A Plan for the **Future** September 2021

Sustainable Infrastructure **Replacement Plan**

A Sustainable Funding Plan for the District

DISTRICT OF OAK BAY

Acknowledgements

The Sustainable Infrastructure Replacement Plan (the Plan) was prepared by Christopher Paine, CPA, CGA, Director of Financial Services, and had substantial input from key District departments. Specifically, the following consultants and departments provided essential data, information, feedback, and support:

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Thank you for taking the time to learn about the District of Oak Bay's plan to replace its infrastructure in a financially sustainable manner.

Asset Management BC is pleased to endorse the process used to create this report.

Read the full endorsement here

Contents

Executive Summary

The District of Oak Bay is a picturesque suburban community located on the traditional territory of the Coast and Straits Salish Peoples, at the southern tip of Vancouver Island. The District has a population of approximately 18,000 people and was incorporated in 1906. One of the District's core responsibilities is to provide stewardship of the public assets that provide crucial services to the community (as outlined in Section 7 of the Community Charter).

A significant portion (approx. $273.9M) of the District's water, sanitary sewer, storm, and road assets are past their recommended useful life. Many other assets are well through their recommended useful life and are due for replacement imminently. Replacing these assets will come at a significant cost. Replacing these assets is considered critical if the District is aiming to sustain the current levels of service. Current funding levels are not sufficient to replace assets at the recommended pace. Council has expressed a desire to address this issue. Not addressing it will result in an increase in water main breaks, water quality challenges, sewer backups, and storm water issues with impacts to private property.

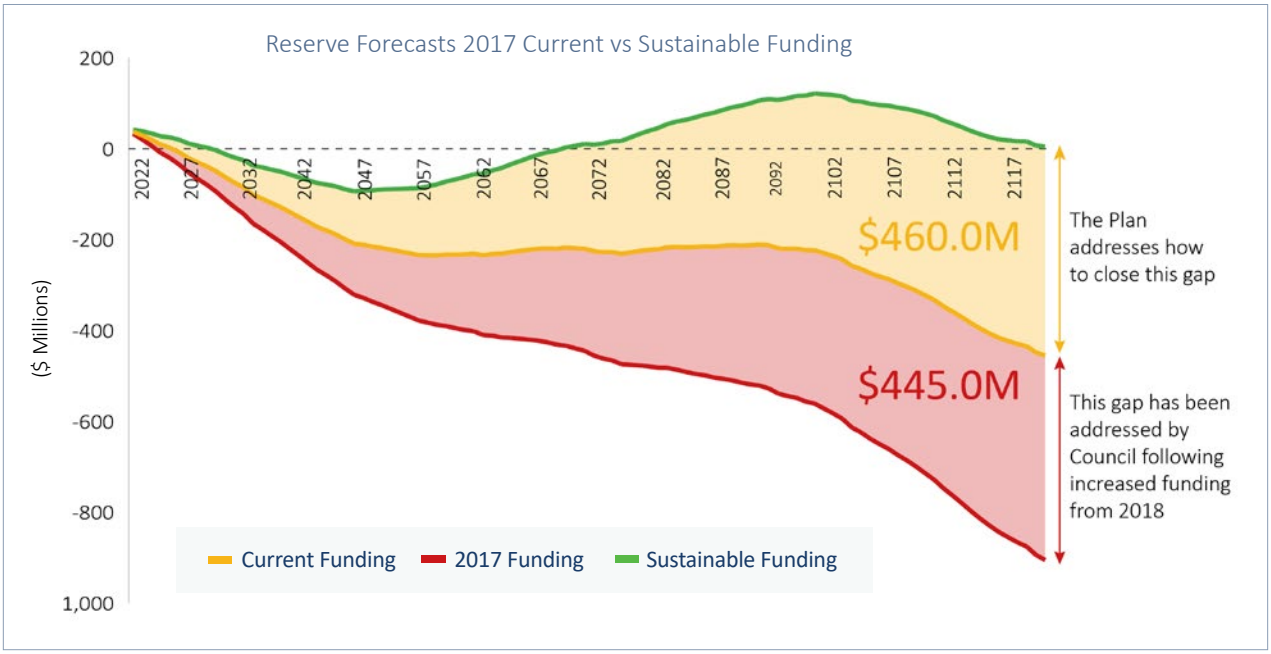
'Recommended Useful Life' in this report generally refers to the replacement cycle recommended by the National Asset Management System

Council has provided strategic direction to address this issue by:

1. developing an asset management program,
2. increasing funding, and
3. increasing capital programming.

Council has made significant progress in closing the forecasted 100-year funding gap. Council began significantly increasing infrastructure replacement funding in 2018. These funding efforts have reduced the forecasted 100-year funding gap by $445.0M. This report recommends how to close the estimated remaining $460.0M 100-year funding gap.

Figure 1: 100 Year Funding Gap Progress



At their June 28, 2021 Regular Meeting of Council, Council received an updated Asset Management Strategy. This Strategy includes a specific program component referred to as '3.0 Long Term Financial Plan'. This Plan has been developed to address the '3.0 Long Term Financial Plan' and has three specific objectives:

1. Forecast infrastructure spending for the next 50-100 years
2. Recommend funding levels required to support long term infrastructure replacement
3. Develop different options to address forecasted funding gaps

Infrastructure Inventory Totals

Since incorporation, the District has proudly acquired and constructed over $900M (2021 dollars) in public assets, including:

- 76 hectares of land
- 106km of roadway
- 30+ buildings
- 100+ units of major equipment and vehicles
- 14 pump stations
- 141km of storm drain
- 100km of sanitary sewer
- 116km of water main

In addition to built infrastructure, the District is responsible for the stewardship of natural assets, including 13km of coastline, approximately 10,000 boulevard trees in its urban forest, and 1.3km of creeks.

Infrastructure Funding & Infrastructure Condition: Not a Unique Challenge in Canada

Funding for infrastructure replacement is proving to be a significant challenge across Canada. A report developed by the Federation of Canadian Municipalities notes a significant proportion of Canada's public infrastructure was built between 1950 and 1970 and is now due for replacement. The condition of the infrastructure is deteriorating, forcing local governments to significantly increase capital output, rapidly increasing the need for funding. The report estimates that the infrastructure funding gap increased from $12B (1985) to $123B (2007) within Canada. The District of Oak Bay has made proactive and transparent efforts to quantify and address its 100-year funding gap; only a small proportion BC local governments have undertaken these efforts.

Key Findings

This report has the following key findings:

- **Infrastructure Inventory:** The District owns and maintains approximately $900.3M[1] (2021 dollars) in assets.
- **Past due Infrastructure:** Approximately $273.9M of these assets are beyond their useful life as recommended by asset management standards (accounting for approximately 40% of depreciable assets).
- **Annual Funding Infrastructure Gap**: The District's annual infrastructure funding gap is estimated to be $4.6M creating a $460M cumulative infrastructure funding gap over the next 100-years if left unchanged. The District can gradually close the annual infrastructure funding gap over 8 years by implementing a series of utility and tax rate increases.
- **Cumulative Infrastructure Funding Gap:** Over the last century, the District's cumulative infrastructure funding gap has grown to approximately $463.5M. The District is confronted with this challenge, given that many of these assets are now due for replacement or will be due for replacement shortly. The District can eliminate this gap by 2076 if the measures in this report are implemented.
- **Spending/Debt:** Spending is forecasted to exceed $1.3B over the next 100 years. Modelling indicates that debt will be required to replace infrastructure, even with recommended tax and utility rate increases. Debt forecasted over the next 100 years is between $175M and $225M.
- **Cost of Climate Change:** Climate change will increase the cost of municipal infrastructure replacement. The financial impact that climate change will have on municipal infrastructure replacement is discussed briefly in the body of this report. However, the financial impact of climate change on private property is not explored in this report.

1. The District owns $28.8M storm, $31.5M sanitary sewer, and $37.9M in water laterals. Under the District's 'Water Rate Bylaw, 1981', and 'Public Sewer Bylaw, 1996', homeowners are responsible for the maintenance and replacement of laterals.

Key Recommendations

This report contains the following key recommendations:

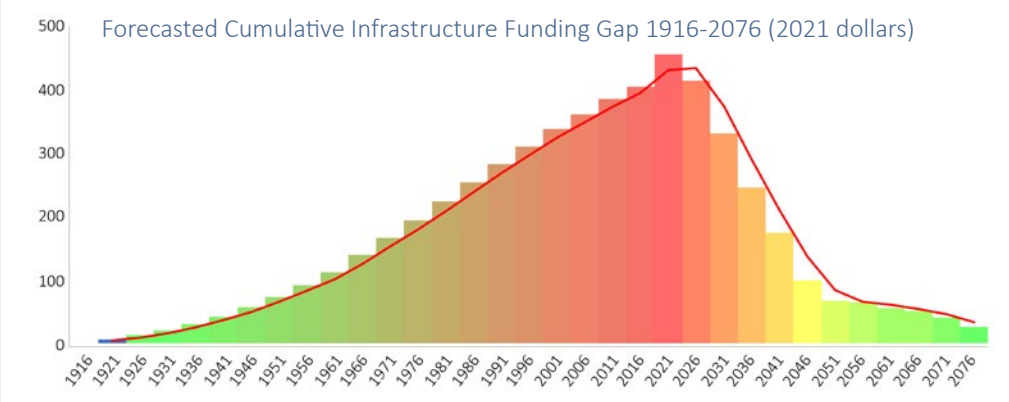
1. **Increase annual reserve contributions to sustainable levels.** Increasing annual funding levels to sustainable levels will halt the growth of the District's cumulative infrastructure funding gap. The recommended increases are listed in the table below. Modelling has indicated that a more rapid transition to sustainable funding (such as a 1-year 20% water utility rate increase) would reduce the 100-year cost of replacement by approximately 1.7% – 2.2%. However, since a rapid transition to sustainable funding has a nominal overall cost impact, a more gradual transition is recommended (such as 6-8 years of successive increases).

Table 1: Impact of Tax/Utility Rate Increase to Median Residential property

	Recommended option	Annual $ Impact
Taxes	6 years, 2.06% per year	$66
Sewer Utility	8 years, 2.50% per year	$7
Water Utility	8 years, 2.50% per year	$10
TOTAL		**$83**

2. **Replace infrastructure that is overdue for replacement over 25 years.** Modelling has indicated that a more rapid pace for replacing overdue infrastructure would not be feasible given the District's forecasted debt levels. Replacing assets over a longer period may result in unacceptable infrastructure condition risk levels.
3. **Significantly increase the replacement of storm, sewer, water, and road.** This report and the Asset Management work completed to date highlight the need to significantly increase the replacement of stormwater, sanitary sewer, water distribution, and road infrastructure. The scale and pace of this replacement will be defined by the ongoing work of the Asset Management Program, and other plans. Staff will partner with the community to determine levels of service and performance, and to set expectations of the capital program's effectiveness. The current forecast requires the District to increase annual capital output by 3-5 times for the next 15 years to reduce risks and the infrastructure maintenance backlog.

Should the District implement these measures, modelling indicates that the cumulative infrastructure funding gap can be eliminated by 2076.



Scope of Work and Limitations

The Plan Objectives

The primary objectives of the Plan are:

1. Estimate the replacement cost for all the District's depreciable assets,
2. Forecast infrastructure replacement spending over a 100-year time frame,
3. Analyze current infrastructure replacement funding levels and recommend adjustments as necessary,
4. Forecast reserve balances and the need for debt financing, and
5. Provide policy recommendations for sustainable capital service delivery.

Constraints, Limitations and Assumptions

Replacement of existing capital only: This report does not model anticipated growth in infrastructure requirements. Forecasts are based on the replacement of existing municipal infrastructure only. For instance, these forecasts have not contemplated the increased capacity required to support future densification or development. The Plan has not anticipated potential future decisions to increase capital service levels such as: building a Carnarvon Park Building, building a more extensive library branch or protective services building, or separating the Uplands combined sewer system.

District-owned capital only: This report examined capital owned by the District only. It does not consider the replacement of capital owned by other organizations, even in the case where the District contributed funding for construction. Two examples include the Neighbourhood Learning Centre and the Oak Bay High School track. In both cases, the District contributed capital funding but is not an owner of the capital.

Inflation: Forecasts are prepared in 2021 dollars. No inflationary factor has been applied to forecasted replacement costs. As unit costs are likely to escalate, the District should consider applying a forced growth increase to recommended investment levels.

Degree of accuracy: Many variables can significantly change forecasted values, including:

1. degree of actual cost escalation experienced,
2. local conditions that impact useful life,
3. current and future Council tolerance for risk and preferred capital service levels,
4. data errors,
5. future economic events and conditions,
6. new senior government regulation,
7. changing community expectations, and
8. actual return achieved on the District's portfolio investments.

Capital grants: Forecasts do not include any potential conditional grants awarded by senior levels of government. Historically, senior governments have not offered many capital grants for the replacement of existing infrastructure. However, forecasts do include ongoing unconditional federal Gas Tax payments.

Works of Art: The District manages and controls various works of art and non-operational historical cultural assets, including buildings, artifacts, paintings and sculptures located at District sites and public display areas. These assets and potential capital maintenance and replacement of these assets are not represented in this Plan.

Play structure components: The District's parks contain many unique play structures. Each component has a different useful life and condition. Play structure replacement was simplified by homogenizing useful lives and forecasted replacement years.

Building components: Projections for the District's facilities portfolio draws on existing information and assumptions regarding standard life expectancies for main building components, building lifespan, and replacement at the end of life. The cost to replace building components and the timing of replacement is based on rule of thumb projections. Individual building component condition assessments and investment prioritization have not been conducted for the purposes of this forecast.

Undedicated reserves: At the time of writing the Plan, the District has approximately $16.7M in undedicated reserves that could be used for infrastructure replacement. These reserves have been allocated to asset classes based on forecasted spending over the next 20 years for the purpose of calculating the District's cumulative infrastructure funding gap. Council could choose to use these funds for different asset classes.

Parkland assessed values: Parkland is assessed and valued using an institutional park rate applied by BC Assessment.

Curb and gutter forecasts: The District does not currently maintain an accurate inventory of curb and gutter. At the time this report was written, the technical review team used their professional judgment to estimate that 90% of roads have curb and gutter, and 40% of curb and gutter are past their recommended useful life.

Sidewalks: The District does not currently maintain an accurate sidewalk inventory. At the time this report was written, the technical review team used their professional judgment to estimate that that 50% of roads have sidewalk and 25% are past their recommended useful life.

Infrastructure replacement standards: Forecasts are prepared with the assumption that infrastructure will be replaced at the same standard that currently exists. However, some of the District's infrastructure does not meet existing standards. For instance, some of the District's sidewalks may be widened from 1.5m to 2.0m when replaced.

Climate change: This report briefly discusses some of the risks to the District's infrastructure from the impacts of climate change. The impact of climate change on private property is not discussed. Further review, funding and staff capacity is required should Council or the community wish to understand the broader implications of climate change risk to the community.

Council decision making: The variable with the most impact on financial modelling contained in this report is Council decision making. Council determines funding levels, infrastructure replacement pace, and capital service levels.

Sources of Information

The following sources of information were used to construct the Plan:

- Tangible Capital Asset Inventory (working database)
- Preliminary Facilities Master Plan data (Facilities Master Plan expected 2022)
- Graphical interface layers for park, sanitary sewer, storm drain, and water assets (working databases)
- Playground Inventory Assessment, 2021 prepared by Habitat Systems
- Internal equipment replacement plans: Police Department, Public Works, Fire Department, and Parks, Recreation and Culture (working databases)
- Internal replacement plans for fountains, benches, picnic tables, and waste receptacles (working databases)
- Oak Bay Pavement Management Study 2013
- Oak Bay Water Supply Master Plan 2019
- Sanitary and Storm Sewer Condition Assessment 2015-2017
- Task 2 – Sea Level Rise Modelling and Mapping Report June 2020, Capital Region Coastal Flood Inundation Mapping Project
- Asset Management for Sustainable Service Delivery, Asset Management BC, 2019
- Urban Forest Management Strategy 2017, Diamond Head
- McNeill Bay Foreshore Erosion, 2018 Recession Rate Monitoring, Kerr Wood Leidal Consulting Engineers
- District of Oak Bay Asset Management Policy (updated 2021)
- International Infrastructure Management Manual, International Edition 2015, Institute of Public Works Engineering Australasia

SECTION A:
Overview of Asset Management in Oak Bay

Asset Management BC Framework

The Asset Management BC Framework identifies three major steps in the Asset Management process:

- **Assess** asset management practices and the state of assets.
- **Plan** what needs to be done to improve asset management.
- **Implement** the plans.

The District has made considerable progress through this three-part process since 2015 as a result of Council governance decision making.

Figure 2: Asset Management Process Steps

Assess

In 2015 Council directed that staff establish an Asset Management Program. From that point until 2018, staff assessed the state of asset management practices in the District and developed the Asset Management Policy and Asset Management Strategy.

Plan

In 2018 the District's Asset Management Policy was developed and then amended in 2021. As a result the Asset Management Strategy outlines numerous program components. Many of these Asset Management Strategy components have been completed, and many are underway. Please see Figure 3 to see current asset management program components.

The integration of long-term financial planning is an integral part of the asset management process. The Plan provides Council and the public with a preview of what financial resources are necessary to implement Asset Management Strategy components.

Implement

By the end of 2023 the District will have produced a:

- Water Master Plan, 2020,
- Sustainable Infrastructure Replacement Plan, 2021,
- Sanitary Sewer Master Plan, 2022,
- Storm Master Plan, 2023,
- Facilities Master Plan, 2022,
- Urban Forest Management Strategy, 2017, and
- Pedestrian and Sidewalk Master Plan, 2022.

Staff will be tasked with preparing a consolidated capital program that considers all master plans and delivers capital investment in the most cost-effective manner.

Asset Management Program Components

Figure 3: Asset Management Program Components

Pavement Management Plan 2013	Sanitary and Storm Sewer Condition Assessment 2015-2021	Water Master Plan 2020
Playground Inventory Assessment 2021	Sustainable Infrastructure Replacement Plan 2021	Pedestrian and Sidewalk Master Plan 2022
Facilities Master Plan 2021-2022	Sewer Master Plan 2021-2022	Storm Master Plan 2022-2023
Parks, Recreation, and Culture Master Plan 2024	Transportation Master Plan TBD	Natural Assets Master Plan TBD
Urban Forest Management Strategy 2017	Foreshore Capital Plan Ongoing	Vehicle and Equipment Replacement Plan Ongoing

Overview of Asset Inventory

Oak Bay is a picturesque suburban community located on the traditional territory of the Coast and Straits Salish Peoples, on the southern tip of Vancouver Island. Since incorporation, the District has acquired and constructed over $900 million in public assets, including:

- 76 hectares of land
- 106km of roadway
- 30+ buildings
- 100+ units of major equipment and vehicles
- 14 pump stations
- 141km of storm drain
- 100km of sanitary sewer
- 116km of water main

In addition to built infrastructure, the District is responsible for the stewardship of natural assets including 13km of coastline, approximately 10,000 boulevard trees in its urban forest, and 1.3km of creeks.

Table 2: Asset Management Inventory Value

Asset	Quantity	Replacement Value	Useful Life
Natural Assets	N/A	N/A	N/A
Land	75.68 ha	$149.1M	N/A
Park Structures	45+	$6.7M	3-20
Roads	106.1km/ 944k m^2	$171.5M	75
Buildings	30+	$80.7M	75
Vehicles & Equipment	100+ units	$15.7M	5-40
Drainage	141km	$171.2M	50-100
Sanitary Sewer	100km	$137.4M	50-125
Water	116km	$168.0M	50-80
Total		**$900.3M**[1]	

1. This includes $28.8M storm, $31.5M sanitary sewer, and $37.9M in water laterals. Under the District's 'Water Rate Bylaw, 1981', and 'Public Sewer Bylaw, 1996', homeowners are responsible for the maintenance and replacement of laterals.

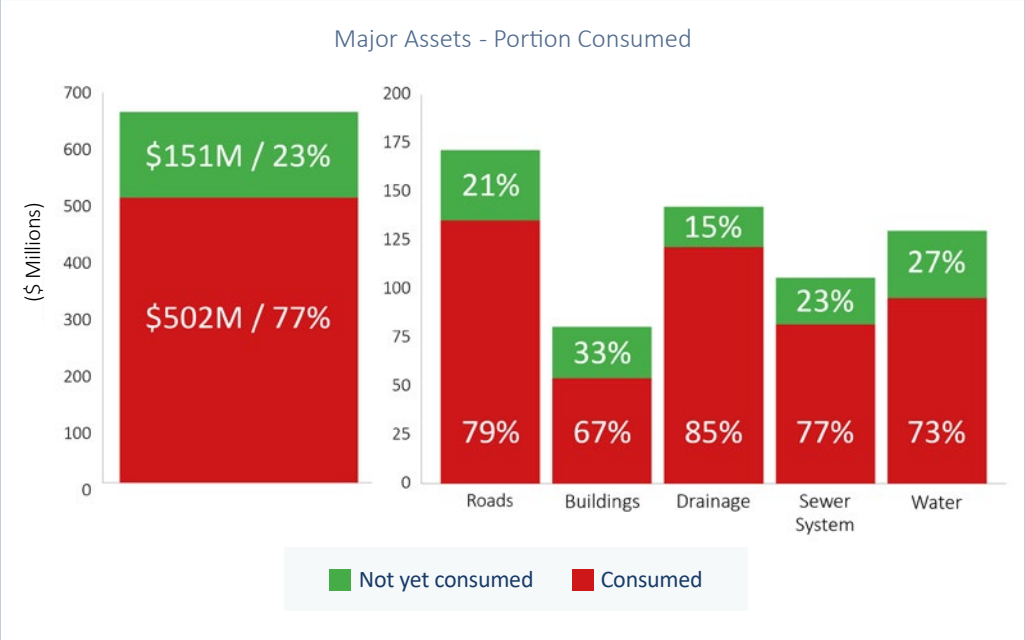
Many of the District's assets have reached the end of their useful lives as recommended by the National Asset Management System (NAMS). Table 3 shows the percentage of overdue assets for replacement, and the dollar value of the assets past their recommended useful life. This demonstrates the need for significant investment in infrastructure replacement over the short and midterm (1-25 years).

