

ENGINEERING DEPARTMENT 2025 BUSINESS PLAN

Committee of the Whole

DEPARTMENT RESPONSIBILITIES

- Providing technical expertise to other departments with respect to municipal services and projects
- Reviewing land development projects
- Designing and overseeing the construction of capital projects
- Implementing the asset management plan
- Providing technical expertise in the creation and management of Council's approved 5-year Capital plan



CORE BUSINESS

The Engineering Department is organized into four key areas:



Asset
management



Capital projects



Development
engineering



Permitting

STAFFING LEVELS

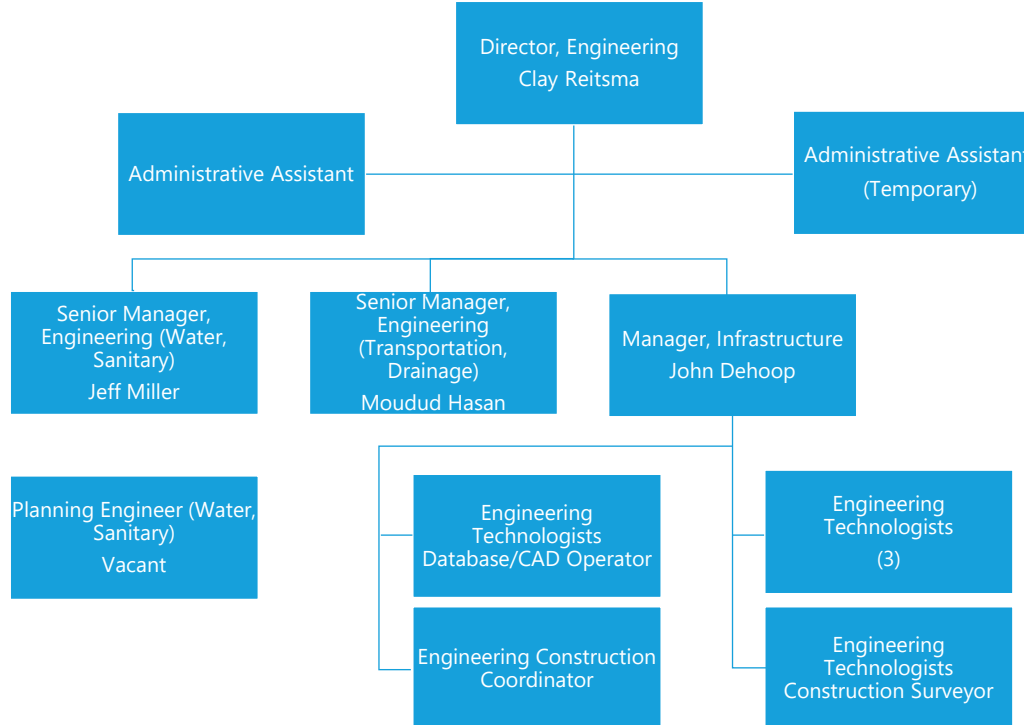
13

Total positions
as of
July 1, 2024

- 12 Full-Time, Permanent (1 Vacant)
- 1 Temporary

(Exempt 5; CUPE 8)

