City of Port Coquitlam | Asset Management Plan

2024

Parks

Final Version
August 2024

Contents

List of Figures

List of Tables

1,400	Number of assets on record in the Parks asset database
$41.1 million	2023 replacement cost of these assets
1990s	Decade with the highest capital expenditures on the construction or acquisition of Parks assets ($21.4M)
2020s	Decade with the first major forecasted asset replacement spike ($21.8M)
62%	Percentage of assets in poor or worse condition, or with less than 40% service life remaining.
$25.6 million	Current age- and condition-based infrastructure backlog
$20.9 million	Current replacement cost of assets with a very high risk rating
$5.9 million	Annual City spending on capital, maintenance, and operations related to Parks
4.1%	System-generated recommended capital reinvestment rate for Parks System infrastructure ($1.7M per year)
5.2%	Port Coquitlam's actual capital reinvestment rate ($2.2M per year)

Executive Summary

This asset management plan (AMP) for the City of Port Coquitlam provides a detailed cross-sectional analysis of the City's Parks assets. It is a continuation of Port Coquitlam's efforts to build a formal and well-structured asset management program that began with the completion of an asset management strategy in 2019. The strategy identified the development of an AMP for each of the City's eight asset portfolios areas: Water, Sanitary, Drainage, Transportation, Parks, Parks, Fleet & Equipment, and Information Services.

Asset management plans help agencies develop a detailed understanding of their community infrastructure and major capital assets support daily operations. This data-rich knowledge can support better decision-making and help maintain high but affordable service levels.

Valuation and Condition

Port Coquitlam's Parks portfolio has 1400 assets on record including various sports fields, courts, playground equipment, and pedestrian walkways and trails, as well as fencing and utilities assets. The total current replacement cost of all Parks assets is estimated at $41.1 million as of 2023, with Sports Fields & Courts comprising 53% of the portfolio.

Keeping assets in good condition allows the City to deliver services to residents safely and effectively. Condition data helps to prevent premature and costly rehabilitation or replacements, and ensures that lifecycle activities occur at the right time to maximize asset value and useful life while minimizing costs.

Typically, condition ratings can be established in two ways. The age-based approach simply uses an asset's age as a proxy for its condition: older assets have less service life remaining than newer ones, and are assumed to be in poorer shape. In contrast, in-field condition assessments rely on detailed inspections by qualified staff who assess each asset against robust, technical criteria.

Based on a combination of field inspection data and age, 62% of all Parks assets, with a current replacement cost of $25.6 million, are in poor or worse condition or have less than 40% service life remaining. These assets may be candidates for replacement in the immediate or short term and should be monitored closely to avoid costly failures that may disrupt service and pose a risk to public health and safety. It is also more economical to keep assets in at least fair or better condition, with smaller and more frequent maintenance. Similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

Lifecycle Management and Long-term Replacement Needs

As with most communities across Canada, Port Coquitlam is facing an aging infrastructure stock. Expenditures on Parks infrastructure averaged $6.3 million per decade over the last 60 years. The largest expenditures were made in the 1990s, dominated by sports fields. Based on current replacement costs, more than 50% of the current Parks asset portfolio was placed into

service in the 1990s, a period during which the City experienced a 28% population growth rate, its largest in the last three decades. New infrastructure is often funded or constructed by development, or partially funded by external partners. However, the ongoing maintenance and replacement costs are borne by the municipality as the asset owner. The initial cost for new assets is only a fraction of the entire lifecycle cost to operate, maintain and replace them. Consequently, the challenge for municipalities is the considerable lifecycle costs of many assets that now fall on taxpayers alone to fund.

As assets age, their performance diminishes, often more rapidly as they approach the final quarter of their design life. Assets require ongoing investments in operations, maintenance, and rehabilitation so that service level can be maintained and delivered consistently. The City's average annual budget for Parks totals $5.9 million annually. Of that, $3.5 million per year is spent on the inspection, maintenance, and replacement of Parks assets. An additional budget of $2.4 million per year is allocated to operational expenditures that maintain acceptable levels of service and efficient operations, but have no direct impact on asset life.

Eventually, aging assets must be replaced. Analysis shows that the City is currently amidst the largest replacement spike in the 50-year forecast period, totaling nearly $22 million between 2023 and 2032. A second major replacement spike is expected in the 2050s, also totaling $20.8 million. Majority of these expenditures are associated with sports fields, courts, and fencing.

Deferring replacements can lead to infrastructure backlogs, which can cause a drop in the quality of service provided to residents. The City's current age-based backlog is $2.8 million, comprising assets that have exceeded their useful life but still remain in service. However, this figure increases to $25.6 million when assets in poor or worse condition or with less than 40% service life remaining, are included in the backlog estimate.

Although not all assets forecasted for replacement will need to be replaced, having a multi-decade view of infrastructure needs is essential for financial planning. A long-term view allows staff to prepare ahead of time for major capital works, avoid unplanned expenditures, and minimize extreme fluctuations in user fees and tax rates.

Applying a Risk-based Approach

Keeping up with replacement needs poses a substantial challenge for most local governments and public agencies across Canada. A risk-based approach to infrastructure spending can help prioritize capital projects, refine backlog and future needs, and channel funds to where they are needed most. Rather than taking the worst-first approach, a risk-based approach ranks assets based on their condition/performance as well as their criticality—providing a more complete rationale for project selection.

This AMP applies a quantitative approach to risk for all assets. Data that can best explain the probability of asset failures and help approximate the various consequences of these failure events has been modeled to develop asset risk matrices. As risk is a product of the probability of an asset's failure and the overall consequence of the failure event, a high risk-rating does not necessarily suggest that an asset is unable to safely perform its intended function. Even new

assets can carry a high risk rating, given their strategic, financial, economic, and socio-political importance to the community.

This analysis indicates that 93 Parks assets, with a combined replacement cost of $20.9 million have a very high risk rating. Most of these assets are various sports fields and courts, and playground equipment assets, which carry a moderate to major consequence of failure. In addition, majority of the assets also had a high probability of failure, due to their poor condition ratings. An additional 114 assets, with a combined replacement cost of $10.4 million, were assigned a high risk rating. Many of these assets were also playground equipment assets, but utility assets and various parklands, paths, and trails were also included in this group.

Delivering Affordable Levels of service

Together with risk assessments, levels of service offer another lever that the City can use to deliver high-quality but affordable infrastructure programs. Levels of service describe how well agencies deliver services and whether service quality meets the expectations of the community. They can be measured using key performance indicators.

For Parks, a total of 81 key performance indicators (KPI) were selected—the most of any service area. This included 38 KPIs to measure customer levels of service, and 43 to track the City's technical levels of service. Technical levels of service can be thought of as the activities and steps the organization takes (inputs) to deliver customer levels of service (outputs). KPI data can be used to inform decisions to maintain, increase or decrease levels of service. Investments in capital and/or maintenance related activities may be adjusted to reduce the frequency of requests and improve customer levels of service. However, adjusting levels of service must be considered in light of cost, performance and risk.

Residents expect only the highest levels of service. However, it is not possible to meet all expectations. Instead, as funds are limited, customer satisfaction must be balanced with the cost to deliver services and the risk posed to organization. Higher service levels come at a higher price, and can only be provided by either diverting funds from one program to another (tradeoff), or by increasing tax or utility rates. Conversely, lower service levels may reduce funding needs, but can pose greater risk to the organization and the public.

Financial Strategy: Implementing the Asset Management Plan

The financial strategy provides a consolidated analysis for the City's eight service areas. They are grouped based on how assets within each service area are funded. Tax-funded service areas rely on property tax revenues, and include Drainage, Transportation, Parks, Facilities, Fleet & Equipment, and Information Services. Water and Sanitary services are funded directly through their respective utility levies.

Although senior government grants are used to supplement the City's infrastructure spending needs, these are not included in the financial strategy. The aim of the financial strategy is to allow the City to build a sustainable infrastructure program using its own permanent and predictable sources of funding, namely, property taxes and utility levies. It will position Port Coquitlam to gradually eliminate annual funding deficits and achieve full, annual capital funding requirements for both tax- and levy-funded service areas.

Tax-Funded Service Areas

For tax-funded services, the annual average capital requirements total $33.8 million. The City currently contributes $7.9 million annually to its Long-Term General Infrastructure Reserve (LTGIR), creating a combined annual funding deficit of $25.9 million for these six service areas.

To close this gap for tax-funded assets, the City's property taxes would need to increase by 35%, based on 2023 revenues of $74.9 million. As this is not feasible, it is recommended that the City adopt a 15-year phase-in period, requiring a 1.00% annual increase to property taxes each year over this time period. This additional revenue would be fully allocated to the LTGIR. We note that the City already increases annual contributions to the LTGIR by 1% per year based on prior year's levy. As such, the recommended 1.00% increase would be over and above this existing annual increase, for a combined annual increase of 2.00% over the next 15 years.

Drainage Utility

Currently, drainage infrastructure is funded through property taxes. However, there is strong rationale for implementing a dedicated drainage utility levy, and municipalities across Canada have begun to implement this fee structure. Contributing factors include climate change impacts that are driving the need for new or upgraded drainage infrastructure and flood protection, and the higher relative lifecycle costs of drainage assets compared to water and sanitary infrastructure. These expenditures also reduce funds available for other tax-funded assets. If a drainage utility is established, a Long-Term Drainage Infrastructure Reserve (LTDIR) would be created, with annual contributions to this reserve funded through the levy rather than property taxes.

Levy-Funded Service Areas

Similar analysis was conducted for levy-funded services. For water and sanitary, average annual capital requirements total $4.5 million and $4.2 million, respectively. The City currently allocates $1.1 million to the Long-Term Water Infrastructure Reserve (LTWIR), generating an annual funding deficit of $3.4 million. Current allocations to the Long-Term Sewer Infrastructure Reserve (LTSIR) total $850 thousand, also resulting in an annual funding deficit of $3.4 million.

In 2023, Port Coquitlam's water and sanitary revenues totaled $13.1 million and $9.6 million, respectively. To eliminate the funding deficit for each service area, additional contributions are needed to the LTWIR and LTSIR. For water, this would require a one-time levy increase of 26%, specifically for the purpose of phasing in full funding for water. Similarly, achieving full funding for sanitary services would require a one-time levy increase of 35%.

Consistent with tax-funded service areas, it is recommended that the City adopt a 15-year phase-in period to gradually achieve full funding for water and sanitary services. Under this model, water rates would see an annual increase of 0.55% for each year over the phase-in period; sanitary rates would require an increase of 1.03% annually. As with tax-funded services, these increases are in addition to the existing 1% annual increase for each service area.

For both tax- and levy-funded services, these models seek to eliminate annual funding deficits and achieve full funding. Alternative models are also illustrated, with target funding levels set at 75% and 50% of annual capital requirements.

While achieving these lower targets may reduce the impact on property tax rates and utility levies, they may perpetuate infrastructure challenges and reduce service levels. Additional financial, economic, social, reputational, and public health and safety risks may also increase as a result of inadequate funding.

As such, it is recommended that the City endeavour to achieve full funding for both tax- and levy-funded service areas. The recommendations presented do not account for inflation; staff should periodically consider the impacts of inflation on both annual capital expenditures, and additional contributions required to the LTGIR, the LTWIR, and the LTSIR to maintain fiscal strength. Further, addressing the infrastructure backlog requires the strategic use of reserves and the City's development cost charges. In addition, asset criticality and risk analysis should be used to prioritize projects.

As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. This periodic funding should not be incorporated into an AMP unless there are firm commitments in place. However, it can be used to help close the infrastructure gap more quickly, or lower the long-term impact on tax and utility levies. It should be noted that the above recommendations do not include the use of reserves or debt. Depending on the urgency of projects and the impact on levels of services, reserves and debt may be used as supplementary, viable options.

Approach and Methodology

This asset management plan (AMP) was developed as part of the City of Port Coquitlam's current engagement with PSD Citywide. Individual AMPs were developed for each of the City's eight service areas, requiring substantial effort and collaboration over three years.

Developing the Asset Management Plan

The contents in this document were developed in five steps, summarized below.

Build a comprehensive asset inventory

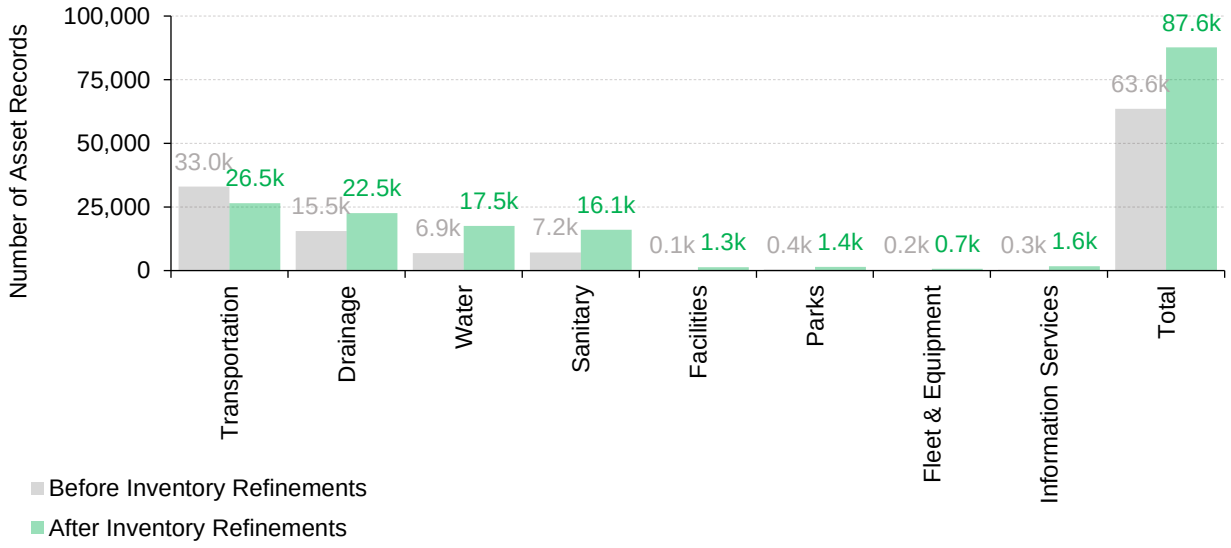
City staff manage multiple large-scale and complex infrastructure datasets, found across different departments and in multiple formats. These datasets contain primary and secondary asset data. Primary data includes asset valuations, such as historical and current replacement costs; in-service dates; useful life estimates; quantities; and condition data. It is virtually impossible to produce any asset management-related reporting without this prerequisite information.

