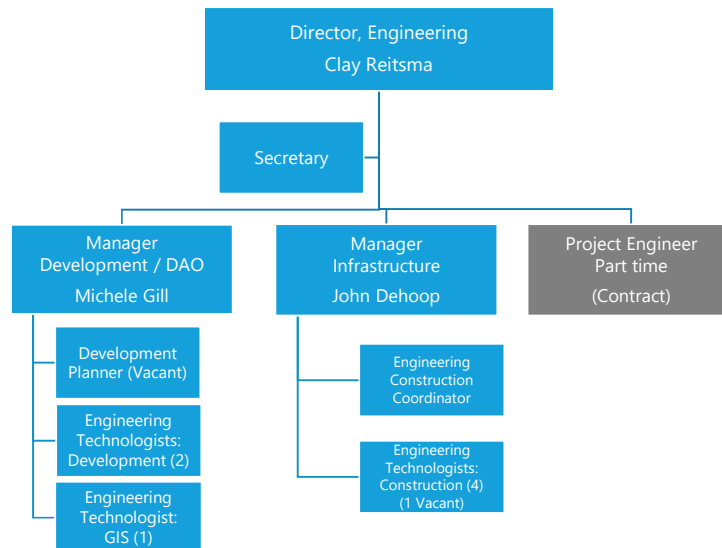




ORGANIZATIONAL STRUCTURE



STAFFING LEVELS

14

Total positions
as of October 16, 2021

13 Permanent Full Time (2 Vacant)

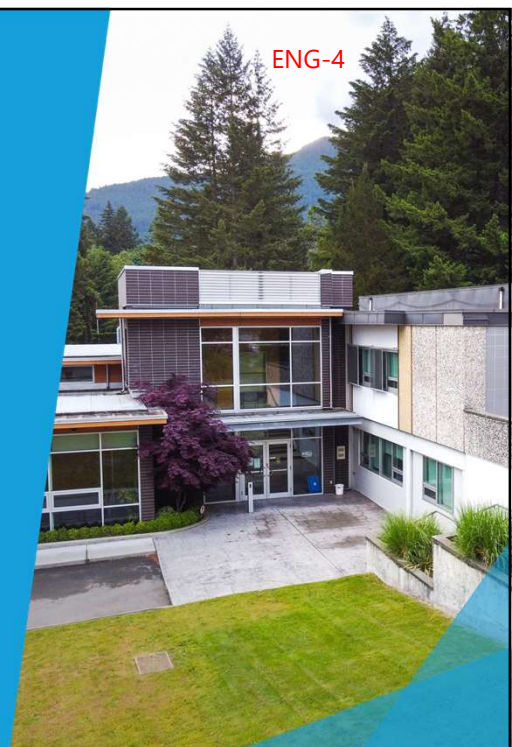
1 Contractor

(Exempt 3; CUPE 10; Contract 1)

DEPARTMENT FOCUS

The Engineering Department is primarily responsible for:

- providing technical expertise to other departments with respect to municipal services and projects;
- reviewing and approving development projects;
- designing and overseeing construction of capital projects;
- implementing the asset management plan; and
- providing technical expertise in the creation and management of Council's approved 5 year Capital plan.



CORE BUSINESS

The Engineering Department is responsible for four key services:



**ASSET
MANAGEMENT**



**CAPITAL
PROJECTS**



**DEVELOPMENT
ENGINEERING**



PERMITTING

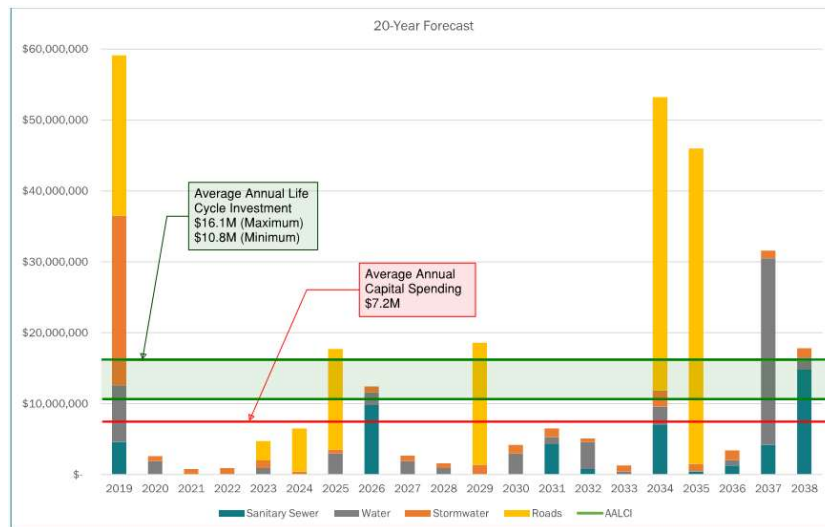
ASSET MANAGEMENT

ENG-6



- The Engineering Department is responsible for the following assets under the Municipality's Asset Management plan:
 - Drinking water treatment and distribution assets.
 - Wastewater collection and treatment assets.
 - Storm water 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



ASSET MANAGEMENT: DRINKING WATER

ENG-8



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

SOUTH END

- Ground water source (Cowichan Aquifer)
- 162 km of pipes
- 4 pump stations
- 12 reservoirs
- Backup water can be supplied via South End Water S 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: STORM WATER

Management of storm water and flood protection

ASSETS

- 160km of pipes valued at \$213M
- 16 managed wet lands
- 5 flood pump stations
- 4 km of dykes

KEY SERVICES

- Future planning of storm water 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

ENG-10

ASSET MANAGEMENT: STORM WATER

ENG-11



ASSET MANAGEMENT: WASTEWATER

ENG-12

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

SOUTH END

- 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

CROFTON

- 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

CHEMAINUS

- Chemainus WWTP (secondary treatment, aerobic digestion, biosolids dewatering)
- 29 km of pipes
- 7 pump stations
- Marine discharge to Stuart Channel

MAPLE BAY

- Maple Bay WWTP (secondary treatment, membrane filtration)
- 1 km of pipes (privately owned)
- Marine discharge to Maple Bay

ASSET MANAGEMENT: WASTEWATER

ENG-13



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

ENG-14 MUNICIPALITY OF
NORTH
Cowichan



Chemainus STP



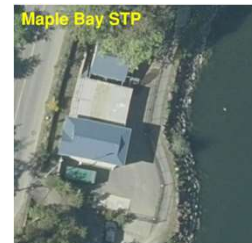
Crofton STP



Joint Utility Board (JUB)
STP



Maple Bay STP



Maple Bay STP

ASSET MANAGEMENT: ROADS

ENG-15



KEY FACTS:

- Approximately **280 kilometres** 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
- Herd Road
- 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 the Municipality include:

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

ASSET MANAGEMENT: ROADS

ENG-16



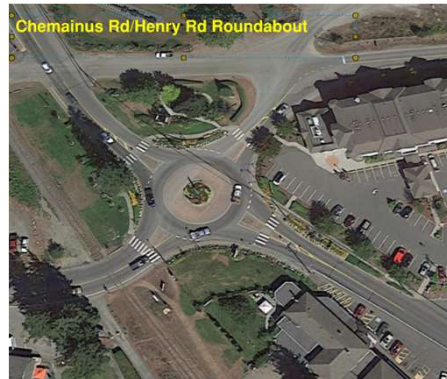
KEY SERVICES:

- 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, cross-walks, 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

ENG-17

MUNICIPALITY OF
NORTH
Cowichan



DEVELOPMENT ENGINEERING

Supports the development of land as it relates to subdivision, municipal infrastructure and services

KEY SERVICES

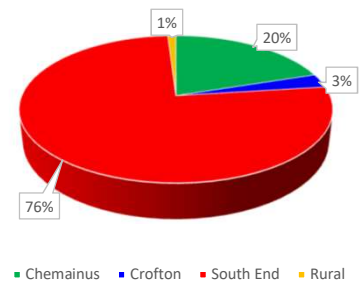
- Process subdivision applications.
- Respond to subdivision inquiries.
- Review and prepare internal reports regarding servicing for the Planning Department related to:
 - Rezoning Applications;
 - Development Permits;
 - Development Variance Permits; and,
 - Building Permits.
- Construction approval and inspection of municipal infrastructure constructed by developers (water, sanitary sewer, drainage, roads).
- Processes applications for municipal services.
- Official Community Plan advisory services.