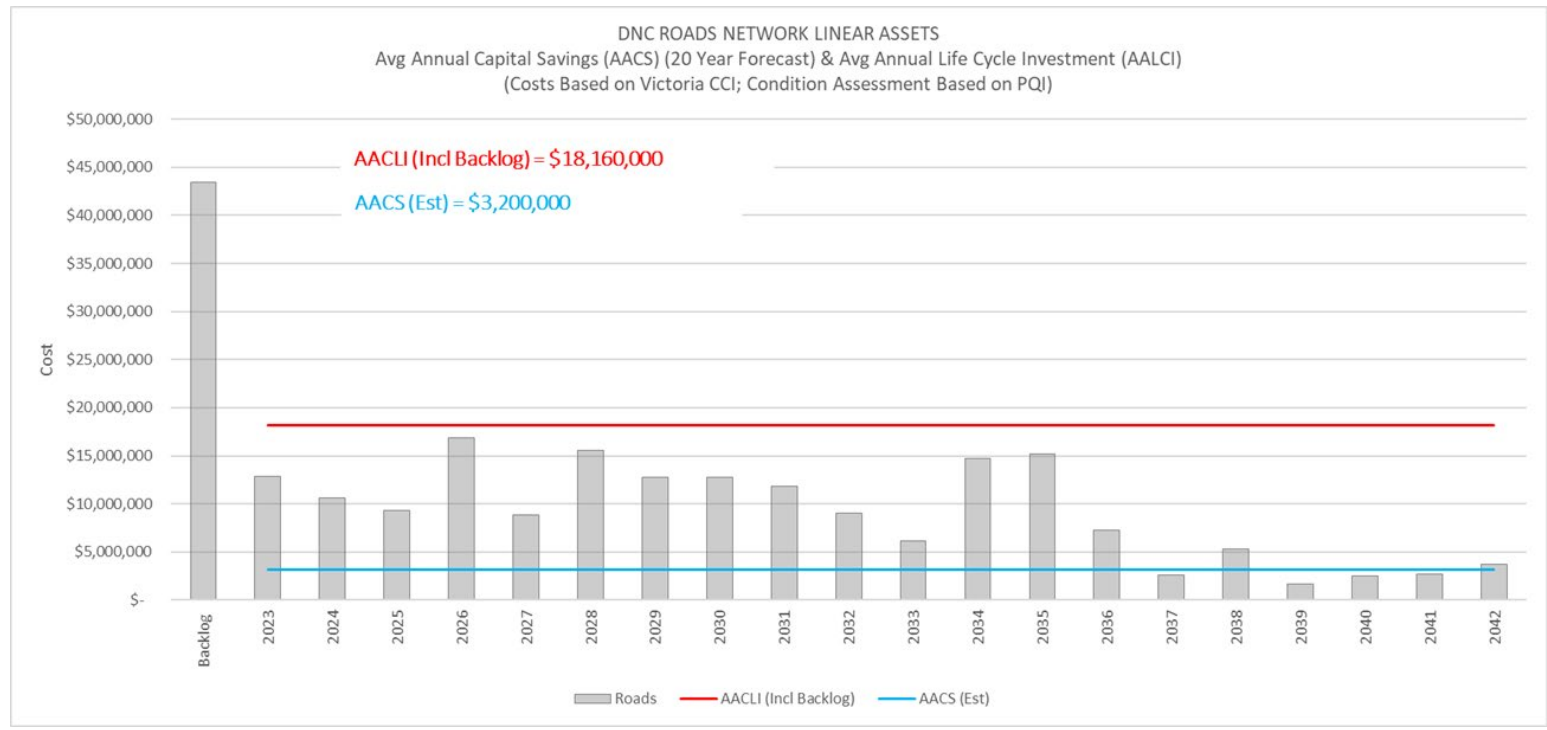
ORGANIZATIONAL STRUCTURE



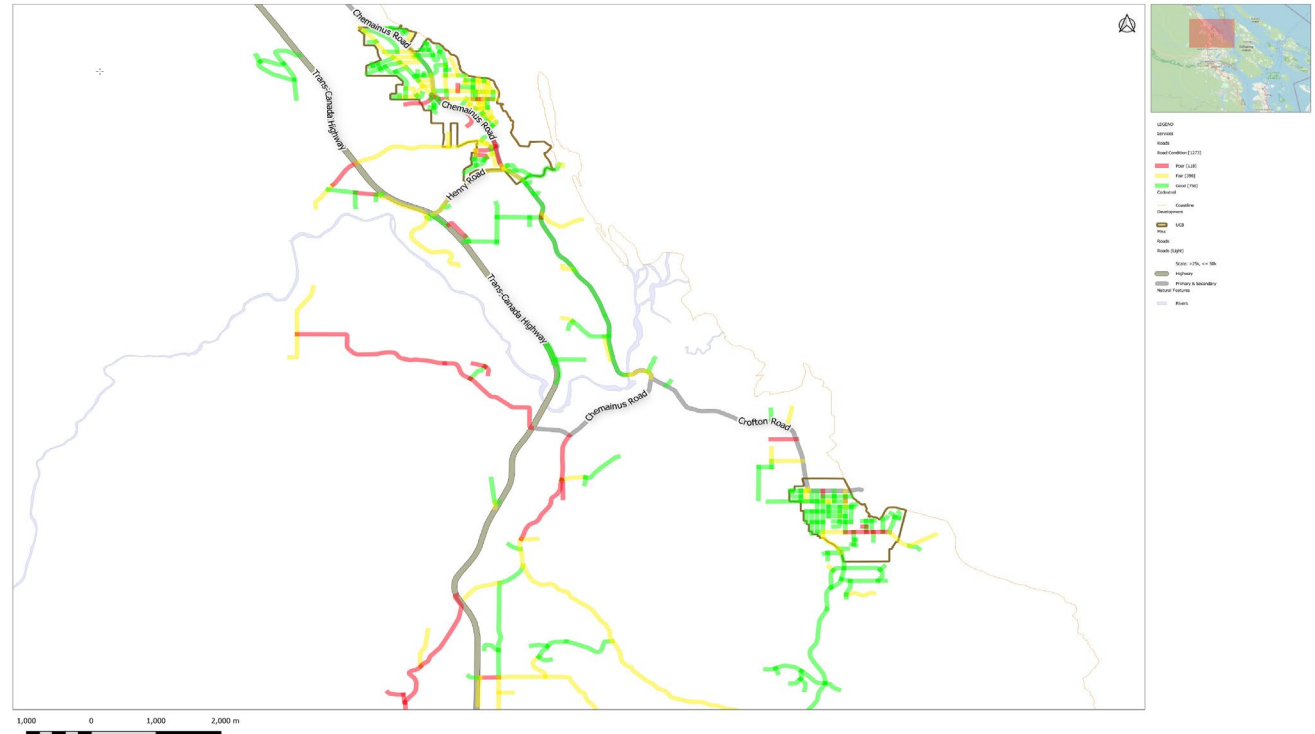
ASSET MANAGEMENT

- The Engineering Department is responsible for the following assets under North Cowichan's Asset Management plan:
 - Drinking water treatment and distribution assets
 - Wastewater collection and treatment assets
 - Stormwater conveyance and treatment assets
 - Roads and active transportation assets
 - Natural assets (with assistance from Environment Group)
- Key asset management responsibilities:
 - Implementing systems to monitor asset condition
 - Planning for replacement of assets (for lack of capacity or end of useful life)
 - Replacement of assets prior to end of useful life
 - Preparing Requests for Proposals (RFPs) and tender packages and evaluating responses to RFP calls and tenders

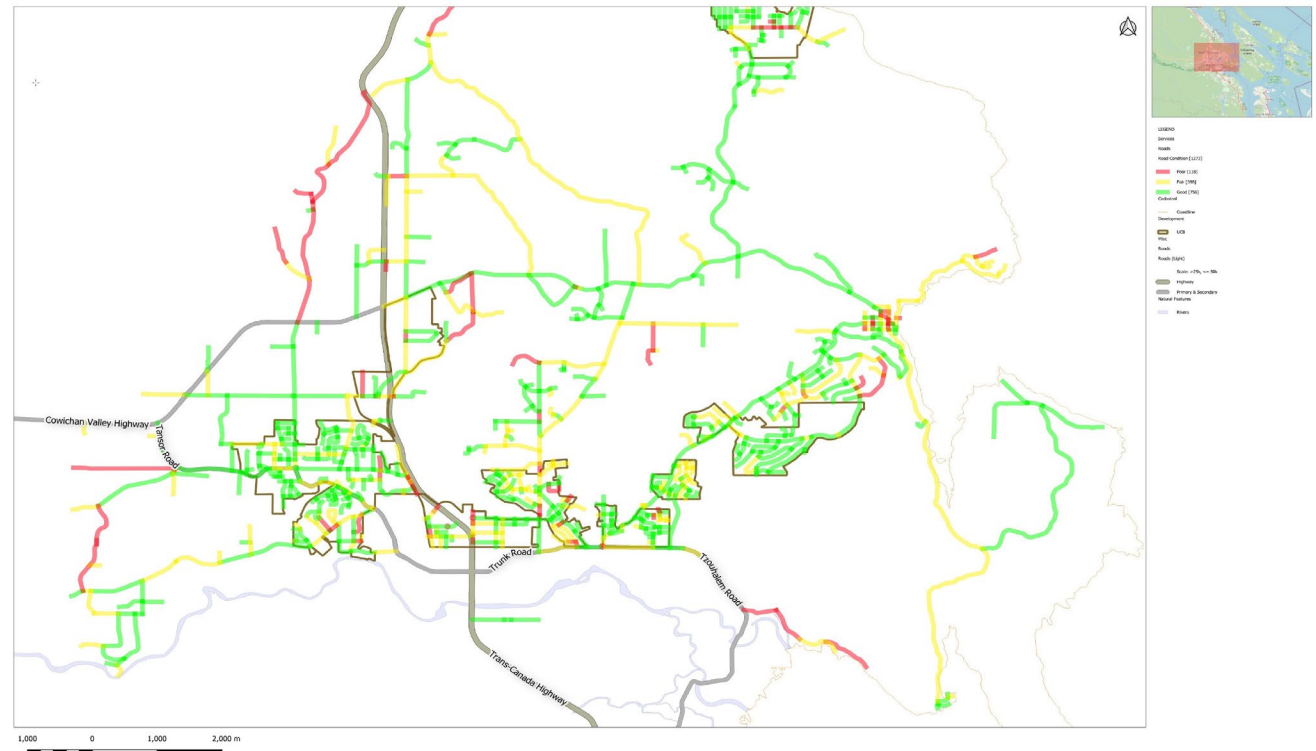
ASSET MANAGEMENT (ROADS)