Secondary data provides more contextual information about an asset, such as its location, failure history, size, type, material, etc. These fields are used to establish an asset's criticality and develop risk models.

Both datasets were analyzed, refined, and verified through rigorous staff reviews. Identified gaps were closed through desktop research and/or physical in-field data collection by City staff. All new and existing datasets were ultimately consolidated to build a single source of truth (SST). A sharp focus was placed on data accuracy and currency, in particular, asset replacement costs and useful life estimates. These are key inputs for long-term financial planning and are necessary for determining the magnitude and timing of investments.

This finalized data was then uploaded into Citywide, the City's primary asset management software application. The inventory refinements resulted in a 38% increase in the number of total assets on record for all service areas, from 63,603 asset records to 87,647. For Parks, data refinements increased the number of assets on record from less than 400 to nearly 1,400—a 260% increase.

Figure 1: Number of Asset Records Before and After Inventory Refinements



Conduct asset-level risk assessments and build risk models

Preliminary risk models were developed for each asset class to establish asset risk ratings based on their probability and consequence of failure. Staff reviewed all risk models and provided feedback on the parameters used, including the suitability of parameters and how they were ranked and weighted. Once finalized, these models were built in Citywide and applied to all relevant assets to generate risk matrices.

Compile lifecycle activity data

To better understand the total cost of ownership of all assets, annual operating, maintenance, and capital spends were analyzed. Staff provided feedback on various lifecycle interventions applied to major asset types; the triggers for each treatment and its impact; and typical budget associated with each activity. Data in any available service level sheets was also reviewed and aggregated.

In addition to identifying lifecycle interventions that may help extend the life of the asset (e.g., regular maintenance and repairs), activities that support the delivery and continuity of acceptable service levels were also included. For example, grass cutting, litter pick up, and graffiti removal do not have a direct impact on asset lifespan, but they are part of providing Parks services to residents.

Compile levels of service data

Four core values were established across each of the City's eight asset portfolios to ensure that the delivery of services are reliable, safe, affordable and practical. To track the performance of the Parks, technical and customer-oriented key performance indicators (KPIs) were selected and populated with data ranging from 2018 to 2021. A total of 81 KPIs were selected, with 38 used for customer levels of service, and 43 for technical levels of service.

Develop financial strategy

The preceding content and information are used to develop a financial strategy. The strategy outlines the City's current funding position for each asset category and a path to reach sustainability by closing any identified funding gaps. Development of the strategy involves a comprehensive review of all pertinent financial documents, including audited statements, and collaboration with Finance staff.

Information from asset management plans can be used to determine appropriate levels of funding for capital and operational budgets. Reinvestment rates can be used to determine annual capital expenditure targets, or allocations to reserves, to ensure that asset replacement needs are met as they arise. Key performance indicators can be helpful in determining how much to allocate to operational budgets in order to maximize the life of assets while maintaining acceptable levels of service and efficient operations.

Limitations and Constraints

This AMP required substantial effort by staff. It was developed based on best-available data, and was subject to the following broad limitations, constrains, and assumptions:

1. The analysis in this AMP is highly sensitive to several critical data fields, including an asset's estimated useful life, replacement cost, quantity, and in-service date. Inaccuracies or imprecisions in any of these fields can have substantial and cascading impacts on all reporting and analytics.

2. User-defined and unit cost estimates, based typically on staff judgment, recent projects, or established through completion of technical studies, offer the most precise approximations of current replacement costs. When this isn't possible, historical costs incurred at the time of asset acquisition or construction can be inflated to present day. This approach, while sometimes necessary, can produce highly inaccurate estimates. It was not deployed in this AMP.

3. An asset's condition is essential for estimating its current and future performance, and the investments that may be required to bring it back to a state of good repair. When actual, in-field condition assessment data isn't available, the asset's age can be used to approximate its condition. Although asset age is integral to asset management planning, it can produce an over- or understatement of asset needs. As a result, financial requirements generated through age analysis can differ from those produced by staff using field observations.

4. The risk models are designed to support objective project prioritization and selection. However, in addition to the inherent limitations that all models face, they also require availability of important asset attribute data to ensure that asset risk ratings are valid, and assets are properly stratified within the risk matrix. Missing attribute data can misclassify assets.

5. The AMP is cross-sectional, offering a synopsis of the City's infrastructure up to a given time period. Some information may become outdated quickly. This can result from new condition assessments, or acquisition or disposal of assets that was not reflected at the time the AMP was developed.

It is quite common for municipalities to experience these limitations as they develop their first asset management plan. Although many data gaps were closed during this project, some may still persist. Closing these data gaps and overcoming limitations is an iterative process, requiring dedicated staff time and other resources. Staff will continue to refine the City's asset inventory to further enhance data quality and integrity for future iterations of this AMP and all asset management reporting.

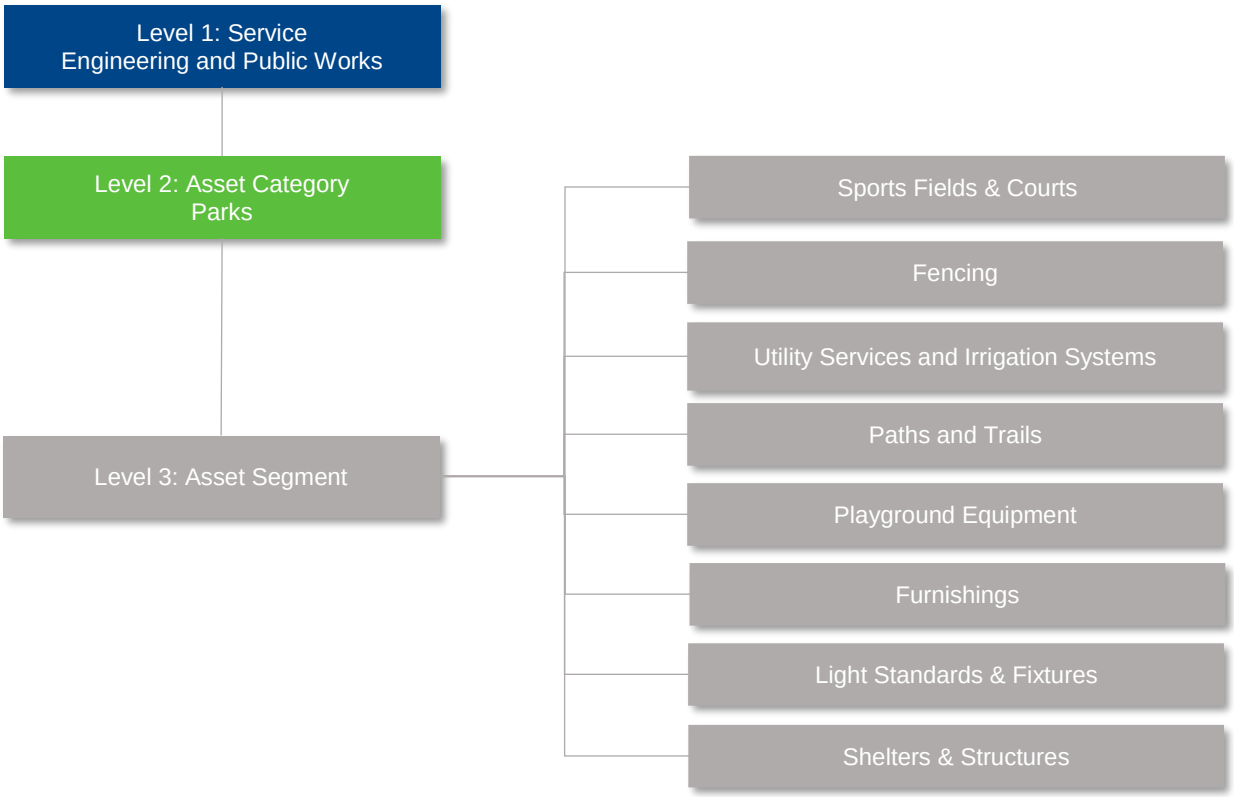
State of the Infrastructure

The state of the infrastructure (SOTI) provides a detailed overview of City of Port Coquitlam's Parks assets. It identifies how assets were classified as part of a larger network and system of assets; the current quantity and replacement value of all assets; and, a detailed age and condition profile.

Asset Hierarchy and Data Classification

Asset hierarchy illustrates the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is reported and interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Key details are summarized at the asset segment level.

Figure 2: Asset Hierarchy and Data Classification



Inventory and Valuation

The City of Port Coquitlam's Parks database contains nearly 1,400 asset records including 49 sports fields and courts, more than 24km of paths and trails, as well as playground equipment, shelters, furnishings, lighting, and utilities. The total replacement cost was estimated at $41.1 million as of 2023.

Costing Methods

As part of compliance with PSAB 3150, municipalities across Canada were required to establish historical costs for all capital assets. However, asset management analysis and reporting require accurate current replacement costs. Several approaches can be taken to estimate the cost of replacing a like-for-like asset that offers identical or similar service levels. These are illustrated in Table 1.

Table 1: Methods for Establishing Replacement Costs

Costing Method	Description	Accuracy
CPI	Historical or acquisition costs are inflated to current day using available inflation indices. Given its tendency to provide inaccurate estimates for older assets, this approach is used when other methods cannot be applied with reasonable confidence.	Low
Cost Per Unit	Using procurement data from recent projects, including invoices, quotes, and/or tenders, the unit cost of an asset is applied to all asset types (segments) to establish total current replacement costs. This method is typically can be applied to linear assets.	High
User-defined	Similar to the cost per unit approach, this method also requires procurement data and staff judgement to estimate an asset's current acquisition cost. This method is typically applied to non-linear or point assets	High

Table 2 summarizes the quantity and current replacement cost of the City's Parks assets as managed in its primary asset management register, Citywide. With a combined current replacement cost of nearly $22 million, the City's sports fields and courts are its largest asset group within Parks, making up 53% of the total portfolio.

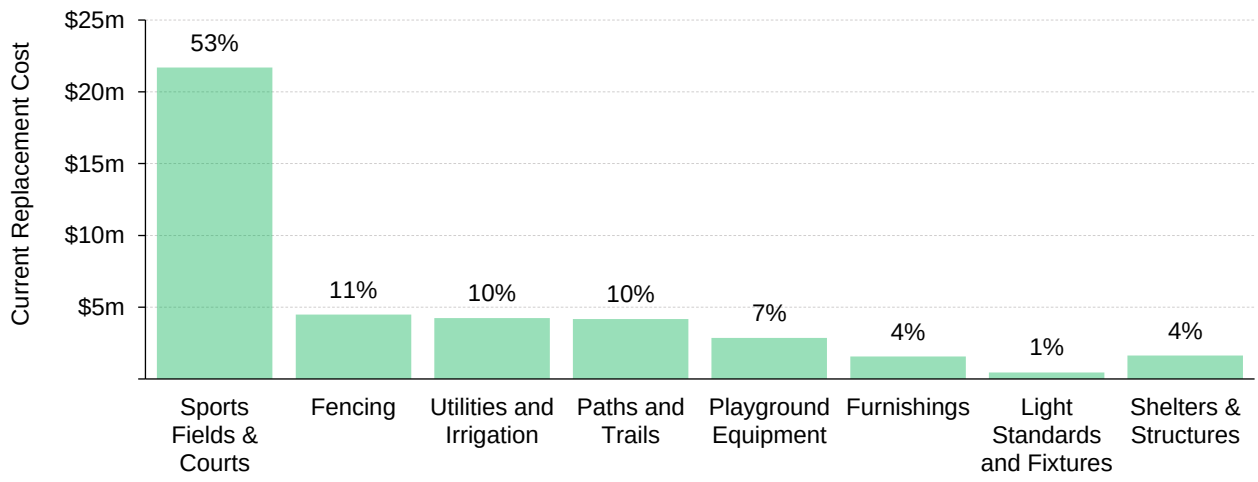
The replacement costs outlined below were initially established by staff in 2021. They were then increased in 2023 by 10% to reflect prevailing market conditions and account for inflation over the last two years.

Table 2: Detailed Asset Inventory

Segment	Quantity	Replacement Cost	Primary Costing Method
Sports Fields & Courts	49	$21,687,945	User-defined
Fencing	12,927m	$4,479,365	User-defined
Utilities & Irrigation	100	$4,231,144	User-defined
Paths & Trails	24,117km	$4,181,976	User-defined
Playground Equipment	100	$2,856,010	User-defined
Furnishings	1,041	$1,563,959	User-defined
Light Standards & Fixtures	120	$462,000	User-defined
Shelters & Structures	102	$1,626,544	User-defined
Total		**$41,088,943**	

Pools, spray parks and washroom facilities are included in the Facilities asset portfolio. Shelters and structures include skate parks, picnic tables, picnic shelters, and benches. Furnishings include garbage cans, bollards, and signs. These smaller assets were not fully inventoried at the time of this AMP but can be included as future work with the City's asset management program. Trees and other natural assets such as flower beds and landscaping were also not included with this AMP, but can be considered with the development of a future natural asset management strategy.

Figure 3: Portfolio Valuation



Asset Condition

Reliable long-term planning for asset replacements hinges on accurate current condition ratings. Condition data helps to prevent premature and costly rehabilitation or replacements, and ensures that lifecycle activities occur at the right time to maximize asset value and useful life while minimizing costs.

Source of Condition Data

Typically, condition ratings can be established in two ways. The age-based approach uses an asset's age as a proxy for its condition: older assets have less service life remaining than newer ones, and are assumed to be in poorer shape. In contrast, in-field condition assessments rely on detailed inspections by qualified staff who assess each asset against robust, technical criteria. Both age and in-field condition ratings provide useful data to refine long-term projections.

