Report

MUNICIPALITY OF NORTH Cowichan

Date	March 5, 2025	File:
Subject	State of Land Development and Servicing Constraints	

PURPOSE

To update Council on the state of the land development and servicing constraints. A staff presentation will be provided at the meeting.

INTRODUCTION

North Cowichan is faced with an unprecedented number of land development applications (370+ applications; 10,100 units). The modelling shows North Cowichan has 20+ years of infrastructure capacity (residual capacity) based on historical growth rates. Engineering allocates capacity to a given development as applications are processed, assuming capacity is available. Often, capacity is allocated well ahead of a connection. However, until a development approval expires, staff must "lock in" the allocation. The problem is the size and number of applications requiring allocation of residual capacity, which means we have nearly exhausted our 20+ year supply of residual capacity. There is little to no residual capacity remaining for follow-on applications without the need for costly infrastructure upgrades that need to commence in the immediate term. This puts at risk North Cowichan's ability to continue to realize high-density housing in key growth areas in the OCP and to meet other key policy objectives, such as supporting economic development in the municipality (e.g., adequate capacity to support a large employer on industrial lands). This rate of development also exceeds the financial and staff capacity of North Cowichan to construct the infrastructure ahead of development.

DISCUSSION

North Cowichan's existing infrastructure is designed for a low-density growth pattern consisting mostly of single-family homes. The land use designations set out in the 2022 Official Community Plan (OCP) represent a higher density in existing serviced areas and, in the case of Bell McKinnon, in an area with no sanitary servicing. Section 9.1 (water infrastructure) and Section 9.2 (sanitary infrastructure) states that infrastructure upgrades will be required where density is proposed. Much of the increased density will be achieved by constructing multi-storey wood structures using mass timber construction which has much higher required fire flow (RFF), which will require a significant amount of water main upgrades to ensure that the RFF can be delivered. More specifically, the Bell McKinnon Local Area Plan (BMLAP) notes that insufficient infrastructure is a major limiting factor for growth (Section 7.1).

Consequently, in the Engineering Department Business Plan, updating the North Cowichan's water and sanitary models and updating the DCC bylaws, were identified as key priorities. All six models (three water and three sanitary) have been updated. Staff now have a fulsome understanding of the impacts of the 2022 OCP, Bill 44, and projected development activity (based on population growth projections and active applications) of North Cowichan's water and sanitary systems.

The modelling indicates sufficient capacity to service upwards of 4,200 units across North Cowichan, equivalent to approximately 20 years of growth based on historical growth rates. However, over the last number of years, North Cowichan has seen an unprecedented number of applications (e.g., approximately 10,100 units in total) that, if processed, would require North Cowichan to legally service these parcels (before it is able to do so). In addition, there is pre-zoned land in North Cowichan where the services are lacking or not present at all. This poses a significant legal risk to North Cowichan based on the legal advice received by our solicitors. Staff have been actively engaged with our solicitors and putting together a plan to put a number of safeguards into place, including bylaw amendments, to limit North Cowichan's legal exposure moving forward.

It is important to note that staff are professionally compelled to inform new applicants that servicing is not possible unless significant investments are put in place as part of the approval (i.e., either in the form of no-build covenants at the time of rezoning or a firm commitment by the developer to advance municipal infrastructure). These discussions occur now, as applicants want clarity before making significant investments to advance their projects.

The purpose of this report is to highlight that this issue is a significant concern to advancing development in the community, as the infrastructure costs are substantial across all our systems and will likely render a number of projects non-viable in the short term unless other funding solutions are identified. As per Council direction, staff will also be engaging with the development community on increasing community amenity contributions beginning in early March, which staff anticipate will be a three to four-fold increase to current Development Cost Charges (DCC) rates moving forward. Given the sector's challenges, staff are also expecting significant pushback to these costs. However, if not borne by the development community, it would significantly burden existing taxpayers or other levels of government to help defray some of these costs.

Land Development Patterns, Impacts to Infrastructure and System Monitoring

Historically, North Cowichan's zoning and land use designations have espoused a lower-density form of housing. Over the years, North Cowichan has changed how it develops. These changes have the potential to impact infrastructure. The two most impactful changes are:

1) **Denser development:** Denser development can have longer-term benefits, such as lower maintenance and renewal costs per person, less water consumption, and lower sewage flow rates. In the longer term, everything else being equal, a denser development pattern will tend to result in lower per capita infrastructure maintenance and renewal costs. However, the shorter-term issue is significant infrastructure upgrade costs if the density is located in an area where the density was not contemplated. This is because trunk mains (the larger pipes that convey water and sewage across North Cowichan) and pump stations may not be large enough, may not be in the right location, or may not be present.
2) **Large multi-story wood framed structures (MSWFS**): MSWFS have significantly higher required fire flows versus a lower density residential development pattern. For example, areas of North Cowichan consisting of single-family homes have a fire flow requirement of 60 L/s for 1.4 hrs, which requires 300 m^3 of reservoir fire storage. An MSWFS incorporating fire retardant design features typically has a fire flow requirement of 120 L/s for 2.0 hrs and requires 870 m^3 of reservoir fire storage, approximately three times the volume. An MSWFS that DOES NOT incorporate fire

retardant design features typically has a fire flow requirement of 250 L/s for 3.2 hrs and requires 2,930 m^3 of reservoir fire storage, approximately 10 times the volume. To get the water from the reservoir to the fire, the trunk mains, and in some cases local mains, need to be increased in size to ensure that the flow can be delivered at sufficient pressure at the location of the fire.

The combination of density and the move to MSWFS has the most dramatic impact on the water system. Bill 44 is also likely to impact the water system because of the proximity of one building to another.

Berkey's Corner provides a good example of the impacts of changing development patterns and archetypes on fire flows. The figures below illustrate the impact of densification. For Figure 1 & 2, the coloured dots mean the following (RFF = Required Fire Flow):

1. Green: Lower density residential (typically single-family homes). RFF = 60 L/s.
2. Yellow: Higher density residential (typically multi-family structures). RFF = 120 L/s.
3. Red: Commercial and institutional areas. RFF = 150 L/s.
4. Blue: Industrial areas. RFF = 225 L/s.

For Figure 3 & 4, the coloured dots are red and green. Red dots indicate that the Available Fire Flow (AFF) is less than the RFF. Red dots indicate that the AFF is greater than the RFF.

Figure 1 shows the RFF for a low-density development pattern. Note the prevalence of green dots. Figure 2 shows more yellow dots in place of the green dots, indicating that those areas are expected to develop to a higher density in the future. This is consistent with the development pattern represented in the Build-Out Model.

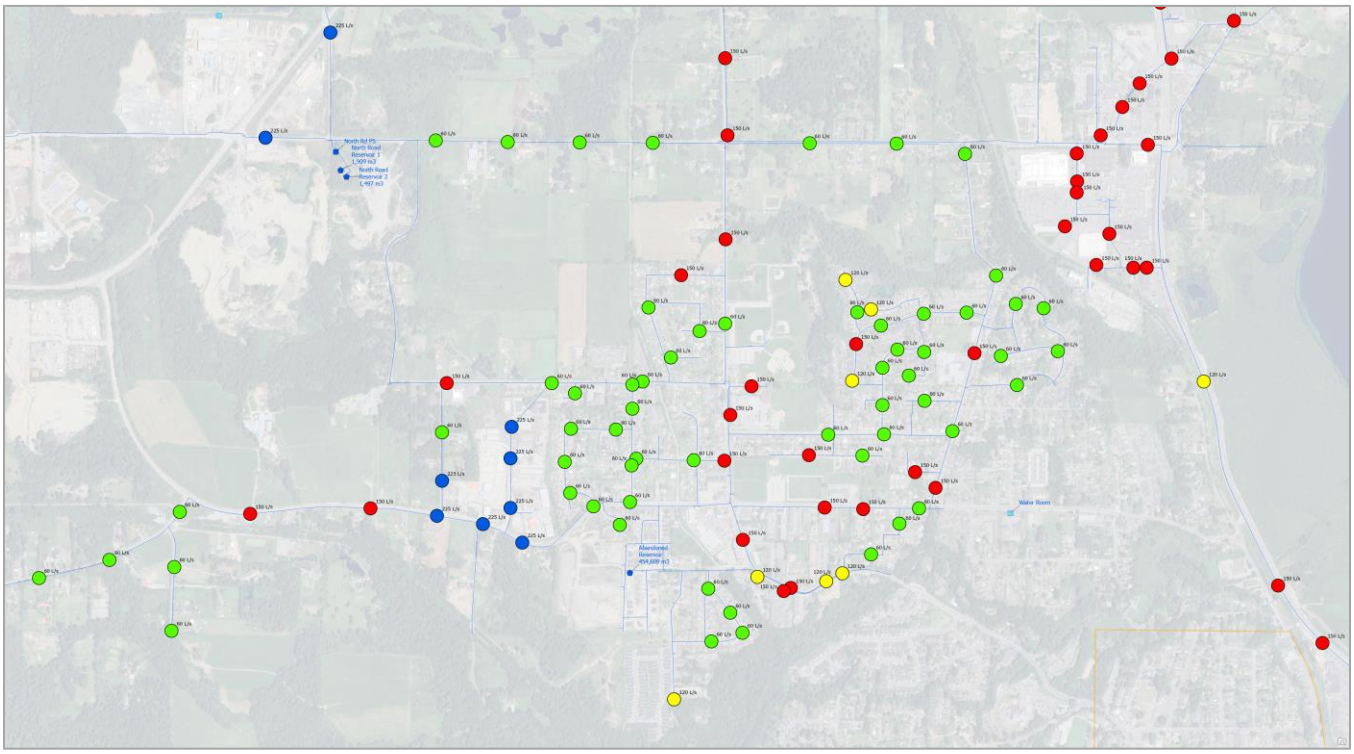

Figure 1 Berkey's Corner Area: RFF (Low-Density Model; Single-Family Units).