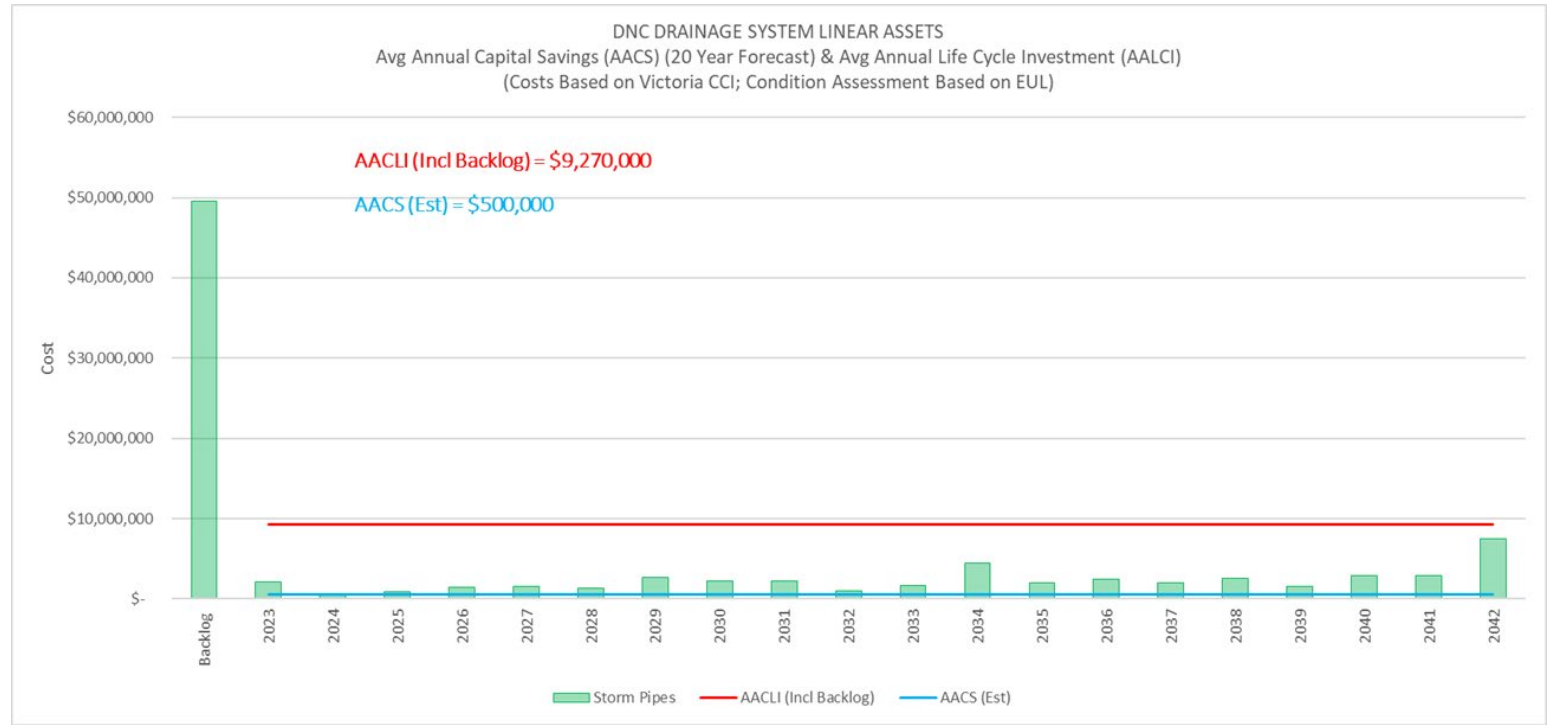
ASSET MANAGEMENT (ROADS: NORTH)



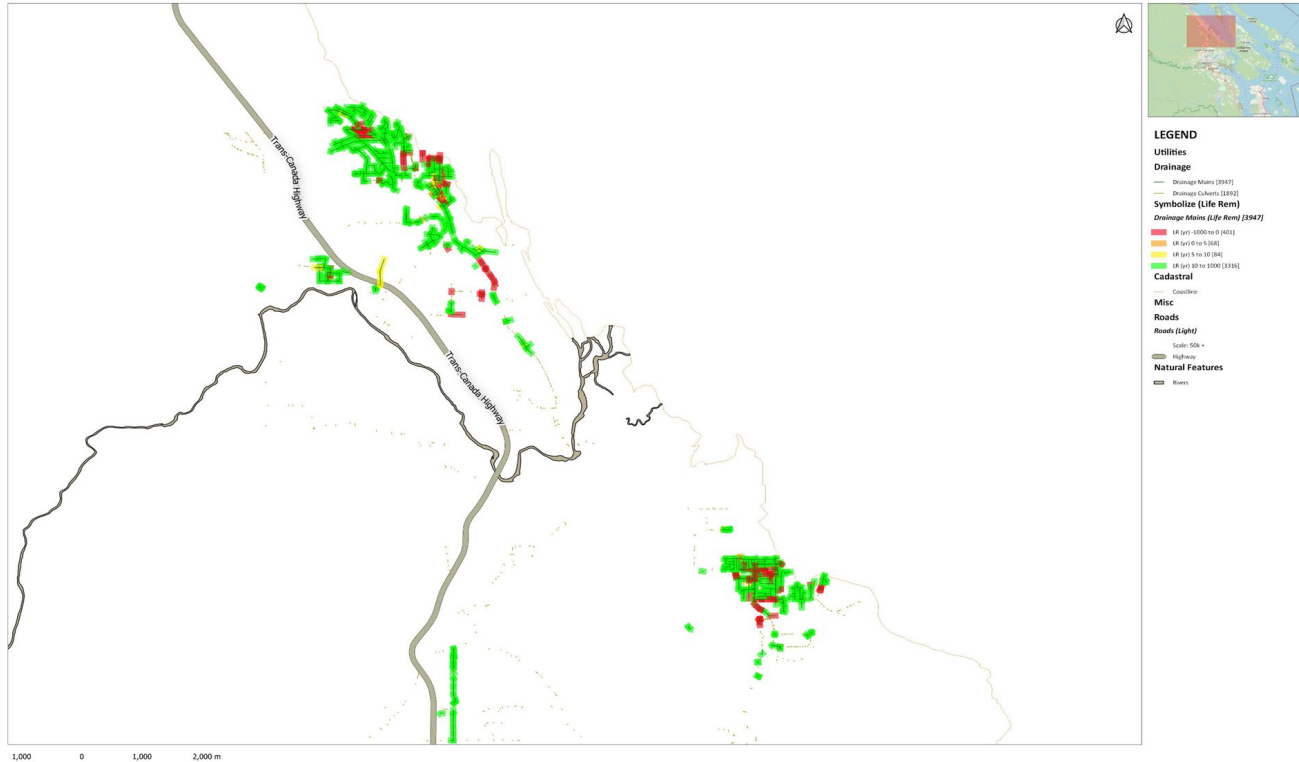
ASSET MANAGEMENT (ROADS: SOUTH)