Based on replacement costs, 77% of Parks assets were included as part of condition assessments conducted in 2019 and 2020 of major assets such as playground equipment and sports fields. Age was used as an estimate for condition for the remaining 23% of assets.

Table 3: Source of Condition Data

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source
Parks	Sports Fields & Courts	100%	2020 condition assessments
	Fencing	100%	2020 condition assessments
	Utilities and irrigation	0%	Age-based estimates only
	Parklands, Paths, Trails	29%	2019 condition assessments and age-based estimates
	Playground Equipment	100%	2020 Condition Assessments
	Furnishings	14%	2020 condition assessments and age-based estimates
	Light Standards and Fixtures	0%	Age-based estimates
	Shelters & Structures	0%	Age-based estimates
	Landscaping & Natural Capital	0%	Age-based estimates
Total		**77%**	

Condition Assessment Guidelines

Condition Assessment Guidelines were developed for Parks assets to support the collection of condition data (Appendix A). It is recommended that the guidelines be used to complete some assessments each year, and the collected data be uploaded to Citywide, the City's asset management software

Condition Rating System

A condition rating scale provides a standardized and descriptive framework that can be used to assign a condition score to all assets, typically on a range of 0-100. This AMP uses a general condition rating scale, aligned with the federal Canadian Core Public Infrastructure Survey.

Table 4: General Condition Rating Scale – All Assets

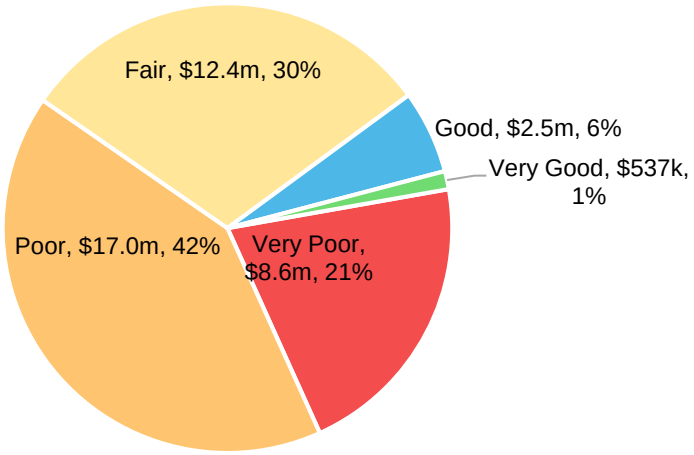
Condition Rating	Description	Criteria	Service Life Remaining (%)
Very Good (80-100)	Fit for the future	Asset is new or recently rehabilitated	80-100
Good (60-80)	Adequate for now	Asset is performing well; minor defects; only regular maintenance required	60-80
Fair (40-60)	Requires attention	Asset is operational, but signs of deterioration evident; some elements exhibit significant deficiencies; renewal upgrade, or replacement required in the medium term	40-60
Poor (20-40)	Increasing potential of service disruption	Asset approaching end of service life; condition below standard; significant deterioration; renewal, upgrade, or replacement in the short term	20-40
Very Poor (0-20)	Unfit for sustained service	Service life is fully consumed; asset remains in service beyond service life; widespread and advanced deterioration; may be unusable and requires immediate replacement	0-20

Projected Asset Conditions

Figure 4 summarizes the replacement cost-weighted condition of all Parks assets. Based on in-field inspection and age data, 62% of assets with a current replacement cost of $25.6 million are in poor to very poor condition, or have less than 40% service life remaining. Additional detail is provided in subsequent figures at the asset type or segment level.

Assets in poor or worse condition may be candidates for replacement in the immediate or short term and should be monitored closely to avoid costly failures that may disrupt service and pose a risk to public health and safety. Similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

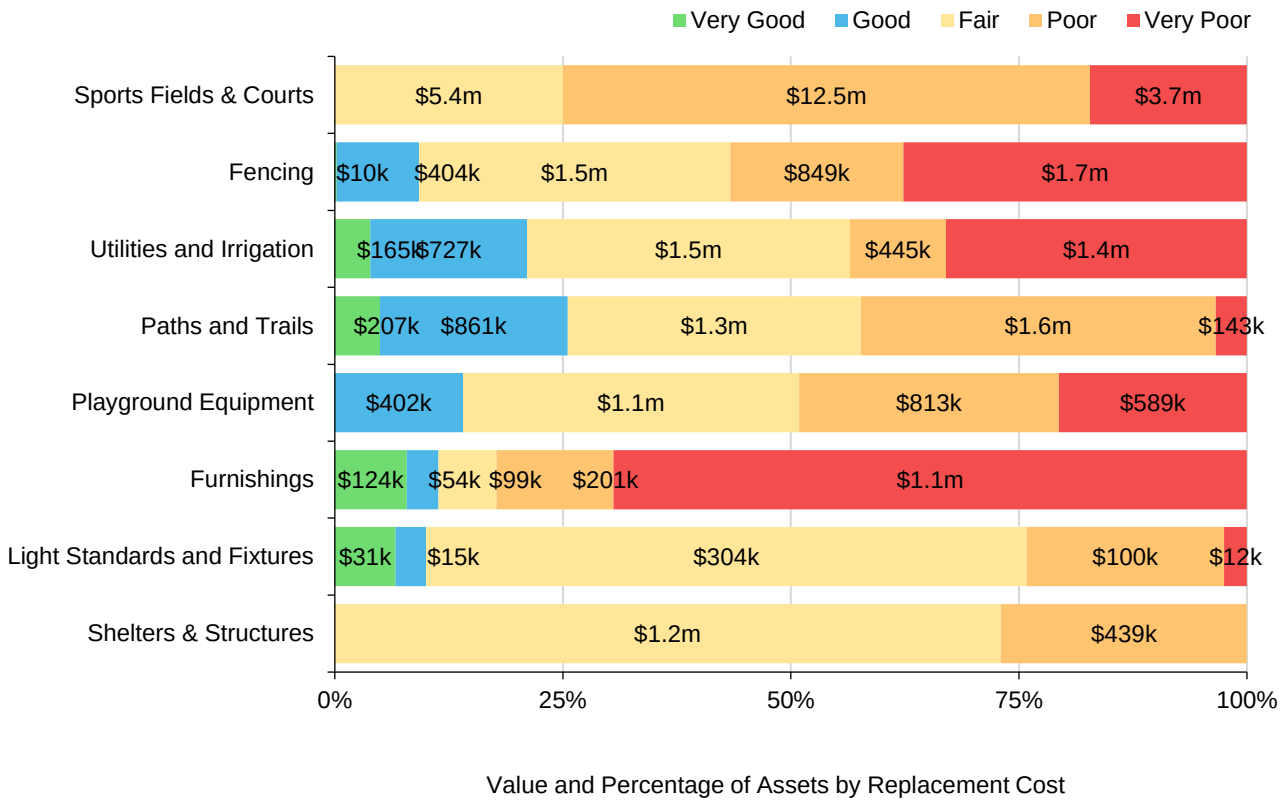
Figure 4: Asset Condition: All Parks Assets



It is often more economical to keep assets in at least fair or better condition. Smaller but more frequent investments in asset maintenance can extend its serviceable life, minimize lengthy and unexpected service disruptions, and help avoid more expensive repairs and renewals in the future. This approach also helps deliver more consistent and predictable service levels.

As illustrated in Figure 5, a substantial portion of assets within each group received a condition rating of poor or worse. Based on replacement costs, the largest of these assets are various sports fields and courts.

Figure 5: Asset Condition – By Asset Segment



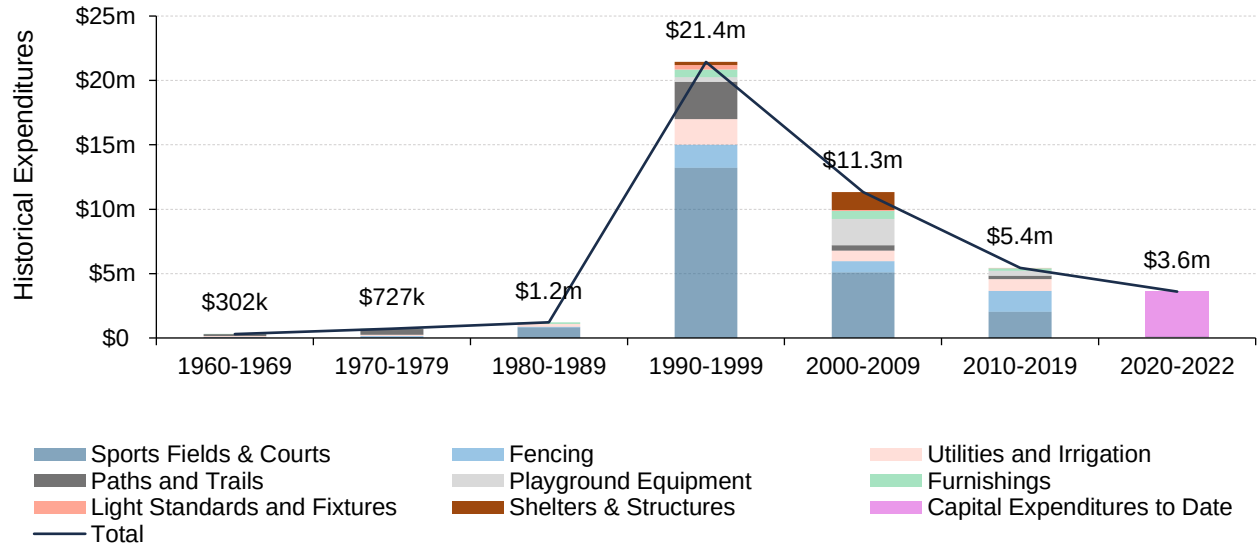
Age Profile

An asset's age profile provides valuable insights and can help identify assets that may be candidates for further evaluation through condition assessment programs; inform the selection of lifecycle strategies; and improve planning for potential replacement spikes. Although imperfect on its own, asset age can help triage asset needs when used in conjunction with other data points, including condition, asset criticality, planned upgrades, project bundling, and prior failure history.

Historical Asset Expenditures

Figure 6 illustrates historical expenditures on the construction or acquisition of Parks assets since 1960. The data reflects the City's current or active inventory only; assets that have been disposed of or decommissioned over time are not included. Although community infrastructure needs and expectations can evolve significantly over decades, understanding past investment patterns can be informative in planning for future needs.

Figure 6: Historical Expenditures on Asset Construction or Acquisition



Expenditures on Parks infrastructure averaged $6.3 million per decade over the last 60 years. The largest expenditures were made in the 1990s, dominated by sports fields. Based on current replacement costs, more than 50% of the City's current Parks asset portfolio was placed into service in the 1990s, a period during which the City experienced a 28% population growth rate, its largest in the last three decades. In the current decade, the City has made capital investments of $3.6 million between 2020-2022.

Historical spending, when combined with an asset's established design life, can be used to forecast upcoming replacement needs across long-term, often multi-decade time horizons.

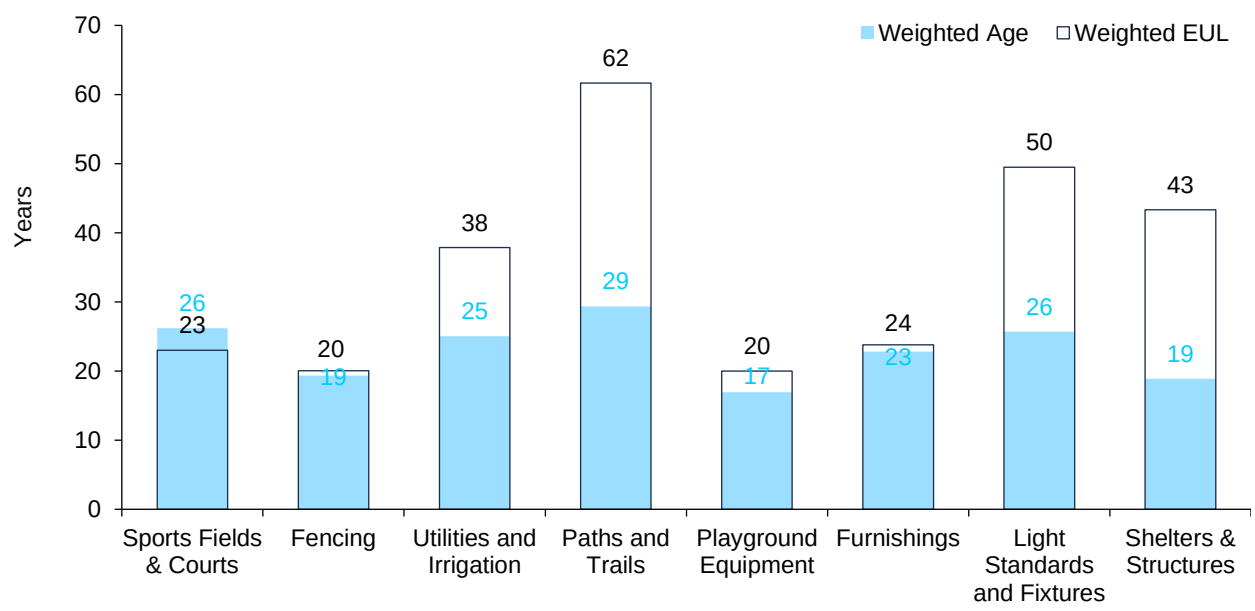
Serviceable Life vs. Current Asset Age

An asset's estimated useful life (EUL) is the serviceable lifespan of an asset during which it can be expected to deliver its intended function safely and effectively. As assets age, their performance diminishes, often more rapidly as they approach the final quarter of their design life.

Determining accurate EULs for all assets is essential for building reliable long-term forecasts and informing condition assessment programs. EULs for all assets were established and verified by staff to ensure they are aligned with broader industry standards, but also reflect typical asset performance and expectations in Port Coquitlam.

Figure 7 plots the average established useful life of Parks assets against their current average age. Both values were weighted by the replacement cost of individual assets.