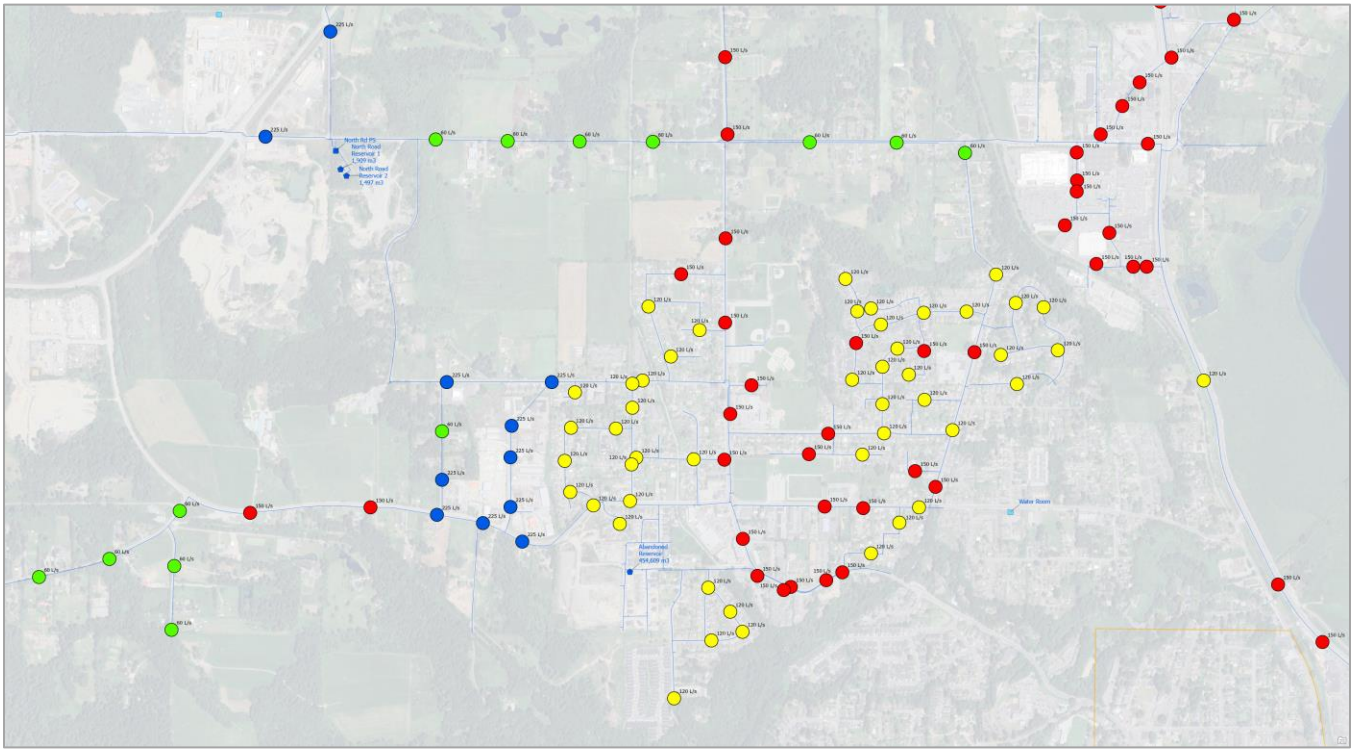

Figure 2 Berkey's Corner Area: RFF (High-Density Model; Multi-Family Units).

Figure 3 shows the fire flow deficiencies in the system under a lower density development pattern. The reason that there are any red dots at all is that modelling is using an RFF = 60 L/s (the currently accepted standard per the Master Municipal Contract Documents design standards), while the existing systems were designed for 45 L/s (a much older standard). Note the relatively small number of red dots versus Figure 4. Figure 4 shows the fire flow deficiencies under a higher-density development pattern. There are significantly more red dots.

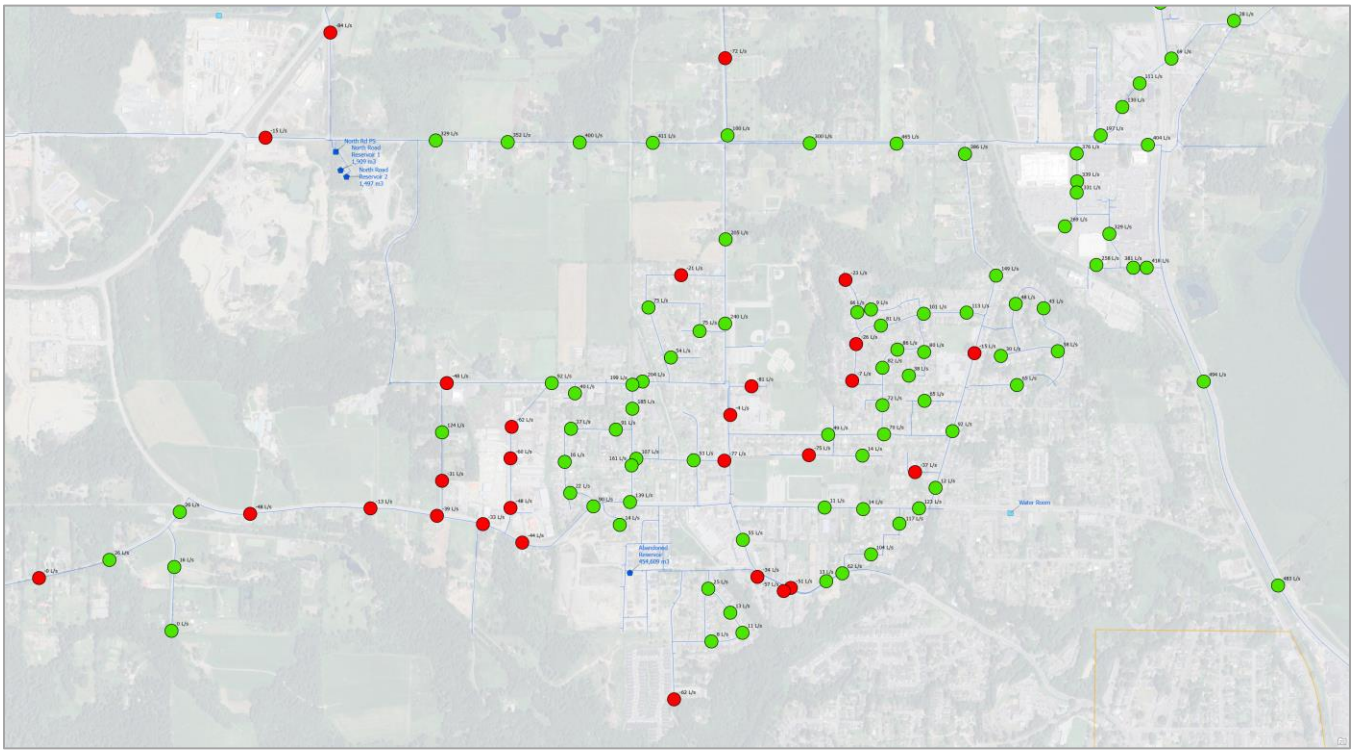

Figure 3 Berkey's Corner Area: Fire Flow Deficiencies (Low-Density Model; Single-Family Units).