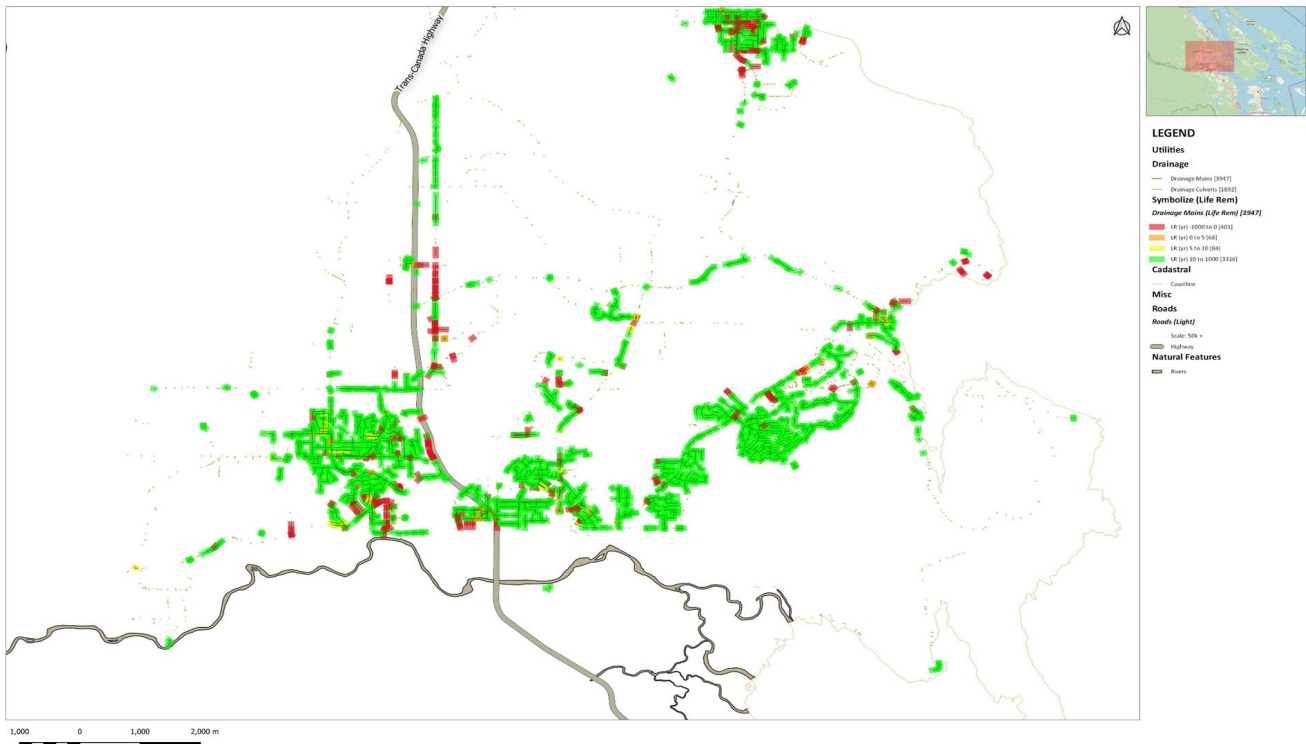
ASSET MANAGEMENT (DRAINAGE LINEAR ASSETS)



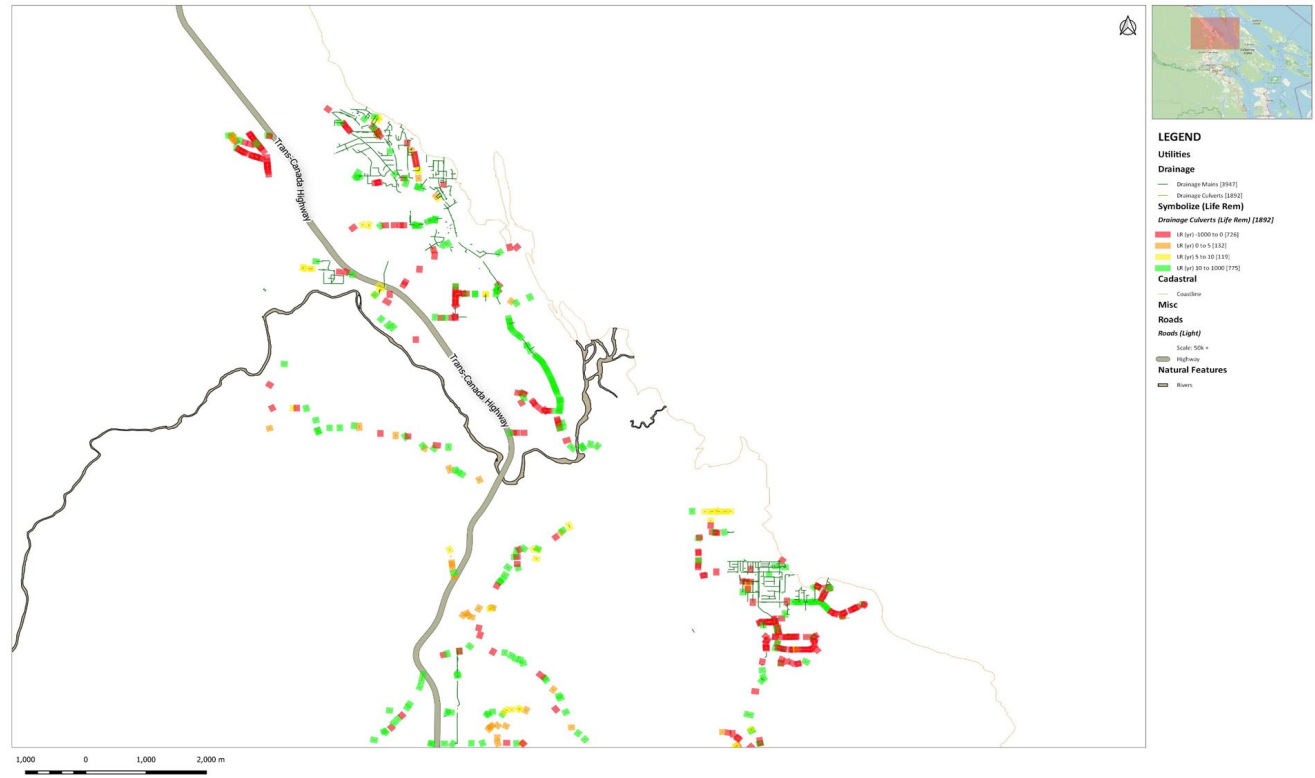
ASSET MANAGEMENT (DRAINAGE PIPES: NORTH)