Figure 7: Average Asset Age vs. Estimated Useful Life

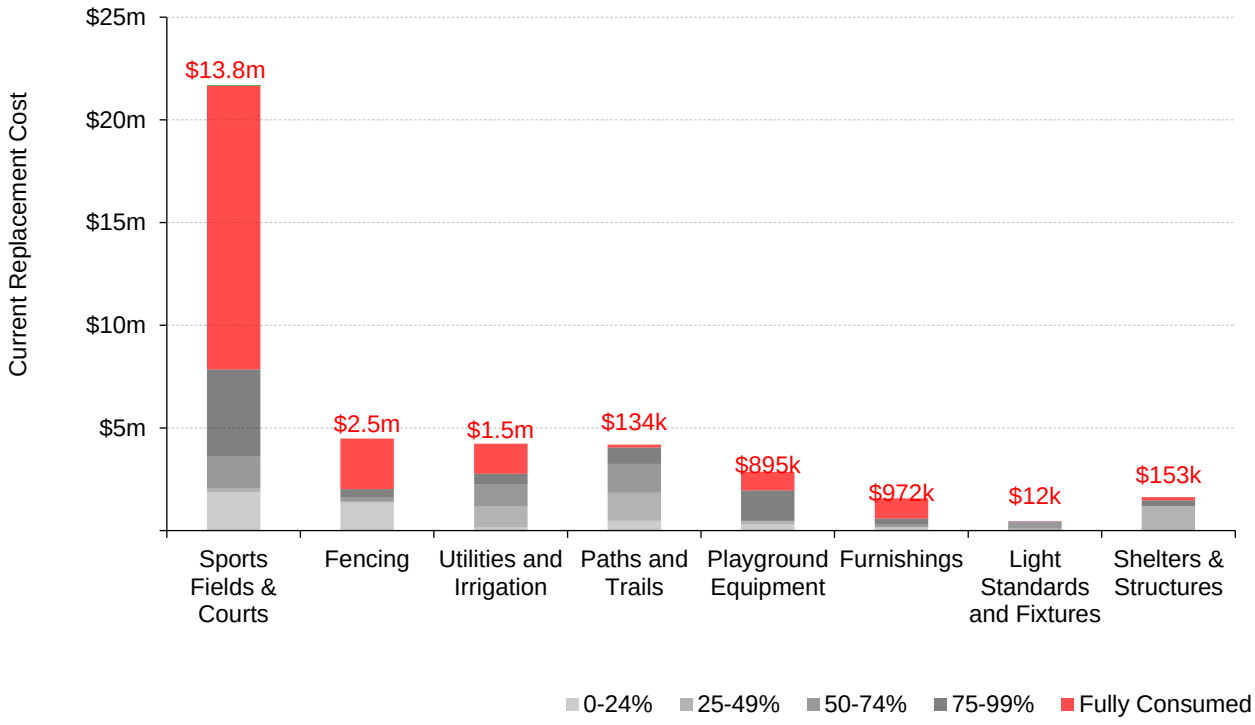


Age analysis suggests that major assets such as sports fields, courts, fencing, and utilities are either in the latter stages of their lifespan or remain in service beyond their established useful life. Given their nature, many of these assets, such as tennis courts and soccer fields, can continue to deliver their intended function safely and effectively, although at a lower service quality. Other aging assets, such as playground equipment, should be monitored more closely to ensure they do not pose safety risks.

Figure 8 shows a detailed distribution of the City's Parks assets based on the portion of useful life consumed to date. The distribution shows that more than half of Sports Fields and Courts, with a current replacement cost of $13.8 million, remain in service beyond their estimated useful life.

Similarly, more than 30% of Playground Equipment assets have also fully consumed their useful life but continue to remain in service. These assets include swings, slides, climbing apparatuses, and other play structures. Targeted inspections of these older assets are recommended to ensure they do not pose any safety risks to users.

Figure 8: Percentage of Estimated Useful Life Consumed



Lifecycle Management

The initial construction or acquisition of assets, particularly major infrastructure, represents only a fraction of the total cost of ownership that agencies can expect to incur. Assets require ongoing operations, maintenance, repair, and replacement to ensure they can continue to deliver their intended functions. These reinvestments back into infrastructure are necessary through the life of the asset.

Lifecycle costs include activities that have a direct, tangible impact on the asset's lifespan such as maintenance, repairs, and replacements. Additional operational costs are also needed to customer-oriented service levels and efficient operations.

Current Lifecycle Framework

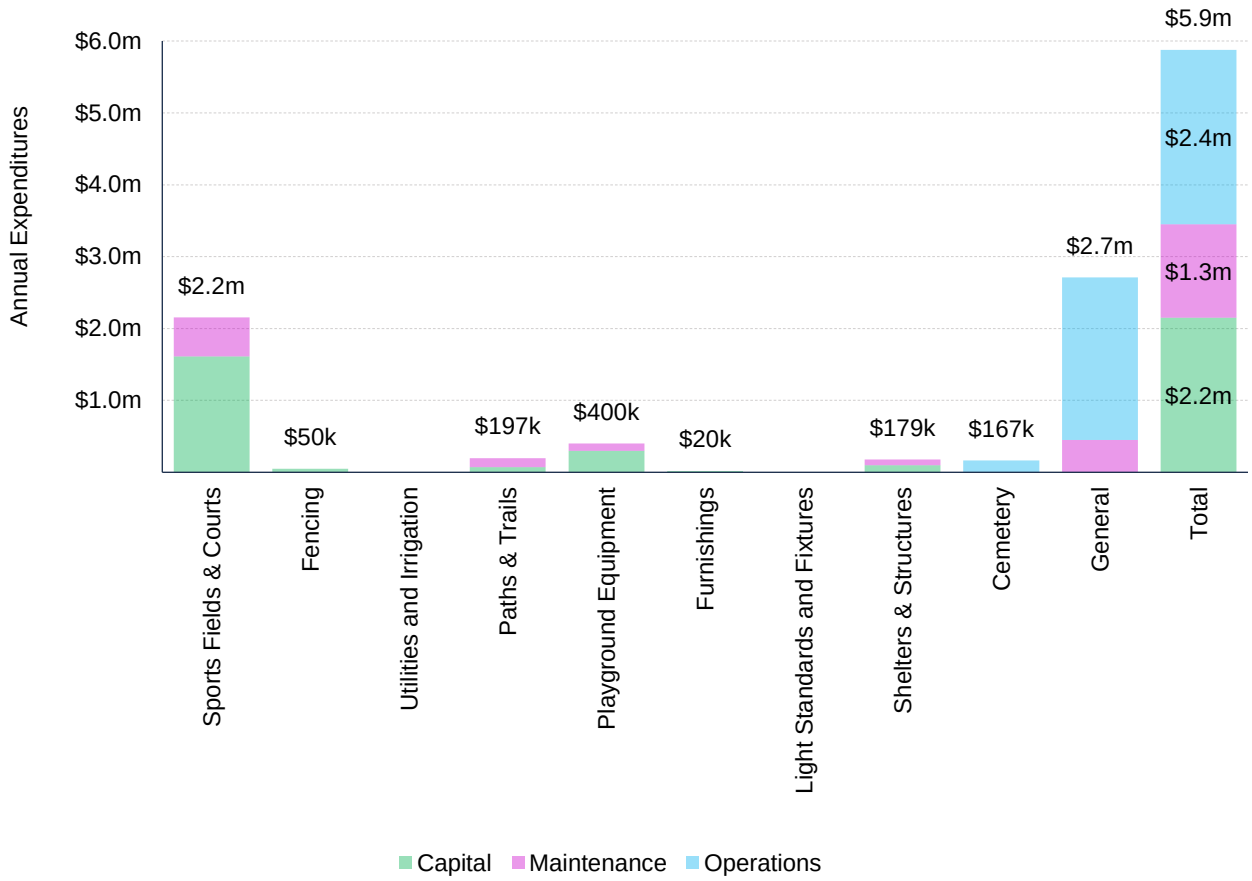
The City of Port Coquitlam's approach to lifecycle management is comprehensive. Maintenance, repair and replacement activities are guided by inspections, asset age, and staff judgment through routine monitoring. Lifecycle strategies are meant to ensure the City's Parks have minimum downtime and can safely and reliably deliver desired services to the community. This section summarizes the City's lifecycle framework for each asset segment, modeled on Table 5.

Table 5: Components of a Lifecycle Framework

Component	Description		
Activity	The treatment, event, or intervention implemented		
Activity Type	**Capital** Major repairs, renewals, rehabilitations, upgrades, and replacements	**Maintenance** Activities that have a direct and tangible impact on asset lifespan such as inspections, maintenance and minor repairs.	**Operations** Activities and costs needed to maintain acceptable service levels and efficient operations. No impact on asset lifespan.
Activity Trigger	This can include an asset's age and/or a minimum condition threshold. Other triggers may include priority levels, service requests, and previously established frequency.		
Impact on Serviceable Life	Impact on an asset's serviceable lifespan resulting from the activity completed		
Annual Budget	Typical funding available (actual spending may vary from year to year). Expenditure history from 2019-2021 was used to calculate a 3-year average.		
Reinvestment Rate	Annual budget as a portion of the total Parks asset portfolio replacement cost of **$41,088,943**.		

Figure 9 summarizes annual expenditures by service and expenditure type. On average, the City allocates $5.9 million annually on Parks operations, maintenance, and asset replacements.

Figure 9: Summary of Capital, Maintenance, and Operating Expenditures



Of the $5.9 million annual Parks budget, $3.5 million is spent on the inspection, maintenance, and replacement of assets. An additional $2.4 million is allocated towards operational expenses that maintain acceptable levels of service and efficient operations, but have no direct impact on asset life (e.g. grass cutting, litter pick up, graffiti removal).

The following table outlines the City's current lifecycle framework for Parks.

Table 6: Lifecycle Framework

Activity	Type	Activity Trigger	Impact on Serviceable Life	Budget
Athletic Field Replacement	Capital	Condition	Extended by 25 years	$50,000
Barrier Fence Replacement	Capital	Condition	Extended by 20 years	$50,000
Court Resurfacing	Capital	Condition	Extended by 10 years	$30,000
Park Furniture Replacement	Capital	Condition	Extended by 20 years	$20,000
Playground Replacements	Capital	Condition	Extended by 20 years	$300,000
Secondary Path Resurfacing	Capital	Condition	Extended by 40 years	$30,000
Skate Bowl Resurfacing	Capital	Condition	Extended by 20 years	$100,000
Sport Court Components	Capital	Condition	Extended by 10 years	$30,000
Trail Resurfacing	Capital	Condition	Extended by 40 years	$40,000
Artificial Turf Replacement	Capital	Condition	No impact	$1,500,000
Sub-Total Capital				**$2,150,000**
Building Maintenance	Maintenance	Scheduled	Extended by 10 years	$78,900
Park Maintenance	Maintenance	Condition	Extended by 5 years	$329,100
Park Inspections	Maintenance	Scheduled	Extended by 5 years	$45,100
Ball Diamond Maintenance	Maintenance	Scheduled	Extended by 5 years	$146,500
Irrigation	Maintenance	Scheduled	Extended by 5 years	$76,700
Playground Inspection and Maintenance	Maintenance	Scheduled/Condition	Extended by 5 years	$100,300
Sport Court Maintenance	Maintenance	Scheduled/Condition	Extended by 5 years	$62,600
Sport Field Maintenance	Maintenance	Scheduled	Extended by 5 years	$269,600
Artificial Turf Maintenance	Maintenance	Scheduled	Extended by 5 years	$66,180
Pedestrian Route Inspection and Maintenance	Maintenance	Scheduled/Condition	Extended by 5 years	$18,500
Trail Inspection and Maintenance	Maintenance	Scheduled/Condition	Extended by 10 years	$108,200
Sub-Total Maintenance				**$1,301,680**

Activity	Type	Activity Trigger	Impact on Serviceable Life	Budget
Cemetery Internments	Operations	By request	No impact	$150,000
Cemetery Markers	Operations	By request	No impact	$16,560
Grass Fall/Winter Cleanup	Operations	Scheduled	No impact	$69,900
Grass Cutting	Operations	Scheduled	No impact	$281,400
Grass - Special Events	Operations	By request	No impact	$3,080
Horticulture Beds	Operations	Scheduled	No impact	$83,000
Hanging Baskets	Operations	Scheduled	No impact	$26,400
Shrub/Perennial Beds	Operations	Scheduled	No impact	$430,400
Overpass Banners	Operations	By request	No impact	$3,180
Graffiti/Pressure Washing	Operations	Scheduled	No impact	$120,300
Illegal Dumping	Operations	By request	No impact	$12,160
Janitorial	Operations	Scheduled	No impact	$158,870
Litter and Garbage	Operations	Scheduled	No Impact	$454,200
Vandalism	Operations	Condition	No impact	$73,980
Brushing and Clearing	Operations	Scheduled	No impact	$108,200
Invasive Species	Operations	Scheduled	No impact	$29,760
Tree Pruning and Maintenance	Operations	Scheduled/Condition	No impact	$80,200
Tree Planting	Operations	Scheduled/Condition	No impact	$36,200
Tree Removals	Operations	Condition	No impact	$163,200
Tree Watering	Operations	Scheduled	No impact	$43,700
Tree Inspections	Operations	Scheduled/Condition	No impact	$81,200
Sub-Total Operations				**$2,425,890**
Total				**$5,877,570**

Reinvestment Rates

Capital reinvestment rates, expressed as a percentage of asset replacement costs, offer valuable information about the financial sustainability of infrastructure assets. Reinvestment rates can be used to determine annual capital expenditure targets, or allocations to reserves, to ensure asset replacement needs are met as they arise.

Maintenance and operational costs are not reflected in reinvestment rates, but are important considerations for operational budgeting in order to maximize the life of assets while maintaining acceptable levels of service and efficient operations.

Table 7 illustrates two types of reinvestment rates: segment and service area. The segment-level reinvestment is calculated by dividing the total capital expenditures of an asset segment by the replacement cost of that particular asset segment. The service area reinvestment rate is calculated by dividing capital expenditures for each asset segment over the total replacement cost of the service area as a whole. The overall, combined service area reinvestment rate can be used for long-term financial planning and strategic decision-making.