Table 3: Value of Infrastructure Past Recommended Useful Life

Asset	Quantity overdue	% overdue for replacement	$ value past recommended useful life
Park Structures	N/A	11.9%	$0.8M
Roads	39.6km	32.5%	$55.8M
Buildings	30+	8.3%	$6.7M
Vehicles & Equipment	35 units	25.5%	$4.0M
Drainage	103.0km	72.3%	$103.0M
Sanitary Sewer	56.0km	52.9%	$56.0M
Water	47.6km	36.6%	$47.6M
Total		**41.9%**[1]	**$273.9M**

1. $273.9M as a percentage of the District's total depreciable assets (excluding laterals) of $653.0M

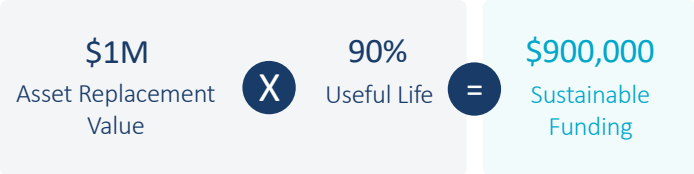
Figure 4: Proportion of Assets Consumed | Figure 5: Proportion of Assets Consumed by Asset Class



The bar on the left shows the proportion of depreciable assets that have been consumed (red) vs. the proportion of depreciable assets with remaining recommended useful life (green). On the right, the five bars shows a breakdown of proportion of infrastructure consumption by major asset class.

Infrastructure Replacement Funding

Sustainable funding means that the District sets aside funding as assets age (see page 18). For example, sustainable funding for an asset with a replacement value of $1M that is 90% through its useful life would be $900,000 (90% x $1M). Annual contributions would be made through the life of the asset to spread out the cost of replacement.



Cumulative Infrastructure Funding Gap by Asset Class

- The replacement cost of the District's depreciable assets is estimated to be $653.0M.
- On average, these assets are 76.9% through their recommended useful life.
- Therefore, sustainable funding would result in a required reserve balance of $502.0M (76.9% x 653.0M).
- In contrast, the District has set aside $38.5M in reserves for infrastructure replacement. With these reserves there is a $463.5M cumulative infrastructure funding gap ($502.0M – $38.5M).

Table 4: Cumulative Infrastructure Funding Gap By Asset Class

Asset	Replacement Value (except land)	Sustainable Reserve Target	Reserve Balances	Cumulative Infrastructure Funding Gap
Natural Assets	Unknown	$-	$1.2M	$(1.2)M
Park Structures	$6.7M	$3.1M	$0.4M	$2.7M
Roads	$171.5M	$135.3M	$4.6M	$130.7M
Buildings	$80.7M	$54.3M	$4.2M	$50.1M
Vehicles & Equipment	$15.7M	$10.3M	$6.5M	$3.8M
Drainage	$142.4M	$121.7M	$5.0M	$116.7M
Sanitary Sewer	$105.9M	$81.9M	$8.7M	$73.2M
Water	$130.1M	$95.4M	$7.9M	$87.5M
Total	**$653.0M**	**$502.0M**	**$38.5M**	**$463.5M**

Example

Let's assume that the District owns a fire truck worth $2.0M. This fire truck is 10 years old and has a useful life of 20 years. Sustainable funding would mean that the District has saved $1.0M towards the replacement of the fire truck (10 / 20 years X $2.0m). Anything less than $1.0M in the fire truck replacement reserve would be considered a cumulative infrastructure funding gap. So, if the District has saved $700,000, the Cumulative Infrastructure Funding Gap would be $300,000.

Current vs. Sustainable Funding by Asset Class

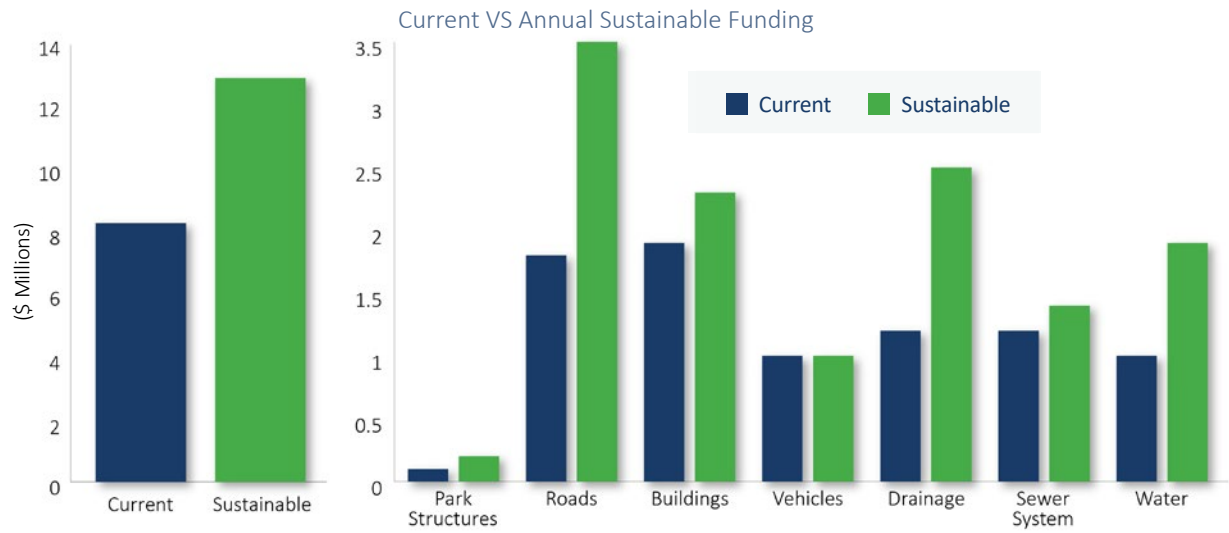
A cumulative infrastructure funding gap is created when sustainable annual funding is not established, and reserve balances don't grow sufficiently as assets age.

Table 5: Current vs. Sustainable Funding by Asset Class

Asset	Sustainable Annual Funding	Current Annual Funding	%	Annual Funding Gap
Natural Assets	Unknown	N/A	Unknown	$-
Park Structures	$0.2M	$0.1M	50%	$0.1M
Roads	$3.5M	$1.8M	51%	$1.7M
Buildings	$2.3M	$1.9M	83%	$0.4M
Vehicles & Equipment	$1.0M	$1.0M	100%	$-
Drainage	$2.5M	$1.2M	48%	$1.3M
Sanitary Sewer	$1.4M	$1.2M	86%	$0.2M
Water	$1.9M	$1.0M	53%	$0.9M
Total	**$12.8M**	**$8.2M**	**64%**	**$4.6M**

Sustainable funding means funding is gradually set aside as assets age. This funding is placed in a reserve and used when an asset is due for replacement. It is unusual for local governments to fund infrastructure replacement sustainably, at least initially. More often, only a proportion of the total replacement costs are set aside as assets age. This approach leads to sharp tax increases and/or debt financing when assets come due for replacement. Debt financing increases the cost of infrastructure replacement over the long term. The District of Oak Bay is no exception. The District has not been sustainably funding the replacement of its infrastructure annually, and it is now faced with a 'cumulative infrastructure funding gap' like most Canadian local governments.

Figure 6: Current vs Sustainable Funding | Figure 7: Current vs Sustainable Funding by Asset Class



The bars on the left (Figure 6) show the total Annual Sustainable funding (green) compared to current (blue) funding levels. The bars on the right (Figure 7) show the Annual Sustainable funding compared to current funding levels for each of the District's major assets.

- Annual sustainable funding for existing infrastructure is estimated to be approximately $12.8M.
- The District's annual infrastructure funding has grown significantly since 2017 ($3.7M) and is now $8.2M in the 2021-2025 Financial Plan. This is approximately 64% of annual sustainable funding.
- If action is not taken to close this annual funding gap, the District's cumulative infrastructure funding gap will continue to grow by $4.6M ($12.8M less $8.2M) per year (or $460.0M over the period 2022-2121).

Spending, Reserve and Debt Forecasts

The District is forecasted to spend approximately $1.3B (2021 dollars) over the next 100 years (2022-2121) on infrastructure replacement, depending on Council direction. Approximately 36% of this (or $469.7M) is forecasted to occur over the next 25 years. This demonstrates that a proportionate amount of the District's assets are overdue for replacement or will soon be due for replacement.

Figure 8: 100-Year Infrastructure Spending (25 Year Catch Up)

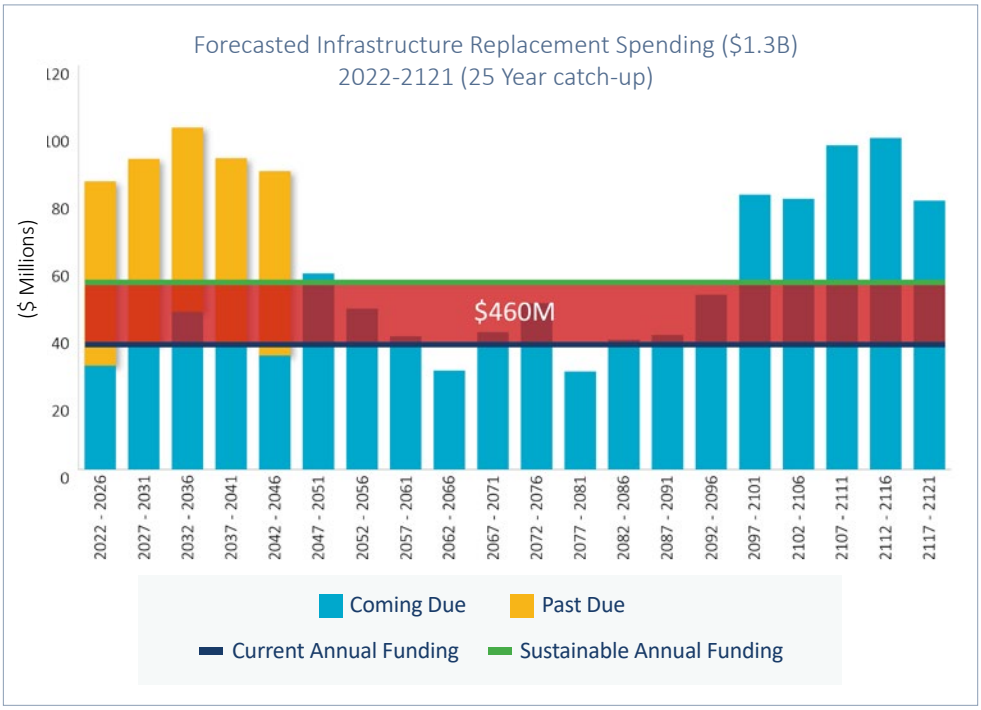
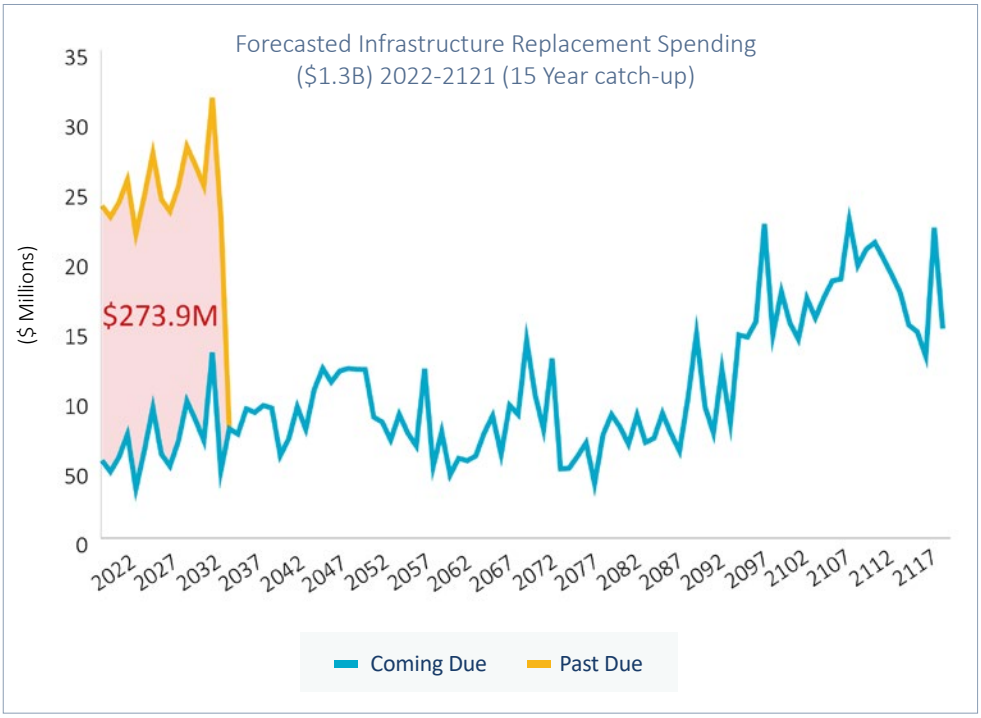


Figure 9: 100-Year Infrastructure Spending by Year



The District is forecasted to incur between $175M and $225M in debt to replace its infrastructure between 2022-2121. Existing reserve balances and future contributions at current funding levels will not be sufficient to replace infrastructure at a responsible pace.

Notice that even if the District were to increase all reserve contributions to sustainable levels starting in 2022, debt would still be required between 2026-2069 (see Figure 11). At current funding levels, the District would need to borrow $855M and incur an interest expense of approximately $395M (for net proceeds of $460M) to fund infrastructure replacement. This report outlines several options to increase reserve contributions in conjunction with debt financing.

Figure 10: 100-Year Infrastructure Spending Funding Gap

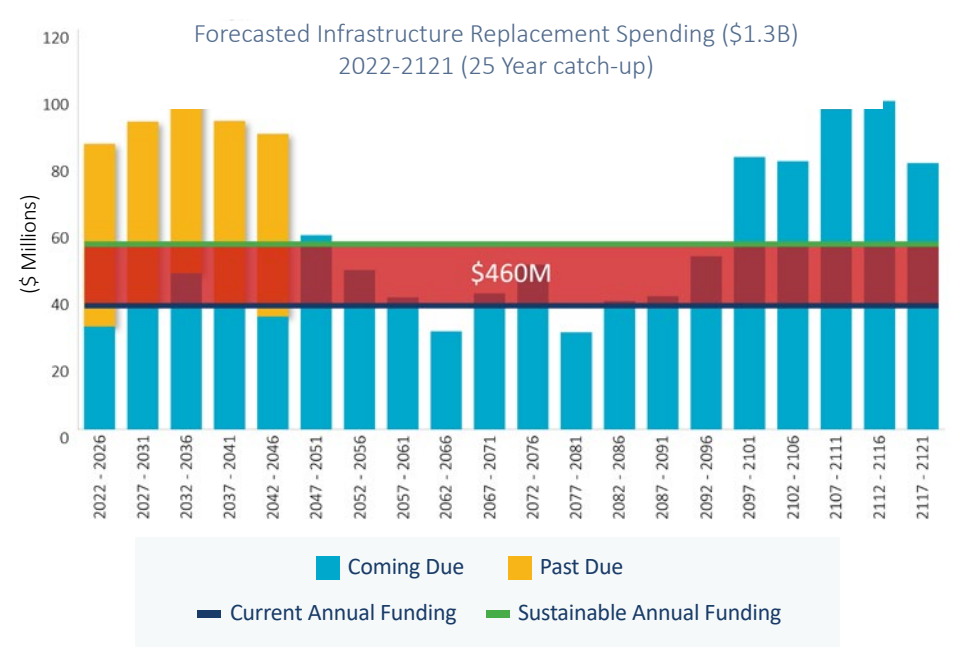
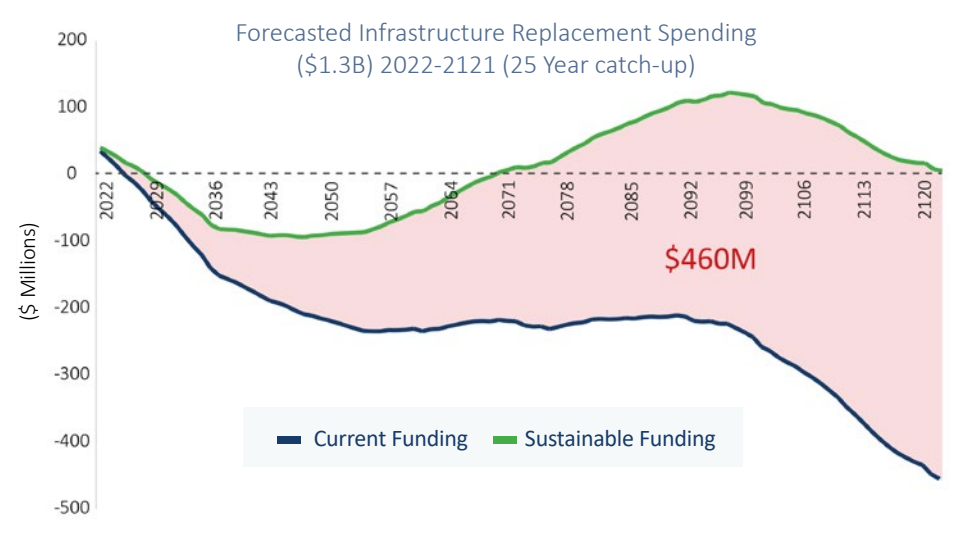


Figure 11: 100 Year Reserve Forecast, Current vs Sustainable Funding



Options for increasing utility and tax rates and debt financing are presented in this report's 'Roadmap to Infrastructure Funding Sustainability' section.

Impact of Climate Change on Forecasts

The financial impact of climate change on infrastructure replacement was not thoroughly examined while the Plan was being developed. However, it is acknowledged that climate change will impact the cost and planning of infrastructure replacement. Climate change will likely impact infrastructure replacement forecasts in the following ways:

Rainfall storm events: Currently, the planning to replace storm and sewer main incorporates increased capacity needed to handle increased peak flow from more intense and frequent rainfall events. Engineering standards estimate that approximately 15% additional capacity is required to adequately respond to increased peak flow due to climate change. Some pipes are already sized to handle the increased peak flow. Other pipes will need to be upsized. Upsizing a main can add approximately 5-20% in extra cost. If the District needed to upsize between 20-40% of its sanitary or sewer pipe inventory, it could cost an additional $4.8M – $9.6M (2021 dollars).

Coastline erosion: In 2011, the District commissioned an ongoing erosion monitoring program for the western portion of McNeill Bay. This monitoring program continues, and the most recent inspections have estimated an erosion rate of 1-2cm per year. This monitoring progress does not attribute current erosion to climate change. However, climate change may present the District with an increased challenge of preserving its coastline for the recreational enjoyment of its residents and visitors. Therefore, the 2021-2025 Financial Plan funds two separate studies that identify options for the mitigation of ocean erosion on McNeill Bay and McMicking Point.

Sea level rise: In 2019, the Capital Regional District commissioned a project referred to as the 'Coastal Flood Inundation Mapping Project.' One of the deliverables of this project was to produce a sea-level rise modelling and mapping report. This was completed in June of 2020. This report found that 'As suspected during initial investigation, the low-lying areas chosen for detailed inundation modelling show increasing vulnerability to coastal flooding as mean sea levels increase. In particular, McNeill Bay is acutely affected in the 2.0m [Relative Sea Level Rise] scenario'. The modelling indicates there could be a significant impact to public infrastructure. The Plan does not quantify or forecast the impact of such modelling. Future work could be conducted if directed by Council and funded in the financial plan.