DEVELOPMENT ENGINEERING

KEY SUBDIVISION FACTS

- Estimated new lots created in 2021
 - Chemainus 15
 - Crofton 2
 - South End 57
 - Rural 1
 - **TOTAL 75**

% New Lots Created by Location



ENG-19

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
- Service Applications for water, sewer and drain connections

2022 BUSINESS PLAN

PROJECTED BUSINESS PLAN DELIVERABLES

ENG-22



Actions/Projects	Start Date	Strategic Alignment
Relocate the Joint Utility Board Effluent Outfall.	2018	Council Strategic Plan
Create 10 year capital plan (OCP dependent).	2022	Master Plan of Council (Asset Management Investment Plan)
Update Subdivision Bylaw (incl Engineering Design Standards).	2021	Council Strategic Plan
Update Development Cost Charge (DCC) Bylaw (OCP dependent).	2022	Council Strategic Plan
Improve pedestrian safety on Boys Road (timing dependent on JUB outfall pipe routing).	2022	Council Strategic Plan

PROJECTED BUSINESS PLAN DELIVERABLES

ENG-23



Actions/Projects	Start Date	Strategic Alignment
Water model updates (Chemainus, Crofton, South End) (OCP dependent).	2022	Council Strategic Plan
Sanitary model updates (Chemainus, Crofton, South End) (OCP dependent).	2022	Council Strategic Plan
Master Drainage Plan Update and Model Development (OCP dependent).	2023	Council Strategic Plan
Bell McKinnon LAP servicing assessment (water/sanitary models update, drainage assessment, traffic impact assessment).	2021	Council Strategic Plan
Engineers and Geoscientists BC (EGBC) Professional Practice Management Plan (PPMP).	2022	Statutory Requirement

DEPARTMENTAL ASSESSMENT (FINDINGS)

CONTEXT

In 2020/2021 management undertook a capacity assessment for the department for short term needs.

Key Findings

- Not able to keep up with current workload.
- Limited infrastructure planning/asset management capacity.
- Limited transportation/active transportation engineering expertise/capacity.
- Limited capacity to carry out capital projects internally:
 - Assist with more complex studies related to infrastructure upgrade paths.
 - Ramp up and down capacity to clear asset replacement backlog, execute capital projects.
 - Ramp up and down development review capacity as required.
- Limited capacity to respond to requests for service from public.
- Limited capacity to review and update business processes.

OPERATING BUDGET - SUPPLEMENTAL BUDGET REQUESTS NET NEW STAFFING REQUEST

ENG-25



Position	Rationale	Implications of Deferment	Projects Deferred/Delayed	Budget Impact
Senior Engineer Utilities	<p>Former Senior Manager of Engineering's position has been left vacant with move to Director position.</p> <p>Department has limited utilities planning capacity.</p> <p>Department lacks sufficient capacity to adequately support Operations Department and Engineering Development Group.</p> <p>Engineering Association implementing new rules for oversight that will require additional engineering capacity.</p> <p>Succession planning.</p>	<p>Some projects will take longer to execute (delayed); some will have to be deferred.</p> <p>When issues arise with the operation of the water, sanitary and drainage systems, Operations may not receive timely support from Engineering.</p> <p>Challenges implementing asset management processes including timely asset renewals, assessment of development impacts, acquisition of co-funding.</p> <p>Improvement to departmental business processes and compliance with Engineering Association's oversight requirements will be delayed.</p>	<p>Deferred:</p> <ol style="list-style-type: none"> 1. Chemainus/Crofton STP Screen Upgrades 2. Chemainus/Crofton STP Thickeners 3. Development of a Drainage Model 4. Boys Rd Upgrade Project <p>Delayed:</p> <ol style="list-style-type: none"> 1. JUB STP Outfall Project 2. Chemainus STP MWR Registration 3. Water Model Updates 4. Sanitary Model Updates 5. Updating bylaws (Subdivision, DCC) 6. EGBC-driven business process improvements. 	<p>\$121K + Benefits</p> <p>Sources of Funding</p> <p>Utility Fees: \$97k</p> <p>General Taxation: \$24k</p>