Table 7 shows that the City's annual Parks capital expenditures of $2.2 million yield an overall, service area reinvestment rate of 5.2%.

Table 7: Current Reinvestment Rates

Segment	Annual Capital Budget	Segment Capital Reinvestment Rate	Service Area Capital Reinvestment Rate
Sports Fields & Courts	$1,610,000	7.4%	3.9%
Fencing	$50,000	1.1%	0.1%
Utilities & Irrigation	$0	0%	0%
Paths & Trails	$70,000	1.7%	0.2%
Playground Equipment	$300,000	10.5%	0.7%
Furnishings	$20,000	1.3%	0.0%
Light Standards & Fixtures	$0	0%	0%
Shelters & Structures	$100,000	6.1%	0.2%
Total	**$2,150,000**		**5.2%**

Reinvestment Rate Benchmarks

Although there is no scientific or industry consensus on how much an agency should spend or allocate to reserves each year for asset replacements, some benchmarking is available to provide guidance on adequate reinvestment levels, or target reinvestment rates (TRR).

Inconsistencies in methodologies and incomplete details make for imperfect comparisons but can still be very useful. Actual reinvestments also vary considerably across municipalities, and reflect many factors, including current asset conditions, financial capacity, and council priorities.

Canadian Infrastructure Report Card

In 2016, the Canadian Infrastructure Report Card (CIRC) produced an assessment of the health of municipal infrastructure as reported by cities and communities across Canada. The CIRC remains a joint project produced by several organizations, including the Federation of Canadian Municipalities (FCM), the Canadian Society of Civil Engineers (CSCE), the Canadian Network of Asset Managers (CNAM), and the Canadian Public Works Association (CPWA).

The 2016 version of the report card contained recommended reinvestment rates that can serve as benchmarks for municipalities. The report card contains both a range for reinvestment rates that outlines the lower and upper recommended levels, as well as actual municipal averages.

Rates for Parks assets were unavailable from CIRC, but an average of 1-3% is typically used for major infrastructure groups, such as roads, facilities, water, sanitary, and storm.

System Generated Reinvestment Rates

Using the City's inventory data, Citywide Asset Manager generates the average annual requirements (AAR) associated with each asset. The AAR is calculated by dividing the replacement cost of an asset by its established useful life. This can then be aggregated for all assets to derive category level reinvestment rates.

The AAR serves as a benchmark for annual infrastructure spending (or allocations to reserves) to ensure that asset replacement needs are met as they arise. AAR value is then divided by the total replacement cost of the service area or category to calculate target reinvestment rates.

Table 8: System-generated Reinvestment Rates

Segment	AAR	System-generated TRR
Sports Fields & Courts	$954,707	4.4%
Fencing	$223,831	5.0%
Utilities and Irrigation	$157,862	3.7%
Paths and Trails	$81,209	1.9%
Playground Equipment	$142,801	5.0%
Furnishings	$71,191	4.6%
Light Standards and Fixtures	$9,394	2.0%
Shelters & Structures	$41,847	2.6%
Total	**$1,682,841**	**4.1%**

For Parks assets, the average annual requirements total $1,682,841 for a system-generated target reinvestment rate of 4.1%.

Comparative Analysis

Table 9 compares the City's current reinvestment rates against CIRC's 2016 guidelines and the system-generated reinvestment rates as found in Citywide.

Table 9: Parks Capital Reinvestment Rate Comparison

Benchmark	Assets Included	Target Reinvestment Range	2016 Municipal Average	Port Coquitlam Capital Reinvestment Rate (Segment	Port Coquitlam Capital Reinvestment Rate (Service Area)
CIRC	Major Infrastructure Assets	1-3%	0.7%-1.7%	NA	NA
Citywide Asset Manager	Sports Fields & Courts	4.4%	1.3-1.7%	7.4%	3.9%
	Fencing	5.0%	NA	1.1%	0.1%
	Utilities and Irrigation	3.7%	NA	0.0%	0.0%
	Paths and Trails	1.9%	NA	1.7%	0.2%
	Playground Equipment	5.0%	NA	10.5%	0.7%
	Furnishings	4.6%	NA	1.3%	0.0%
	Light Standards and Fixtures	2.0%	NA	0.0%	0.0%
	Shelters & Structures	2.6%	NA	6.1%	0.2%
	All Parks Assets	4.1%	NA		**5.2%**

The analysis shows that Port Coquitlam's overall reinvestment rate of 5.2% is higher than the CIRC's general target reinvestment rate of 1-3%, the 2016 municipal average for major infrastructure assets, and the system-generated recommended reinvestment rate of 4.1%.

Capital and Operational Budgeting

Information from asset management plans can be used to determine appropriate levels of funding for capital and operating budgets, which serve different purposes.

Table 10: Purpose of Capital and Operating Budgets

Budget	Role in Infrastructure Programs
Capital	The capital budget includes funds to replace existing assets and acquire new, non-growth related assets. Asset replacements are funded by taxpayers and can be determined by reinvestment rates. Growth-related assets and capacity upgrades are partially funded by Development Cost Charges or external parties, or constructed by development. These are determined by growth projects and infrastructure capacity assessments.
Operational	The operational budget includes funds to maintain assets and deliver services. Maintenance costs include activities and expenditures that have a direct impact on assets by prolonging and maximizing their service life or deferring their replacement. These expenditures are informed by asset management plans and key performance indicators. Operational costs include activities and expenditures that maintain acceptable levels of service and efficient operations but have no direct or tangible impact on asset lifespan.

Capital reinvestment rates can be used to determine annual capital expenditure targets, or allocations to reservices, to ensure asset replacements needs are met as they arise.

Key performance indicators can be tracked and used to determine how much to spend on maintenance and operational activities in order to maximize the service life of assets while maintaining acceptable levels of service and efficient operations.

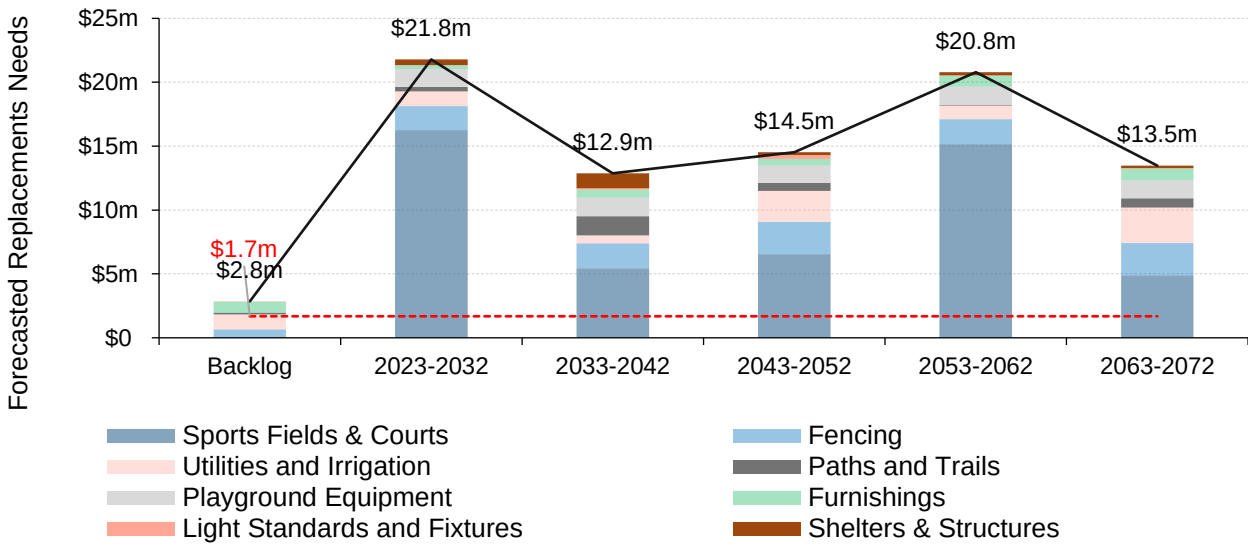
Forecasted Long-term Replacement Needs

In contrast to historical investments in infrastructure, Figure 10 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for Parks assets over the coming decades. The City's average annual requirements for Parks asset replacements total $1.7 million (red dotted line). Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

The City's current capital expenditures of approximately $2.2 million per year on Parks asset replacements are more than the target value of $1.7 million needed to ensure that replacement needs are met.

The chart shows that replacement needs are highest in the current decade, totaling $21.8 million between 2023 and 2032, and average $16.7 million per 10-year period through the forecast horizon. A second major spike is expected in the 2050s, totaling nearly $21 million.

Figure 10: Forecasted Long-term Replacement Needs



The chart also shows an age-based backlog of $2.8 million, comprising assets that have reached the end of their estimated useful life. However, previous condition analysis suggests that $25.6 million in assets are considered poor or worse condition, or have less than 40% service life remaining. These assets may also already be candidates for immediate or short-term replacement because of their assumed condition. Both age and condition should be used to forecast replacement needs and refine capital expenditure estimates.

The magnitude of capital needs typically far exceeds what most agencies can afford to fund. A risk-based approach can be used to direct funds to where they are needed most first in order to strategically address age- and condition-based backlogs.

Risk Analysis

The level of risk an asset carries determines how closely it is monitored and maintained, including the frequency of various lifecycle activities, and the investments it requires on an ongoing basis.

Some assets are also more important to the community than others, based on their financial and economic significance, their role in delivering essential services, the impact of their failure on public health and safety, and the extent to which they support a high quality of life for community stakeholders. Although public health and safety is paramount, many factors other than an asset's age or condition must be considered when prioritizing investments in infrastructure and making the most of limited funds.

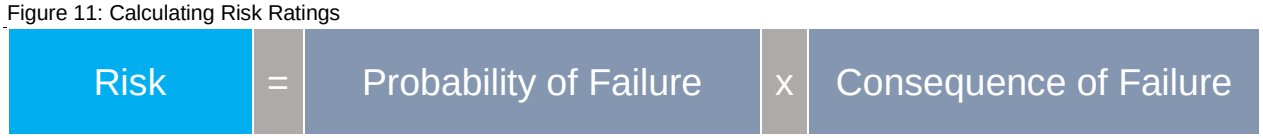
Keeping up with replacement needs poses a substantial challenge for most local governments and public agencies across Canada. A risk-based approach to infrastructure spending can help prioritize capital projects to channel funds where they are needed most. Rather than taking the worst-first approach, a risk-based approach ranks assets based on their condition/performance as well as their criticality—providing a more complete rationale for project selection.

Calculating Asset Level Risk

Risk is a product of two variables: the probability that an asset will fail, and the resulting consequences of that failure event. It can be a qualitative measurement, (low, medium, high) or quantitative measurement (1-5), that can be used to rank assets and projects, identify appropriate lifecycle strategies, optimize short- and long-term budgets, minimize service disruptions, and maintain public health and safety.

The approach used in this asset management plan relies on a quantitative measurement of risk associated with each asset. The probability and consequence of failure are each scored from 1 to 5, producing a minimum risk index of 1 for the lowest risk assets, and a maximum risk index of 25 for the highest risk assets.

Figure 11: Calculating Risk Ratings



Probability of Failure

Several factors can help decision-makers estimate the probability or likelihood of an asset's failure. Typically, these can include the asset's condition, age, previous performance history, and any identified vulnerability to extreme weather events. Each of these factors and individual attributes must also be weighted based on how well it can predict and explain the likelihood of asset failure.

Consequence of Failure

The consequence of failure describes the overall effect that an asset's failure will have on an organization's asset management goals. Consequences of failure can range from insignificant and minor, to severe. Cracks on a tennis court may be an inconvenience, however, defects on swing can lead to injury and expose the City to financial liabilities.

The parameters used to describe and measure an asset's consequence of failure will aim to align with the Triple Bottom Line (economic, social, environmental) approach to risk management as well as other considerations including regulatory, health and safety, and strategic.

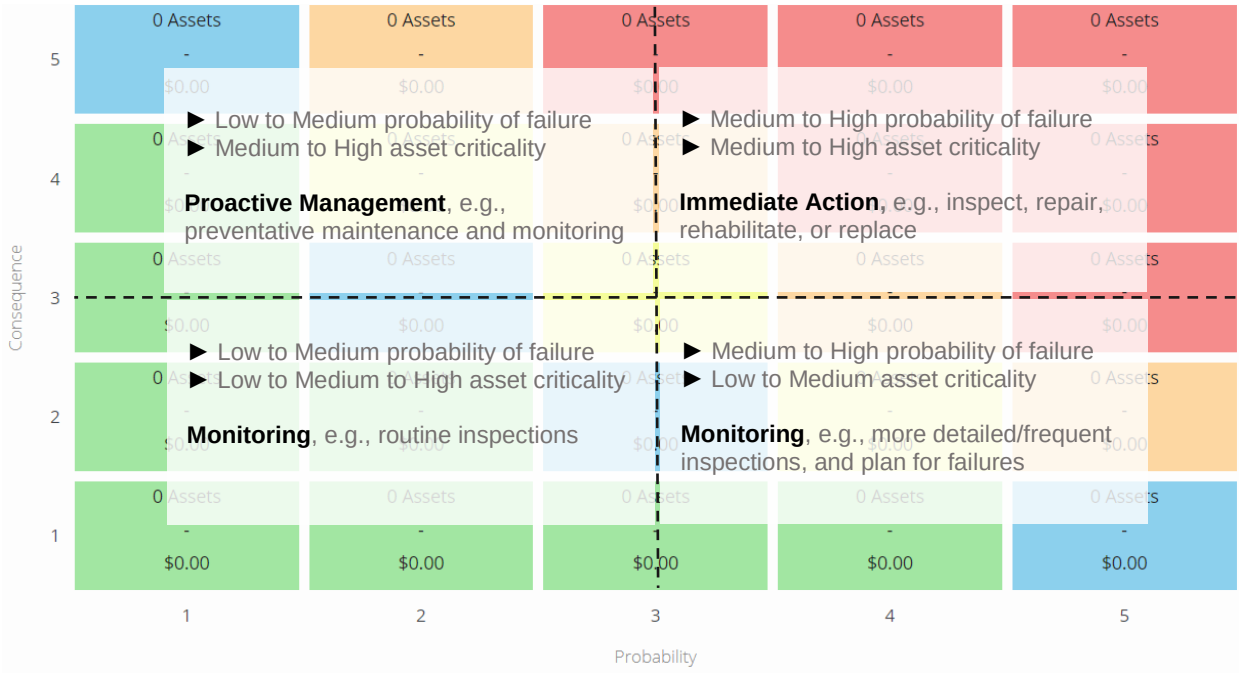
When various types of consequences that the organization and community may face from an asset's failure are identified and properly weighted based on their relative magnitudes, an asset's criticality can be approximated.