Roadmap to Infrastructure Funding Sustainability

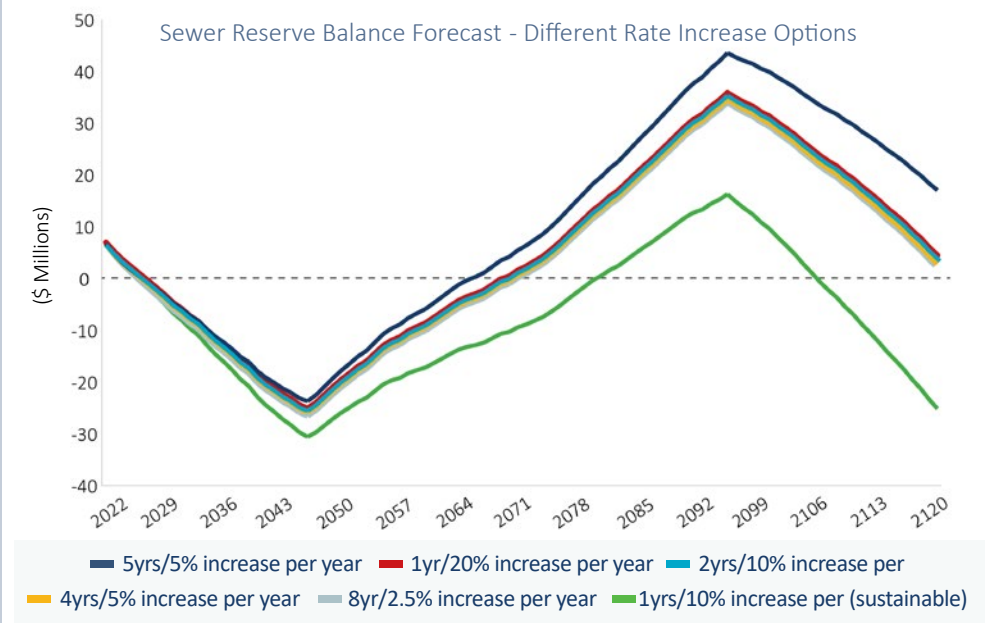
The infrastructure replacement forecasts modelled in the Plan indicate the District will need to increase annual funding levels before its cumulative infrastructure funding gap grows unsustainably.

Deferring utility and tax rate increases will result in higher costs to the District's residents over the next 100 years. Although tax and utility fee increases can be unpopular, sustainable funding will reduce debt servicing costs and increase investment returns that can be reinvested in infrastructure replacement. The Plan has developed tax and utility rate increases for the sewer and water utilities and general taxation below.

Sewer Utility

The District will likely have to take on debt between 2027-2065 to fund needed sewer infrastructure replacement. Six sewer utility rate increases are presented in Table 6 on page 24. Modelling indicates that debt financing is required in all options.

Figure 12: Sewer Reserve Forecast Rate Increase Options



Sustainable funding for sewer infrastructure is estimated to be $1.4M annually, while current funding is $1.2M. To increase annual funding to sustainable levels the District would need to increase sewer utility fees by approximately 10% ($0.2M). However, since the District has not been sustainably funding sewer infrastructure replacement, the District will need to exceed annual sustainable funding to ensure reserves remain positive after 2065. Note the red line in Figure 12. The green line represents an increase in sustainable funding. Notice that reserves are forecasted to go negative after 2107.

The Plan recommends the District implements option 5 (8 years of 2.5% sewer utility increases). Options 2 to 5 are the least expensive options to the ratepayer over the next 100 years. These options are within 1.7% of the cost of each other. Options 1 and 6 are not recommended as these options are the most expensive options to the ratepayer over the next 100 years.

Table 6: Sewer Utility Rate Increase Options

Sewer Utility Inc. Options[1]	Incremental Utility Fees Paid 2022-2121	Total Debt Interest Paid 2022-2121	Total Investment returns earned 2022-2121	Net Cost to Ratepayer 2022-2121	
1: 1 x 10%	$18,410,000	$47,700,000	$(2,466,000)	$63,644,000	
2: 1 x 20%	$40,310,000	$21,500,000	$(10,198,000)	$51,612,000	
3: 2 x 10%	$39,800,000	$22,100,000	$(10,034,000)	$51,866,000	
4: 4 x 5%	$39,400,000	$22,100,000	$(9,573,000)	$51,927,000	
5: 8 x 2.5%	**$38,986,000**	**$22,700,000**	**$(9,214,000)**	**$52,472,000**	**Recommended**
6: 5 x 5%	$49,000,000	$20,300,000	$(14,172,000)	$55,128,000	

1. Does not include normal forced growth operating budget increases such as rising wages and materials cost

Water Utility

The District will likely have to take on debt between 2026-2063 to fund needed water infrastructure replacement. Six water utility rate increases are presented in Table 7 below. Modelling indicates that debt financing is required in all options.

Sustainable funding for water infrastructure is estimated to be $1.9M annually, while current funding is $1.0M. To increase annual funding to sustainable levels the District would need to increase water utility fees by approximately 20% ($0.9M).

The Plan recommends the District implement option 4 (8 years of 2.5% water utility increases).

Table 7: Water Utility Rate Increase Options

Water Utility Inc. Options[1]	Incremental Utility Fees Paid 2022-2121	Total Debt Interest Paid 2022-2121	Total Investment returns earned 2022-2121	Net Cost to Ratepayer 2022-2121	
1: 1 x 20%	$93,300,000	$24,800,000	$(6,146,000)	$111,954,000	
2: 2 x 10%	$92,833,500	$25,200,000	$(5,821,000)	$112,212,500	
3: 4 x 5%	$91,900,500	$26,000,000	$(5,200,000)	$112,700,500	
4: 8 x 2.5%	**$90,034,500**	**$27,600,000**	**$(4,077,000)**	**$113,557,500**	**Recommended**
5: 5 x 5%	$114,292,500	$21,800,000	$(16,000,000)	$120,092,500	

1. Does not include additional increase for water utility operating expense forced growth

General

Funding for tax-funded infrastructure (Roads, Buildings, Vehicles, Drainage and Parks) is currently 63% sustainable ($6M vs $9.5M). The District can increase contributions to sustainable levels by increasing taxes by 12.4% (or $400 to the median residential property). Even with an immediate 12.4% tax increase, the District would not likely be able to avoid the need to use debt to fund infrastructure replacement between 2028-2065. The District can choose to moderate the 12.4% over several years without significant impact to debt interest or investment returns. The option to moderate the 12.4% tax increase over 4 years is 2.2% more costly than an immediate 12.4% increase over the 100-year time frame.

Table 8: General Taxation Rate Increase Options

Tax Increase Option[1]	Incremental Taxes Paid 2022-2121	Total Debt Interest Paid 2022-2121	Total Investment returns earned 2022-2121	Net Cost to Taxpayer 2022-2121	
1: 1 x 12.4%	$350,000,000	$34,800,000	$(43,076,000)	$341,724,000	
2: 3 x 4.1%	$346,500,000	$38,159,000	$(39,689,000)	$344,970,000	
3: 4 x 3.1%	$344,750.000	$39,830,000	$(38,066,000)	$346,514,000	
4: 6 x 2.06%	**$341,250,000**	**$43,103,000**	**$(34,990,000)**	**$349,363,000**	**Recommended**

1. Does not include additional increase for tax funded operating expense forced growth

Modelling indicates that increasing taxes above sustainable levels (12.4%) will not reduce debt interest or increase investment revenues enough to offset additional taxes. For instance, raising taxes by 14.4% (2% above 12.4% sustainable) will result in $57M in additional taxes being levied, $30.3M additional investment returns, and reduce debt interest by $7.4M for a total net increase of $19.3M ($57.0M-$30.3M – $7.4M).

The Plan recommends the District implements Option 4 (6 years of 2.06% tax increases) so that increases can be implemented gradually. Options 1 to 3 are the least expensive options to the ratepayer over the next 100 years. Option 4 is estimated to be approximately 2.2% more expensive than Option 1 to the taxpayer over the next 100 years.

Summary

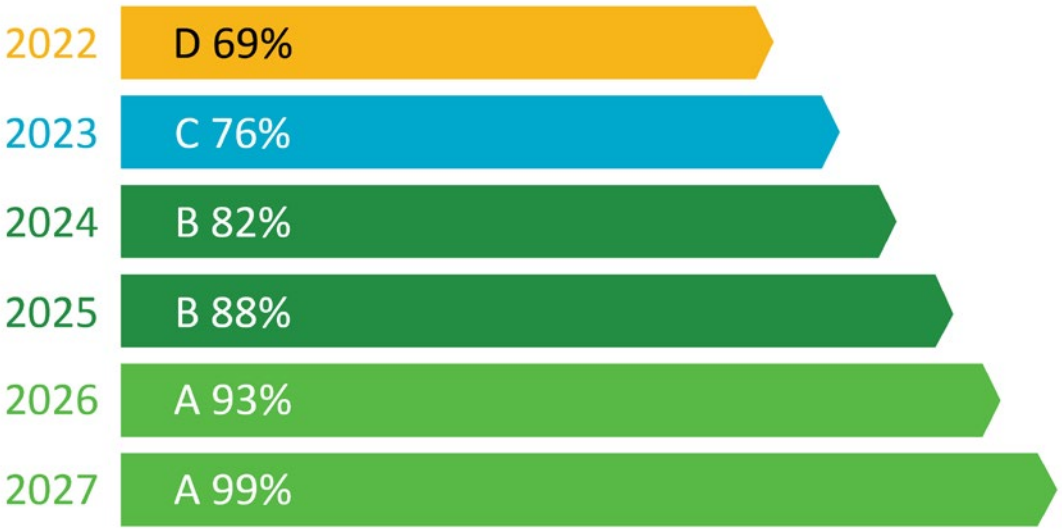
The recommended increases are detailed in Table 9. The recommended increases are moderated over several years and are not significantly more expensive when compared to larger, quicker increases over the 100-year life of the plan. Therefore, they are likely to be most palatable to the community.

Table 9: Impact of Recommended Utility & Tax Rate Increases to Median Residential Property

	Recommended option	Annual $ Impact
Taxes	6 years, 2.06% per year	$66
Sewer Utility	8 years, 2.50% per year	$7
Water Utility	8 years, 2.50% per year	$10
Total		**$83**

Annual increases as proposed above will result in sustainable funding being achieved by 2027 moving the District from a D funding rating to an A rating. These ratings are defined in Appendix A.

Figure 13: Annual Sustainable Funding Progress 2022-2027

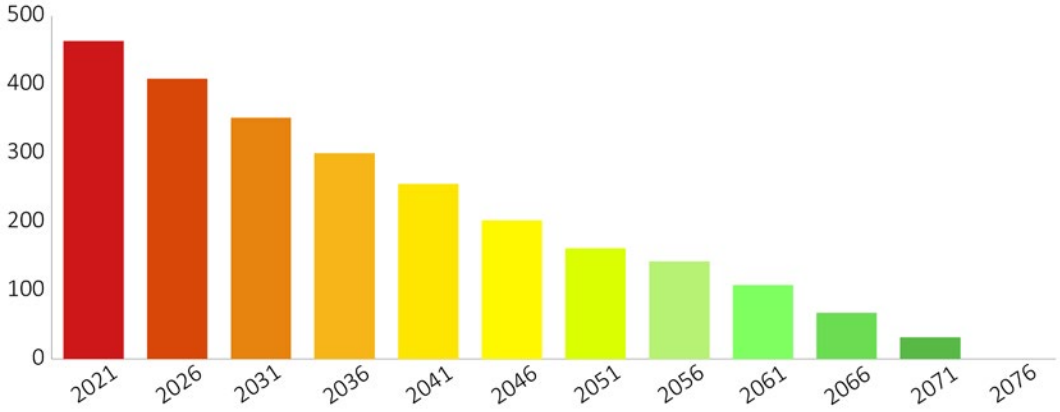


Achieving sustainable annual funding is the first and most crucial step in addressing the District's long-term infrastructure replacement funding challenges. Reaching annual sustainable funding will halt the growth of the District's cumulative infrastructure funding gap. This gap has grown over many decades, and it will take many decades to be substantially reduced.

Modelling indicates that the District can eliminate its cumulative infrastructure funding gap by 2076 if the following measures are undertaken:

1. Tax and utility rate increases recommended in Table 9 are implemented,
2. Infrastructure that is past its recommended useful life is replaced over the next 25 years, and
3. Infrastructure is replaced as it comes due for replacement moving forward.

Figure 14: Cumulative Infrastructure Funding Gap 2021-2076



SECTION B:
Inventory of Capital Services

Natural Assets

Trees

In 2017, the District commissioned its Urban Forest Management Strategy. This Strategy estimates that the District maintains over 10,000 boulevard trees.

In a survey of 316 community members, referenced in the District's Urban Forest Management Strategy, the most important benefits provided by the urban forest were perceived as:

- Reduced storm water runoff and improved flood control (86%)
- Habitat for native plants and animals (83%)
- Improved air quality (83%)
- Beautification of the District (80%)
- A place for heritage trees (79%)
- Carbon storage and sequestration (77%)

The Urban Forest Management Strategy recommends that the District add canopy cover, tree inventory and green infrastructure spatial data into the corporate asset management system. The Strategy goes on to recommend that the District should, when possible, quantify:

- the value of services they deliver,
- the cost of maintenance, and
- their appreciating value over time using available tools or expert analysis.

The District is currently reviewing software options for tree inventory and has begun collecting the Garry Oak and its associated ecosystem inventory data.

Creeks and Streams

Creek	Length
Bowker	511m*

*This is the portion of the creek within the District's boundaries which also flows through Victoria and Saanich.

Waterfront

Oak Bay boasts over 13km of natural coastline, much of which is publicly accessible. The public enjoys a significant recreational benefit from frequent use of the waterfront.

Land

The District owns and maintains many parks, green spaces and civic lands. Land assets do not usually need to be replaced or substantially repaired, assuming that they are well maintained. As a result, no infrastructure replacement costs related to land are contemplated in the Plan. However, the District spends significant resources each year on the maintenance of land, which is embedded in the District's operating budget.

Land & Parks Inventory

Table 10: Park Land Listing

Park Land	Area (ha)	Assessed Value
Uplands Park	33.80	$31.9M
Windsor Park	4.31	$10.5M
Carnarvon Park	3.95	$8.4M
Anderson Hill Park	2.68	$7.3M
Walbran Park	2.60	$7.1M
Mary Tod Island	2.59	$3.4M
Trafalgar Park	1.71	$4.6M
Bowker Creek	1.53	$7.1M
Firefighter's Park	1.33	$10.3M
Willow's Park	1.24	$5.0M
Lafayette Park	0.89	$2.8M
Queen's Park	0.65	$1.1M
Nottingham Park	0.42	$1.5M
Oakdowne Park	0.38	$1.5M
Loon Bay	0.32	$1.3M
Haynes Park	0.26	$1.1M
Quimper Park	0.23	$1.9M
Native Plant Garden	0.21	$1.8M
Total	**59.10**	**$108.6M**

Table 11: Land Under Buildings

Land under Buildings	Area (ha)	Assessed Value
Henderson Recreation Centre and Park	8.23	$2.7M
Oak Bay Marina/Turkey Head	1.38[1]	$14.8M
Oak Bay Recreation Centre	1.35	$3.3M
Public Works	0.96	$2.0M
Monterey Centre/Library	0.75	$2.5M
Fire/Police Station	0.59[2]	$3.1M
Municipal Hall	0.53	$2.2M
Tod House	0.15	$1.5M
Welcome House	0.12	$1.1M
Welcome House 2	0.06	$0.8M
Total	**14.12**	**$34.0M**

1. Does not include water lot lease area
2. Does not include adjacent Firefighter's park

	Area (ha)	Assessed Value
Other	2.16	$2.2M
Assessed Boulevard	0.69	$5.5M
Boulevards	Unknown	Unknown

Parks Maintenance Service Levels

The District has established detailed service levels for its parks and green spaces as assigned in Table 12 below. The service level definitions can be found in Appendix C. These service levels demonstrate the significant financial resources that the District commits to maintain its land.

Table 12: Parks Maintenance Service Levels

Park/Garden/Monument/ Green Space/ Sports Field	Service Level
Anderson Hill	Natural Area Level 3
Bowker Creek Walkway	Park Level 2
Cadboro Bay Parking Areas	Park Level 3
Carnarvon Park	Sports Fields Level 1
Carnarvon Park Planters	Garden Level 2
Causton's Green	Garden Level 1
Cedar Hill Strip	Park Level 3
Cedar Hill Cross Road at Cadboro Bay Road	Park Level 2
Cenotaph	Park Level 2

Park/Garden/Monument/ Green Space/ Sports Field	Service Level
Cochrane's Common	Garden Level 1
Corbett's Corner	Garden Level 1
Costain's Green	Natural Area Level 3
Entrance	Gardens Level 1
Estevan Planters	Garden Level 1
Fireman's	Sports Field Level 1
Foul Bay at Cadboro Bay	Garden Level 1
Foul Bay at Oak Bay Ave Garden	Garden Level 1
Foul Bay Strip and Planters	Park Level 2
Gordon Head Rockery	Park Level 3
Gyro Planters	Garden Level 2
Haynes	Open Space Level 3
Henderson Centre Garden	Garden Level 1
Henderson Church	Park Level 3
Juniper Hill	Park Level 3
Kitty Islet	Natural Area Level 3
Kiwanis Playground	Playground/ Open Space Level 1
Lafayette	Playground/Sport Field Level 1
Lokier Garden	Garden Level 1
Loon Bay	Open Space Level 3
Mary Todd Island	Natural Area Level 3
McMicking	Natural Area Level 3
Monterey Centre Garden	Garden Level 1
Municipal Hall Garden	Garden Level 1
Native Plant Garden	Natural Area Level 3
Nottingham	Open Space/ Playground Level 1
Oak Bay Ave Planters & Hampshire	Garden Level 1
Oak Bay Police and Fire Hall Planters	Park Level 1
Oak Bay Rec Centre Garden	Garden Level 1
Oak Bay Signs, Beach Drive at McNeil	Park Level 1
Oakdowne	Open Space/ Playground Level 3
Queen's Park	Park Level 3
Quimper	Open Space/ Playground Level 2

Park/Garden/Monument/ Green Space/ Sports Field	Service Level
Rose Garden	Garden Level 1
Scented Garden	Garden Level 1
Trafalgar Park	Park Level 2
Turkey Head Walkway	Benches/ Level 3
Upland's Cenotaph	Park Level 2
Upland's Park	Natural Area Level 3
University Woods Entrance	Park Level 3
Walbran	Natural Area Level 3
Wessex Strip and Circle	Park Level 3
Willow's Beach	Park Level 2
Windsor Pavilion Garden	Garden Level 1
Windsor Pavilion Park	Park Level 2

Park Structures

Total Current Replacement Cost $6.7M	Total Park Infrastructure Overdue for Replacement $0.8M
Current Annual Funding $0.1M	Annual Sustainable Funding Target $0.2M
Total Park Structure Reserves $0.4M	Sustainable Reserve Target $3.1M
% Annual Sustainable Funding Target 50%	Cumulative Infrastructure Funding Gap $2.7M

Park Structures

The District of Oak Bay is blessed with a variety of parks from children's playgrounds, water spray park, sports facilities, beach accesses, natural areas, beautiful gardens, par 3 golf, and more. This section examines the infrastructure found at the District's parks. It does not include land nor recreational facilities. Recreational facilities are quantified in the Building section.

The District also offers a Park Furniture Donation Program. The current program is sustainably funded. Donors provide funds that pay for the installation and repairs, and maintenance of the donated park furniture. The District's previous program was not sustainable. Donors paid for the capital construction and installation, and the District was expected to fund maintenance and replacement of the capital in perpetuity.

Park Structures Inventory

Structure	Service Life (years)	Quantity	Current Replacement Value	Annualized Cost
Benches	15-25	273	$0.3M	$0.02M[3]
Irrigation	40	-	$0.7M	$0.02M
Parking lots[1]	25-75	152,000 sq ft	$2.3M	$0.05M
Play Structures	45+	9/28,300 sq ft	$1.2M	$0.07M
Sports Courts	18	7/115,300 sq ft	$1.8M	$0.05M
Other structures[2]	15-30	543	$0.4M	$0.01M[3]
Total			$6.7M	$0.22M

1. Does not include parking lots adjacent to municipal buildings. Parking lots adjacent to municipal buildings have been included in the building replacement cost.
2. Includes picnic tables, water fountains, and waste receptacles.
3. Funded in the Park's operating budget

Parks Structures Condition Assessment

B-

Park Structures are assigned an overall B- condition assessment score. A modified American Society of Civil Engineers alphanumeric system was used to assign scoring as defined in Appendix A. This system is used to rate each major asset class based on: (1) Condition and Performance, (2) Capacity vs. Need, and (3) Funding vs. Need. The District's Park Structures score well when grading capacity vs need. As with many other asset classes, funding is not currently sustainable, resulting in assets being held beyond their recommended useful life. This results in a reduced condition and performance score.