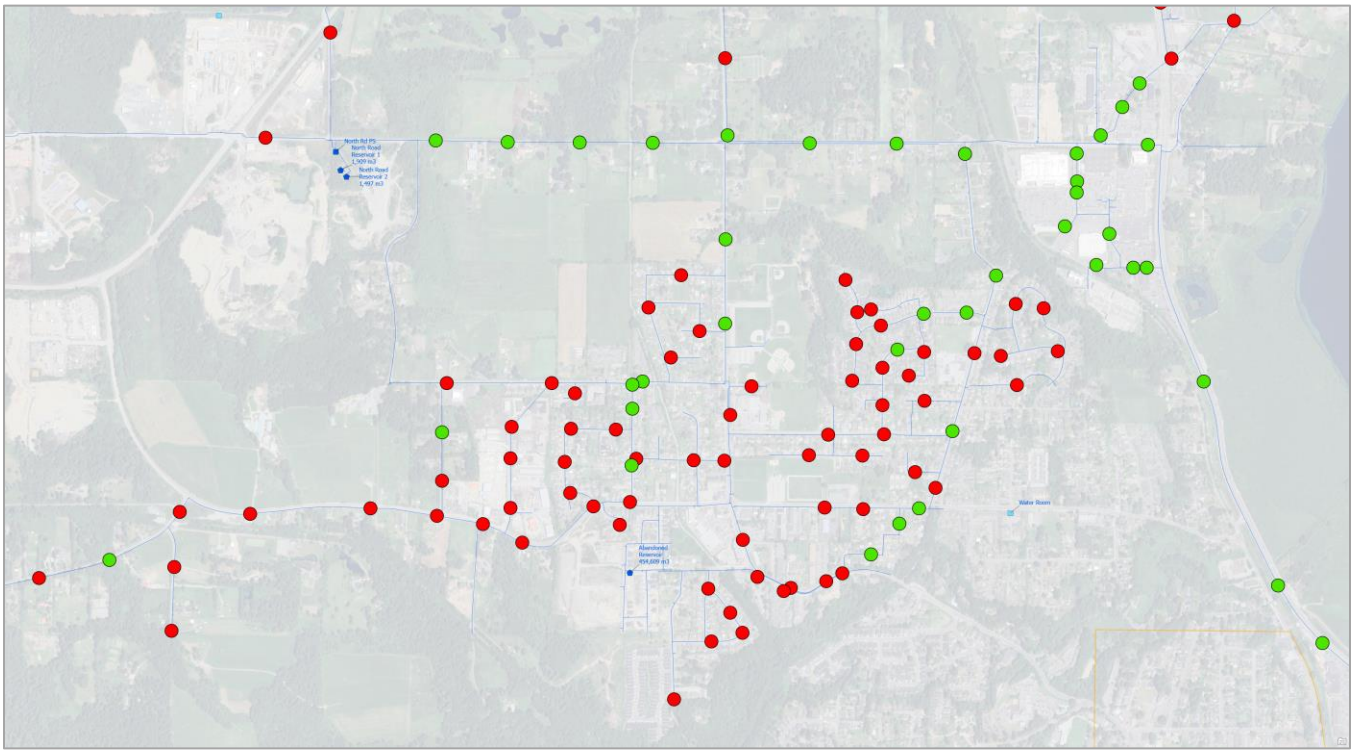

Figure 4 Berkey's Corner Area: Fire Flow Deficiencies (High-Density Model; Multi-Family Units).

The net impact of the higher density growth pattern and archetype is that the water mains need to be upsized to reduce pressure losses while delivering sufficient flow to meet the higher RFF. The required upgrades in the Berkey's Corner area are shown in Figure 5.

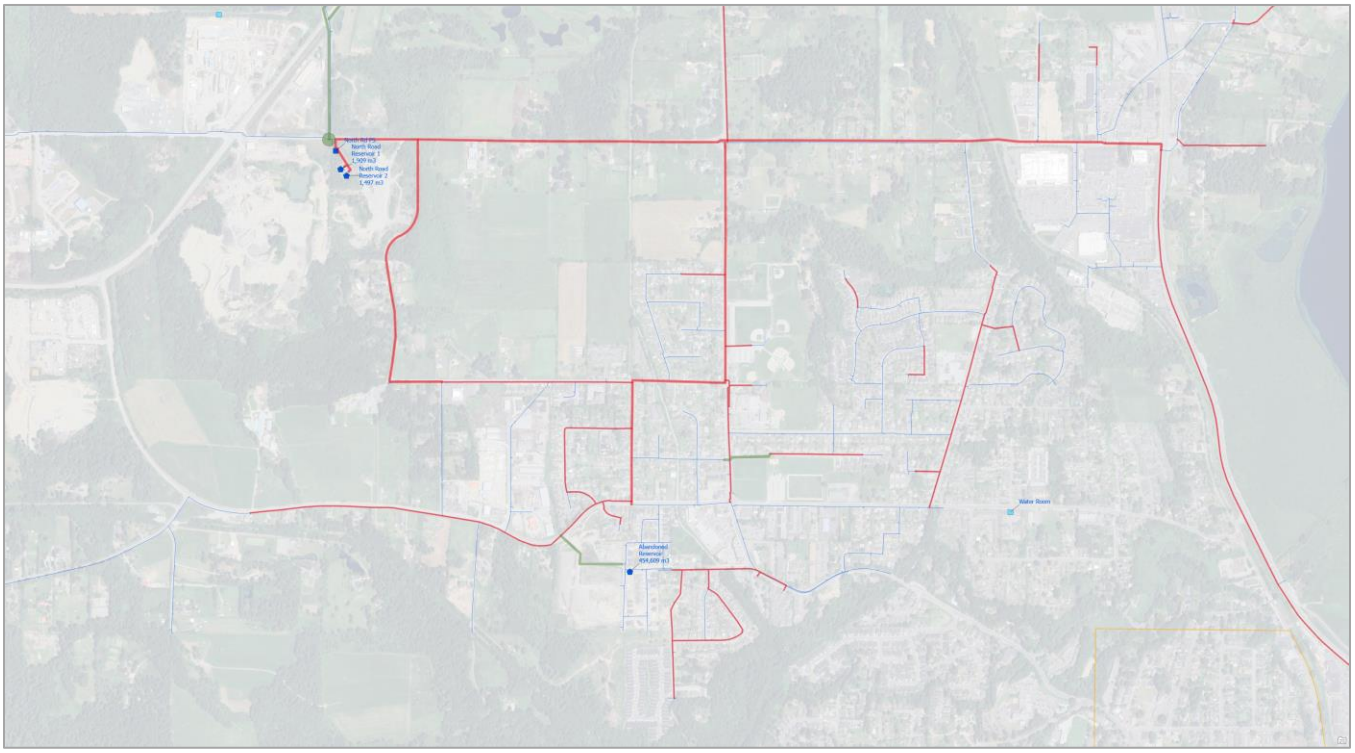

Figure 5 Berkey's Corner Area: Fire Flow Deficiencies (High-Density Model; Multi-Family Units).

Figure 6 & 7 show the pipe upgrades triggered due to higher density and MSWFS municipal-wide. The thick red lines are pipes that need to be upsized. The thin red lines are pipes that need to be relined/replaced with a lower friction pipe material to reduce friction losses. The green lines are new pipes.