Table 11: Types of Consequences of Asset Failure

Type of Consequence	Description
Direct Financial	Direct financial consequences are typically measured as the replacement costs of the asset(s) affected by the failure event, including interdependent infrastructure.
Economic	Economic impacts of asset failure may include disruption to local economic activity and commerce, business closures, service disruptions, etc. Whereas direct financial impacts can be seen immediately or estimated within hours or days, economic impacts can take weeks, months and years to emerge, and may persist for even longer.
Socio-political	Socio-political impacts are more difficult to quantify and may include inconvenience to the public and key community stakeholders, adverse media coverage, and reputational damage to the community and the City.
Environmental	Environmental consequences can include pollution, erosion, sedimentation, habitat damage, etc.
Public Health and Safety	Adverse health and safety impacts may include injury or death, or impeded access to critical services.
Strategic	These include the effects of an asset's failure on the community's long-term strategic objectives, including economic development, business attraction, etc.

Individual risk models are developed for all Parks assets, and applied to the City's inventory within Citywide to establish asset risk ratings. These risk indices or ratings are then used to stratify assets within a risk matrix, as illustrated in Figure 12.

Figure 12: Generic Risk Matrix



Since risk ratings rely on many factors beyond an asset's physical condition or age, assets in a state of disrepair can sometimes be classified as low risk, despite their poor condition rating. In such cases, although the probability of failure for these assets may be high, their consequence of failure ratings were determined to be low based on the attributes used and the data available.

Similarly, assets in very good condition can receive a moderate to high risk rating despite a low probability of failure. These assets may be deemed as highly critical to the City based on their costs, economic importance, social significance, and other factors.

Continued calibration of an asset's criticality and regular data updates are needed to ensure these models more accurately reflect an asset's actual risk profile.

Risk Models and Matrices

The following section outlines the proposed risk models for Parks assets. Factors and weights used in both the probability of failure and consequence of failures are outlined, along with the associated ranges that will be used to classify individual assets. Resulting risk matrices are also illustrated for each major asset type, as well as the Parks as a whole.

Two factors were used to help explain potential asset failure. These include the service life remaining of each asset and its age-based condition ratings. In the model below for probability of failure, the age-based condition is presumed to better estimate and explain an asset's likelihood of failure, receiving a high weighting.

Figure 13: Probability of Failure

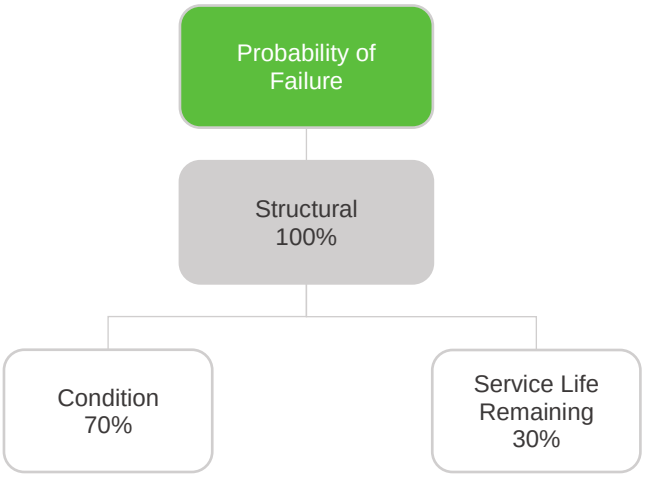


Table 12 outlines the relationship between the probability of failure and the ranges used for each of the above factors. Assets with a condition rating of 20% or less, or with a remaining service life of less than 10%, have the highest likelihood of failure, i.e., 'Almost Certain'.

Table 12: Defining Probability of Failure Ranges

Factor	Range (0-100%)	Probability of Failure
Condition (%)	Greater than 80	1—Rare
	60 - 80	2—Unlikely
	40 - 60	3—Possible
	20 - 40	4—Likely or Probable
	0 – 20	5—Almost Certain
Service Life Remaining (%)	Greater than 40	1—Rare
	30 - 40	2—Unlikely
	20 - 30	3—Possible
	10 - 20	4—Likely or Probable
	0 - 10	5—Almost Certain

The model in Figure 14 outlines the type of potential consequences that may result from failure of a facility asset. Data for Parks includes the replacement cost of each asset and asset type. These attributes are used to assist in measuring and quantifying the direct financial, socio-political, and health and safety related consequences of potential asset failures.

Figure 14: Consequence of Failure

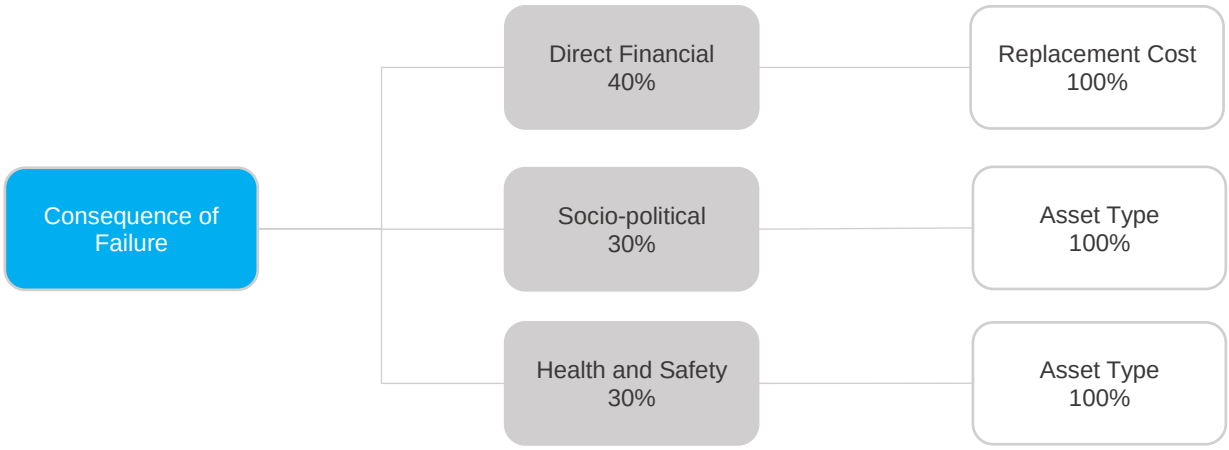


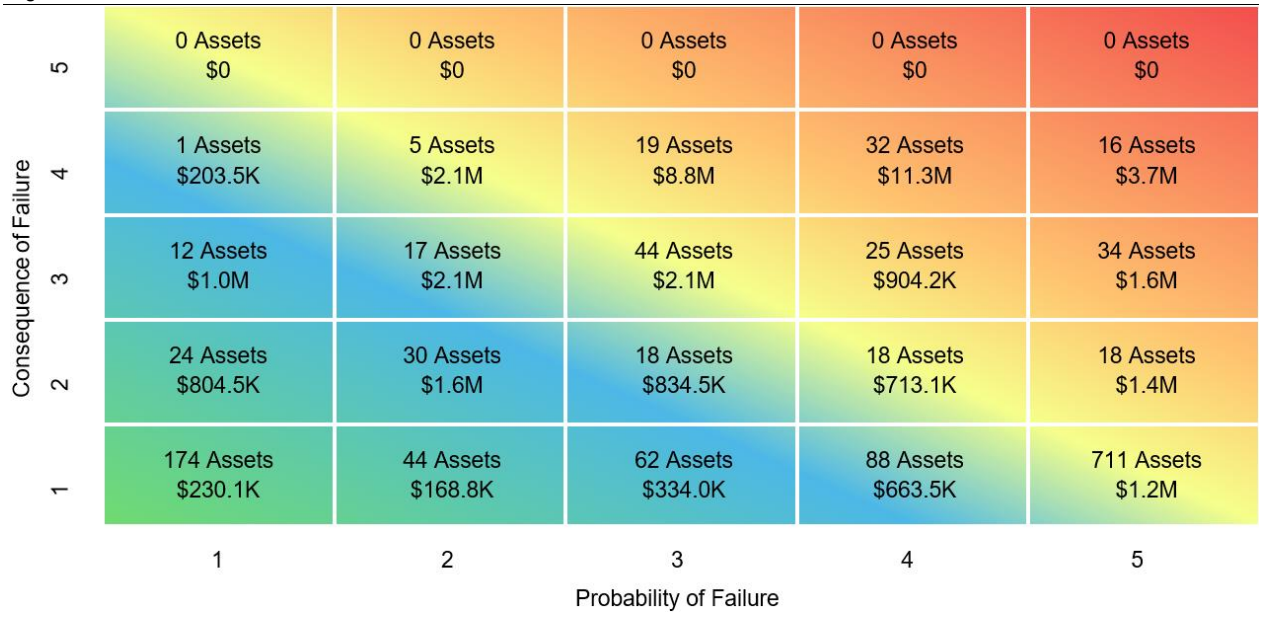
Table 13: Defining Consequence of Failure Ranges

Type of Consequence	Measure	
Direct Financial	Replacement Cost	Consequence of Failure
	Less than $10,000	1—Insignificant
	$$10,000 - $50,000	2—Minor
	$50,000 - $100,000	3—Moderate
	$100,000 - $500,000	4—Major
	Greater than $500,000	5—Severe
Socio-political	Asset Type	Consequence of Failure
	Fencing	1—Insignificant
	Parks Furnishings	2—Minor
	Park Lights, Paths & Trails	3—Moderate
	Sports Fields & Courts	4—Major
	Playground Equipment	5—Severe
Health and Safety	Asset Type	Consequence of Failure
	Fencing	1—Insignificant
	Parks Furnishings	2—Minor
	Park Lights, Paths & Trails	3—Moderate
	Sports Fields & Courts	4—Major
	Playground Equipment	5—Severe

Risk Matrix

The risk matrix below is based on the previous risk model developed for Parks. It is generated using available asset data.

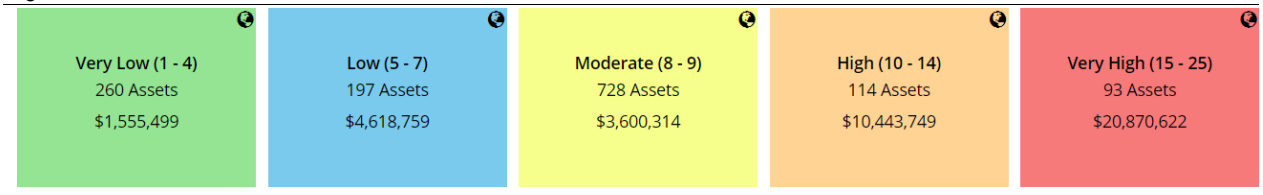
Figure 15: Detailed Risk Matrix



The consolidated risk matrix in Figure 16 shows that 93 Parks assets, with a combined replacement cost of $20.9 million have a very high risk rating. Most of these assets are various sports fields and courts, and playground equipment assets, which carry a moderate to major consequence of failure. In addition, majority of the assets also had a high probability of failure, due to their poor condition ratings.

An additional 114 assets, with a combined replacement cost of $10.4 million were assigned a high risk rating. Many of these assets were also playground equipment assets, but utility assets and various parklands, paths, and trails were also included in this group.

Figure 16: Consolidated Risk Matrix



Levels of Service

Levels of service (LOS) measure the quality and quantity of service provided, and offer direction for infrastructure investments. They are necessary for performance tracking and reporting. Many agencies attempt to deliver levels of service that cannot be sustainably funded by the existing tax base. This can lead to an eventual drop in quality of service, or increases to tax and utility rates to fund higher service levels.

LOS should be affordable and aligned with the community's long-term vision for itself and the service attributes it most values for different infrastructure programs.

Defining Levels of Service

Levels of service measure the quality, function, and capacity of an asset class or service area. LOS is an internationally recognized concept, employed across a variety of sectors, including public infrastructure. The International Standards Organization's ISO 55000 defines levels of service as the "parameters, or combination of parameters, which reflect the social, political, environmental, and economic outcomes that the organization delivers."

Levels of Service Framework

A typical levels of service framework includes several common components, as outlined in the table below.

Table 14: Components of a Levels of Service Framework

Component	Description and Purpose
Core Value	Typical core values that can be used for infrastructure programs include safety, reliability, efficiency, sustainability, and affordability.
Levels of Service Statement	The LOS statement expands on each core value and converts it into an objective for each service area.
Customer Levels of Service	CLOS are measurements or qualitative descriptions that help **describe the performance of the asset group or service area from an end-user perspective**. CLOS measure experiences, e.g., customer satisfaction with quality of recreational Parks; average travel times between major residential and commercial centres; watermain breaks; sewage backups; and, health and safety incidents.
Technical Levels of Service	TLOS are typically more operational in nature and are designed to measure the **various activities and steps that the organization takes to deliver the customer-oriented levels of service**. They can include data on maintenance activities and different condition assessment programs. TLOS are often seen as inputs whereas CLOS are viewed as outputs. Some KPIs can be both customer and technical oriented.
Key Performance Indicators	For both CLOS and TLOS, suitable key performance indicators (KPIs) must be selected to support reporting and tracking of each.

Core Values and Service Statements

Table 15 outlines the four core values developed for service delivery across the City's eight asset portfolios. Service statements expand on the values to convert them into broader goals.