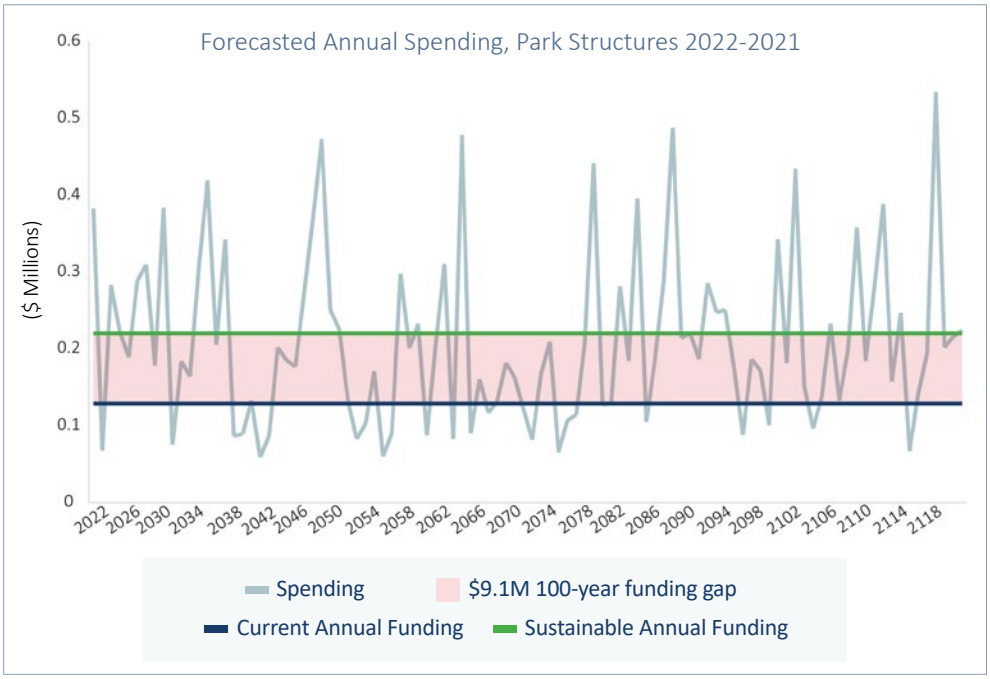
Structure	Overall	Condition & Performance	Capacity vs Need	Funding vs Need
Benches	B	C	A	B+
Irrigation	B+	B	A	B+
Parking lots	B-	B	A-	F
Play Structure	C+	C	B	F
Sports Courts	C	A-	C	F
Other Structures	B+	B	A	B+

Park Structure Infrastructure Overdue for Replacement ('Backlog')

Total value of park structure assets that have reached recommended useful life estimated at:	$0.8M

Parks Structures Spending Forecasts

Spending on park structure replacement for the next 100 years is forecasted to be $20.9M (2021 dollars). Approximately $0.8M of this is for the replacement of park assets that have exceeded their expected useful life ('backlog'). The remainder ($20.1M) is for the replacement of water assets that will come due for replacement during 2022-2121.



The estimated annual sustainable infrastructure reserve contribution for park structures is $0.2M, while the current funding is $0.1M. If this funding level continued, the District would face an additional $9.1M cumulative funding gap by 2121.

Road Infrastructure

Total Current Replacement Cost $171.5M[1]	Total Road Infrastructure Overdue for Replacement $55.8M
Current Annual Funding $1.8M	Annual Sustainable Funding Target $3.5M
Total Road Asset Reserves $4.6M	Sustainable Reserve Target $135.3M
% Annual Sustainable Funding Target 51.4%	Cumulative Infrastructure Funding Gap $130.7M

1. This is the cost to fully reconstruct the road, sidewalks and curb and gutter. Repaving during a road's lifecycle is in addition to this. The full life-cycle cost of our road network, sidewalks, and curb and gutter is estimated to be $274.6M

The District owns and maintains a road network of approximately 106km including local, collector, and arterial roads. The District also owns and maintains a large network of sidewalks, curbs, and gutters. In 2012, the District commissioned a Pavement Management Study to assist the District in planning and prioritizing road rehabilitation and maintenance. This study recommended increasing annual funding to $2.8M to maintain the existing network condition. The District's 2021 Pavement Management budget is $1.3M and grows to $2.4M by 2025 in the five-year financial plan.

Road Inventory

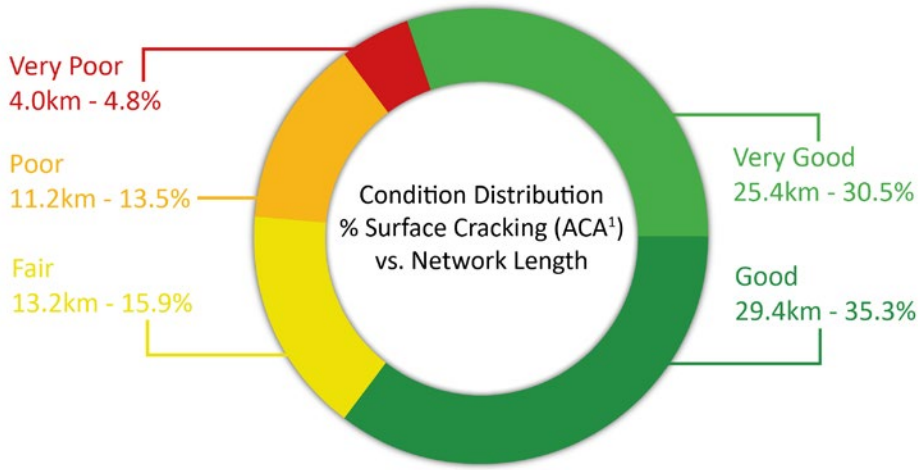
	Quantity		Current Replacement Value	Annualized Cost
Local	70.3km	562,100m^2	$71.6M[1]	$1.77M[2]
Collector	16.5km	159,300m^2	$20.3M[1]	$0.50M[2]
Arterial	9.7km	129,600m^2	$16.5M[1]	$0.41M[2]
Other[3]	9.6km	93,800m^2	$11.9M[1]	$0.30M[2]
Curb & Gutter[4]	Unknown	Unknown	$20.1M	$0.21M
Sidewalk[5]	Unknown	Unknown	$31.1M	$0.31M
Total	**106.1km**	**944,800m^2**	**$171.5M**	**$3.50M**

1. Does not include the cost to resurface the road which will typically happens twice during a road's life cycle.
2. Includes the cost of 2 road resurfacings during the useful life of the road.
3. This is mainly composed of Beach Dr road which is classified differently because it has special properties that do not fit well in other established road classifications.
4. Data related to length and quality of existing curb and gutter was not readily available during the preparation of this Plan. Staff have assumed that 90% of the road length in Oak Bay have a curb and gutter. Forecasted curb and gutter replacement has been evenly spread across 2022-2121.
5. Accurate data related to width and quality of existing sidewalks was not readily available during the preparation of this Plan. Staff have assumed that 50% of roads have sidewalk on both sides. Forecasted sidewalk replacement has been evenly spread across all years in this Plan.

D+

Road Condition Assessment

Road infrastructure is assigned an overall D+ condition assessment score. A modified American Society of Civil Engineers alphanumeric system was used to assign scoring as defined in Appendix A. This system is used to rate each major asset class based on: (1) Condition and Performance, (2) Capacity vs. Need, and (3) Funding vs. Need. The District's Road infrastructure scores low due to poor condition/performance and funding scores. In 2012, the District commissioned a Pavement Management Study to assist the District in planning and prioritizing road rehabilitation and maintenance. Pavement distress tests were conducted in the summer and fall of 2012. Approximately 83km of paved roads were analyzed. At the time, 6.2% cracking was observed. This study concluded that approximately 4km (or 5%) of pavement observed was in very poor condition and 11.2km (or 13%) of pavement observed was in poor condition.



Very Good	Good	Fair	Poor	Very Poor
0-1% ACA	<1-5% ACA	<5-10% ACA	<10-30% ACA	<30-100% ACA

	Overall	Condition & Performance	Capacity vs Need	Funding vs Need
Roads	C	C	A	F
Curb & Gutters	D	C	D	F
Sidewalk	D	C	D	F

1. All Cracked Area (ACA) is a measure of the surface area of the pavement with observed cracking

Road Asset Past Recommended Useful Life ('Backlog')

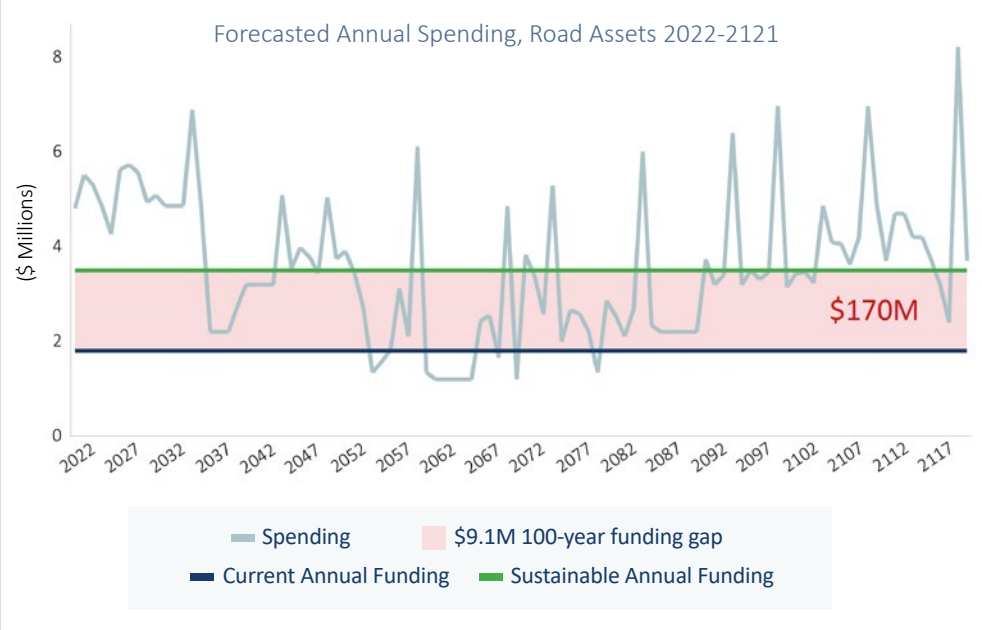
Total value of road assets that have reached recommended useful life estimated at:	$55.8M

Approximately $8.7M worth of Road assets have come due since 2015.

Road Spending Forecasts

Spending on road infrastructure replacement for the next 100 years is expected to be $356.3M (2021 dollars). Approximately $55.8M of this is for the replacement of road assets that have exceeded their recommended useful life ('backlog'). The remainder ($300.5M) is for the reconstruction and resurfacing of road assets that will come due for replacement during 2022-2121.

Figure 15: Forecasted Road Asset Spending 2022-2121



The estimated annual sustainable infrastructure reserve contribution for road assets is $3.5M, while the current funding is $1.8M. If this funding level continued, the District would face an additional $170M cumulative funding gap by 2121.

The District may choose how quickly to replace the 'backlog.' The longer the District takes to replace its 'backlog' road assets, the quicker costs required to keep a road serviceable will escalate. One option would be to replace all road assets that are past their expected useful life over a 15-year period (2022-2037). This would result in $78M in road asset replacement spending 2022-2037. This plan recommends replacing the backlog over 25 years to ensure debt servicing remains within prescribed limits.

Building Assets

Total Current Replacement Cost $80.7M[1]	Total Building Infrastructure Overdue for Replacement $6.7M
Current Annual Funding $1.9M	Annual Sustainable Funding Target $2.3M
Total Building Asset Reserves $4.2M	Sustainable Reserve Target $54.3M
% Annual Sustainable Funding Target 82%	Cumulative Infrastructure Funding Gap $50.1M

1. This is the cost to fully replace the buildings. It does not include life-cycle capital maintenance. The full life cycle costs of facilities is estimated to be $172.6M.

Buildings

District-owned buildings support several critical functions of local government, public works/services, community development, and emergency operations. They serve as storage for records, historical documents, and specialized vehicles/equipment. Furthermore, they provide recreation, community-based activities and programs, and a regional cultural identity. Collectively they represent a substantial portion of District capital assets. For these reasons, the District commissioned a long-term building asset management plan prepared by Moore Wilson Architects and WSP Canada in 2016. This plan spanned twenty years (2016-2035). The District also commissioned a Facilities Master Plan (FMP) in 2021, which is currently underway. The FMP is expected to prioritize proposed facilities capital spending and outline options for the delivery of specific facilities capital projects.

Building Inventory

Building	Current Replacement Value	Lifecycle Capital Maintenance	Total Lifecyle Capital Costs	Life	Annualized Cost*
Oak Bay Recreation Centre	$33.0M	$37.6M	$70.6M	75	$0.77M
Oak Bay Library & Apartments	$7.5M	$8.6M	$16.1M	75	$0.18M
Monterey Centre	$5.5M	$6.2M	$11.7M	75	$0.13M
Henderson Park Recreation Centre	$5.1M	$5.8M	$10.9M	75	$0.12M
Municipal Hall	$4.9M	$5.6M	$10.5M	75	$0.12M
Fire & Police Station	$3.7M	$4.2M	$7.9M	75	$0.09M
Oak Bay Marina Restaurant	$3.6M	$4.1M	$7.7M	75	$0.08M
Windsor Pavilion	$3.1M	$3.5M	$6.6M	75	$0.07M
Public Works Office & Storage	$2.1M	$2.4M	$4.5M	75	$0.05M
Tennis Facility	$2.1M	$2.4M	$4.5M	75	$0.05M
Oak Bay Marina Office	$1.4M	$1.6M	$3.0M	75	$0.03M
Public Works Maintenance	$1.0M	$1.2M	$2.2M	75	$0.02M
Royal Theatre[1]	Unknown	Unknown	Unknown	N/A	Unknown
GVPL Vic Branch[2]	Unknown	Unknown	Unknown	75	Unknown
Other Buildings	$7.7M	$8.8M	$16.4M	75	$0.18M
Total	**$80.7M**	**$92.0M**	**$172.6M**	**75**	**$1.89M**

1. The Royal Theatre is owned by the Capital Regional District. The District of Oak Bay, the District of Saanich, and the City of Victoria are obligated to the capital maintenance costs of the theatre pursuant to CRD Royal Theatre Local Service Area Establishment Bylaw No.1, 1998. The Royal Theatre is a designated Heritage building and therefore conventional replacement cost consideration is not applicable.
2. The Waddington Strata is made up of strata lots 1 and 2. Lot 1 is owned by 5 municipalities which accounts for 22% of strata ownership. Of this 22%, Oak Bay owns 4.19%. In 2008, a replacement cost estimate was prepared which estimated a $65M replacement cost. Assuming a $65M replacement the District would be responsible for less than $600,000 of the replacement costs.

The Greater Victoria Public Library (GVPL) has been in the process of developing its Regional Service Delivery (RSD) Plan from 2019 through 2021. On June 22, 2021 the GVPL Board of Trustees approved the RSD Plan in principle. The RSD Plan recommends replacing the Oak Bay Branch between 2030 and 2035 while expanding the branch size from 11,300 sq ft to 16,000 sq ft.

The District is also currently a part owner in the Central Branch. The RSD Plan estimates that the central branch is 35% undersized. The RSD Plan recommends that the Central Branch be replaced and expanded by 19,350 sq ft by 2025.

The District is currently developing its Fire Services Master Plan. This master plan may recommend options for a new protective services building. The Plan does not integrate consideration for expansion of existing facilities nor acquisition of land for new facilities.

B-

Building Condition Assessment

Building Assets are assigned an overall B- condition assessment score. A modified American Society of Civil Engineers alphanumeric system was used to assign scoring as defined in Appendix A. This system is used to rate each major asset class based on: (1) Condition and Performance, (2) Capacity vs. Need, and (3) Funding vs. Need. Buildings score poorly on funding vs need but score relatively well on capacity vs need. Scoring between different buildings can vary significantly. The District is currently preparing a Facilities Master Plan which will prioritize building capital spending based on condition and community impact.

Table 13: Building Condition Assessment

	Overall	Condition and Performance	Capacity vs Need[1]	Funding vs Need
Oak Bay Recreation Centre	B-	B	B	D
Oak Bay Library & Apartments	C	B	C	D
Monterey Centre	B	B	B+	D
Henderson Park Recreation Centre	B	B	B+	D
Municipal Hall	B	C	A	D
Fire & Police Station	C+	C	B	D
Oak Bay Marina Restaurant	B-	B	A	D
Windsor Pavilion	B+	B	A	D
Public Works Office & Storage	C	C	C+	D

1. This capacity assessment is based on current use of facilities and does not include potential future expanded use such as a growing Engineering staff required to deliver a growing capital program.

Building Asset Infrastructure Overdue for Replacement ('Backlog')

Total value of building assets that have reached recommended useful life estimated at:	$6.7M

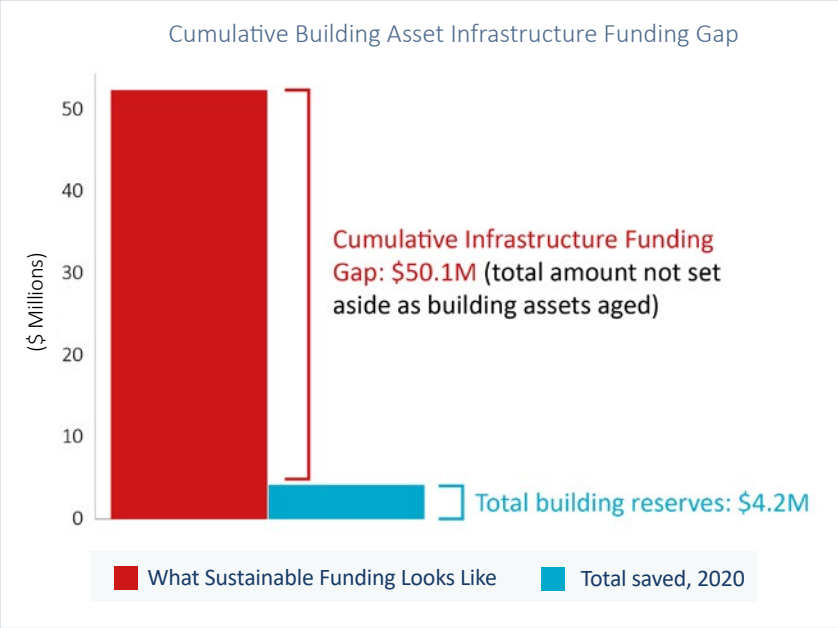
Sustainable funding explained

As assets age, the District sets aside funding in a reserve, so funds are available when a replacement is required. Imagine an asset is 90% through its expected useful life; sustainable funding means that the District has saved 90% of its replacement cost.

Building Asset Cumulative Funding Gap

The current replacement cost of all the building assets is estimated to be approximately $80.7M. On average, these assets are 67% through their expected useful lives. Therefore, the amount of funds that would need to be set aside for cumulative sustainable funding is estimated to be $54.3M (67% x $80.7M). The District has set aside $4.2M resulting in a $50.1M cumulative infrastructure funding gap.

Figure 16: Building Cumulative Infrastructure Gap

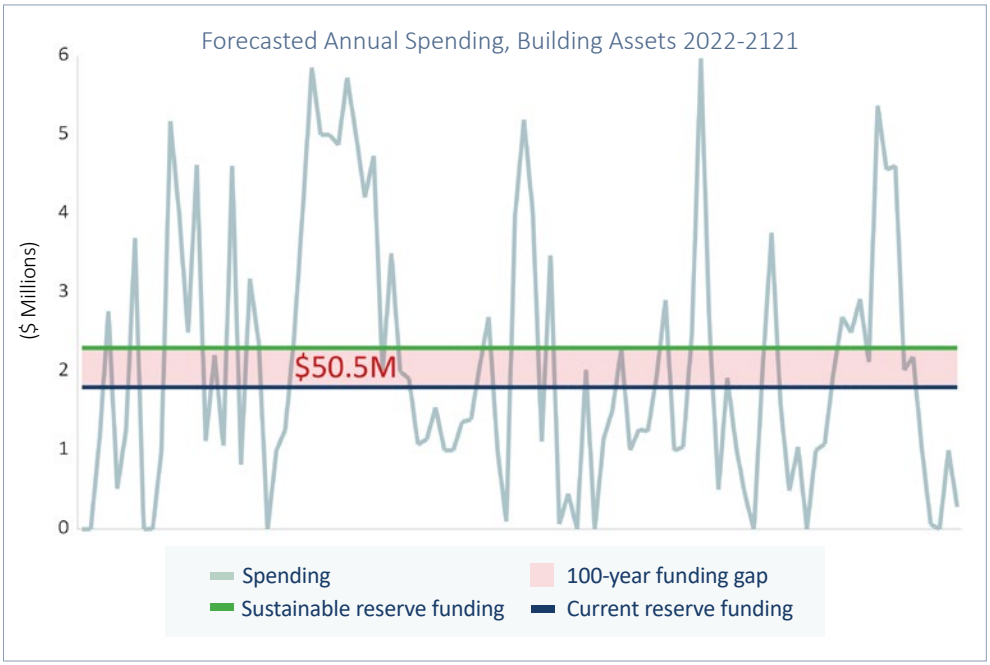


Building Spending Forecasts

Spending on building replacement and capital maintenance for the next 100 years is expected to be $209.8M (2021 dollars). Approximately $6.7M of this is for the replacement of buildings that have exceeded their expected useful life ('backlog'). The remainder ($203.1M) is for building replacement and capital maintenance that will come due for replacement during 2022-2121.

The estimated annual sustainable infrastructure reserve contribution for buildings is $2.3M, while the current funding is $1.8M. If this funding level continued, the District would face an additional $50.5M cumulative funding gap by 2121.

Figure 17: Forecasted Building Spending 2022-2121



Vehicles and Equipment

Total Current Replacement Cost $15.7M	Total Vehicles and Equipment Overdue for Replacement $4.0M
Current Annual Funding $1.0M	Annual Sustainable Funding Target $1.0M
Total Vehicle and Equipment Reserves $6.5M	Sustainable Reserve Target $10.3M
% Annual Sustainable Funding Target 100%	Cumulative Infrastructure Funding Gap $3.8M

Vehicles & Equipment Inventory

The District maintains a large fleet of vehicles to support various services, including: solid waste, street sweeping, fire protection, police services, capital maintenance, water, sewer and storm connections, recreation and others. The District has a robust system for allocation of fleet costs and raising funds for replacement. The use of the fleet is charged out to the various services that they are used for. The charge-out rate includes the anticipated replacement cost of the vehicle. As a result, Public Works vehicle replacement funding has long been sustainable. Council increased funding for police and fire vehicle replacement in 2020 to sustainable levels.