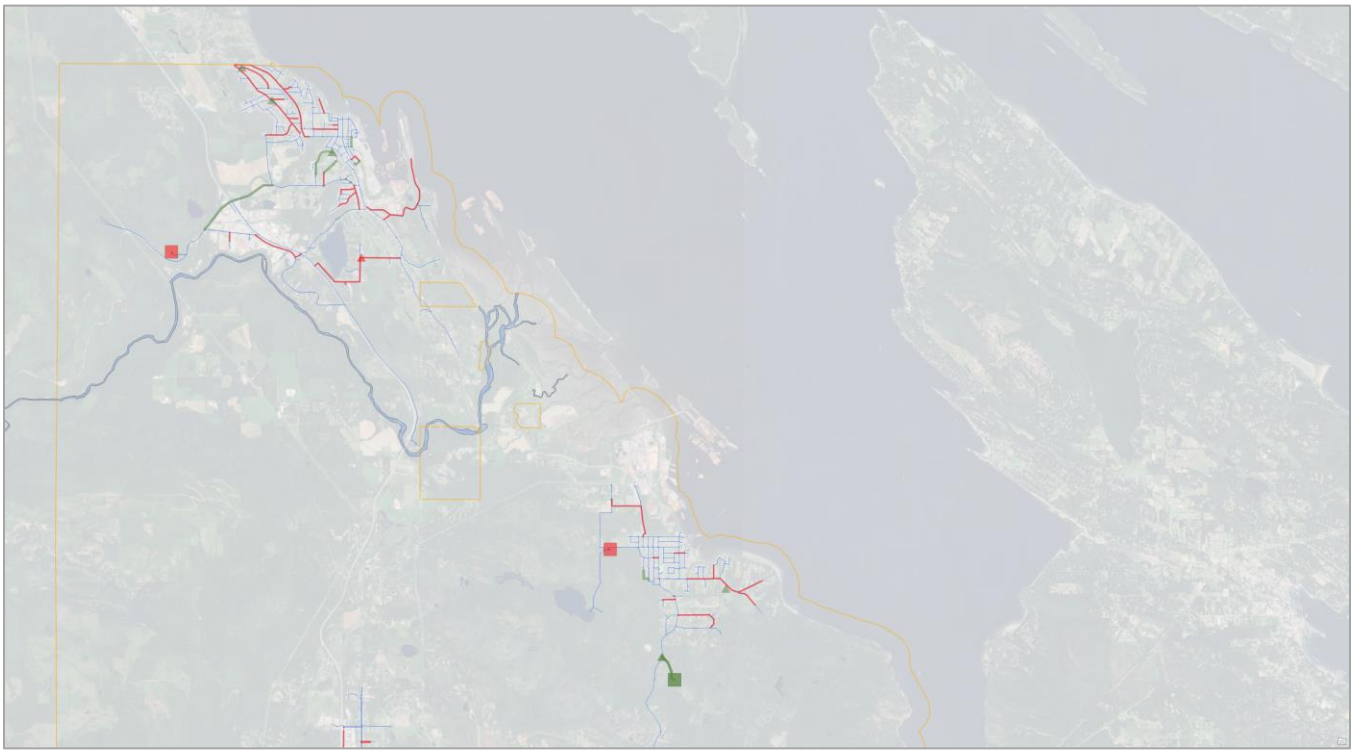

Figure 6 Water pipe upgrades (north, build-out scenario).

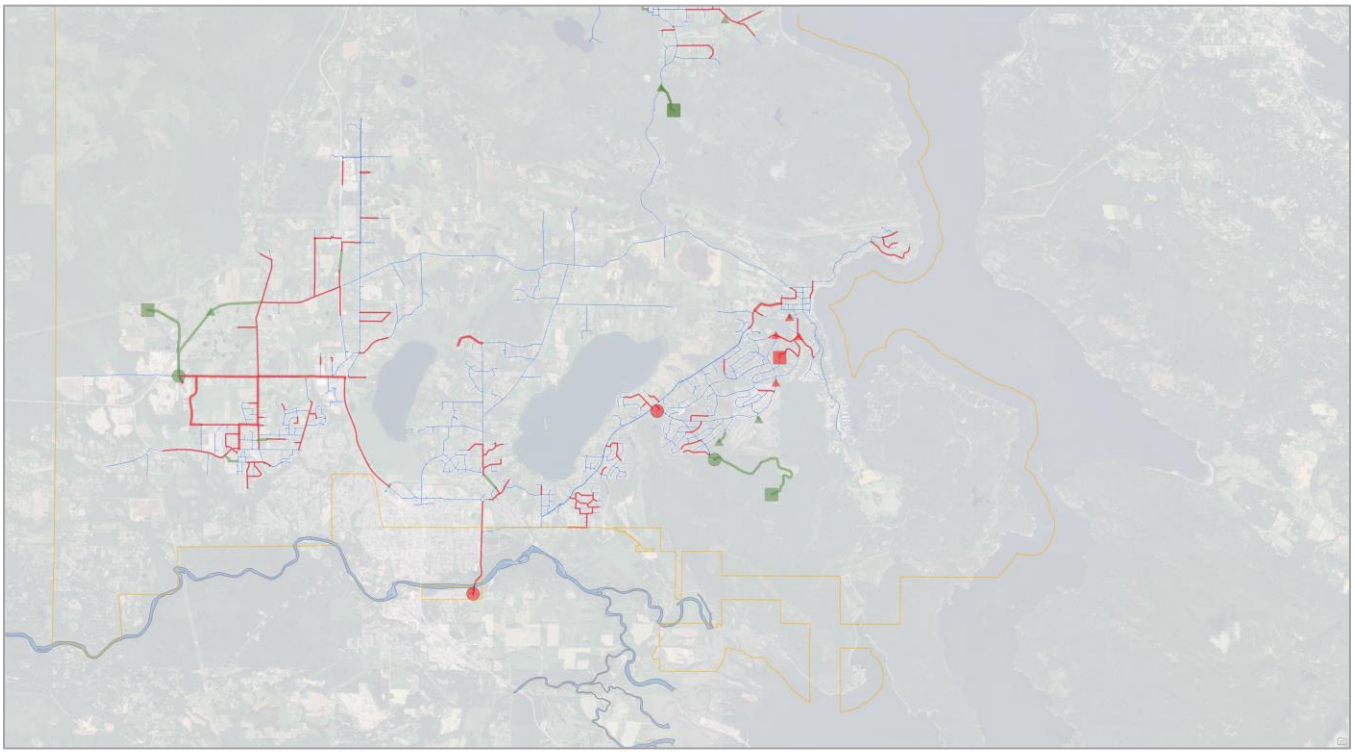

Figure 7 Water pipe upgrades (south, build-out scenario).

Increased density also impacts how closely one must watch for servicing issues. With a less dense development pattern, the infrastructure to service the housing is more spread out, and often, the pipe sizes were more than required to convey flows because of minimum pipe size requirements. However, when density is dropped into an area, it can impact the sizing of mains, whereas dropping in a cluster of single-family homes may not represent enough load to warrant upsizing any mains. If the increased density appears as MSWFS, or clusters of MSWFS, scattered in various areas within North Cowichan, the need to monitor the impacts of any given application, or the impact of one application on another, and the sequencing of the applications, makes it critical that staff monitor the applications as they come in. If the volume of applications is high, such as the last few years, close monitoring of applications and the application of a First In Time, First In Rights system becomes critical.

Planning, Subdivision and Engineering staff are managing an unprecedented number of land development applications. As of the end of January 2025, staff are tracking approximately 370 land development applications at various stages in the land development approval process. The applications amount to approximately 4,200 residential units tied to building permits, subdivisions, development permit applications, and land development agreements. Due to the relatively advanced stage of these applications in the land development process, residual capacity within our water and sanitary systems is reserved (or encumbered) for these units on the assumption that they will proceed and connect. An additional 5,900 residential units are tied to rezonings, pre-applications, and OCP amendments. Residual capacity within our water and sanitary systems is not reserved for these units. Therefore, the total number of residential units that staff are considering is 10,100 residential units.

To put this number of residential units in perspective, there are approximately 15,100 residential units within North Cowichan's boundary. Approximately 11,200 residential units (74%) reside within North Cowichan's four sanitary service areas, and 10,800 residential units (72%) reside within North Cowichan's three water service areas. This means that **the total number of units that staff are currently processing is equivalent to anywhere from 90% to 94% of the total number of units currently existing in North Cowichan's water and sanitary systems**.

When compared to the Province's Housing Target Order of 1,200 units over the next five years, **North Cowichan is managing 3.5 times what the Provincial Housing Target Order requires based on the number of encumbered units alone**. The number of encumbered units currently at the building permit stage is in the order of 1,300 units, which also exceeds the Provincial Housing Target Order.

One final statistic: the 4,200 encumbered units are roughly equivalent to 20 years of growth based on historical growth rates. However, staff are not able to determine how fast units will connect to our systems. The population forecast study included a land economics analysis, which suggests that over the next 10 years, it is anticipated that our growth will be in the order of 700 units per year, which is in the order of 3.5 times historical growth rates.

While nobody can know how fast the 4,200 units will connect and how many of the 10,100 units will complete and connect, staff believe that the historical growth rate is likely not representative of what growth will look like over the next 10 years.

While the number of new connections is not significantly higher than in previous years, the number of building permits and subdivision applications in-stream are significant, in the order of 2,500 units. Assuming that they go to completion in the next 5 years, the growth rate would be approximately 3.3%/yr versus North Cowichan's historical growth rate of 1.1%/yr. The Provincial Housing Target Order of 1,200 units over 5 years amounts to an annual growth rate of 1.6%. In consideration of the Province's push to build as much housing as possible, as fast as possible, the growth rate will likely be closer to 3.3%/yr than 1.1%/yr. An average growth rate of 2.2% would equate to 335 units per year.

In order to better manage the impacts of changing development patterns, and in anticipation of higher than historical growth rates, staff have developed tools to track better where the land development applications are located within our systems, how many units are tied to those applications, and how much of the residual capacity in our systems they are consuming.