Table 15: Core Values and Service Statements

Core Value	Service Statement
Reliable	Service delivery is reliable and provided with minimal service disruption to meet agreed upon levels of service.
Safe	All safety standards and regulatory requirements are met to protect public health, safety, and the environment.
Affordable	Services are affordable, fair, and equitable, accounting for the full cost of service delivery at agree upon levels of service.
Practical	Resources are prioritized towards the delivery of basic infrastructure and services first.

Selecting Suitable KPIs

Given the complexity of infrastructure services, countless customer and technical levels of service KPIs can be used to monitor performance, and ultimately, adjust the cost, performance, and risk associated with different assets. For the purpose of asset management planning, KPIs selected should be higher-level in nature and summarize the performance of the asset group as a whole rather than enumerate hundreds of daily, operational indicators.

The KPIs should also be aligned with corporate goals and initiatives. This maintains a 'line of sight' between staff activities, end-user experiences, and council direction as typically illustrated in strategic planning documents, i.e., measuring what matters most to Port Coquitlam residents. In addition, rather than generating new metrics, the selected KPIs should first maximize data already available. Often, available data can be readily converted into meaningful KPIs.

For Parks, a total of 81 KPIs were selected. This included 38 KPIs to measure customer levels of service, and 43 to track the City's technical levels of service. A practical way to distinguish the between the two is to think of technical levels of service as the activities and steps the organization takes to deliver customer levels of service. Given their significance, historical data for the last four years was retrieved to illustrate performance trends for customer levels of service.

Table 16: Customer Levels of Service

KPI	2018	2019	2020	2021	Trend
Capital					
% of parks assets in poor or very poor condition	*	*	*	62%	
% of playgrounds in poor or very poor condition	*	*	*	49%	
% of sport fields and courts in poor or very poor condition	*	*	*	75%	
% of park fencing in poor or very poor condition	*	*	*	57%	
% of park furniture in poor or very poor condition	*	*	*	82%	
% of trails/paths in poor or very poor condition	*	*	*	42%	
Maintenance					
# of pedestrian trail/path maintenance calls	103	190	270	314	↗
# of sport court maintenance calls	12	24	27	32	→
# of sports field maintenance calls	30	43	31	31	→
# of park maintenance calls	76	96	100	107	↗
# of bench, table and picnic structure maintenance calls	40	23	24	24	→
# of playground & exercise park maintenance calls	24	34	33	101	↗
# of park lighting calls	20	13	17	24	→
# of fence and bollard calls	39	35	18	24	→
# of irrigation calls	30	21	29	25	→
# of park drainage calls	7	7	5	8	→
# of cemetery maintenance calls	23	24	19	18	→
Operations					
# of leaf collection calls	NA	NA	2	12	↗
# of grass cutting calls (boulevard, parks, meadows)	46	57	29	5	↘
# of special events calls	10	6	3	12	→

KPI	2018	2019	2020	2021	Trend
# of garbage can and park litter calls	66	98	103	134	↗
# of sharps removal calls	13	23	34	40	↗
# of illegal dumping calls	31	63	75	96	↗
# of hanging basket calls	1	2	4	3	→
# of landscaping calls	23	34	44	49	↗
# of boulevard vegetation maintenance calls	90	103	122	129	↗
# of laneway vegetation maintenance calls	88	101	96	94	→
# of flail mowing calls	17	11	13	26	→
# of tree assessment calls	170	210	237	289	↗
# of tree pruning/removal calls	448	610	660	919	↗
# of tree watering calls	11	10	9	20	↗
# of Christmas decoration calls	NA	NA	1	5	↗
# of invasive species calls	48	55	49	68	→
# of skate park calls	0	3	4	1	→
# of dog park calls	30	43	44	56	↗
# of graffiti calls	37	61	66	89	↗
# of vandalism calls	9	13	15	15	→
# of locks and security calls	8	10	11	11	→

Table 17: Technical Levels of Service

KPI	2021	Budget
Capital		
Athletic Field Replacement		$50,000
Barrier Fence Replacement		$50,000
Court Resurfacing		$30,000
Park Furniture Replacement		$20,000
Playground Replacements		$300,000
Secondary Path Resurfacing		$30,000
Skate Bowl Resurfacing		$100,000
Sport Court Components		$30,000
Trail Resurfacing		$40,000
Artificial Turf Replacement		$1,500,000
Annual capital reinvestment		$2,150,000
Maintenance		
Building Maintenance		$78,900
Park Maintenance - maintenance, repairs, and cleaning (scheduled & reactive)	100%	$329,100
Park amenities inspections - scheduled per service levels A, B & C	100%	$45,100
Ball diamond maintenance - scheduled (weekly and monthly activities)	80%	$146,500
Irrigation maintenance - scheduled per service levels A, B & C	85%	$76,700
Playground inspections and maintenance - scheduled per service levels A and B	85%	$100,300
Sport court maintenance - scheduled per service levels A and B	100%	$62,600
Sport field maintenance - scheduled per service levels A, B & C	100%	$269,600
Artificial turf maintenance - scheduled (monthly and annual activities)	100%	$66,180
Trail/path inspections and maintenance - scheduled per service levels A, B & C	80%	$108,200
Pedestrian Route inspection and maintenance	100%	$18,500
Average annual maintenance expenditures		$1,301,680
Operations		
Fall/winter cleanup - as required for Priority 1, 2 and 3 areas	100%	$69,900

KPI	2021	Budget
Grass cutting - scheduled per service levels A, B & C	100%	$281,400
Grass cutting and parks maintenance for special events	100%	$3,080
Annual beds - scheduled maintenance	100%	$83,000
Hanging baskets - procurement and scheduled maintenance	100%	$26,400
Perennial bed maintenance - scheduled per Service Level A, B & C	100%	$430,400
Graffiti removal and pressure washing per service levels A, B & C	100%	$120,300
Illegal dumping in parks - removal of items as reported or observed	100%	$12,160
Litter and garbage in parks, fields, trails, paths - scheduled per service levels A, B & C	100%	$454,200
Janitorial	100%	$158,870
Vandalism prevention and repair	100%	$73,980
Brushing and Clearing - scheduled per service level A and B	100%	$108,200
Invasive species removal - scheduled per service level A and B	100%	$29,760
Overpass Banners - installation and removal	100%	$3,180
Tree pruning and maintenance - scheduled per age of tree (4847 trees)	200	$80,200
Number of trees planted or replaced - per inspection and assessment	80	$36,200
Tree removals	NA	$163,200
Tree watering - scheduled per service level A and B (276 trees)	100%	$43,700
Tree inspections and risk assessment - scheduled per tree monitor list and reactive	100%	$81,200
Cemetery - Interments (burials, cremations, niches)	129	$150,000
Cemetery - Markers (headstones, cemetery markers, graves)	81	$16,560
Average annual operations expenditures		$2,425,890

Levels of Service Analysis

Table 18 shows the percentage change in service requests for KPI's that best align with asset condition and performance. These may be helpful indicators in determining if sufficient funding and resources are being allocated to the maintenance and replacement of assets.

Table 18: Trends in Customer Levels of Service KPIs – Asset Condition and Performance

KPI	Percentage change between 2018-2021
# of pedestrian trail/path maintenance calls	+205%
# of sport court maintenance calls	+167%
# of sports field maintenance calls	+3%
# of park maintenance calls	+41%

Table 19 shows the change in service requests for KPI's that best align with service delivery, but have no direct or tangible impact on asset lifespan. These may be helpful indicators in determining if sufficient funding and resources are being allocated towards service delivery.

Table 19: Trends in Customer Levels of Service KPIs – Service Delivery

KPI	Percentage change between 2018-2021
# grass cutting calls	-89%
# illegal dumping calls	+210%
# litter calls	+103%
# graffiti removal calls	+141%

KPI data can be used to support decisions to maintain, increase or decrease levels of service to reduce the frequency of requests and incidents. Trends should be considered in further detail with knowledgeable staff to understand potential influences and context before making decisions. For example, service level performance may be affected in a given year by weather, material pricing, supply chain issues, staff absences or contractor availability. These factors should be taken into account to determine if the effects are temporary, or longer term and potentially warranting adjustment. Adjusting levels of service must also be considered in light of cost, performance, and risk, as further explained below.

Balancing Cost, Performance and Risk

Levels of service are fundamentally about balancing three key parameters: cost, performance, and risk. Any adjustment to one of these parameters will have a direct impact on the other two. High performance and low risk may require a substantial budget. In contrast, if constituents can tolerate lower performance from community assets, they incur a lower cost but assume a higher risk.

Table 20 briefly outlines how these parameters change when maintenance or capital related service levels are maintained, increased, or decreased. Those service levels have a direct impact on assets by maximizing their service life or deferring their replacement.

Table 20: Balancing Cost, Performance, and Risk

Levels of Service Goal	Impact on Cost	Impact on Asset Performance	Impact on Risk
Maintain	Minimum impact on cost; possible escalation due to market conditions	No expected change beyond typical deterioration	No expected change in asset risk rating
Increase	• Costs increase due to more frequent maintenance, rehabilitation, and/or replacement cycles • Tax rates and utility rates may increase • Increasing asset capacity or enhancing functionality may further escalate costs	• Assets are maintained at a higher condition, delivering higher expected performance • User experience and quality of life may improve	• With a more robust lifecycle program, asset failure may be reduced, resulting in a lower risk rating • User safety and environmental protection may improve
Decrease	• Costs may decrease as lifecycle programs are reduced and services are eliminated	• Assts may deteriorate faster and fail earlier than expected due to deferral of maintenance needs • User experience and quality of life may worsen	• Deferred maintenance may lead to higher failure rates, resulting in higher exposure • User safety and environmental protection may decrease

A sustainable levels of service approach requires municipalities to periodically recalibrate these parameters. Ultimately, trade-offs must be made between different programs based on demand, and between service quality and cost to constituents.

Financial Strategy

Each year, the City of Port Coquitlam makes important investments in its infrastructure to ensure assets deliver their intended function safely and efficiently. These efforts contribute to making Port Coquitlam a highly desirable place to live. The 2023 ranking of The 100 Most Livable Cities in Canada by the *Globe and Mail* placed the City at 17th.

Given the magnitude of infrastructure needs, it is common for municipalities, including Port Coquitlam, to experience annual shortages in funding. This creates annual funding deficits, requiring projects to be deferred to later years. This, in turn, creates long-term infrastructure backlogs.

Achieving full-funding for infrastructure programs is a substantial challenge for municipalities across Canada. Closing annual funding gaps and avoiding long-term backlogs can take many years.

This financial strategy provides a consolidated analysis of the City's eight service areas, and is designed to support the implementation of asset management plans and gradually eliminate gaps identified in the City's annual reinvestment rates.

The financial strategy also provides support for the development of 10-20 year capital plans for each asset group with the City's asset management program.

Approach and Methodology

The assets included in the City of Port Coquitlam's eight service areas have a combined 2023 replacement cost of $1.9 billion, as illustrated in Table 21 below. The table also summarizes the average annual requirements (AAR) for each service area, and the equivalent system-generated target, capital reinvestment rate (TRIR). The City's overall AARs total $42.5 million, generating an equivalent reinvestment rate of 2.2%. To put this differently, the City should invest, on average, 2.2% of the overall current replacement costs of its infrastructure portfolio back into these assets to remain current with replacement needs.

Table 21: Service Area Replacement Costs and Target Reinvestment Rates

Service Area	Replacement Cost	Average Annual Requirements (AAR)	System-generated Target Capital Reinvestment Rate (TRIR)
Transportation	$533,082,256	$15,648,055	2.9%
Drainage	$446,128,207	$7,406,986	1.7%
Water	$303,278,014	$4,541,037	1.5%
Sanitary	$266,373,836	$4,214,139	1.6%
Facilities	$262,262,312	$4,561,458	1.7%
Parks	$41,088,943	$1,682,841	4.1%
Fleet & Equipment	$33,488,624	$3,156,517	9.4%
Information Services	$9,580,473	$1,298,008	13.5%
Total	**$1,895,282,667**	**$42,509,042**	**2.2%**

The overall and individual, service area reinvestment rates serve as critical benchmarks, ensuring that asset replacements needs are met as they arise, and projects are not deferred. However, this 'full funding' is difficult to achieve for most municipalities across Canada, leading to annual infrastructure deficits, which can in turn accumulate to create long-term infrastructure backlogs.

The purpose of the financial strategy is to position Port Coquitlam to meet its target reinvestment rates as outlined above. This is done by examining the City's current funding levels for each service area, quantifying funding gaps, and identifying a roadmap to close these gaps. To ensure fiscal prudence, only those funding sources considered sustainable are integrated with the strategy. The concept of sustainable funding is discussed in more detail.

Current Financial Planning Framework

Port Coquitlam is a growing city. The community saw a growth rate of 4.9% between 2016 and 2021, and has a current population of more than 61,000 residents. Different funding and financing mechanisms are used to ensure that the City's infrastructure portfolio can continue to meet the needs of a growing and evolving population. The focus of the asset management plans and the financial strategy is the City's current asset portfolio.

Capital Budget

The City's capital budget is a forward-looking document that is used to plan for long-term investments, including infrastructure, that provide benefits to Port Coquitlam over time and support service delivery. The capital budget is traditionally funded from tax levies, user fees, senior government transfers and grants, development cost charges (DCCs), debt, and reserves. These funds are used to cover the expenses of maintenance, replacement, and expansion of the asset base which is tied to the level of services provided by the City.

The distinction must be made between the replacement of exiting assets and investments in new assets, including upgrades and expansions. Asset management plans and this financial strategy pertain to the replacement of existing assets. New assets are purchased, built, developed, or contributed to or by the City to specifically accommodate the growth of population or the expansion of services or service levels.

Debt

Debt can be used as a strategic funding source for major public works. The benefits of leveraging debt judiciously for infrastructure planning include:

- the ability to stabilize tax and user rates when dealing with variable and uncontrollable factors,
- equitable distribution of the cost and benefits of infrastructure over its useful life,
- a secure source of funding,
- the ability to proceed with projects sooner than waiting to save enough in cash or grants to pay for the project all at once and,
- flexibility in cash flow management.