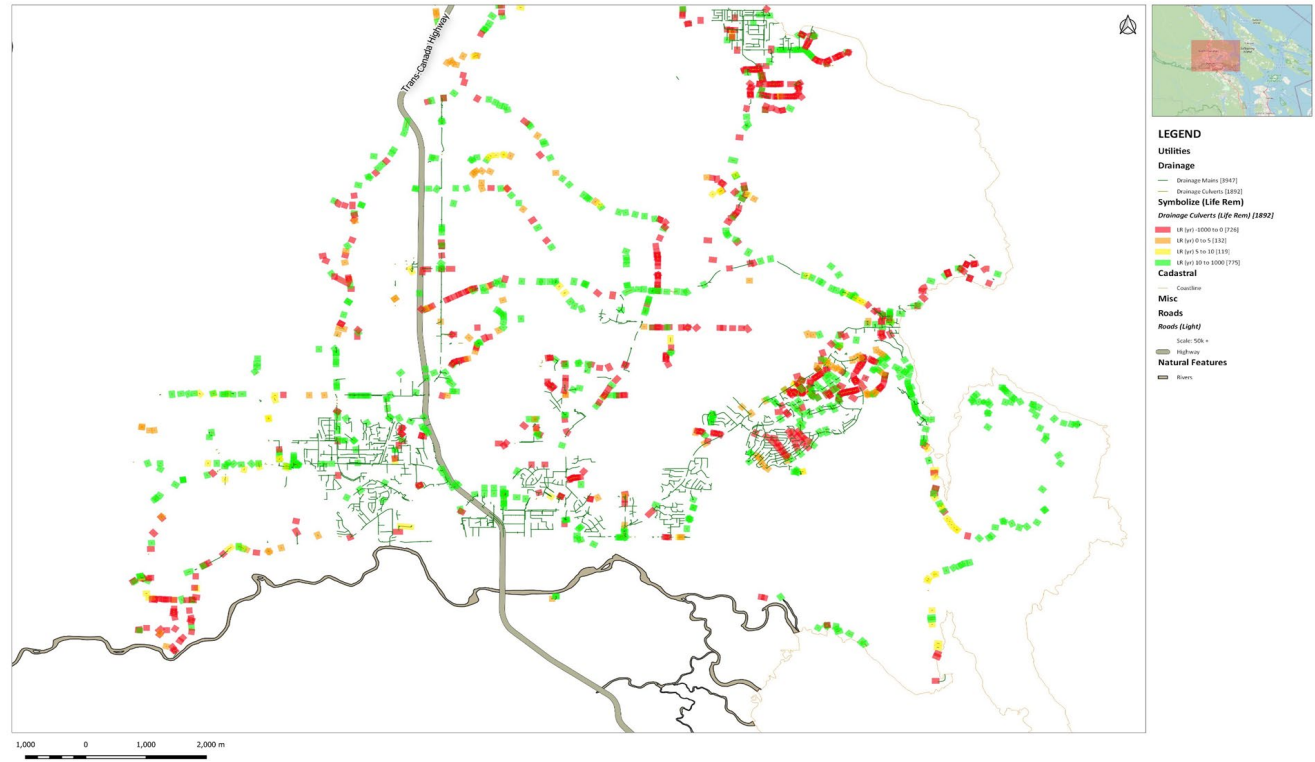
ASSET MANAGEMENT (DRAINAGE PIPES: SOUTH)



ASSET MANAGEMENT (DRAINAGE CULVERTS: NORTH)



ASSET MANAGEMENT (DRAINAGE CULVERTS: SOUTH)



ASSET MANAGEMENT (DRINKING WATER)

Assets: Approximately **240 km** of pipes valued at **\$208M**, 5 dams, 7 pump stations, 16 reservoirs, and 10,000 connections.

SOUTH END

- Groundwater source (Cowichan Aquifer)
- 162 km of pipes
- 4 pump stations
- 12 reservoirs
- Backup water can be supplied via South End water system via City of Duncan water system

CROFTON

- Surface water source (Cowichan River) via Paper Excellence pulp mill
- 27 km of pipes
- 2 pump stations
- 3 reservoirs
- 2 dams (@ Crofton Lake)
- Backup water can be supplied from South End water system.

CHEMAINUS

- Surface water source (Holyoak Lake) and ground water source (Chemainus Aquifer)
- 54 km of pipes
- 1 pump station
- 2 reservoirs
- 3 dams (2 @ Holyoak, 1 @ Banon Reservoir)

- City of Duncan supplies water to a few areas surrounding the City limits within the Municipality.
- Private water systems have been discouraged with the exception of bare land stratas and 25 homes in Genoa Bay (circa 1967).

ASSET MANAGEMENT (DRINKING WATER)

Management of drinking water supply, including treatment, reservoirs, distribution system

KEY SERVICES

- Ensure compliance with Island Health requirements for drinking water (Chemainus, Crofton, South End). Oversight of compliance reporting to the Province (9 reports per year)
- Future planning of water supply and distribution infrastructure
- Define and manage capital projects for replacement of existing infrastructure and construction of new infrastructure
- Manage Local Area Service requests for water services from the public
- Engineering technical assistance to Operations
- Assist with emergency response
- Working with First Nations and other local governments

ASSET MANAGEMENT (STORMWATER)

Management of stormwater and flood protection

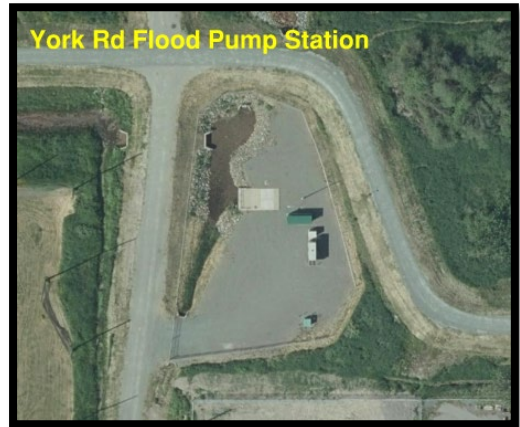
ASSETS

- 160 km of pipes valued at \$213M
- 16 managed wetlands
- 5 flood pump stations
- 4 km of dykes
- 2 flood gates

KEY SERVICES

- Future planning of stormwater and flood protection infrastructure
- Define and manage capital projects for replacement of existing infrastructure and new infrastructure
- Engineering technical assistance to Operations
- Assist with emergency response
- Working with First Nations and other local governments

ASSET MANAGEMENT (STORMWATER)



York Rd Flood Pump Station



Canada Ave Flood Pump Station



Canada Ave Flood Pump Station

ASSET MANAGEMENT (WASTEWATER)

Assets: Approximately **150 km** of pipes valued at **\$188M**, 14 pump stations, 4 treatment plants.