Status of the Sanitary and Water Modelling Projects and Impacts to North Cowichan's Systems

Over the last three years, staff have undertaken significant work to update our population forecasts and water and sanitary models. Our work was delayed due to the Province promulgating Bill 44, which has presented significant challenges in terms of predicting where and how much growth will occur, given that Bill 44 essentially allows for a quadrupling of density on lots within the Urban Containment Boundary where most of our servicing is. If realized, such increased density would profoundly affect our system capacity. It is still not entirely clear how Bill 44 will play out, but staff have factored in some allowance for Bill 44 levels of density in the future model. The models containing existing and future loads on our systems are now complete. Staff have also developed a new land development application mapping system that tracks the location and unit counts associated with every land development application within North Cowichan (see Figure 8 & 4).

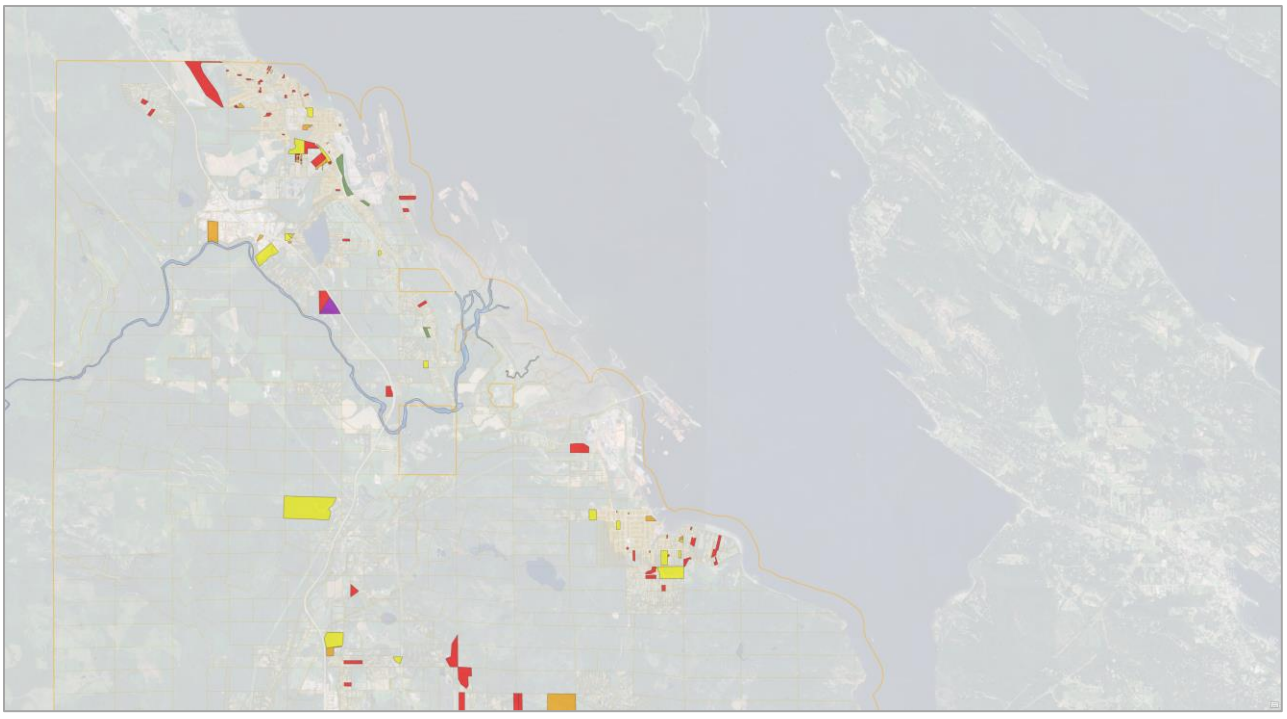

Figure 8 Land development applications (north).

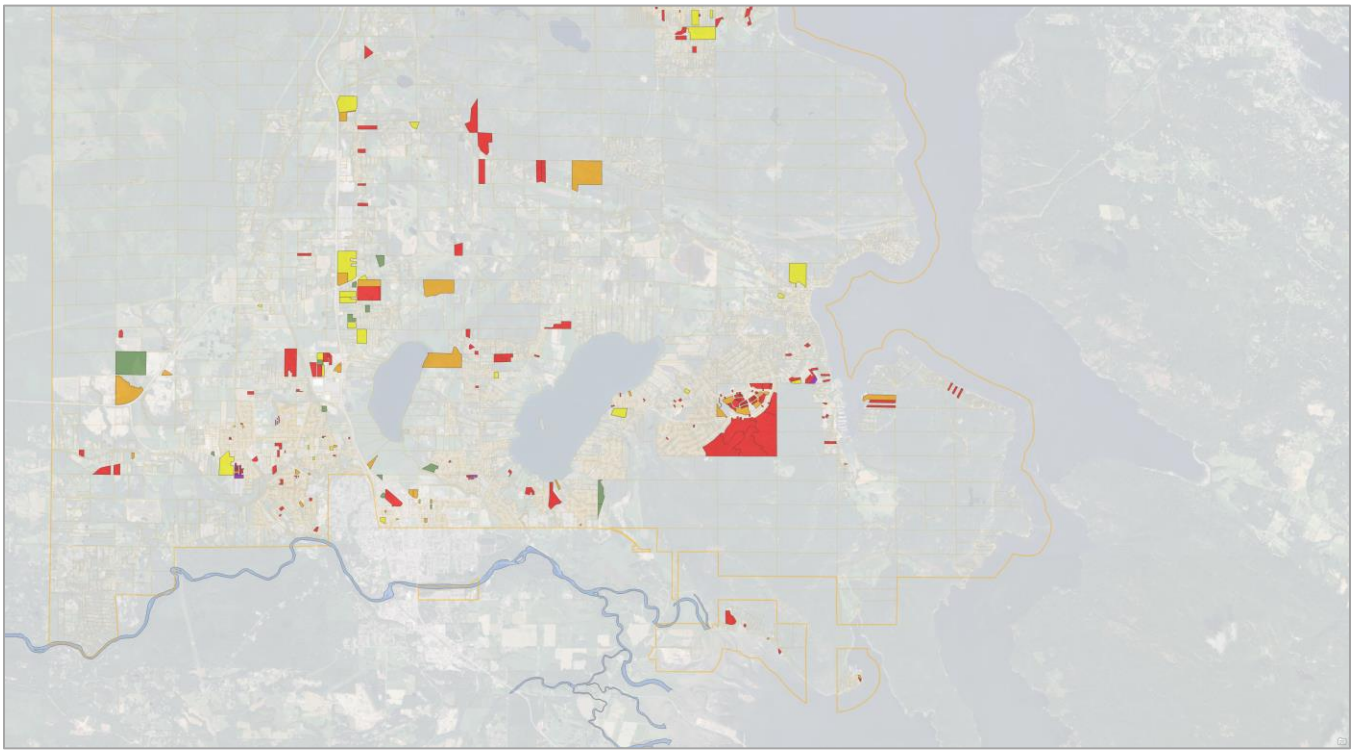

Figure 9 Land development applications (south).

Data from the land development map is transferred to the existing models. The existing models are then used to track the impact of encumbered land development applications on North Cowichan's water and sanitary infrastructure. The reason we only count applications at the building permit, subdivision, and development permit stage, along with units tied to land development agreements, is because it is assumed that developers have expended substantial funds to advance their applications, and so until a building permit, subdivision preliminary layout approval, development permit or land development agreement has expired, staff consider those units as having been assigned a portion of the residual capacity within our water and sanitary systems.

Based on the locations and number of encumbered units, we are at or near the limits of our capacity in all of our systems, and upgrades will be required to increase capacity. For clarification, North Cowichan is able to service the encumbered applications, which represent a significant amount of housing. The issue we face is that the encumbered unit count is so high that there is very little to no capacity remaining to consider any further applications without requiring no-build covenants until the capacity is in place to service additional encumbrances.

How Staff are Addressing Servicing Constraints

Move Forward with Infrastructure Upgrades

Using the modelling, staff have identified some of the larger, more costly upgrades and have commenced with the design and, in some cases, the construction of those upgrades.

Chemainus

Key projects include:

1. Chemainus Water Reservoir #3 (DCC project).
2. Chemainus STP Centrifuge and Drum Thickener.
3. Maple Street Sanitary Pump Station Assessment & Upgrade.
4. Miscellaneous critical pipe upgrades.

