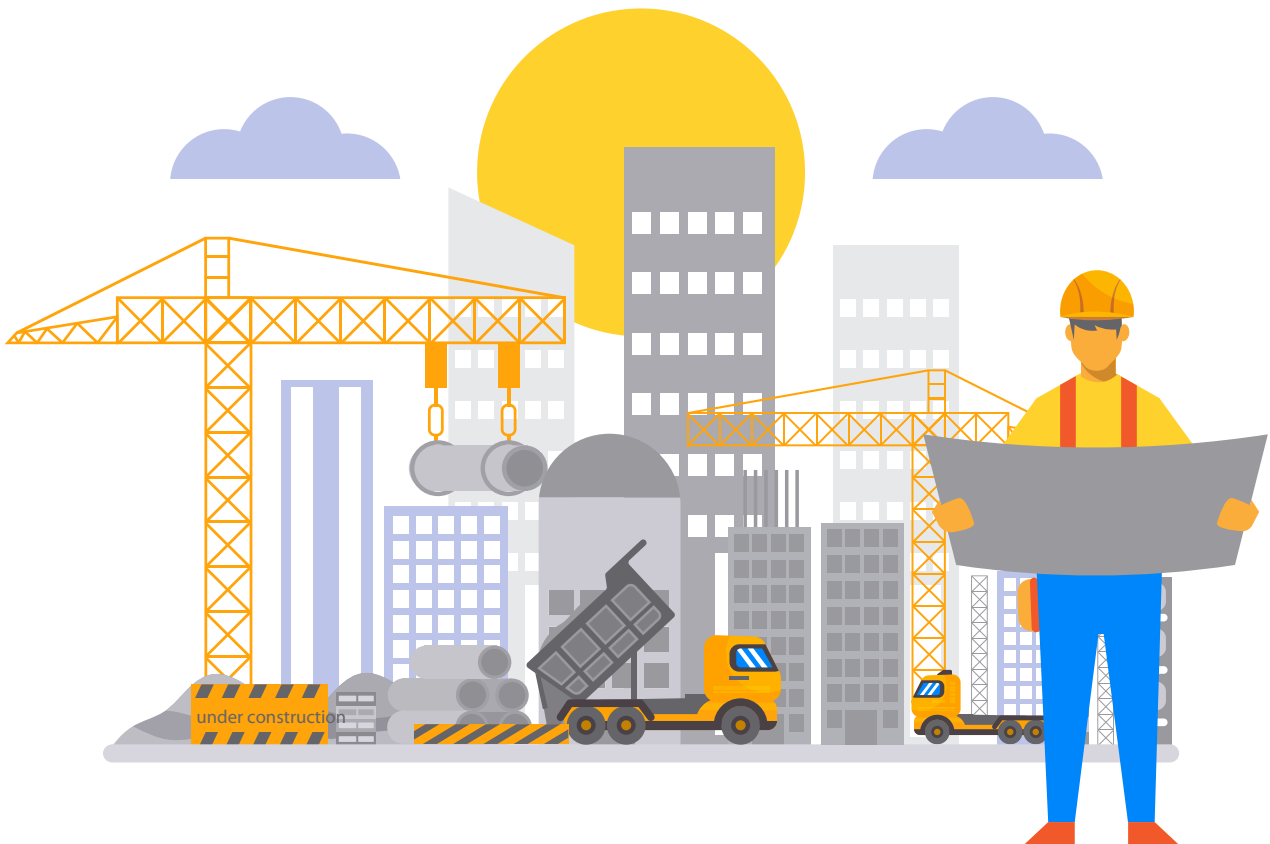
Major Projects that were designed in 2021 and will start construction in 2022 include:

- Midtown Gateway;
- Terminal Avenue Upgrades – Esplanade to Commercial Street;
- Haliburton Street Sidewalk; and
- Albert Street Complete Streets – Pine Street to Dunsmuir Street.
- An update of the City's standard tender document has been completed and implemented.
- The Provincial Professional Governance Act came into effect in November 2020. The Act covers all entities in the private and public sector that practice professional engineering. This new Act requires entities to have an organizational quality management system in place to be able to practice engineering. The Engineering Projects group developed a quality management system and is certified by the Engineers and Geoscientists of BC (EGBC).

- The City's Purchasing Department is in the process of implementing an e-bidding platform which will see tenders be submitted digitally. This will be a positive change for both the Engineering Projects group and the construction community.
- The City is developing a Negotiated Request for Proposal document for procurement of construction services.
- Council added capacity to the projects group, funding a new Project Engineer position who started in 2021.

2022 Considerations and Opportunities

- Leverage the City's new negotiated request for proposal document to ensure best value is received on major upcoming construction projects.
- To complete significant projects such as Midtown Gateway, Terminal Avenue Upgrades and Albert Street Complete Streets.
- Enhance ability to support other City Departments with project management, as required.





FACILITIES ASSET MANAGEMENT

Responsibility for facility capital planning, facility asset management, and energy and emissions management within facilities was transferred in 2021 from Parks, Recreation and Culture to a new Facility Asset Management group in the Engineering Department. This included a portfolio of approximately 100 corporate service and recreational facilities and three FTEs, including a new manager. Working closely with Parks, Recreation and Culture, this group identifies and plans for asset renewals and facility mid-life refits, while also considering energy and emissions-saving opportunities in line with the City's Climate Resiliency Strategy.