SOUTH END	CROFTON	CHEMAINUS	MAPLE BAY
<ul style="list-style-type: none"> - JUB WWTP (aerated lagoon with tertiary add-on) - 103 km of pipes - 13 pump stations - Co-owned with Duncan - Serves DNC, Duncan, CVRD and Cowichan Tribes - Freshwater discharge to Cowichan River 	<ul style="list-style-type: none"> - Crofton WWTP (secondary treatment, aerobic digestion) - 18 km of pipes - 4 pump stations - Serves DNC, Penelakut First Nation (Halalt First Nation pending) - Marine discharge to Osborne Bay 	<ul style="list-style-type: none"> - Chemainus WWTP (secondary treatment, aerobic digestion, biosolids dewatering) - 29 km of pipes - 7 pump stations - Marine discharge to Stuart Channel 	<ul style="list-style-type: none"> - Maple Bay WWTP (secondary treatment, membrane filtration) - 1 km of pipes (privately owned) - Marine discharge to Maple Bay

ASSET MANAGEMENT (WASTEWATER)

Management of wastewater systems including, collection, treatment and capital upgrades

KEY SERVICES

- Ensure compliance with Provincial and Federal requirements for sewage effluent (Chemainus STP, Crofton STP, JUB STP, Maple Bay STP). Oversight of compliance reporting to the Province and Canada (28 reports per year).
- Future planning of wastewater collection and treatment infrastructure.
- Define and manage capital projects for replacement of existing infrastructure and construction of new infrastructure.
- Manage Local Area Service requests for wastewater services from the public.
- Engineering technical assistance to Operations.
- Assist with emergency response.
- Working with First Nations and other local governments.

ASSET MANAGEMENT (WASTEWATER)



Chemainus STP



Joint Utility Board (JUB) STP



Crofton STP



Maple Bay STP



Maple Bay STP

ASSET MANAGEMENT (ROADS)

KEY FACTS:

- Approximately **300 km** of paved roads valued at **\$220M**
- Bare land stratas own and maintain private roads themselves
- Approximately \$3.0M per year is budgeted for renewals, replacement and improvements

7 bridges across rivers and streams:

- Lakes Road (need structural repairs)
- Herd Road (needs deck repair)
- Chemainus Road
- Canada Avenue (2 bridges nearing end of useful life)
- Gibbins Road
- Westholme Road

3 footbridges:

- Somenos Creek
- Chemainus Lake
- Kingston Park

4 large diameter culverts:

- Richards Trail
- Mary Street
- Drinkwater Road
- Menzies Road

MoTI roadways within North Cowichan include:

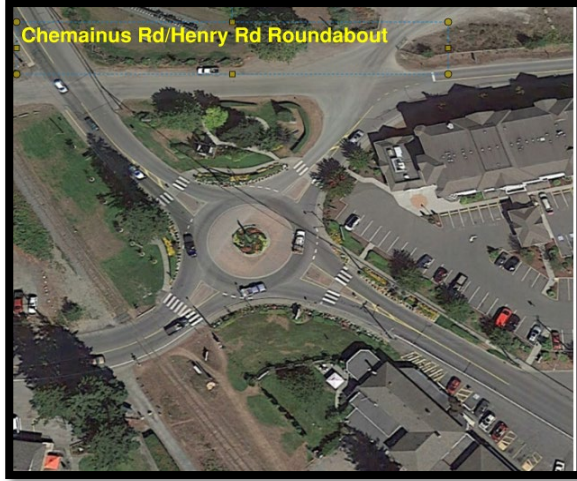
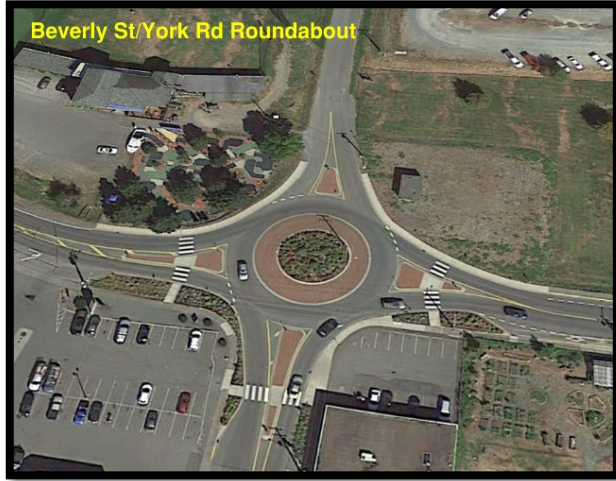
- Crofton Road
- Tzouhalem Road
- Mount Sicker Road (Chemainus road east of Trans Canada Highway)

ASSET MANAGEMENT (ROADS)

KEY SERVICES:

- Future planning of transportation and active transportation infrastructure
- Define and manage capital projects for replacement of existing infrastructure and construction of new infrastructure
- Manage traffic-related requests for service (traffic calming, signs, crosswalks, etc.) from the public
- Engineering technical assistance to Operations
- Assist with emergency response
- Working with First Nations and other local governments and the Province

ASSET MANAGEMENT (ROADS)



SUPPORT TO LAND DEVELOPMENT

Supports land development (Planning and Subdivisions) with respect to infrastructure servicing

KEY SERVICES

- Reviews referrals from Planning and Subdivisions:
 - Subdivision Applications
 - Rezoning Applications
 - Development Permits
 - Development Variance Permits
 - Building Permits
- Undertakes capacity assessments for all water, sanitary, drainage, and roads infrastructure:
 - Construction approval of larger municipal infrastructure constructed by developers
 - Official Community Plan advisory services
 - Reviews Local Area Service and lot-level service requests

ENGINEERING (PERMITTING)

OTHER FACTS

The Engineering Department issues the following permits:

- Utility Permits (Hydro, TELUS, Shaw, and FortisBC)
- Highway (Driveway) Access Permits
- Highway (Road) Use/Construction Permits
- Blasting Permits
- Event Permits (parades, street celebrations, marches, etc.)
- Hydrant Use Permits