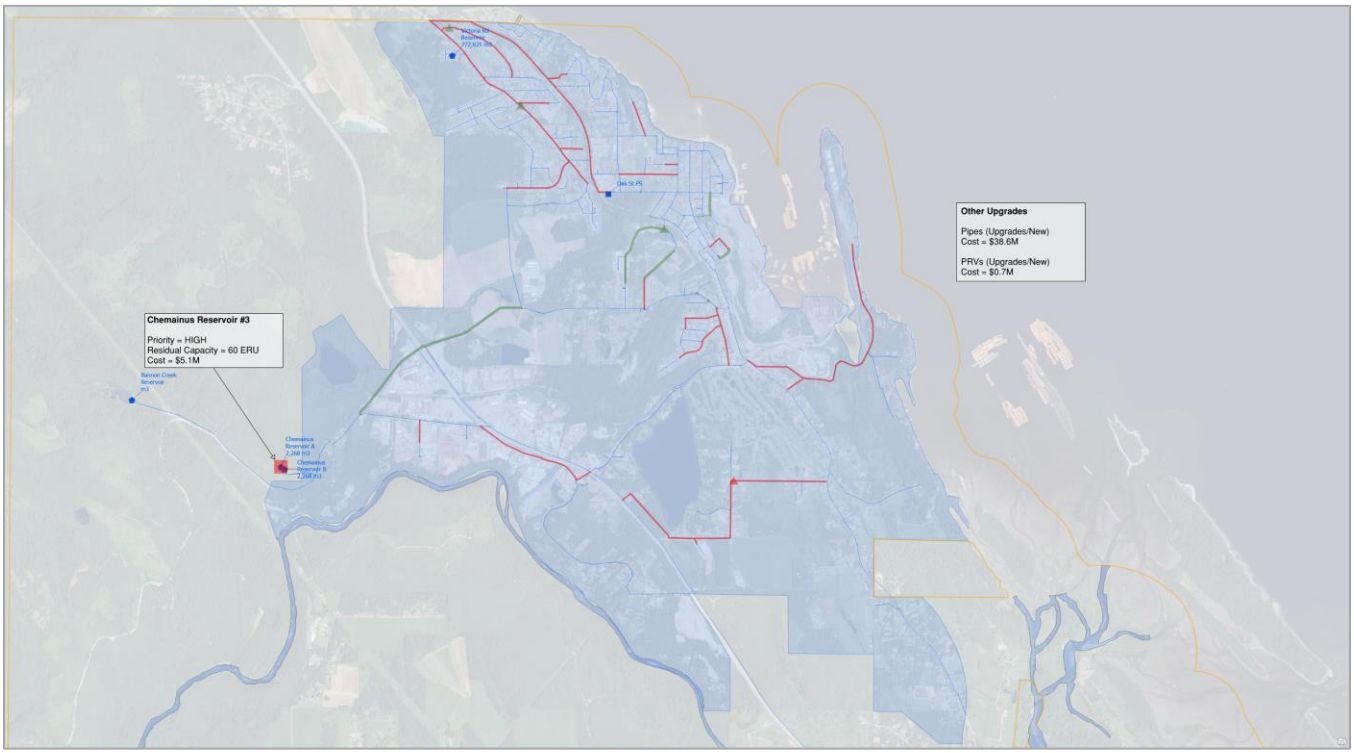

Figure 10 Chemainus water system projects.

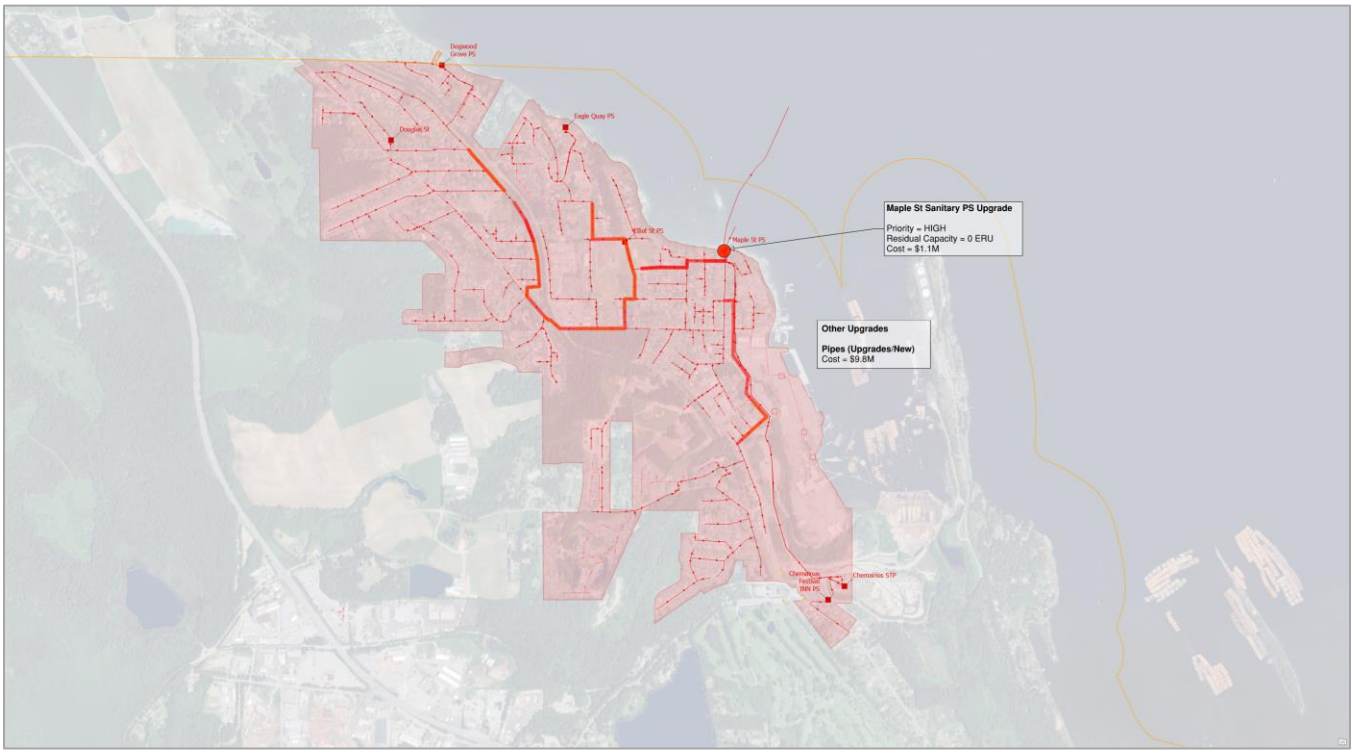

Figure 11 Chemainus sanitary system projects.

Crofton

Key projects include:

1. Connection to Paper Excellence water supply line to Mill.
2. Crofton Sewage Treatment Plant Clarifiers #3, #4 and Drum Thickener (co-funded by grant).

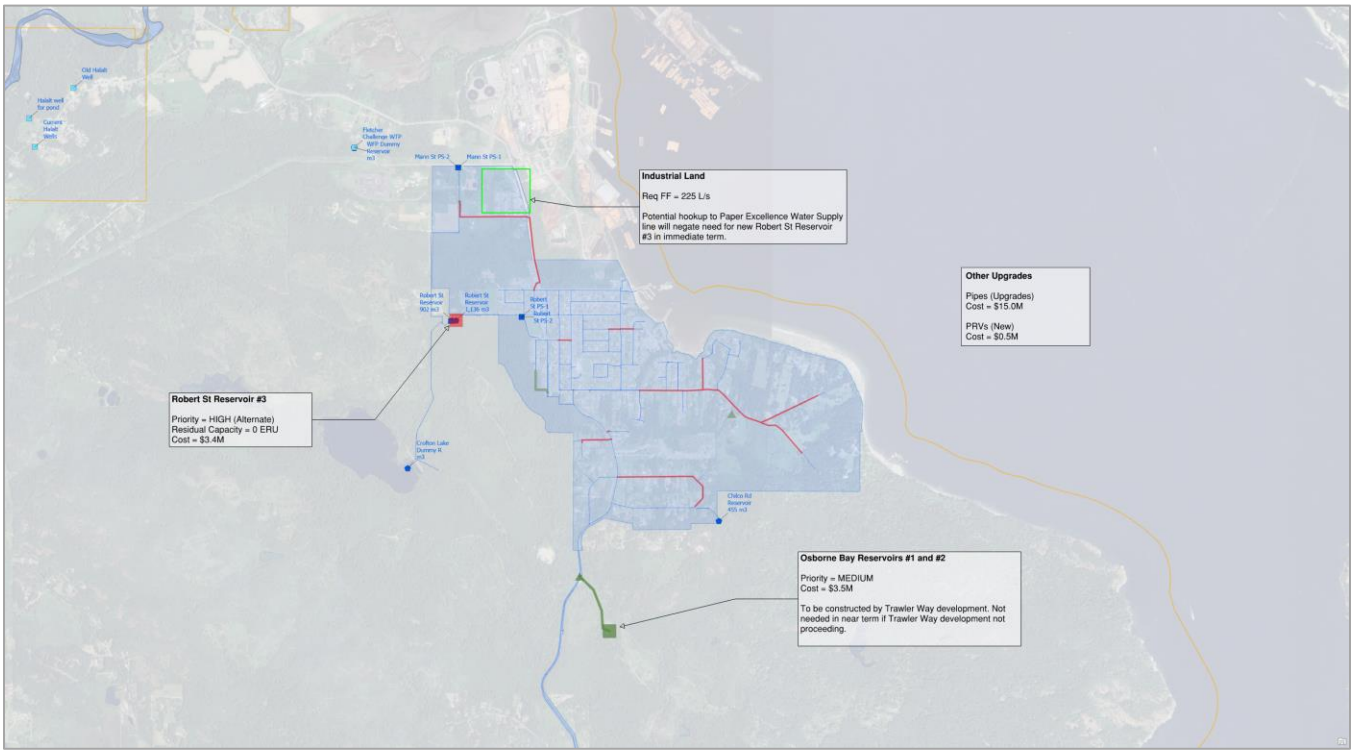

Figure 12 Crofton water system projects.