Table 14: Vehicle & Equipment Inventory

Structure	Quantity	Service Life	Current Replacement Value	Annualized Cost
General Vehicles & Equipment	103	8-35 years	$5.7M	$0.42M
Fire Vehicles & Equipment	11	5-20 years	$6.0M	$0.37M
Police Vehicles & Equipment	7	6-15 years	$0.4M	$0.05M
Parks, Recreation, & Culture	40	10-40 years	$3.6M	$0.20M
Total	**161**		**$15.7M**	**$1.04M**

B+

Vehicles & Equipment Condition Assessment

Vehicles and Equipment were assigned an overall B+ condition assessment score. A modified American Society of Civil Engineers alphanumeric system was used to assign scoring as defined in Appendix A. This system is used to rate each major asset class based on: (1) Condition and Performance, (2) Capacity vs. Need, and (3) Funding vs. Need. Vehicles score high relative to other asset classes mainly because of near sustainable funding levels. Sustainable funding levels allow the District to replace vehicles when they come due for replacement, therefore, maintaining a high condition/performance score.

Table 15: Vehicle and Equipment Condition Assessment

Structure	Overall	Condition and Performance	Capacity vs Need	Funding vs Need
General Vehicles	A-	B	A	A
Fire Vehicles	B	C	B+	B
Police Vehicles	A	B+	A	A
Parks, Recreation, and Culture Vehicles	B	B	B+	B

Vehicle and Equipment Gap ('Backlog')

Total value of vehicle and equipment assets that have reached recommended useful life estimated at:	$4.0M

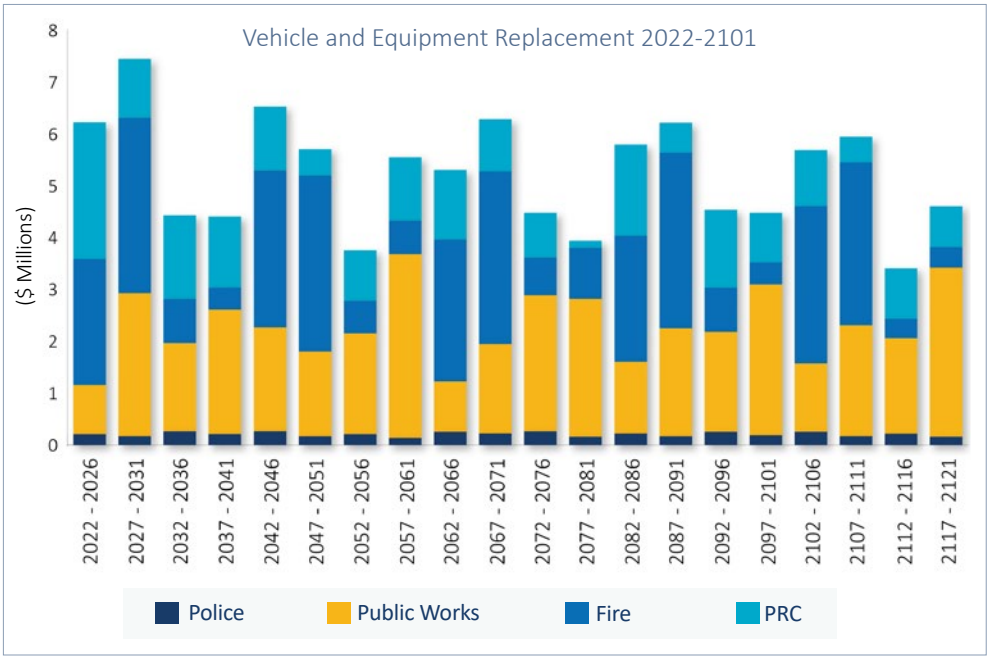
Sustainable funding explained

As assets age, the District sets aside funding in a reserve, so funds are available when a replacement is required. Imagine an asset is 90% through its expected useful life; sustainable funding means that the District has saved 90% of its replacement cost.

Vehicle and Equipment Funding Gap

The current replacement cost of all vehicles and equipment is estimated to be approximately $15.7M. On average, these assets are 66% through their expected useful lives. Therefore, the amount of funds that would need to be set aside for cumulative sustainable funding is $10.3M (66% x $15.7M). The District has set aside $6.5M resulting in a $3.8M cumulative infrastructure funding gap.

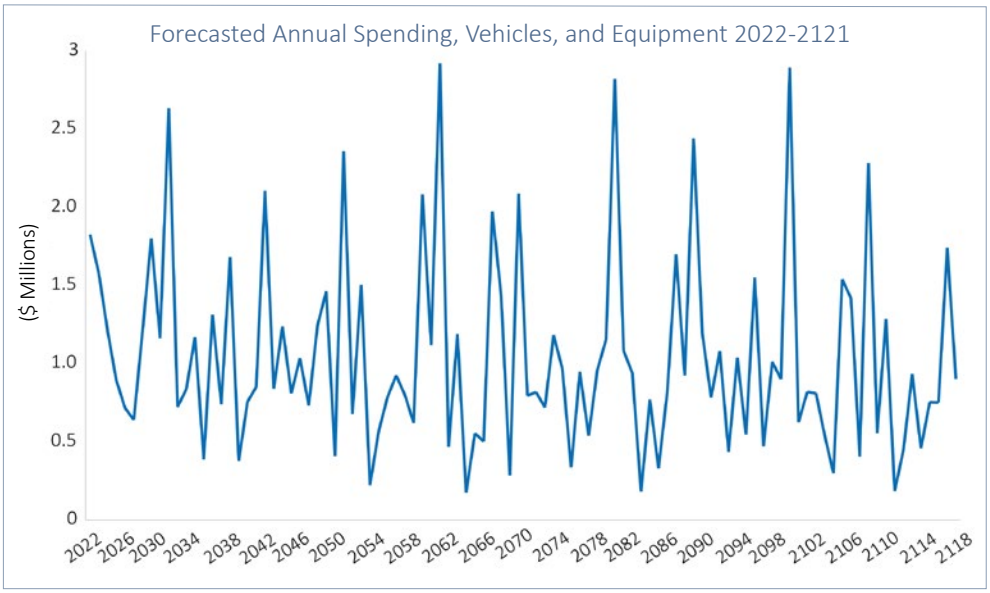
Figure 18: Vehicles & Equipment 100 Year Spending by Department



Vehicle & Equipment Spending Forecasts

Spending on vehicle and equipment replacement for the next 100 years is forecasted to be $104.7M (2021 dollars). Approximately $4.0M of this is for the replacement of vehicles and equipment that have exceeded their expected useful life ('backlog'). The remainder ($100.7M) is for the replacement of vehicles and equipment that will come due for replacement during 2022-2121.

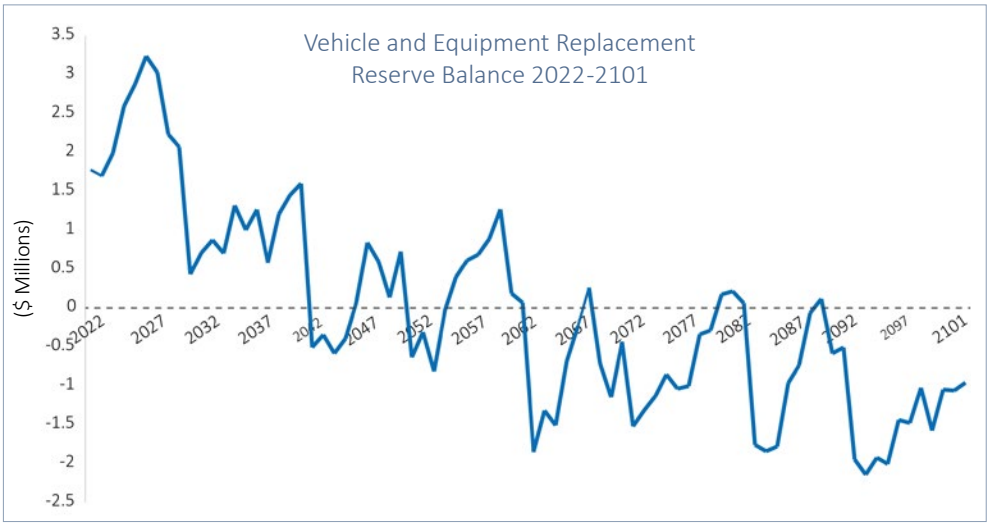
Figure 19: Vehicles & Equipment 100 Year Spending



Vehicle & Equipment Reserve Forecasts

Vehicle and Equipment replacement reserve balances are forecasted to remain stable over the next 100 years. However, contributions are slightly unsustainable, and there is a small cumulative infrastructure funding gap, so a clear downward trend is visible in the reserve balance forecasts.

Figure 20: Vehicles & Equipment 80 Year Reserve Forecast



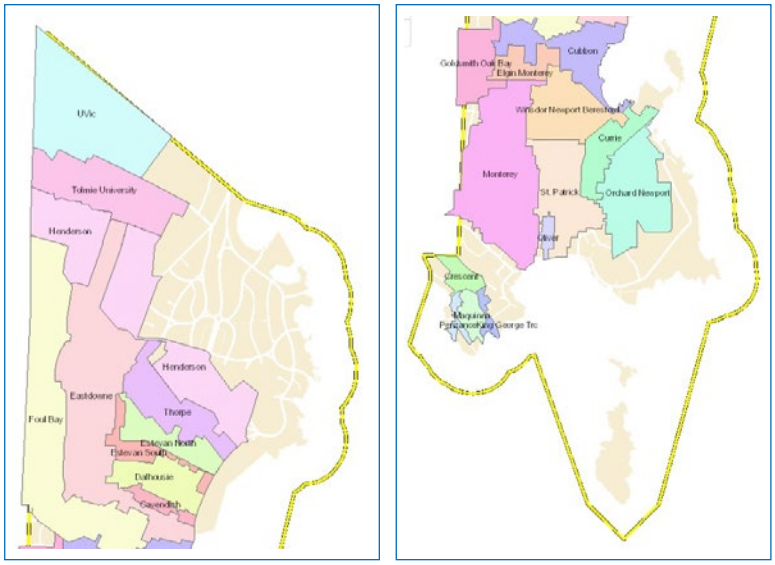
Individual reserves (such as the Fire Equipment replacement reserve) may be forecasted to go negative. Vehicle and Equipment reserve internal borrowing can be used to mitigate this.

Drainage Infrastructure

Total Current Replacement Cost $171.5M	Total Drainage Infrastructure Overdue for Replacement $103.0M
Current Annual Funding $1.2M	Annual Sustainable Funding Target $2.5M
Total Drainage Reserves $5.0M	Sustainable Reserve Target $121.7M
% Annual Sustainable Funding Target 48%	Cumulative Infrastructure Funding Gap $116.7M

The District owns and maintains approximately 140km of storm water main separated into 24 catchment areas as detailed in Figure 21. Many storm water assets were installed between 1920 and 1940, making them between 80 and 100 years old, which is over their recommended useful life. Based on this age data, the majority of assets are in Poor and Fair condition and need to be replaced as soon as possible. In 2015, the District initiated a closed-circuit television (CCTV) condition assessment of its sanitary and storm drain system. To date, 84km (of 104km) of sanitary and storm pipes have been inspected via CCTV. These results will be integrated into the District's stormwater master plan currently scheduled for 2022.

Figure 21: Drainage Catchment Areas



Drainage Inventory

Table 16: Drainage Infrastructure Inventory

Structure	Quantity	Service Life (years)	Current Replacement Value	Annualized Cost
Mains	141.3km	50-100	$141.3M	$2.45M
Laterals[1]	5,438[2]	50-100	$28.8M[1]	N/A[1]
Manholes	1,306	50-100	Included in main cost	Included in main cost
Lift Stations	2	75	$1.1M	$0.01M
Total			**$171.2M**	**$2.46M**

1. Under the District's 'Public Sewer Bylaw, 1996', homeowners are responsible for the maintenance and replacement of laterals.
2. The assumption is that there are approximately 500 fewer storm drain connections than sanitary sewer connections.

C-

Drainage Condition Assessment

Drainage infrastructure is assigned an overall C- condition assessment score. A modified American Society of Civil Engineers alphanumeric system was used to assign scoring as defined in Appendix A. This system is used to rate each major asset class based on: (1) Condition and Performance, (2) Capacity vs. Need, and (3) Funding vs. Need. Funding for stormwater main replacement is less than half of the sustainable level. Drainage infrastructure has the highest proportion (73%) of infrastructure overdue for replacement of any asset class totalling $103M.

Table 17: Drainage Infrastructure Condition Assessment

Structure	Overall	Condition and Performance	Capacity vs Need	Funding vs Need
Mains	D+	D	B	D
Laterals	C-	D	A	N/A
Culverts	C-	D	B	D
Manholes	C-	D	B	D

Drainage Infrastructure Overdue for Replacement

Total value of drainage assets that have reached recommended useful life estimated at:	$103M

Approximately $8.3M worth of drainage assets have come due since 2016.

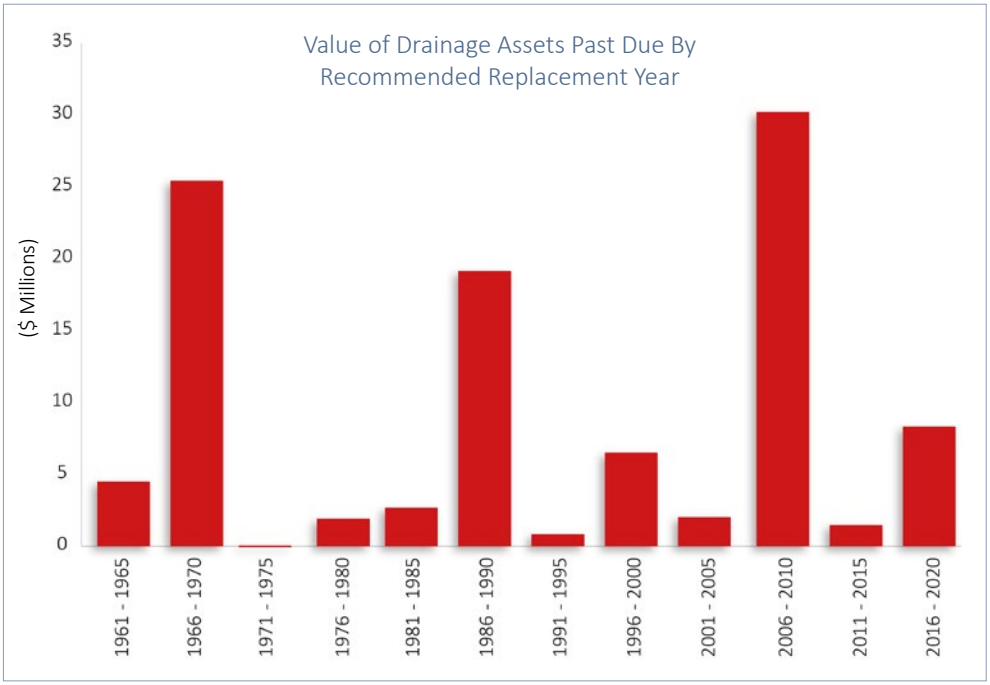
Drainage Asset Cumulative Funding Gap

The current replacement cost of all the drainage assets (not including laterals) are estimated to be approximately $142.4M. On average, these assets are 85.5% through their expected useful lives. Therefore, the amount of funds that would need to be set aside for cumulative sustainable funding is $121.7M (85.5% x $142.4M). **The District currently has no reserves dedicated for drainage asset replacement.** However, there is approximately $16.7M in undedicated capital reserves. Staff estimate that approximately 29.9% of these undedicated reserves will be used for drainage replacement, or approximately $5.0M. This results in an approximate $116.7M cumulative funding gap.

Sustainable funding explained

As assets age, the District sets aside funding in a reserve, so funds are available when a replacement is required. Imagine an asset is 90% through its expected useful life; sustainable funding means that the District has saved 90% of its replacement cost.

Figure 22: Past Due Drainage Assets



Drainage Asset Spending Forecasts

Spending on drainage infrastructure replacement for the next 100 years is expected to be $253.8M (2021 dollars). Approximately $103.0M of this is for the replacement of drainage assets that have exceeded their expected useful life ('backlog'). The remainder ($150.8M) is for the replacement of drainage assets that will come due for replacement during 2021-2121. The District may choose how quickly to replace the 'backlog' infrastructure replacement. The longer the District chooses to take to replace its 'backlog' drainage assets, the greater the risk of main breaks, flooding and related disruptions.

Our recommendation is to replace all drainage assets that are past their expected useful life ('backlog') over 25 years (2022-2047). This would result in $66M in drainage asset replacement spending 2022-2047. The Plan recommends replacing the backlog over a 25-year period to ensure debt servicing remains manageable.

Figure 23: Drainage Cumulative Infrastructure Funding Gap

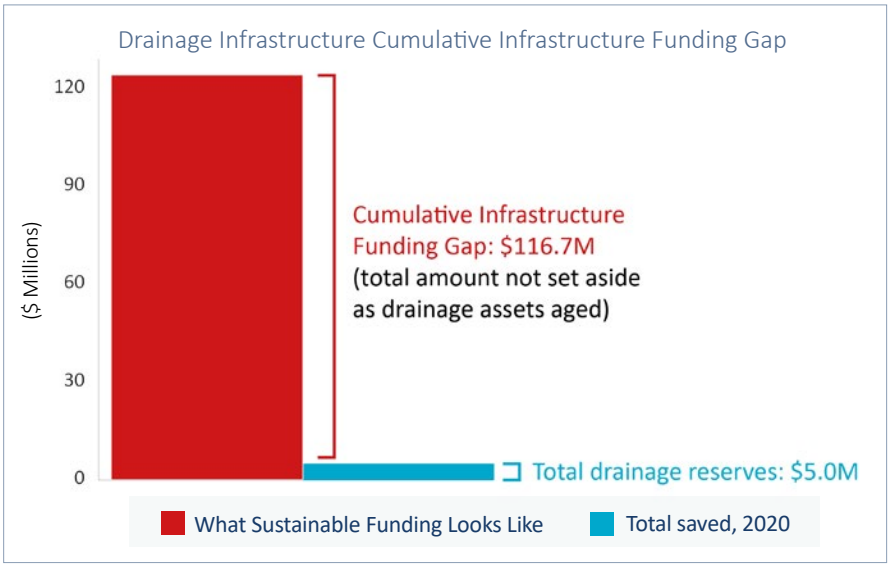
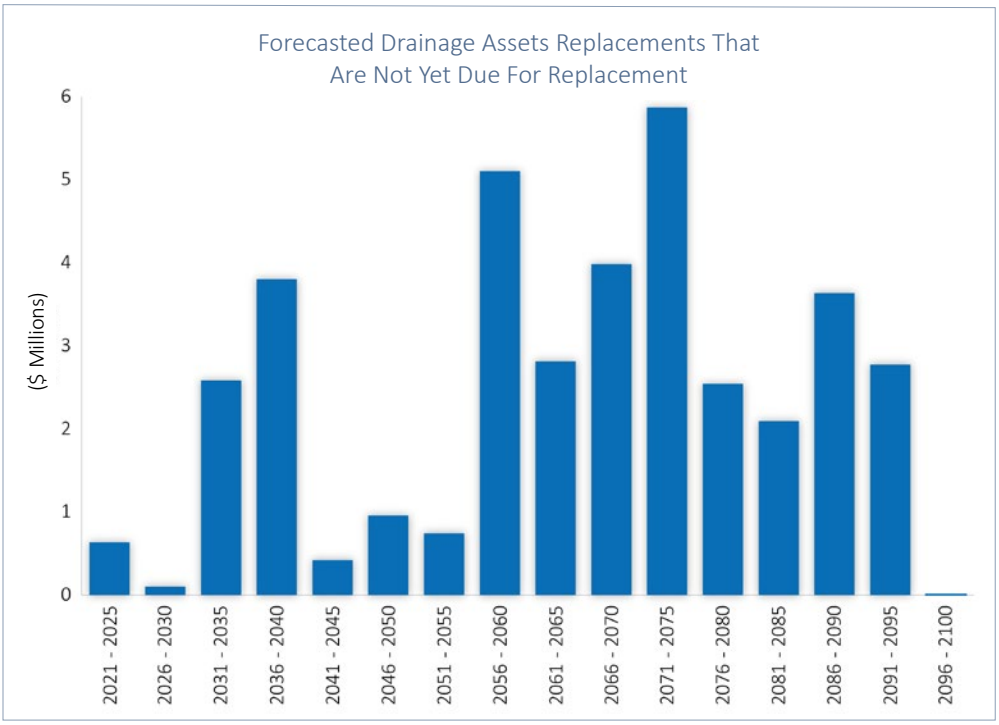


Figure 24: Drainage Assets 100 Year Spending Forecasts

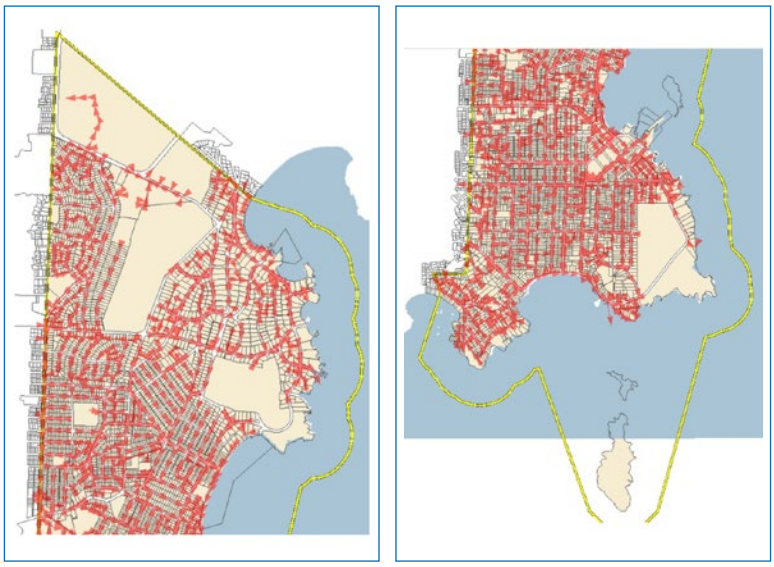


Sanitary Sewer Infrastructure

Total Current Replacement Cost $137.4M	Total Sanitary Sewer Infrastructure Overdue for Replacement $56.0M
Current Annual Funding $1.2M	Annual Sustainable Funding Target $1.4M
Total Sanitary Sewer Reserves $8.7M	Sustainable Reserve Target $81.9M
% Annual Sustainable Funding Target 86%	Cumulative Infrastructure Funding Gap $73.2M
Sanitary Sewer Asset Debt Forecast 2022-2121 $8.0M - $30.1M	Weighted Average Age of Sanitary Sewer Main 64.3Yrs

The District owns and maintains approximately 100km of sanitary sewer main and seven lift stations. Many sanitary sewer assets were installed between 1912 and 1940, making them between 80 and 110 years old, which is over their recommended useful life. Based on this age data, the majority of assets are in Poor and Fair condition and need to be replaced as soon as possible. In 2015, the District initiated a closed-circuit television (CCTV) condition assessment of its sanitary and storm drain system. To date, 84km (of 104km) of sanitary and storm drain pipes have been inspected via CCTV. These results will be integrated into the District's sanitary sewer master plan that is currently being prepared.