2024 ACCOMPLISHMENTS

Accomplishments	Strategic Alignment
CONSTRUCTION	
Beaumont Water Main Replacement (Phase 3)	Asset Management
View Street Water Main Replacement	Asset Management
Herd Road Water Main Upgrade	BMLAP
Kingsview Road/Maple Bay Road Water Main Upgrades	Asset Management
Menzies Road Culvert Replacements	Asset Management

2024 ACCOMPLISHMENTS

Accomplishments	Strategic Alignment
CONSTRUCTION	
Canada Avenue Flood Gate & Road Upgrades	Disaster Prevention
Banon Reservoir Dredged	Asset Management
Chemainus Wells Chlorination System Upgrade	Asset Management
Access Road to Holyoak Lake Rebuild	Asset Management
X-Walk & Wheelchair Ramps: Herons Way at Ardea Place	Asset Management
Brook Street Sanitary Sewer Replacement (Queen Street – Morgan Street)	Asset Management

2024 ACCOMPLISHMENTS

Accomplishments	Strategic Alignment
CONSTRUCTION	
694 Arbutus Avenue CMP Culvert Replacement	Asset Management
620 Maple Mountain Road Drainage Modelling & Upgrades	Asset Management
6371 Genoa Bay Road Drainage Modelling & Upgrades	Asset Management

2024 ACCOMPLISHMENTS

Accomplishments	Strategic Alignment
DESIGN	
Norcross Road Culvert Replacement (between Anzio Road & Westcott Road)	Asset Management
Herd Road Bridge Deck Rehab & Structural Repairs	Asset Management
Cowichan Lake Road Water Main Improvements	Asset Management
Fairview Way/Place Water Main Replacement	Asset Management
Trans-Canada Highway Water Main (Open Air Classroom – Drinkwater Rd)	Asset Management
Trillium Terrace AC Water Main Replacement (Phases 1 & 2)	Asset Management

2024 ACCOMPLISHMENTS

Accomplishments	Strategic Alignment
DESIGN	
Chemainus STP Screen Replacement	Asset Management
Chemainus STP Biosolids Thickener	Asset Management
Chemainus STP Sludge Centrifuge	Asset Management
Crofton STP Screen Replacement	Asset Management
Crofton STP Biosolids Thickener	Asset Management
Emily Street (York Road – Arthur Street) 450 mm CMP Storm Sewer Replacement	Asset Management

2024 ACCOMPLISHMENTS

Accomplishments	Strategic Alignment
OTHER	
Sanitary Model Updates (3 models; South End, Crofton, Chemainus)	OCP
Water Model Updates (3 models; South End, Crofton, Chemainus)	OCP
Bell McKinnon LAP servicing assessment (water, sanitary, drainage, roads servicing requirements)	OCP, BMLAP
Water Reservoir Structural Assessments (16 Reservoirs)	Asset Management
DCC Project Cost Estimating (3 sanitary systems, 3 water systems, roads, drainage, parks, fire)	OCP
Dam Assessments (Holyoak Dam, Banon Dam, Crofton Dam)	Asset Management



**CLIMATE EMERGENCY
AND ENVIRONMENTAL
SUSTAINABILITY
PRIORITIES**

CLIMATE EMERGENCY AND ENVIRONMENTAL SUSTAINABILITY PRIORITIES

Engineering



PRIORITY 1:

Consider CAEP actions that can be incorporated by Engineering that will reduce GHGs



PRIORITY 2:

Relocate the Joint Utility Board Sewage Outfall (Adaptation)



PRIORITY 3:

Develop climate adaptation measures (flood protection, water storage)

2025 BUSINESS PLAN

2025 KEY DELIVERABLES (INFRASTRUCTURE PLANNING)

Actions/Projects	Strategic Alignment
Master Drainage Plan Update and Model Development	OCP
Update Development Cost Charge (DCC) Bylaw (dependent on OCP, CAEP, Master Transportation Plan, Sanitary Modelling, Water Modelling, Master Drainage Plan)	OCP
Create 10-year capital plan (dependent on OCP, CAEP, Asset Management Plan, Water Modelling, Sanitary Modelling, Master Drainage Plan, Master Transportation Plan, DCC Bylaw Update)	OCP, Asset Management

2025 KEY DELIVERABLES (INFRASTRUCTURE PLANNING)

Actions/Projects	Strategic Alignment
Relocate the Joint Utility Board Effluent Outfall	OCP, Asset Management
Update Subdivision Bylaw (including Engineering Design Standards, green design standards)	OCP, Asset Management
Establish New Budget for Active Transportation Capital Projects	MTP, Asset Management
Finalize Traffic Calming Policy and Establish New Budget for Traffic Calming Infrastructure	MTP, Asset Management

2025 KEY DELIVERABLES (MAJOR CAPITAL PROJECTS – SOUTH END)

Project Name & Number

Berkley Sanitary PS Assess & Upg (291 L/s) [0336]

Birds Eye Drive PRV Upgrade [0452]

Boys Road Multi-Use Pathway (TCH - 500 m E) [0030]

Canada Ave Complete Streets (Active Transp, Road/Utility Upg) [0001]

Cowichan Lake Rd AC WM Decommission & Switch-Over [0281]

Cowichan Lk Rd Sanitary Main Upg (27W - 28Wa) [0443]

Fairview Way/Place WM Replacement [0110]

Genoa Bay Rd Road Rebuild (200m f Genoa Bay) [0236]

Herd Road Bridge Deck Rehab & Structural Repairs [0263]

Hyprescon WM Replacement (Ph 1; Lakes Rd - WharnCliff Rd) [0340]

Hyprescon WM Replacement (Ph 2; Wharncliff - River N Side) [0341]

James St BL (Duncan St - TCH; 630 m; Uni-Directional) [0415]

JUB Outfall Relocation Project [0007]

JUB STP: Cell 1 Diffuser Upgrade & Expansion [0207]

2025 KEY DELIVERABLES (MAJOR CAPITAL PROJECTS – SOUTH END)

Project Name & Number
Lakes Rd Multi-Use Trail (Beverly St - Lochsyde Rd) [0040]
Lakes Road Bridge Repair [0039]
New Kingsview Reservoir [0351]
New Mt Provost Reservoir, Booster Pump, PRV (### ML) [0361]
New Properties Reservoir [0352]
New WM Loop (Paddle Rd - Ford Rd; PPE-0047) [0447]
Properties Sanitary PS Upg (78 L/s) [0355]
Sherman Rd Bike Lanes (Canada Ave - Somenos Rd; Both Sides) [0047]
Somenos Rd Sanitary Main Upg (Auchinachie Rd - 50 m S) [0444]
TCH Sanitary Main Upg (12E - 13E) [0445]
Upgrade Properties Water PS (Add 3rd Pump) [0353]
Upgrade Properties Water PS (Add 4th Pump) [0354]
X-Walk: Tzouhalem Rd @ Jaynes Rd [0294]