Level of Service:

- Provide long-term capital planning for facility asset renewals and upgrades.
- Seek out and optimize opportunities to reduce energy consumption and Green House Gas Emissions within the City's facilities.
- Works with Facility Managers and Operators to prioritize capital renewals to maintain levels of service.
- Manages condition assessments for City-owned facilities and building components, such as building enclosure, electrical and mechanical systems, (including plumbing and HVAC) and structural considerations (including seismic).
- Strategic energy management planning for the organization, including meeting energy saving targets and the reduction of greenhouse gas emissions, including a 13-year partnership with BC Hydro (2008 to 2022).
- Provides project management and project support for projects, oversees the budget planning, tender process, and project execution for several City Departments including, Parks, Recreation and Culture, Bylaw, Nanaimo Fire Rescue, Police Services and other civic facilities as resources allow.

2021 Accomplishments

- Transferred Facilities Asset Management from Parks, Recreation and Culture to Engineering, including two existing FTEs.

- Hired a new manager to head the Facility Asset Management group.
- Started a framework for a Facility Asset Management Strategy
- Continued with detailed condition assessments of our major corporate and recreational facilities to inventory current assets and their condition.
- Began identification and prioritization of imminent and upcoming capital renewals.
- Implemented seven energy savings initiatives at six facilities, for an expected savings of \$55,100 annually.
- Identified and initiated plans to reduce annual Green House Gas Emissions by 2,149 tonnes annually.
- Secured \$133,754 in grants and incentives to offset the capital cost of energy reduction strategies.
- Continual coordination of engineering studies for equipment and system renewals; managed design and tender preparation, and stakeholder involvement for construction activities.

2022 Considerations and Opportunities

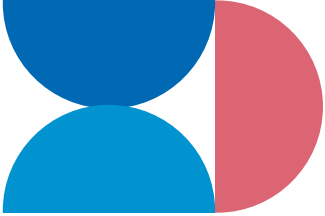
- To complete a DRAFT Facility Master Plan.
- Develop a prioritization process for facility renewals within recommended funding levels.
- Continue to grow the Facilities Asset Management team to service the influx of renewal activities identified in the condition assessments.
- Centralize facility asset record information for broad and easy access.
- Continue to source and optimize grant and other external funding opportunities for energy reduction within facilities.
- Capitalize on energy and emissions saving opportunities as part of ongoing facility renewals.
- Complete design work to significantly reduce GHG at the Nanaimo Aquatic Centre.

PROPOSED OPERATING BUDGET



	2021	2022	2023	2024	2025	2026
	Approved Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget
Revenues						
Engineering & Public Works Administration	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Engineering Support	6,300	5,300	5,353	5,407	5,461	5,515
Facility Asset Planning	-	-	-	-	-	-
Transportation	-	50,000	-	-	-	-
Infrastructure Planning	-	-	-	-	-	-
Construction Management	-	-	-	-	-	-
Annual Operating Revenues	\$ 6,300	\$ 55,300	\$ 5,353	\$ 5,407	\$ 5,461	\$ 5,515
Expenditures						
Engineering & Public Works Administration	\$ 250,058	\$ 259,898	\$ 265,096	\$ 270,398	\$ 275,805	\$ 281,321
Engineering Support	444,865	454,844	463,941	473,217	482,685	492,331
Facility Asset Planning	161,653	423,468	431,938	440,574	449,386	458,373
Transportation	865,809	885,107	902,809	920,861	939,282	958,062
Infrastructure Planning	498,643	505,037	515,139	525,439	535,948	546,664
Construction Management	2,367,671	2,383,970	2,431,400	2,479,765	2,529,112	2,579,432
Annual Operating Expenditures	\$ 4,588,699	\$ 4,912,324	\$ 5,010,323	\$ 5,110,254	\$ 5,212,218	\$ 5,316,183
Net Annual Operating Expenditures	\$ 4,582,399	\$ 4,857,024	\$ 5,004,970	\$ 5,104,847	\$ 5,206,757	\$ 5,310,668
Staffing (FTEs) - Budgeted	44.0	46.0	46.0	46.0	46.0	46.0

Includes ENGPW Admin - General Manager



PROPOSED OPERATING BUDGET

	2021	2022	2023	2024	2025	2026
	Approved Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget	Draft Budget
Expenditure Summary						
Wages & Benefits	\$ 4,252,511	\$ 4,571,063	\$ 4,662,485	\$ 4,755,734	\$ 4,850,851	\$ 4,947,863
Services & Supply Contracts	97,776	109,941	112,140	114,381	116,671	119,001
Materials & Supplies	124,125	118,945	121,071	123,239	125,453	127,711
Utilities	-	-	-	-	-	-
Internal Charges & Other	114,287	112,375	114,627	116,900	119,243	121,608
Debt Servicing	-	-	-	-	-	-
Grants & Subsidies	-	-	-	-	-	-
Annual Operating Expenditures	\$ 4,588,699	\$ 4,912,324	\$ 5,010,323	\$ 5,110,254	\$ 5,212,218	\$ 5,316,183

Includes ENGPW Admin - General Manager