Figure 25: Sanitary Sewer System Ortho



Sanitary Sewer Inventory

Table 18: Sanitary Sewer Infrastructure Inventory

Structure	Quantity	Service Life (Years)	Current Replacement Value	Annualized Cost
Gravity Mains	100.2km	50-125	$100.2M	$1.35M
Pressure Mains	3.9km	75-120	$3.9M	$0.05M
Laterals[1]	5,938	50-125	$31.5M[1]	N/A[1]
Lift Stations	7	75	$1.8M	$0.02M
Manholes	1,316	50-125	Included in main cost	Included in main cost
Total			**$137.4M**	**$1.42M**

1. Under the District's 'Public Sewer Bylaw, 1996', homeowners are responsible for the maintenance and replacement of laterals.

B+

Sanitary Sewer Condition Assessment

Sanitary Sewer infrastructure is assigned an overall B+ condition assessment score. A modified American Society of Civil Engineers alphanumeric system was used to assign scoring as defined in Appendix A. This system is used to rate each major asset class based on: (1) Condition and Performance, (2) Capacity vs. Need, and (3) Funding vs. Need. This asset class scores well for funding, and current capacity services the community well.

Table 19: PACP Format Condition Rating Chart

Structural Defects Grade	Description
5	Pipe has failed or will likely fail within the next 5 years
4	Pipe will probably fail in 5 to 10 years
3	Pipe may fail in 10 to 20 years
2	Pipe unlikely to fail for at least 20 years
1	Failure unlikely in the foreseeable future

In 2015, the District initiated a closed-circuit television (CCTV) condition assessment of its sanitary and storm drain system. To date, 84km (of 104km) of sanitary pipe and storm pipe have been inspected via CCTV. Inspections were completed using the Pipeline Assessment Certification Program (PACP) format. The PACP format uses a five-point grading system to rate pipes' internal structure and operational condition based on video inspection.

From 2015-2017, 17.5% of inspected pipes had grade 5 defects, requiring immediate attention in the next 5 years.

Table 20: Sanitary Sewer Condition Assessment

Structure	Overall	Condition & Performance	Capacity vs Need	Funding vs Need
Gravity Mains	B+	C	A	B+
Laterals[1]	B+	C	A	N/A
Lift Stations	B+	C	A	B+
Manholes	B+	C	A	B+

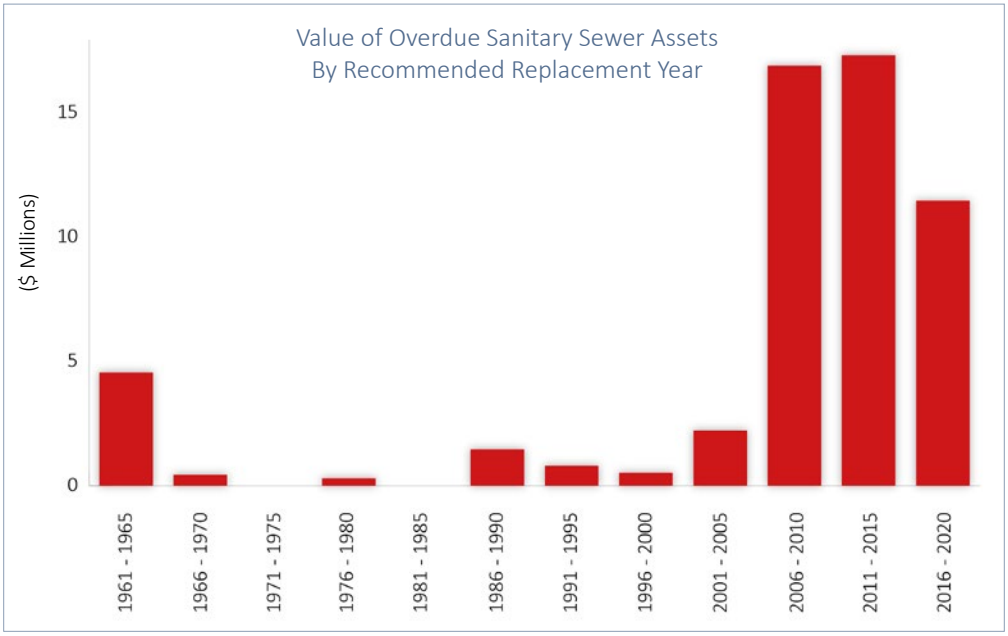
1. Under the District's 'Public Sewer Bylaw, 1996', homeowners are responsible for the maintenance and replacement of laterals.

Sanitary Sewer Asset Infrastructure Gap ('Backlog')

Total value of sanitary sewer assets that have reached recommended useful life estimated at:	$56M

Approximately $11.5M worth of Sanitary Sewer assets have come due since 2016.

Figure 26: Past Due Sanitary Sewer Assets



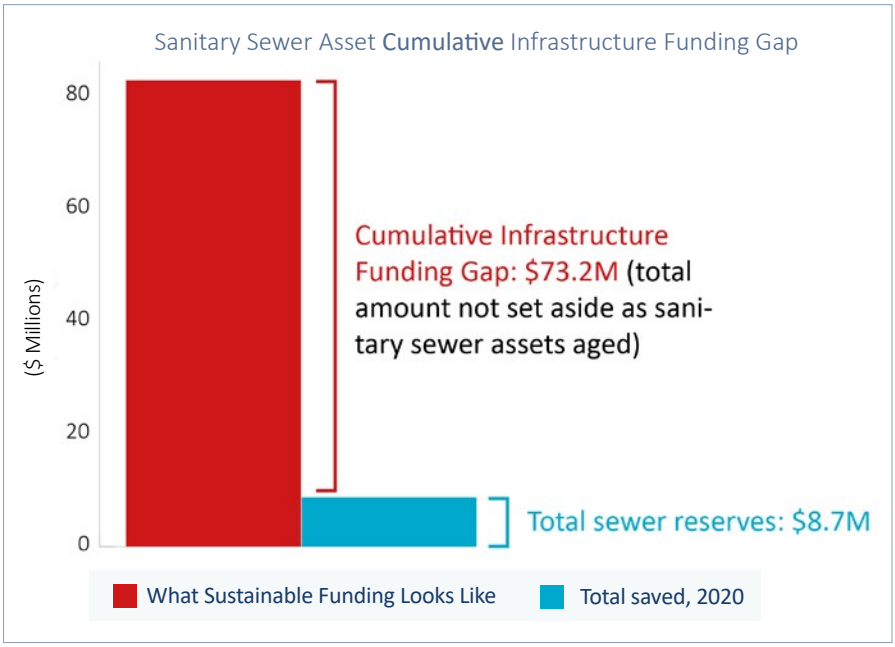
Sanitary Sewer Asset Cumulative Funding Gap

The current replacement cost of the of all sanitary sewer assets are estimated to be approximately $105.9M (excluding laterals). On average, these assets are 77.3% through their expected useful lives. Therefore, the amount of funds that would need to be set aside for cumulative sustainable funding is $81.9M (77.3% x $105.9M). The District has set aside $8.7M resulting in a $73.2M cumulative infrastructure funding gap.

Sustainable funding explained

As assets age, the District sets aside funding in a reserve, so funds are available when a replacement is required. Imagine an asset is 90% through its expected useful life, sustainable funding means that the District has saved 90% of its replacement cost.

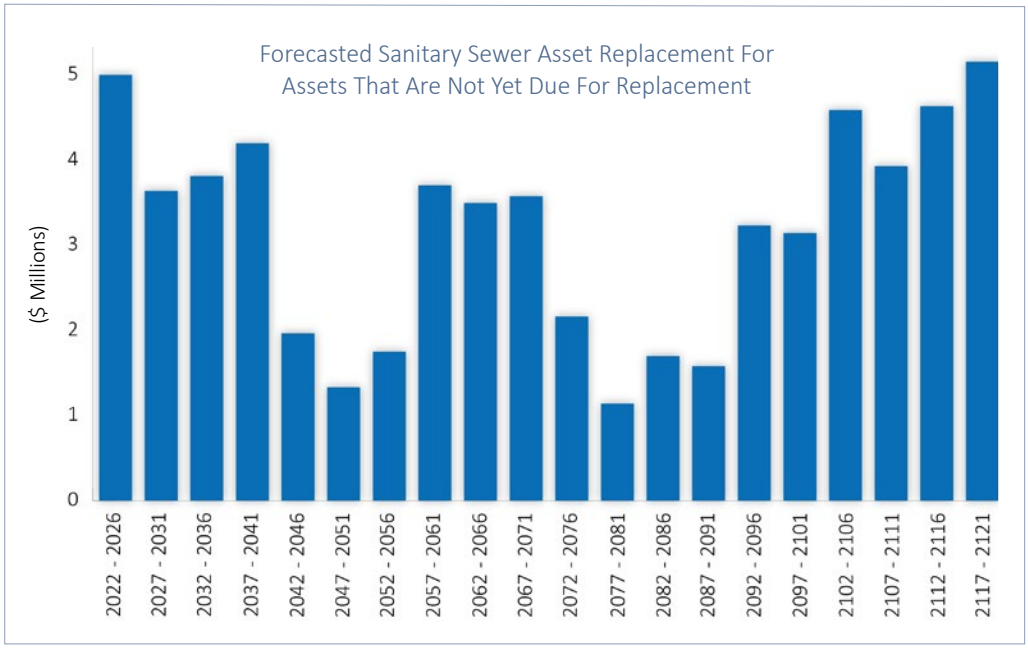
Figure 27: Sanitary Sewer Cumulative Infrastructure Funding Gap



Sanitary Sewer Asset Spending Forecasts

Spending on sanitary sewer infrastructure replacement for the next 100 years is expected to be $180.9M (2021 dollars). Approximately $56.0M of this is for the replacement of sanitary sewer assets that have exceeded their expected useful life ('backlog'). The remainder ($124.9M) is for the replacement of sanitary sewer assets that will come due for replacement during 2022-2121. The District may choose how quickly to replace the 'backlog' infrastructure replacement. The longer the District chooses to take to replace its 'backlog' sanitary sewer assets, the greater the risk of sanitary sewer main failure and related disruptions.

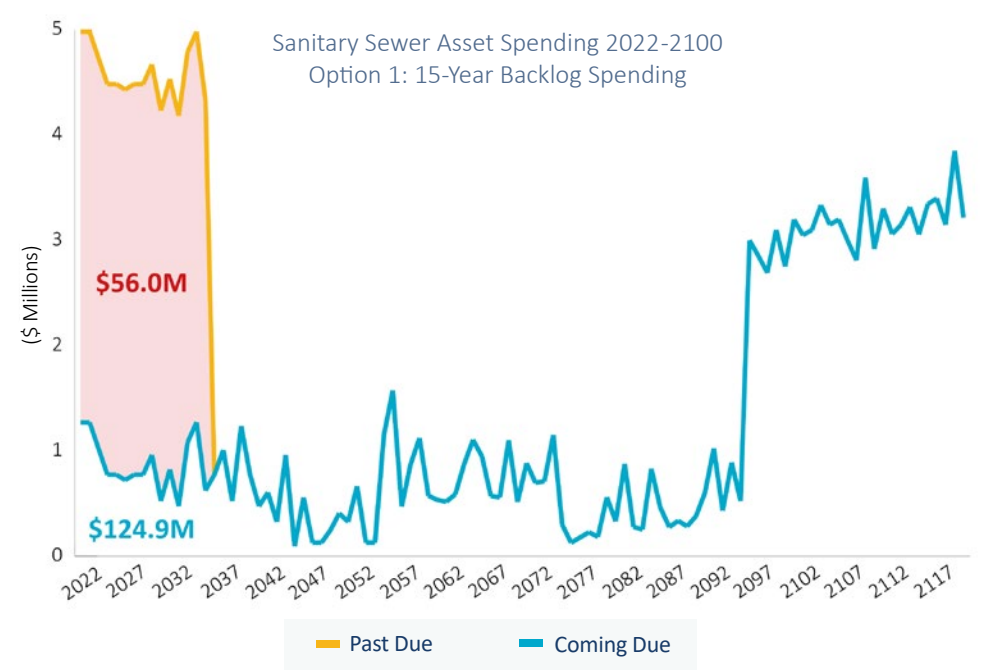
Figure 28: Sanitary Sewer Replacement by Year Range

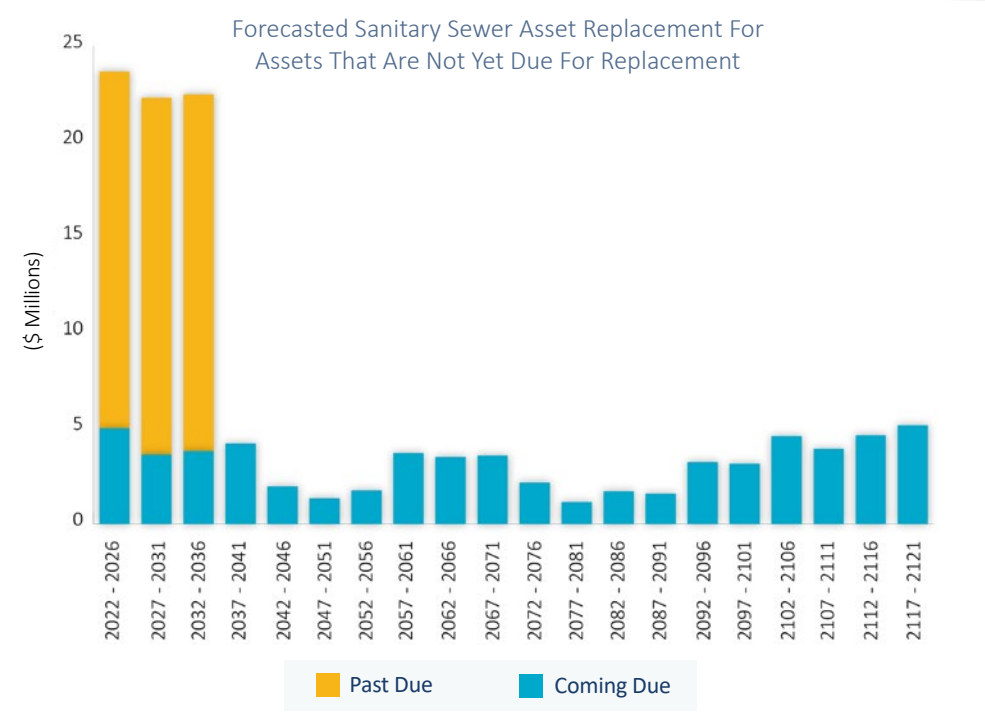


The Plan recommends replacing all sanitary sewer assets that are past their expected useful life over a 25 years (2022-2047). This would result in $75M in sanitary sewer asset replacement spending between 2022-2047.

Sanitary Sewer Reserve Forecasts and Borrowing

Since an accumulated infrastructure gap has been allowed to grow without sustainable reserve contributions, the District will need to borrow in the short term. Forecasted spending through 2036 is expected to exceed available reserves by $38M. This is due to the combination of insufficient reserve contributions and a $56.0M backlog of sanitary sewer infrastructure overdue for replacement.





Annual reserve contributions have been escalating at a rapid pace. In 2018 they stood at $908,000 and reached $1,215,900 in 2021. The 2021-2025 financial plan continues to escalate annual reserve contributions at a pace of $50,000 per year. The annual reserve contributions are expected to reach $1.415M by 2025. The estimated annual sustainable infrastructure reserve contribution for sanitary sewer assets is $1.4M. However, since sustainable reserve contributions have not been made for the vast majority of sanitary sewer assets' life cycle, the District faces a long-term funding challenge.

Figure 29: Sanitary Sewer Reserve Forecast

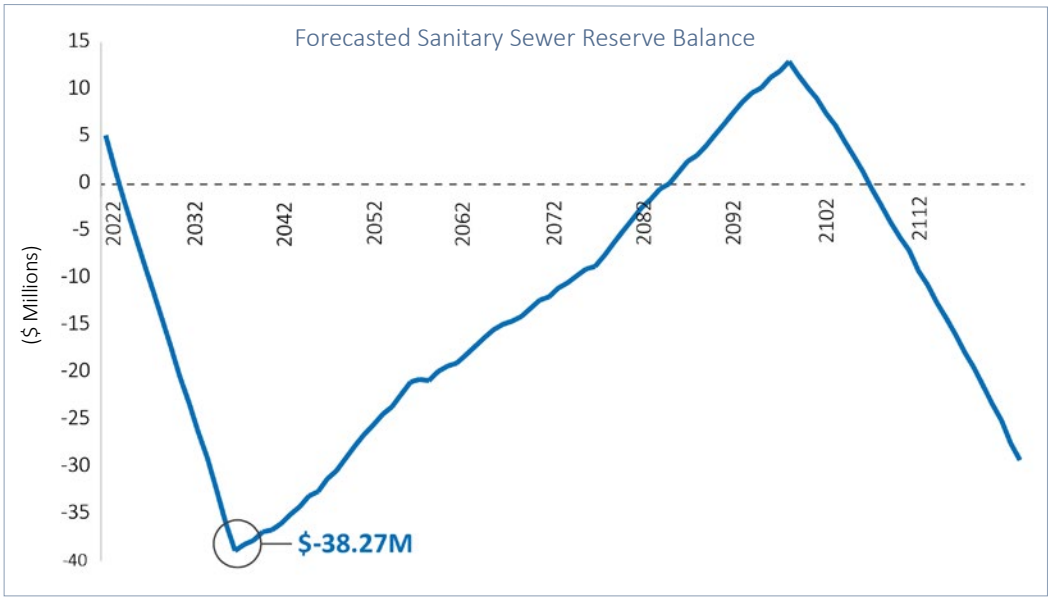


Figure 30: Sanitary Sewer Annual Funding Sustainability

Year	Annual Reserve Funding	Sustainable Annual Funding	% Sustainable Target
2018	$908,000	$1,297,500	70%
2019	$1,115,900	$1,323,500	84%
2020	$1,215,900	$1,350,500	90%
2021	$1,265,900	$1,377,500	92%
2022 (Forecasted)	$1,315,900	$1,404,500	94%
2023 (Forecasted)	$1,365,900	$1,432,600	95%
2024 (Forecasted)	$1,415,900	$1,461,300	97%
2025 (Forecasted)	$1,465,900	$1,490,500	98%

The District will need to take on debt to address the backlog of sanitary assets and those that are due for replacement now, through to 2036. The value of sanitary sewer infrastructure replacement through this period is estimated at $69M. Annual increases to the District's sanitary sewer replacement reserve funding will need to accompany new debt in order to pay debt servicing and save for the ongoing

replacement of sanitary sewer infrastructure. Reserve and debt financing modelling has been prepared to provide infrastructure replacement spend options. Many assumptions have been used to prepare the modelling, including:

1. unit rate cost per meter of sanitary main replacement,
2. age and condition of sanitary sewer inventory, and
3. debt servicing costs.

However, using even the most optimistic assumptions will not change the conclusion that a significant investment in sanitary sewer infrastructure replacement is needed over the next 20-30 years.