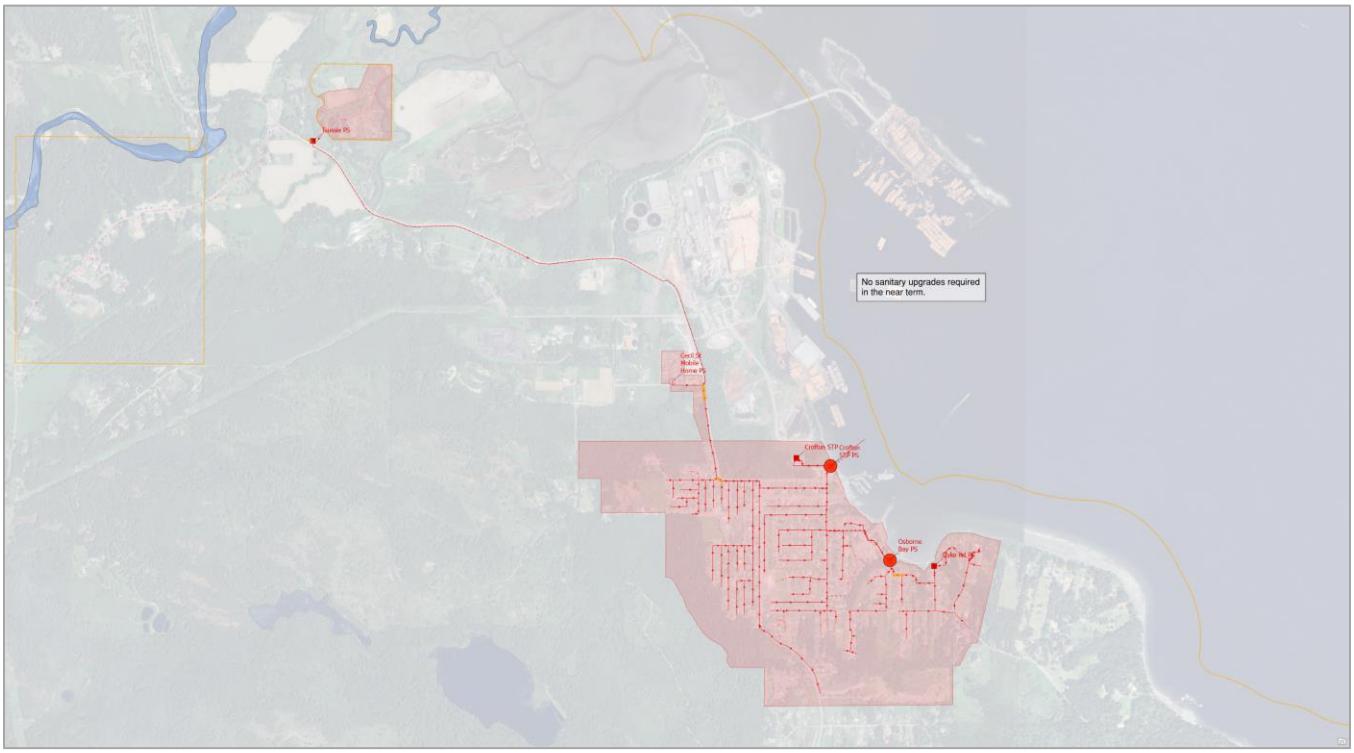

Figure 13 Crofton sanitary system projects.

South End

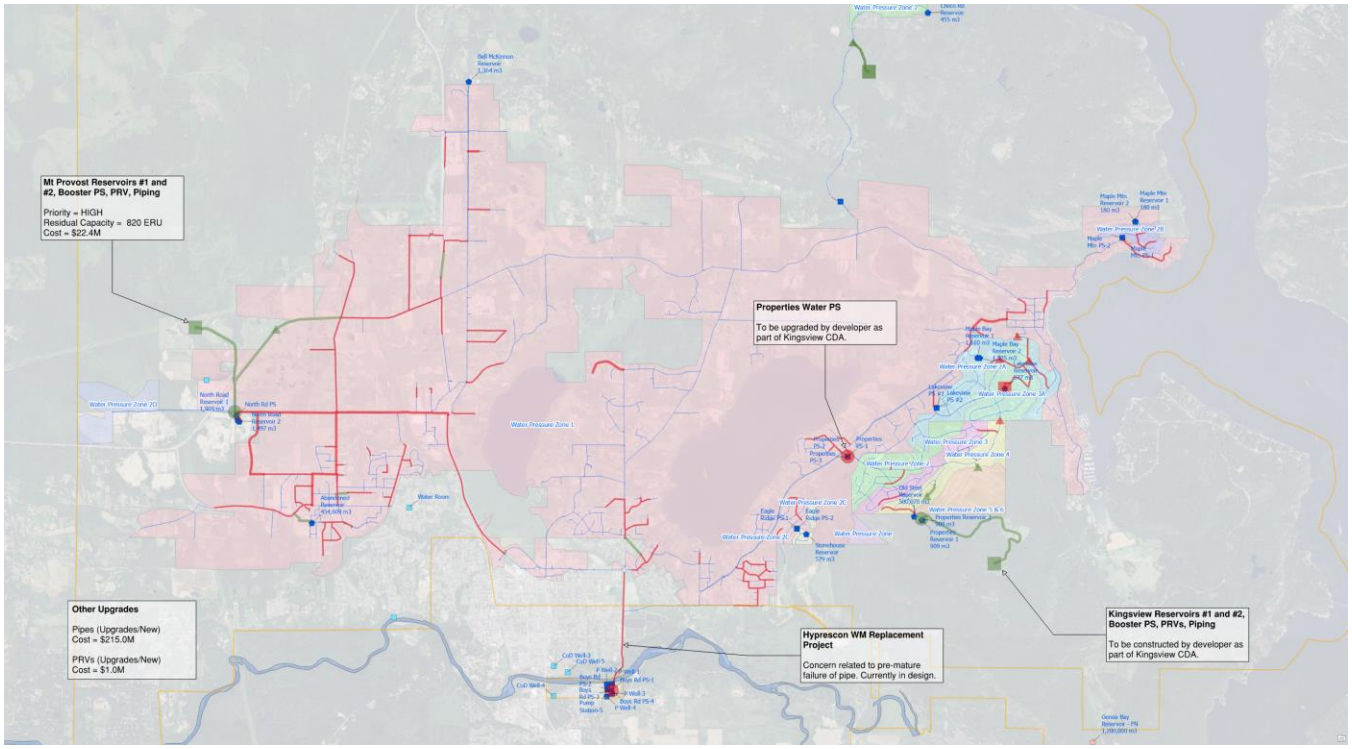

Figure 14 South End water system projects.