OPERATING BUDGET - SUPPLEMENTAL BUDGET REQUESTS NET NEW STAFFING REQUEST

ENG-26 

Position	Rationale	Implications of Deferment	Projects Deferred/Delayed	Budget Impact
Senior Engineer Transportation & Development	<p>Department has limited transportation/active transportation engineering design and planning capacity.</p> <p>Department lacks sufficient capacity to adequately support Operations Department and Engineering Development Group.</p> <p>Engineering Association implementing new rules for oversight that will require additional engineering capacity.</p> <p>Succession planning.</p>	<p>Some projects will take longer to execute (delayed); some will have to be deferred.</p> <p>Challenges implementing asset management processes including timely asset renewals, assessment of development impacts, acquisition of co-funding.</p> <p>Extensive delays addressing Calls for Service.</p> <p>Improvement to departmental business processes and compliance with Engineering Association's oversight requirements will be delayed.</p>	<p>Deferred:</p> <ol style="list-style-type: none"> Boys Rd Upgrade Project <p>Delayed:</p> <ol style="list-style-type: none"> Canada Avenue Floodgate, Road Raising, and Bridge Design Project Updating Bylaws (Subdivision, DCC, Traffic) 	<p>\$121K + Benefits</p> <p>Sources of Funding General Taxation: \$121k</p>

OPERATING BUDGET

ENG-27



	2021 Budget	2022 Budget	\$ Change	% Change	2021 YTD	Supplemental	\$ Change
REVENUE							
Sales of Service	\$ 151,500	\$ 205,000	\$ 53,500	35%	\$ 205,705	\$ -	\$ 53,500
TOTAL REVENUE	\$ 151,500	\$ 205,000	\$ 53,500	35%	\$ 205,705	\$ -	\$ 53,500
EXPENSES							
Administration	\$ 1,605,500	\$ 1,540,965	\$ (64,535)	-4%	\$ 1,188,354	\$ 22,500	\$ (42,035)
Engineering Studies	340,000	130,000	(210,000)	-62%	\$ 63,353	-	(210,000)
TOTAL EXPENSES	\$ 1,945,500	\$ 1,670,965	\$(274,535)	-14%	\$ 1,251,707	\$22,500	\$(252,035)

CAPITAL BUDGET – KEY PROJECTS

Expense	2020	2021	2022	2023	2024	2025
Roads capital	\$5,942,000	\$4,365,180	\$2,566,500	\$3,127,800	\$3,190,400	\$3,254,200
Drainage capital	\$492,500	\$494,500	\$534,500	\$545,190	\$556,090	\$567,210



CLIMATE EMERGENCY
PRIORITIES

CLIMATE EMERGENCY 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:

Increase transit use and active transportation (CAEP)

KEY PERFORMANCE INDICATORS

ENG-31



	2017	2018	2019	2020	2021 ^[1]
DEVELOPMENT (SUBDIVISIONS)					
# of active applications in process	67	73	81	74	82
# of new applications received	32	19	26	13	27
# of applications approved	11	14	16	19	16
# of applications denied, expired, cancelled	3	4	4	5	11
# of lots created	53	20	169	125	75 ^[3]
DEVELOPMENT (PLANNING REFERRALS)					
# building permits reviewed	-	-	117	171	250
# planning application files reviewed ^[2]	-	-	-	138	88
Notes ^[1] Based on current statistics (up to Sep 30/21) projected to Dec 31/21. ^[2] Development Permits, Development Variance Permits, Rezoning, OCP Amendments, ALR Exclusions, Temporary Use Permits. ^[3] Includes estimate of additional new lots created between Oct 1/21 to Dec 31/21 based on status of subdivision applications.					

KEY PERFORMANCE INDICATORS

ENG-32



	2017	2018	2019	2020	2021 ^[1]
CAPITAL PROGRAM					
% approved capital spending v annual budget (%)	-	-	-	69	75 ^[4]
% approved capital spending v annual budget (excl JUB) (%)	-	-	-	-	89 ^[4,5]
PERMITTING					
# of driveway access permits processed ^[2]	-	-	5	4	16
# of highway construction/use permits processed	-	-	23	33	39
# of hydrant use permits processed	-	-	18	11	27
# of utility permits processed	-	-	170	172	187
# of blasting permits processed	-	-	10	6	15
# of service applications processed	-	-	48	32	59
# of event permits processed ^[3]	27	32	21	6 ^[3]	8 ^[3]
# of permits processed in TOTAL	-	-	295	264	351
Notes ^[1] Based on current statistics (up to Sep 30/21) projected to Dec 31/21. ^[2] Excluding driveway access permits issued as part of a building permit review. ^[3] Numbers are lower due to COVID-19 pandemic. ^[4] Excludes financial contributions, monies for land purchase. Budgets adjusted as actual costs determined or best estimate. Projects deferred due to archeological finds, high tenders, or for reasons beyond staff's control are not included in statistic. ^[5] Excludes JUB STP Outfall Project.					