Table 21: Sanitary Sewer User Fee Increase Options

Option	Incremental Utility Fees Paid 2022-2121	Total Debt Interest Paid 2022-2121	Total Investment returns earned 2022-2121[1]	Net Cost to Taxpayer 2022-2121	
Status Quo	-	$63,700,000	$(510,000)	$63,190,000	
1: 1 x 10%	$18,410,000	$47,700,000	$(2,466,000)	$63,644,000	
2: 1 x 20%	$40,310,000	$21,500,000	$(10,198,000)	$51,612,000	
3: 2 x 10%	$39,800,000	$22,100,000	$10,034,000)	$51,866,000	
4: 4 x 5%	$39,400,000	$22,100,000	$(9,573,000)	$51,927,000	
5: 8 x 2.5%	**$38,986,000**	**$22,700,000**	**$(9,214,000)**	**$52,472,000**	] **Recommended**
6: 5 x 5%	$49,000,000	$20,300,000	$(14,172,000)	$55,128,000	

1. includes actuarial adjustments through the Municipal Finance Authority

Water Infrastructure

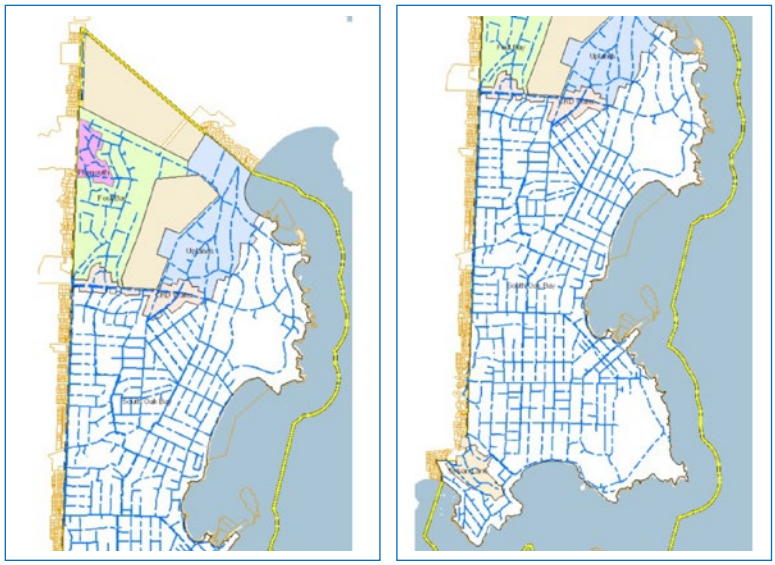
Total Current Replacement Cost $168.0M	Total Water Infrastructure Overdue for Replacement $47.6M
Current Annual Funding $1.0M	Annual Sustainable Funding Target $1.9M
Total Water Reserves $7.9M	Sustainable Reserve Target $95.4M
% Annual Sustainable Funding Target 53%	Cumulative Infrastructure Funding Gap $87.5M
Water Asset Debt Forecast 2022-2121 $50-57M	Weighted Average Age of Water Main 59-65Yrs*

*59 years not including overdue years; 65 years include years past recommended replacement year

Oak Bay is supplied with potable water from Sooke Lake Reservoir via the Regional Water Supply System operated by the Capital Regional District (CRD). The Oak Bay system is bordered by the District of Saanich to the north and the City of Victoria to the west. The Oak Bay water distribution system is comprised of:

- 5 pump stations
- 2 pressure reducing valve (PRV) stations
- 116km of water main
- 6,013 service connections
- 1,098 main line valves
- 494 hydrants

Figure 31: Water Infrastructure Ortho



Water Asset Inventory

Structure	Quantity	Service Life (Years)	Current Replacement Value	Annualized Cost
Mains	116km	50-80	$116.3M	$1.57M
Laterals[1]	5,938	50-80	$37.9M[1]	N/A*
Hydrants	494	50	$8.1M	$0.16M
Valves	1,073	30-50	Included in main cost	Included in main cost
Meters	5,938	25	$2.8M	$0.11M
Lift Stations	5	75	$2.9M	$0.04M
Total			**$168.0M**	**$1.88M**

1. Under the District's 'Water Rate Bylaw, 1981', homeowners are responsible for the maintenance and replacement of laterals.

C

Water Asset Condition Assessment

Water infrastructure is assigned an overall C condition assessment score. A modified American Society of Civil Engineers alphanumeric system was used to assign scoring as defined in Appendix A. This system is used to rate each major asset class based on: (1) Condition and Performance, (2) Capacity vs. Need, and (3) Funding vs. Need.

From 2014 to 2018, there were 29 water main breaks, averaging 5.8 breaks per year. The District's average break rate is 5.1 breaks per year per 100km of installed water main. This break rate is within the observed range for typical Canadian water distribution systems. For comparison, the 2017 MBNCanada Performance Measurement Report [8] presents break frequency information for fourteen municipalities across Canada. Breaks are reported to occur at an average rate of roughly 10 per 100km of water main, with a range of 1 to 32. The majority of the breaks (83%) occurred in mains installed in 1960 and earlier. Approximately 77.6km (66.7%) of the District water mains were installed in 1960 and earlier.

Table 22: Water Infrastructure Condition Assessment

Structure	Overall	Condition and Performance	Capacity vs Need	Funding vs Need
Mains	C	C	A	D
Laterals	C	C	A	D
Hydrants	C+	B	A	D
Valves	C	C	A	D
Meters	C	C	A	D

Water Asset Infrastructure Overdue for Replacement ('Backlog')

Total value of water assets that have reached recommended useful life estimated at:	$47.6M

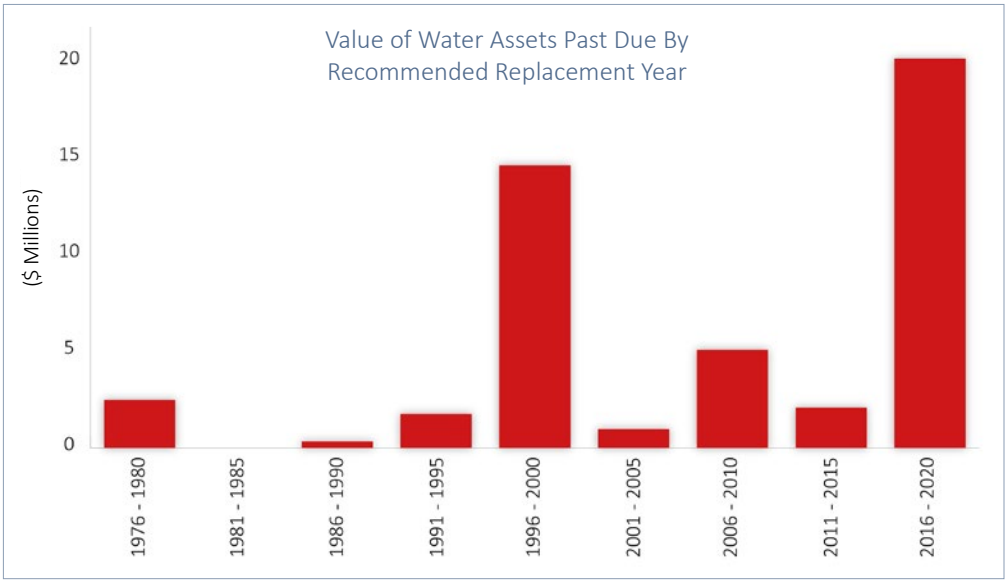
Approximately $20.1M worth of water assets have come due since 2016.

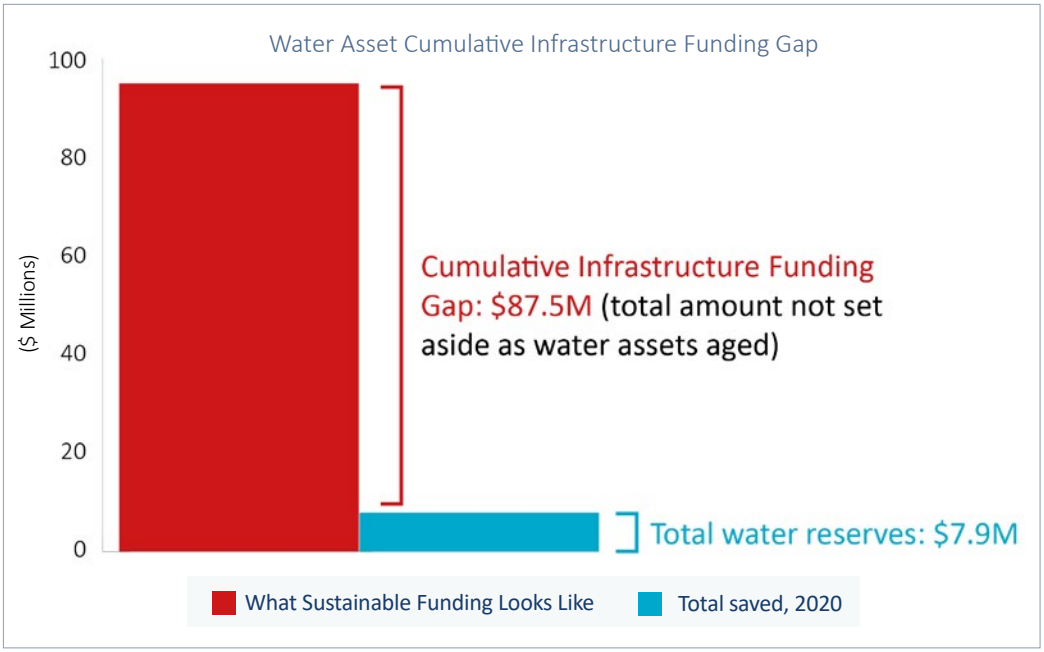
Water Asset Cumulative Funding Gap

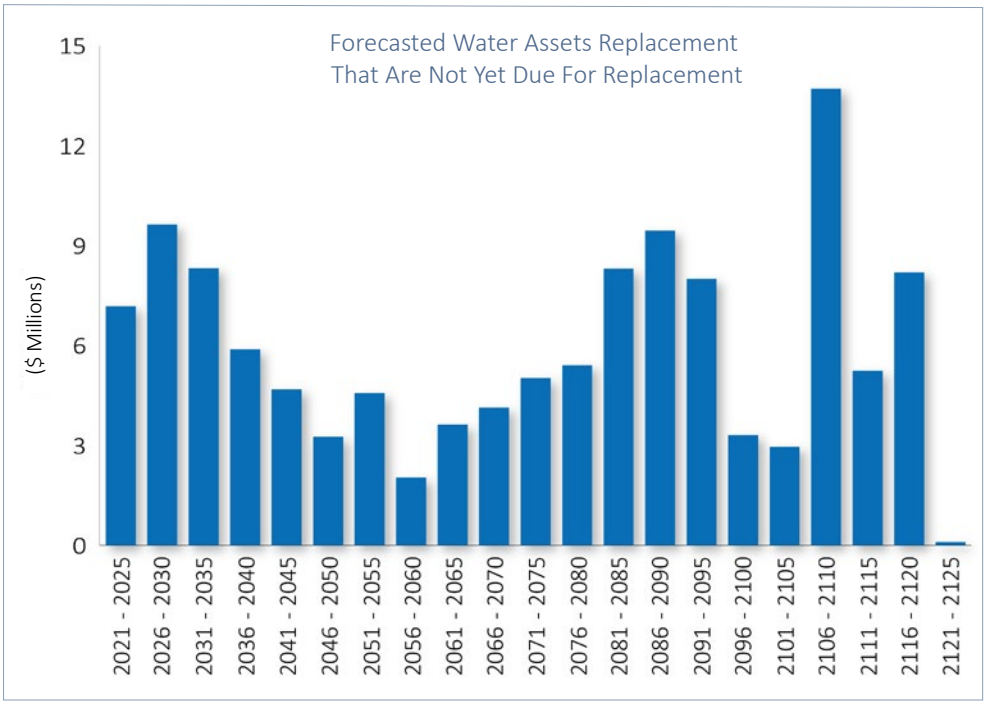
The current replacement cost of all water assets is estimated to be approximately $130.1M (excluding laterals). On average, these assets are 73.3% through their expected useful lives. Therefore, the amount of funds that would need to be set aside for cumulative sustainable funding is $95.4M (73.3% x 130.1M). The District has set aside $7.9M resulting in an $87.5M cumulative infrastructure funding gap.

Sustainable funding explained

As assets age, the District sets aside funding in a reserve, so funds are available when a replacement is required. Imagine an asset is 90% through its expected useful life; sustainable funding means that the District has saved 90% of its replacement cost.

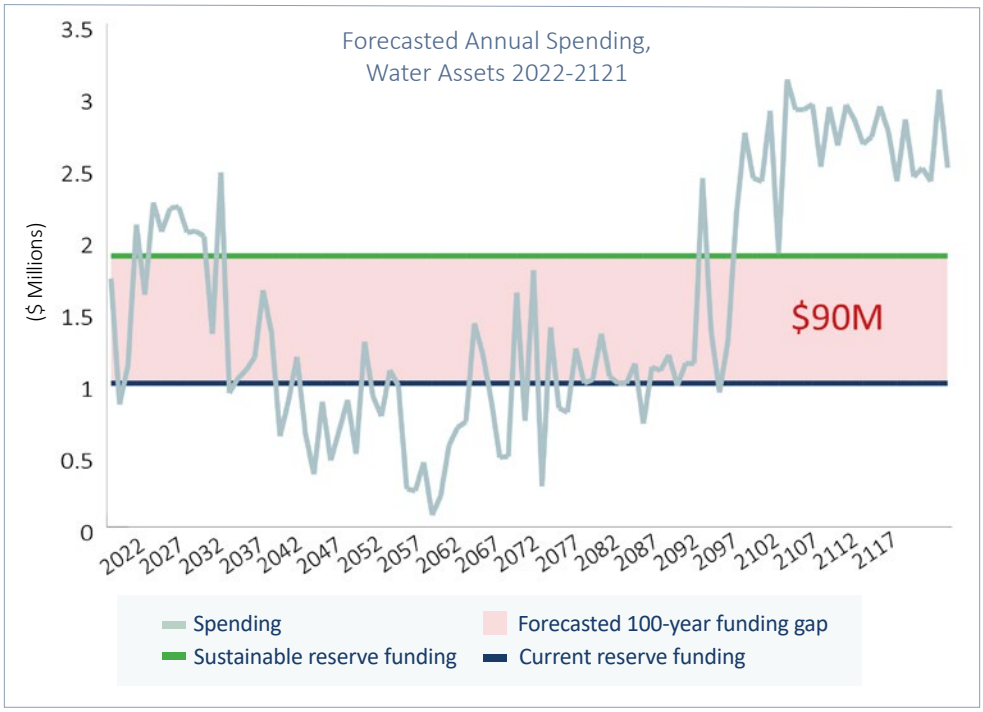






Water Asset Spending Forecasts

Spending on water infrastructure replacement for the next 100 years is expected to be $199.8M (2021 dollars). Approximately $47.6M of this is for the replacement of water assets that have exceeded their expected useful life ('backlog'). The remainder ($152.2M) is for the replacement of water assets that will come due for replacement during 2022-2121.



The estimated annual sustainable infrastructure reserve contribution for water assets is $1.9M, while the current funding is $1.0M. If this funding level continued, the District would face an additional $90M cumulative funding gap by 2121.

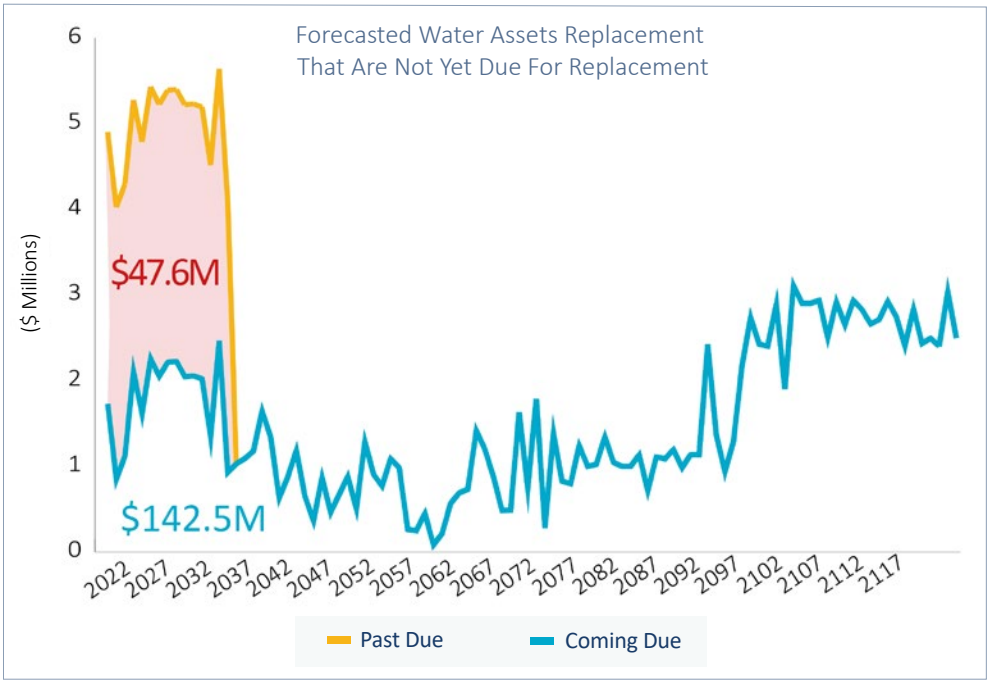
Annual reserve contributions have been escalating at a rapid pace. In 2018 they stood at $700,000 and reached $965,000 in 2021. The 2021-2025 Financial Plan continues to escalate annual reserve contributions at a pace of $100,000 per year. The annual reserve contributions are expected to reach $1.365M by 2025.

The District may choose how quickly to replace the 'backlog' infrastructure replacement. The longer the District chooses to take to replace its 'backlog' water assets, the greater the risk of water main breaks, and water service disruption. Staff's recommendation is to replace all water assets that are past their expected useful life over a 25-year period (2022-2047). This would result in $72M in water asset replacement spending between 2022-2047.

Figure 32: Water Infrastructure Annual Sustainability

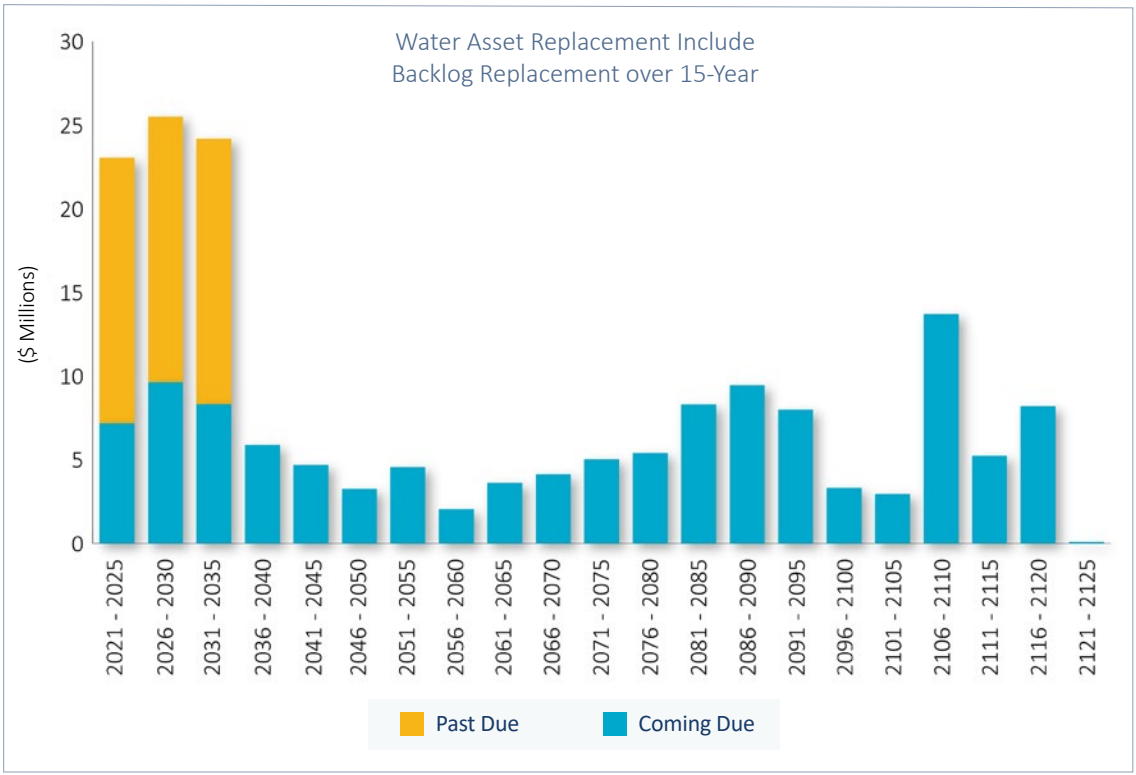
Year	Annual Reserve Funding	Sustainable Annual Funding	% Sustainable Target
2018	$733,000	$1,772,200	41%
2019	$765,000	$1,807,600	42%
2020	$865,000	$1,843,800	47%
2021	$965,000	$1,880,679	51%
2022 (Forecasted)	$1,065,000	$1,918,300	56%
2023 (Forecasted)	$1,165,000	$1,956,700	60%
2024 (Forecasted)	$1,265,000	$1,995,800	63%
2025 (Forecasted)	$1,365,000	$2,035,700	67%

As Figure 32 demonstrates, water infrastructure replacement funding remains unsustainable by 2025. This report provides several faster paced options on page 69.