2025 KEY DELIVERABLES (MAJOR CAPITAL PROJECTS – CROFTON)

Project Name & Number
Adelaide St 1200mm Culvert Repl & Embank Repair (@ Northview Rd) (Ph 2) [0427]
Babine Sanitary Sewer Extension [0183]
CR STP Screen Sys Replace [0004]
Crofton Lake Dam Repairs [0075]
Crofton STP Biosolids Thickener [360]
Crofton STP New Secondary Clarifiers [0359]
Crofton Water Treatment Assessment [0098]
Emily St (York Rd - Arthur St) 450 CMP Storm Sewer Repl [0277]
New Robert St Reservoir #3 (1.49 ML) [0446]

2025 KEY DELIVERABLES (MAJOR CAPITAL PROJECTS – CHEMAINUS)

Project Name & Number
CH STP Screen Sys Replace [0003]
Chemainus Road SW/BL (Victoria - Fir; E Side) [0032]
Chemainus STP Biosolids Thickener [0313]
Chemainus STP Centrifuge [0314]
Chemainus WTP [0390]
Esplanade St Sanitary Main Upg (Maple St - Willow St) [0441]
Maple St (Kin Beach) Sanitary PS Upg (106 L/s) [0363]
New CH Reservoir #3 & Booster Pump (1.67 ML) [0392]
Severne St Sanitary Main Upg (Cedar @ Esplanade St - Severne St @ 50 m W) [0442]

OPERATING BUDGET – ENHANCED SERVICE REQUESTS

NET NEW STAFFING REQUEST

ENG-42

Position	Rationale	Implications of Deferment	Projects Deferred/Delayed	Budget Impact
<p>Administrative Assistant</p>	<p>Assessment of workload for routine duties (non-project related duties) shows that 2.6 FTE required to support Engineering Department and Land Development/ Environment Department. Of the 2.6 FTE, 1.0 FTE provides services specific to supporting Land Development.</p> <p>Need admin support to assist with developing and implementing improved business practices within the department. This will relieve Engineering managers and staff with some administrative work and will improve service delivery in general.</p>	<p>The implementation of business improvement processes will be further delayed, resulting in longer processing times for permits (Hydrant Use, Blasting, Events, Road Construction, Road Access), managing calls for service entries/tracking/responses.</p> <p>Less support to Land Development which will impact the rate at which land development applications are processed.</p>	<p>Delayed:</p> <ol style="list-style-type: none"> 1. Adoption of Laserfiche. 2. Bond list cleanup. 3. Permit application form updates. 4. Incorporation of additional business processes into Prospero. 5. Business process documentation. 	<p>\$86K including Benefits</p> <p>Sources of Funding</p> <p>Utilities: \$20K</p> <p>General Taxation: \$66k</p>

OPERATING BUDGET – ENHANCED SERVICE REQUESTS

NET NEW STAFFING REQUEST

Position	Rationale	Implications of Deferment	Projects Deferred/Delayed	Budget Impact
<p>Planning Engineer (Transportation / Drainage)</p>	<p>This position's purpose is to provide the ability to plan, carry out conceptual design/cost estimate, prioritize projects and programs for the maintenance, upgrade, replacement or new infrastructure for multi-modal transportation (vehicles, walking, bicycles, transit, etc.) and drainage infrastructure systems, and support the Senior Engineer with land development servicing assessments, provide support to calls for service requests, and support the Senior Engineer with land development servicing assessments.</p> <p>Projects arise from three key sources:</p> <ol style="list-style-type: none"> 1) Due to growth where new infrastructure, or upgrades to existing infrastructure, are required. 2) Where assets reach the end of their life. 3) Community improvement projects (typically street-scape improvements). <p>The above work requires sound planning and coordination.</p>	<p>Deferment will delay the development of 10-year capital plans along with master plans. This delay will cause that North Cowichan will continue to plan infrastructure projects on a reactive basis rather than a long-term planning basis.</p> <p>By remaining in reactive mode, the Municipality will be missing opportunities for external funding. Future projects could be developed and be partially shovel ready with a clear definition of the cost implications for the Municipality and funding could be applied for. By changing how future work is planned there would be an improvement of how funding would be utilized from the reserves with knowledge of funds available and future commitments/requirements.</p>	<ol style="list-style-type: none"> 1. Asset management planning 2. 10-year capital plan 3. Implementation plan for Master Transportation Plan (including multi-modal projects) 4. Upgrade of intersections/roundabouts to maintain level of service requirements 5. Master drainage plan and stormwater management design standards 6. DCC bylaw 7. Subdivision Bylaw (Engineering Standards) update 8. Land development application servicing reviews 	<p>\$146k (benefits included) potential start date of April 2025.</p> <p>Sources of Funding General Taxation: \$146k</p>

OPERATING BUDGET

	2024 Budget	2025 Budget	\$ Change	% Change	2024 YTD	Supplemental	\$ Change
REVENUE							
Sales of Service	\$ 157,222	\$ 158,367	1,145	0.7%	\$ 151,584		
TOTAL REVENUE	\$ 157,222	\$ 158,367	1,145	0.7%	\$ 151,584		
EXPENSES							
Administration	\$ 1,937,147	\$ 2,164,049	226,902	11.7%	\$ 1,411,889	\$ 212,000	\$ 438,902
Engineering Studies	\$ 475,763	\$ 100,000	(375,763)	-80%	107,829	-	-
TOTAL EXPENSES	\$ 2,412,910	\$ 2,264,049	(148,861)	-6.2%	\$ 1,519,178	\$ 212,000	\$ 438,902

KEY STATISTICS

	2020	2021	2022	2023	2024
# of permits processed in TOTAL	264	337	313	175 (233)	220 (248)
# of driveway access permits processed ^[2]	4	18	19	7 (9)	9 (11)
# of highway construction/use permits processed	33	30	40	53	42 (50)
# of hydrant use permits processed	11	20	16	12	14 (15)
# of utility permits processed	172	188	150	98	72 (82)
# of blasting permits processed	6	15	17	8	9 (10)
# of service applications processed	32	58	51	27	31 (35)
# of event permits processed ^[3]	6 ^[3]	08 ^[3]	20	36	40 (45)
Notes					
[1] Based on current statistics (up to Oct 31/24; in brackets) extrapolated to Dec 31/24.					
[2] Excluding driveway access permits issued as part of a building permit review.					
[3] Numbers are lower due to COVID-19 pandemic.					