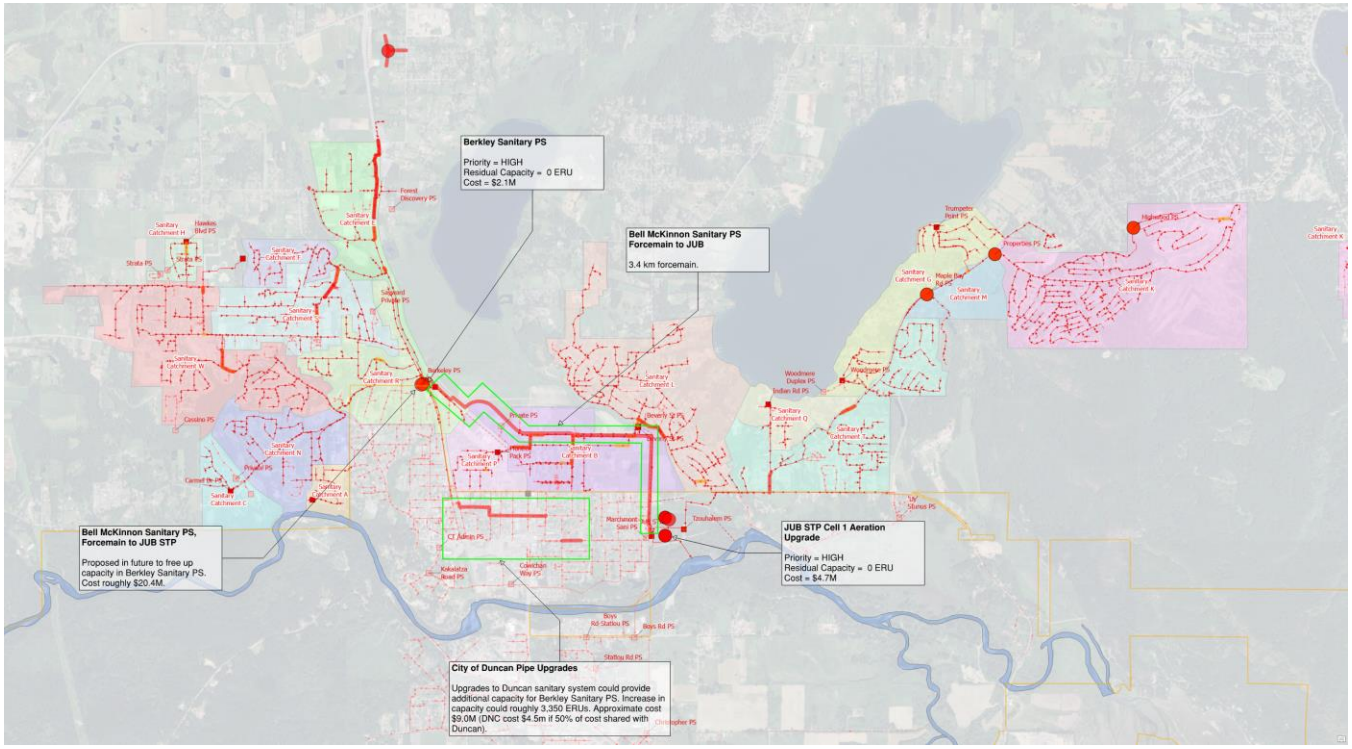

Figure 15 South End sanitary system projects.

Key projects include:

1. Joint Utilities Board Sewage Treatment Plant: Cell 1 Diffuser Upgrade Project (DCC project). The costs of this project are shared by the following jurisdictions based on units of capacity owned: North Cowichan (52.96%), Duncan (30.77%), CVRD Area D Cowichan Bay (6.36%), CVRD Area E Eagle Heights (6.73%), and Cowichan Tribes (3.17%).
2. Berkley Sanitary Pump Station Assessment & Upgrade (DCC project). This pump station discharges into the Duncan sanitary sewer system and ultimately to Duncan's Marchmont Sanitary Pump Station. Therefore, upgrades to the Berkley Sanitary Pump Station and some of Duncan's sanitary pipes and possibly the Marchmont Sanitary Pump Station will be required. Modelling is underway to determine the nature and cost of these upgrades.
3. Hyprescon Watermain Replacement (borrowing).
4. New Mount Provost Water Reservoir, Booster Pump Station and Pressure Reducing Valve Station (consider borrowing).
5. Miscellaneous critical pipe upgrades.

Some projects are financed from our current DCC reserves if they are listed as projects. Some of the projects listed above are not in the current DCC bylaw, but due to the timing of construction, the projects will be included in the new DCC bylaw. They will be funding to varying degrees by development (see section on DCC Bylaw Update). Taxpayers fund a portion of the DCC projects, as DCC projects often have some benefits for existing users. For other projects, staff will seek to obtain co-funding from the provincial and federal governments. In some cases, staff are discussing borrowing and then using DCCs collected in the future to help pay off the loans to advance infrastructure construction. If developers are not able to finance these infrastructure improvements (and without significant federal/provincial support through infrastructure grants), North Cowichan will most likely need to consider borrowing funds for some of these projects. To proceed, this would require electoral approval. The available borrowing limit is roughly $120 million, assuming a long-term interest rate of 4.1%.

Development Cost Charge Bylaw Update

In addition, the future model outputs have been used to generate a list of future projects triggered by growth, including those listed above. Those projects have been costed, and staff are setting the new DCC rates for our three water systems, three sanitary systems, roads, fire and parks for Council consideration and stakeholder consultation. Hopefully, the DCC rates can be adopted by late summer or early fall of this year. Having the new DCC bylaw in place will help fund future infrastructure triggered by growth, as the current bylaws do not contain many of the upgrade projects identified, and the rates do not reflect the significant inflation that has occurred over the last 14 years.

Staff are updating our Master Drainage Plan to identify what upgrades may be required within the drainage system. Upgrades triggered by growth will be costed, and rates will be calculated and included in an updated Drainage DCC bylaw.

The expectation is that developers will need to come together to finance the provision of in-area and out-of-area infrastructure upgrades either through paying outright for the construction of new infrastructure or through DCC credits or DCC front-ender agreements.

Risk Management

As discussed previously, with changing development patterns, large MSWFS, and the pace of development, staff are putting measures into place to manage our risk. Aside from some of the systems put in place to manage the tracking of units and impacts to our systems, staff are also taking the following steps to limit risk to North Cowichan while still allowing the maximum extent possible for processing land development applications. Some examples are provided below:

1. Advising developers as early as possible in the land development application process of the servicing constraints so developers can make decisions about their applications and plan accordingly.
2. Reviewing in-stream applications on a regular basis to assess if applications currently encumbered with capacity can be unencumbered to free up capacity to development applications that have a higher likelihood of proceeding. Staff would reach out to those applications affected to let them know the capacity reserved for their application is being re-assigned.
3. Amendments to the Sewer Bylaw, Water Bylaw and Building Bylaw will provide stronger language to protect North Cowichan when servicing capacity is unavailable.
4. Amendments to the Subdivision Bylaw to update the water and sanitary design standards. The new design standards are based on the new calibrated models, which more closely mimic the actual loads on our systems and, therefore, are less conservative than our existing standards.
5. Bringing forward a report to Council to identify a prioritized list of the most critical infrastructure projects to provide/unlock capacity for development, including projects where borrowing to advance projects makes sense based on Council's Strategic Plan/OCP/Economic Development objectives.
6. Updating the DCC bylaws for water, sanitary, roads, drainage, fire and parks. DCCs provide a way for North Cowichan to reimburse developers through DCC credits and DCC front-ender agreements for their costs constructing infrastructure that enables development to proceed.
7. Aggressively seeking Federal and Provincial co-funding for critical infrastructure projects.

A Word About the Bell McKinnon Local Area Plan

The Bell McKinnon Local Area Plan (BMLAP) area is a greenfield development site. The infrastructure in the BMLAP area is insufficient for the density proposed. There are significant off-site upgrades required to allow the BMLAP area to develop. The BMLAP document identifies these constraints and recommends further study to determine the servicing needs inside and outside the BMLAP area.

Consequently, staff are undertaking a BMLAP servicing study to better define the layout and sizing of infrastructure within the BMLAP area. This work will inform the infrastructure requirements to service the BMLAP area, which should speed up the processing of land development applications.

Moving Forward

Handling Land Development Applications That Are Not Encumbered

Staff are obligated to let developers know when capacity is not available. If a developer wants to proceed with their application, staff will be recommending to Council that the developer be required to register a no-build covenant until the upgrades to the applicable system(s) needed to service their development are in place, and that the development will be subject to the new DCC bylaw charges for the applicable system(s) to help pay for the infrastructure upgrades.

If a developer wants to better understand the servicing constraints within the system(s) that they are intending to connect to, a referral to the Engineering Department will be required. Modelling may be required depending on the level of detail the developer wants.

Keeping Council Informed

When required (such as where bylaw updates are required), staff will be seeking Council direction. As the processing of land development applications continues, reports will continue to be brought forward to Council as usual. When key decisions need to be made around the processing of land development applications or when further updates are required, staff will bring key issues forward to Council for direction.

FINANCIAL IMPLICATIONS

Now that staff have a fulsome understanding of the upgrades required to advance development beyond the 4,200 units of growth that can currently be serviced, to "unlock" further development additional staffing and financial resources will be required.

Staff will be bringing forward a report to Council, to identify a prioritized list of the most critical infrastructure projects to support further development, including projects where borrowing to advance projects makes sense based on Council's Strategic Plan/OCP/Economic Development objectives. There are some risks associated with constructing infrastructure ahead of development, which staff will also provide in the report.

Should Council choose to direct staff to undertake additional projects to support further development, staff will bring forward during Business Planning information on what additional staffing will be required for consideration in the 2026 Budget.

RECOMMENDATION

This report is being provided for information only.

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