Water Reserve Forecasts and Borrowing

Since an accumulated infrastructure gap has been allowed to grow without sufficient reserve contributions, the District will need to borrow in the short term. Forecasted spending through 2036 is expected to exceed available reserves by $41M. This is due to the combination of historic insufficient reserve contributions and a $47.6M backlog of water infrastructure overdue for replacement.



The District will need to take on debt to address the backlog of water assets and those that are due for replacement now through to 2040. The value of water infrastructure replacement through this period is estimated at $84M. Annual increases to the District's water replacement reserve funding will need to accompany new debt in order to pay debt servicing and save for the ongoing replacement of water infrastructure. Reserve and debt financing modelling has been prepared to provide infrastructure replacement spend options. Many assumptions have been used to prepare the modelling, including:

- unit rate cost per meter of water main replacement,
- age and condition of water main inventory, and
- debt servicing costs.

However, using even the most optimistic assumptions will not change the conclusion that a significant and expensive investment in water infrastructure replacement is needed over the next 20-30 years.

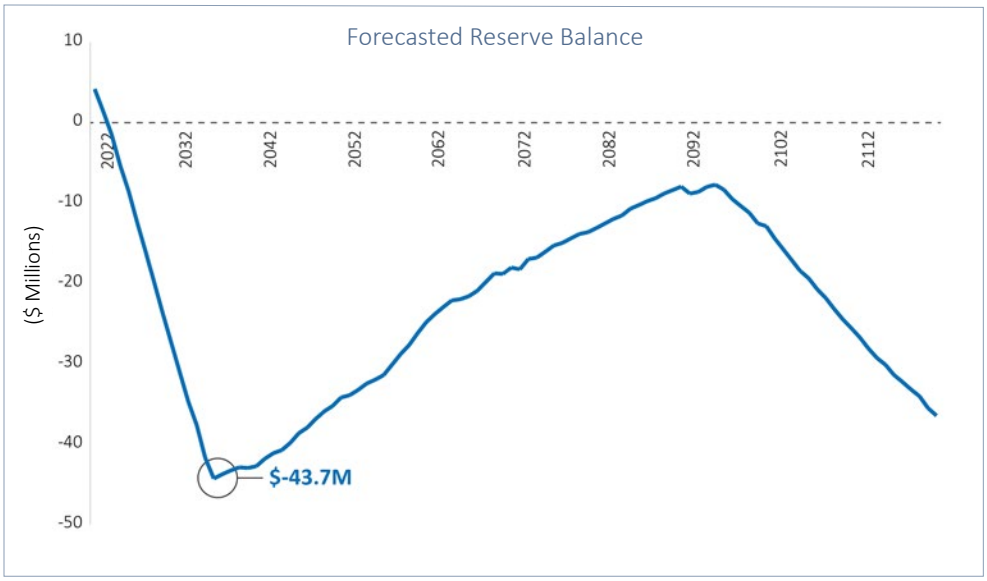


Table 23: Water Utility User Fee Increase Options

Option	Incremental Utility Fees Paid 2022-2121[1]	Total Debt Interest Paid 2022-2121	Total Investment returns earned 2022-2121[2]	Net Cost to Taxpayer 2022-2121	
Status Quo					
1: 1 x 20%	$93,300,000	$24,800,000	$(6,146,000)	$111,954,000	
2: 2 x 10%	$92,833,500	$25,200,000	$(5,821,000)	$112,212,500	
3: 4 x 5%	$91,900,500	$26,000,000	$(5,200,000)	$112,700,500	
4: 8 x 2.5%	**$90,034,500**	**$27,600,000**	**$(4,077,000)**	**$113,557,500**	**Recommended**
5: 10 x 3.5%	$155,927,625	$16,500,000	$(37,400,000)	$135,027,625	
6: 5 x 5%	$114,292,500	$21,800,000	$(16,000,000)	$120,092,500	

1. does not include regular increases required for operating budget forced growth
2. includes actuarial adjustments through the Municipal Finance Authority

Glossary of Terms

Actuarial Adjustment

Anticipated earnings on debt principal payments made to the Municipal Finance Authority (MFA). The MFA issues debt on behalf of BC local governments. The MFA then collects principal payments and holds them in a sinking fund for when the debt comes due. The sinking fund earns interest revenue while being held by the MFA. These earnings are used to reduce the overall principal owed to the MFA from the local government.

Annual Infrastructure Funding Gap

This is the difference between sustainable annual infrastructure funding and actual annual infrastructure funding. Typically annual funding is transferred to a capital replacement reserve. Then when capital is due for replacement, the reserve is used to fund the replacement.

Cumulative Infrastructure Funding Gap

This is the difference between the sustainable reserve target and capital replacement reserves. For instance, suppose your roads are 30% through their life, and their replacement cost is $100M. The sustainable reserve target should be 30% x $100M = $30M. Sustainable reserve targets can be achieved by sustainable annual infrastructure funding. Thirty years of $1M contributions would result in $30M in reserves. However, suppose that the District doesn't implement sustainable annual funding and has saved $0 by year 30. The sustainable reserve target $30M less actual reserves $0 would yield a cumulative infrastructure funding gap of $30M.

Forced Growth

This refers to a necessary and often inflationary increase in the price to provide the same level of service. In the context of infrastructure replacement, it means an increase in the price to replace infrastructure. If the cost to replace a sidewalk in 2022 is 2% greater than the cost to replace the sidewalk in 2021, then forced growth is 2%. Sustainable annual infrastructure reserve contributions should be increased by an appropriate forced growth factor annually. Otherwise, the time value of money will result in the actual value of reserve contributions declining over time.

Sustainable Annual Infrastructure Funding

This is the replacement cost of a piece of infrastructure divided by the total recommended useful life. For instance, if the District expects to have to pay $2M to replace a fire truck, and the fire truck is expected to last 20 years, the sustainable annual infrastructure funding is $2,000,000/20 years = $100,000 per year.

Sustainable Reserve Target

This is what the District's reserve balance should be as assets age when sustainable annual funding is implemented. For instance, if a water pipe is 70% through its life, sustainable funding means that the District will have saved up 70% of the cost to replace that pipe. This can be accomplished by setting aside funds annually via sustainable annual funding.

Weighted Average Useful Life

This refers to the average life of the individual infrastructure components weighted by replacement cost.

Appendix A: Basis for Condition Assessment

Since it is unrealistic to scientifically rate every asset for a high-level Infrastructure Condition Report, a modified American Society of Civil Engineers (ASCE) alphanumeric system was employed for each asset component grouping. Assets are evaluated on a simplified component-by-component basis. Although every rating system is subjective, this process improves accuracy since it incorporates the anecdotal knowledge of the employees with respect to the assets.

The assets (by individual components) are rated using a two-step process in order to ensure consistency, focus, and detail:

Step 1: The first step was to rate the current condition to start understanding the makeup of the overall rating and identify the potential problems the managers were facing. This detail rating considered three factors:

1. Condition and Performance,
2. Capacity versus Need, and
3. Funding versus Need.

Condition and Performance: This first criterion characterizes the current physical condition of infrastructure. The condition index scale below is a general guideline for grading under this category:

A = Excellent	No noticeable defects. Some aging or wear may be visible.
B = Good	Only minor deterioration or defects are evident. Still functions.
C = Fair	Deterioration or defects evident, but function not significantly affected.
D = Poor	Serious deterioration in at least some portion of the structure. Function is inadequate.
F = Failed	No longer functional. A general failure or complete failure of a major structural component.

Capacity versus Need: For most infrastructure categories, this second criterion relates to the demand on a system, such as volume or use, versus its design capacity. This is a critical evaluation criterion for municipalities that are facing ongoing population and community growth. It is also important because a particular asset may be in excellent condition and performing well, but it is simply too small to meet the needs. A grading scale in 10-percent increments is suggested as a guideline for purposes of intuitive assessment as follows:

A	systems that can support 100% of demand
B	systems that can support 90 - 99% of demand
C	systems that can support 80 - 89% of demand
D	systems that can support 70 - 79% of demand
F	systems that can support less than 70% of demand

Funding versus Need: The third evaluation criterion reflects the status of funding dedicated to maintaining, replacing, and improving the current condition of existing infrastructure.

Infrastructure systems need funding that is dedicated, indexed, long-term, and, most importantly, sustainable. The primary measure is the amount of funding provided versus the estimated funds needed to meet or maintain the community's desired quality or performance standard.

Dedicated funds, such as user fees and development charges, need to be applied only to infrastructure systems for which they are raised. Indexing means that funds need to increase as the use of the system increases or as the cost of providing the service increases.

Maintenance and construction costs also need to be considered in the evaluation of funding. Steady funding provides for maintenance that extends the life of infrastructure. Long-term, multi-year funding plans should account for growth estimates so that projects can be designed and constructed in anticipation of needs where it is logical and feasible to do so, and not simply in reaction to inadequate capacity or problems caused by poor maintenance.

The grading system, below, is used as a guideline for purposes of intuitive assessment:

A	90 to 100% of need
B	80 to 89% of need
C	70 to 79% of need
D	41 to 69% of need
F	under 40%

Step 2: The second step was to combine the detailed rating into a single blended rating that represented the overall score of that component. This was then combined into an overall score for the asset class for purposes of the Report Card. An overall 2021 Report Card Rating is then assigned to each asset category based on a consolidation of Condition & Performance, Capacity vs. Need and Funding vs. Need criteria. Each factor equally contributes to the overall weighting. In the future, the District may want to weight the contribution of one or more factors to better reflect their relative impact on sustainability or other factors related to the service itself.

Appendix B: Sensitivity Analysis

The sensitivity analysis below has been conducted to demonstrate how sensitive the findings are to changing assumptions. Changing the assumptions used in the preparation of this report could significantly change its findings.

Recommended Useful Life

The District used National Asset Management System (NAMS) to recommend useful lives when forecasting replacement years. Local conditions, data accuracy, and installation quality, can materially impact when assets are replaced. Furthermore, Council may vary infrastructure service levels within reasonable limits. For instance, Council may choose to accept the higher risk of infrastructure failure by extending the life of assets beyond their NAMS recommended useful life. Accepting a higher level of risk is equivalent to selecting reduced service levels.

This study modelled the impact of increasing useful lives of infrastructure by 25% greater than their NAMS recommended useful life. This results in the following differences:

Infrastructure gap falling from $273.9M to $127.2M ($146.7M reduction)

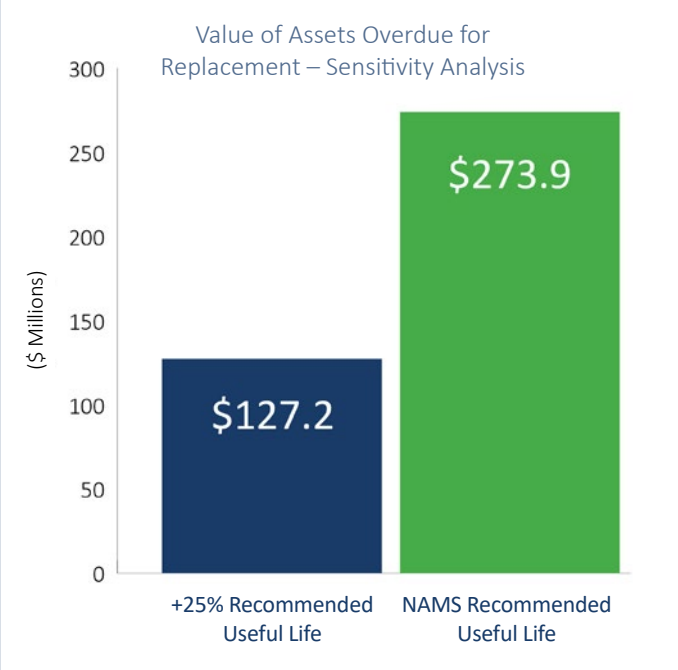
Cumulative infrastructure funding gap falling from $463.5M to $404.5M ($59.0M reduction)

Annual sustainable funding falling from $12.8M to $10.2M ($2.6M reduction)

	NAMS Useful Life	+25% Useful Life
Value of Infrastructure Overdue for Replacement	$273.9M	$127.2M
Cumulative Infrastructure Funding Gap	$463.5M	$404.5M
Annual Sustainable Funding Gap	$4.6M	$2.0M

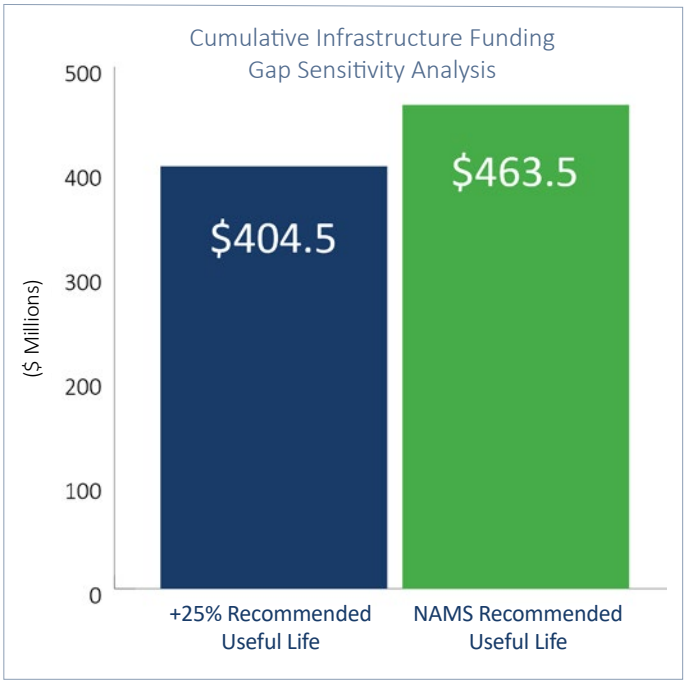
Asset	$ value past recommended useful life	$ value past recommended useful life **(+25% useful life)**
Park Structures	$0.8M	$0.4M
Roads	$55.8M	$31.2M
Buildings	$6.7M	$1.1M
Vehicles & Equipment	$4.0M	$2.0M
Drainage	$103.0M	$61.7M
Sanitary Sewer	$56.0M	$10.5M
Water	$47.6M	$20.3M
Total	**$273.9M**	**$127.2M**

Asset	Cumulative Infrastructure Funding Gap	Cumulative Infrastructure Funding Gap **(+25% Useful Life)**
Natural Assets	$(1.2)M	$0.0M
Park Structures	$2.7M	$2.2M
Roads	$130.7M	$117.6M
Buildings	$50.1M	$39.9M
Vehicles and Equipment	$3.8M	$3.0M
Drainage	$116.7M	$106.5M
Sanitary Sewer	$73.2M	$61.6M
Water	$87.5M	$73.7M
Total	**$463.5M**	**$404.5M**



As the table and graph above demonstrates, when useful life assumptions are increased, the value of assets overdue for replacements fall. This is because fewer assets would be overdue for replacement if their useful was greater.

Asset	Current Annual Funding	Sustainable Annual Funding (NAMS Recommended Useful Life)	%	Sustainable Annual Funding **(+25% Useful Life)**	% **(+25% Useful Life)**
Park Structures	$0.1M	$0.2M	50%	$0.2M	59%
Roads	$1.8M	$3.5M	51%	$2.8M	64%
Buildings	$1.9M	$2.3M	83%	$1.8M	106%
Vehicles and Equipment	$1.0M	$1.0M	100%	$0.9M	111%
Drainage	$1.2M	$2.5M	48%	$1.9M	63%
Sanitary Sewer	$1.2M	$1.4M	86%	$1.1M	109%
Water	$1.0M	$1.9M	53%	$1.5M	67%
Total	**$8.2M**	**$12.8M**	**64%**	**$10.2M**	**81%**



As the table and graph above demonstrates, when useful life assumptions are increased, the calculated cumulative infrastructure funding gap falls. Changing the useful life assumption reduces what the needed sustainable reserve level should be.

Appendix C: Parks Service Level Definitions

Garden Service Level	Description
Level 1 – Well Groomed	**Objective:** First class appearance, impeccably clean and well groomed. **Appearance standards:** Plants are kept manicured and in near perfect health, lawns healthy, uniformly green and thoroughly groomed. Areas are kept virtually free of weeds, invasive plants, litter and debris. Seasonal plantings are kept lush and very showy through the seasons. Noxious weeds are eradicated. **Maintenance practices:** Consistent, frequent attention to many details that affect the health and appearance of the garden. The level of care is achieved by a qualified professional who has considerable freedom and judgement in establishing maintenance operations to suit the site.
Level 2 – Groomed	**Objective:** Generally neat, moderately groomed appearance but not to the same near perfect standards as Level 1. **Appearance standards:** Plants are healthy and vigorous, lawns are healthy, uniformly green and regularly mowed and trimmed. The planted areas have few weeds and no invasive or noxious weeds, litter or accumulated debris. Seasonal plantings are kept lush and showy during their seasonal bloom. **Maintenance practices:** Regular maintenance of fairly high intensity with regular monitoring and adjustment to keep a high visual quality. Many of the maintenance tasks require a qualified professional for proper execution.
Level 3 – Moderate	**Objective:** Generally neat, moderately groomed appearance with some tolerance for the effects of “wear and tear” moderate traffic and natural processes. **Appearance Standards:** Plants and lawns are healthy, lawns are kept within accepted height range for type. Invasive plants, with the exception of listed noxious weeds, and debris are acceptable within limits between regular visits. **Maintenance Practices:** Routine maintenance of moderate frequency and intensity, with regular monitoring to avoid serious deterioration.

Sports Field Service Level	Description
Service Level 1	**Objective:** To improve the safety and long-term quality of outdoor sports fields. All turf grass shall be suited to the locality, site condition and intended function of each project or area and specification. **Appearance Standards:** Sports turf is kept healthy, uniformly green and vigorous and kept within an accepted height range for type. **Maintenance Practices:** Grass will be managed to produce tough grass with maximum wear resistance and encourage deep rooting and anchorage with high density to resist weed invasion.

Natural Areas Service Level	Description
Service Level 3 Moderate	**Objective:** Preserve habitat and ecosystem function while accommodating low intensity activities. **Appearance Standards:** Vegetation retains healthy, normal appearance. Invasive plants shall be controlled and noxious weeds shall be eradicated. **Maintenance Practices:** Maintenance is low as required to maintain ecosystem functioning habitat quality. New native or natural plantings will be kept in a more or less natural condition.

Park/Green Space Service Level	Description
Service Level 3 Moderate	**Objective:** Orderly appearance, well adapted to play and heavy traffic with considerable tolerances for the effect of such use. **Appearance Standards:** Appearance is secondary to functional requirements. Areas are neat and usable. Vegetation retains healthy, normal appearance. Grass kept within accepted height range, trimming may be less frequent. Invasive plants will be controlled and noxious weeds will be eradicated. **Maintenance Practices:** Moderate to low intensity depending on area. Emphasis is on controlling deterioration and adapting the site to activities.

Playground Service Level	Description
Service Level 2	**Maintenance Practices:** A detailed inspection shall be performed every month of the individual playgrounds and the results and actions taken shall be entered in a permanent record available for examination. Maintenance and repairs to equipment and the replacement of components shall be performed in accordance with the manufacturer recommendations.

Urban Forest Management Service Level	Description
Service Level 1	**Objective:** To maintain tree species in a manner in which there is no net loss to species diversity, representation or numbers and to promote the health, safety, preservation and protection of the urban forest on public and private lands. **Appearance Standards:** Appearance is secondary to functional requirements. Trees are maintained to a healthy, normal appearance. **Maintenance Practices:** Consistent, frequent attention to details that affect the health and appearance of the urban forest. For example: tree-related inquiries, including permits, are responded to within 5 business days of the request.

Asset Management BC

September 13, 2021

District of Oak Bay
2167 Oak Bay Avenue,
Oak Bay, BC, V8R 1G2

Attn: Christopher Paine, CPA, CGA, Director of Financial Services

RE: **"Sustainable Infrastructure Replacement Plan"**

Dear Sirs:

We are pleased to see that the District has prepared its **"Sustainable Infrastructure Replacement Plan" (SIR),** ***a plan for sustainable infrastructure funding across the District*** . Municipal Infrastructure exists to provide services to the community. One of the municipal core responsibilities, as set out in the *Community Charter* is "providing for stewardship of the public assets of its community". Having functional and reliable infrastructure supports the services delivered, minimizes costs, and mitigates risks for the community.

Asset Management BC is pleased to endorse the process used to create this report. The fundamentals of asset management for our BC Local governments are contained in the document **"Asset Management for Sustainable Service Delivery: A BC Framework."** You have referred to this Framework the SIR Plan. The asset management process has many components and is a never-ending process while your community requires assets to provide services.

The SIR Plan is consistent with the intent of the Framework and is a very important document for you to provide a plan for affordable, sustainable services. In particular, the SIR Plan meets the intent of the Long-term Financial Plan component of the Framework. It is a dynamic document that should be continuously updated as service levels change, assets are repaired, upgraded, or replaced and new assets are put into service.

We commend the work of the District for bringing this forward as it is a step toward achieving financial sustainability. Furthermore, we are aware of the work currently being carried out to ensure technical and functional sustainability.

Yours Truly

Wally Wells

Wally Wells P. Eng.
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Asset Management BC
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website: www.assetmanagementbc.ca

Figures & Tables

Figures

Tables