Following an initial reduction in interest rates amid the Covid-19 pandemic, interest rates have risen steadily since. As a result, the cost of servicing the debt through interest payment has

increased substantially, making its use for infrastructure projects less compelling. The following graph shows the historical changes to Municipal Finance Authority of BC (MFA) lending rates[1].

Figure 17: Historical MFA Lending Rates[2]

Port Coquitlam currently has $17.6 million (2023 opening balance) of net debt outstanding for the Coast Meridian Overpass. This debt has an annual principal and interest payments of $1.0 million, which are expected to continue until 2039. The City also has outstanding debt for the Port Coquitlam Community Centre which currently has $48.8 million outstanding and carries an annual principal and interest payment of $2.3 million, which expires in 2049.

The funding options outlined in this plan allow Port Coquitlam to fully fund the long-term infrastructure replacement requirements without further use of debt.

[1] https://mfa.bc.ca/clients/long-term-borrowing: "New Issues are often funded by issuing a 10 year bond, locking in a fixed interest rate for ten years. As clients may borrow for up to thirty years, loans longer than ten years a typically refinanced every five years, following the initial ten years."

[2] The illustration does not consider actuarial adjustments.

Senior Government Support

Given the magnitude of investments needed in infrastructure, municipalities often rely on senior government programs to supplement their funding for capital projects and capacity building initiatives. These programs are subject to change with evolving federal and policy landscape, and therefore, create some vulnerability for municipalities that may rely heavily on these funding streams.

Of particular importance is the Canada Community-Building Fund (CCBF), formerly the federal Gas Tax Fund. In the past, municipalities have considered the CCBF a sustainable funding source used for infrastructure projects. Administered through a 10-year tripartite agreement (2014-2024) with the Government of British Columbia and the Union of British Columbia Municipalities (UBCM), the CCBF provides all municipalities with a permanent, predictable, and indexed source of infrastructure funding.

Port Coquitlam received $241k from the CCBF in 2022. Although historically stable, the City should actively monitor and evaluate the potential repercussions of a newly elected government on the CCBF and other senior government funding streams, considering the potential impact on funding priorities, allocations, and eligibility criteria.

While the structure of the transfers may evolve, both the province and federal governments continue to provide reliable sources of funding for asset management and infrastructure programs. When possible, transfers should be leveraged by the City to address the backlog of existing assets that have exceeded their service life.

Sustainability

Although senior government transfers—both recurring such as the CCBF, and one-time, project-specific grants and transfers—can be used to augment the City's fiscal capacity, this funding strategy relies only on the City's own-source revenues. These are limited to property taxes and utility levies. While a stable funding stream, the City typically earmarks the CCBF to fund new assets; as such, it was not integrated with the financial strategy. However, the City should consider allocating these funds to the replacement of existing assets, at least until the backlog has been addressed.

Reserves

Reserves play a critical, often primary, role in long-term financial planning for infrastructure investments. The benefits of having reserves available for infrastructure planning include:

- the ability to stabilize tax and user rates when dealing with variable and sometimes uncontrollable factors;
- financing one-time or short-term investments;
- accumulating the funding for significant future infrastructure investments;
- managing the use of debt; and,
- normalizing infrastructure funding requirement.

Long-Term Infrastructure Reserves

The City of Port Coquitlam's dedicated, long-term infrastructure reserves include the Long-Term General Infrastructure Reserve (LTGIR), the Long-Term Sewer Infrastructure Reserve (LTSIR), and the Long-Term Water Infrastructure Reserve (LTWIR). These reserves are funded through property taxes and utility levies. The current balance of these reserves totals $24.1 million.

Table 22: Long-Term Infrastructure Reserve Balances

Reserve	Balance
Long-Term General Infrastructure Reserve (LTGIR)	$15,688,227
Long-Term Water Infrastructure Reserve (LTWIR)	$4,816,463
Long-Term Sewer Infrastructure Reserve (LTSIR)	$3,619,233
Total	**$24,123,923**

Since 2010, the City has consistently made annual contributions, calculated as the prior year's amount plus an additional 1% of the prior year's taxation or utility levy. The intent of these reserves is to ensure the City can fund future asset replacement requirements in the short and long terms. This is accomplished through annual transfers to the Capital Reserves to complete work identified in the Annual Capital Programs.

Capital Reserves

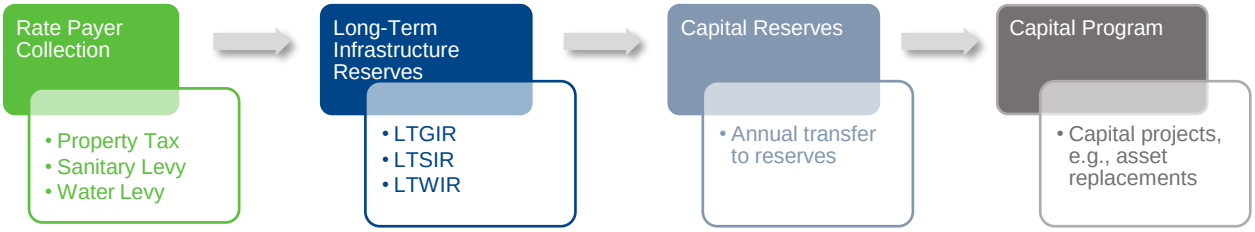
In addition to the long-term infrastructure reserves, Port Coquitlam also has other capital reserves used to implement the capital program. These reserves are funded by property taxation, utility levies, and the sale of land or assets. While these are predominately intended to support either new assets or the expansion of existing assets, the City can still draw from these reserves to address the backlog in the short term and support the reduction of any deficits over time. The forecasted balance of these reserves as of December 31, 2023, is $25.3 million.

Table 23: Capital Reserve Balances

Reserve	Balance
General Capital	$2,712,053
Sewer Infrastructure	$1,017,166
Water Infrastructure	$14,888,201
Land Sale	$3,326,828
Equipment Replacement	$2,079,097
Cart Replacement	$1,254,886
Total	**$25,278,231**

The figure below illustrates the flow of funding at the City, from collection of property taxes and utility levies, to implementation of the capital program.

Figure 18: Funding Flow



Since the annual capital program is funded through reserves, the aim of the financial strategy is to synchronize long-term infrastructure reserve contributions with the average annual requirements identified for the eight service areas, as illustrated in Table 21. As such, the recommendations focus on the incremental increases to the annual long-term infrastructure reserves contributions.

Development Cost Charges (DCC) Program

Port Coquitlam's DCC bylaws are regulated by the province through the *Local Government Act*. The City uses DCCs collected to finance a portion of upcoming infrastructure costs associated with the growth of new developments. The program is designed to ensure that the benefiters (new development) contribute to the installation costs.

The City's DCC Program encompasses infrastructure earmarked for both replacement and expansion. Recognizing that existing rate payers may receive benefit from the construction or expansion of infrastructure, the capital costs are partially reduced from DCC collections and supplemented by alternative funding sources. Because of this, the DCC contributions are limited to fund specified infrastructure projects used to establish the DCC fees in the in the Bylaws.

As such, whenever possible, the DCC contributions should be leveraged by the City to provide funding for assets slated for replacement and expansion when addressing the current asset backlog. This maximizes the value of the investment by achieving two goals with one asset replacement: replacement for condition/age and upgrading for additional capacity.

Achieving Reinvestment Rate Targets

This section identifies annual infrastructure and annual funding deficits for each of the City's eight service areas. The system-generated average annual requirements are contrasted against two figures. The first is the City's actual annual reinvestments into its assets, calculated by aggregating capital expenditures on various lifecycle programs for each service area. The second is its annual contributions to long-term infrastructure reserves (LTIRs).

We make a distinction between actual reinvestments on infrastructure each year which may be funded and financed through various streams, and annual contributions to the LTIRs funded only through sustainable sources, i.e., property taxation or utility levies. The recommendations in the financial strategy hinge on the latter, i.e., adjusting annual contributions to the LTIRs to achieve target reinvestment rates.

Separate analysis is presented for tax-funded and rate-funded service areas. Tax funded service areas are funded by property taxes and collected as general revenue. Rate funded service areas are those funded by the collection of utility fees. Tax-funded service areas include: Drainage, Transportation, Parks, Facilities, Fleet & Equipment, and Information Services. Utility Levy -funded service areas include: Water and Sanitary Services.

Tax-Funded Service Areas

As illustrated in Table 24, the City's average annual requirements for its six tax-funded service areas total $33.8 million. Annual capital expenditures total approximately $15 million for these assets, creating an infrastructure deficit of $18.8 million.

Table 24: Comparing Average Annual Requirements Against Current Capital Reinvestments

Service Area	Average Annual Requirements	Current Capital Reinvestments	Annual Infrastructure Deficit
Drainage	$7,406,986	$2,500,000	$4,906,986
Transportation	$15,648,055	$5,784,500	$9,863,555
Parks	$1,682,841	$2,150,000	$(467,159)
Facilities	$4,561,458	$583,112	$3,978,346
Fleet and Equipment	$3,156,517	$2,922,167	$234,350
Information Services	$1,298,008	$1,019,334	$278,674
Total	**$33,753,865**	**$14,959,113**	**$18,794,752**

The current capital reinvestments listed above are funded through both own-source revenues, e.g., property taxation, and other streams. Table 25, however, quantifies the City's contributions to the LTGIR. The City's ability to make consistent contributions to the LTGIR will determine how sustainable infrastructure programs are. These contributions will build up the LTGIR and are necessary for gradually eliminating the annual infrastructure deficit, as well as managing persistent backlogs.

LTGIR contributions are funded from the City's property taxation revenue—the primary, predictable, and sustainable (See the Sustainability section) source of funding for infrastructure needs.

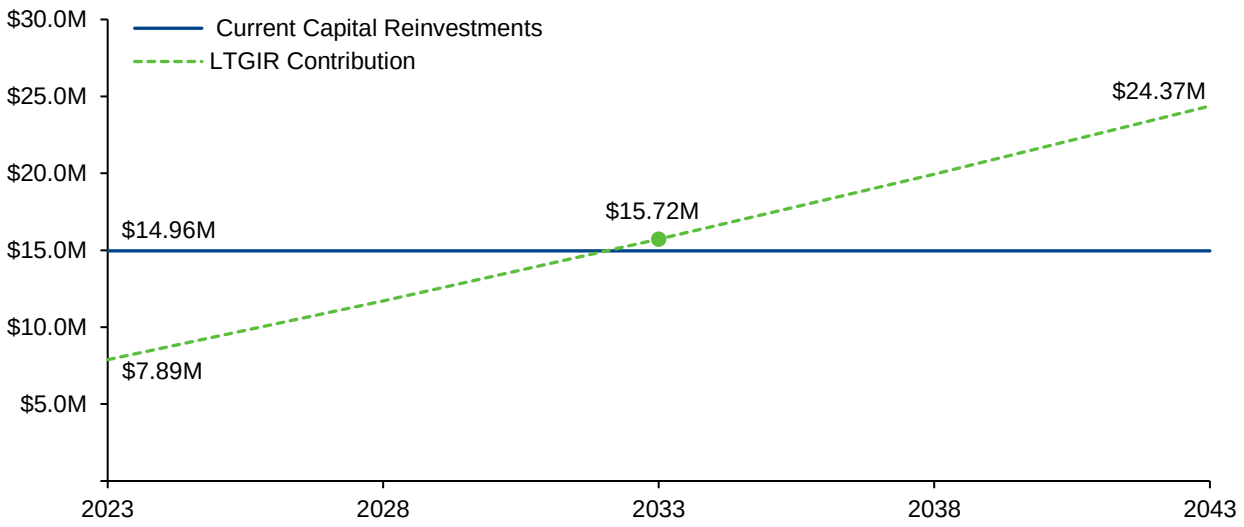
This analysis shows that based on its current annual contributions of $7.9 million to the LTGIR, an annual funding deficit of $25.9 million is generated each year. These annual contributions outpace the City's actual capital spending each year, illustrated in Table 24 above as $15 million.

Table 25: Comparing Average Annual Requirements Against Annual Contributions to the LTGIR

Service Areas	Total Average Annual Requirements	Annual Contributions to LTGIR	Annual Capital Funding Deficit	Funding Level
Tax-Funded	$33,753,865	$7,885,600	$25,868,265	23%

The City increases annual contributions to the LTGIR each year by an additional 1% of the prior year's tax levy. At this rate, contributions will total more than $24 million by 2043. However, under the current funding framework for existing assets, despite this judicial strategy, annual capital spending on tax-funded service areas will continue to outpace these annual contributions until 2033.

Figure 19: Annual Contributions to the LTGIR vs. Annual Capital Spending



This illustration does not account for inflationary increase to annual capital expenditures or other market pressures, which would increase the gap between annual contributions and current reinvestments, and extend the timeline of fully funding capital spends through annual contributions. Although infrastructure spending can be supplemented by other streams, a more sustainable funding framework would see the City increase its fiscal capacity through own-source revenues, i.e., property taxation.

Annual Deficits

The City currently faces two types of deficits. The infrastructure deficit is the gap between average annual requirements and current capital expenditures. This gap currently stands at $18.8 million, as illustrated in Table 24.

The second, the annual capital funding deficit, is the gap between average annual requirements and contributions to the LTGIR, calculated as $25.9 million as illustrated in Table 25. Before the annual infrastructure deficit can be addressed, the funding deficit must first be closed by increasing contributions to the LTGIR. As such, it is the target of the financial strategy.

Funding Models

The funding models presented below outline funding goals, and how the annual deficit decreases with reductions in these targets. These deficit figures are used to calculate resulting rate increases to allow the City to close the annual contribution deficit for LTGIR.

At the full-funding level, the City would need to meet the full $33.8 million annual requirements, and close a $25.9 million current funding gap. Understanding that the financial impact on rate payers may be difficult, options to reduce the annual funding to a level of 75% and 50% of the AAR are included.

Table 26: Funding Levels and Resulting Funding Deficits

Model	Funding Goal	Current Contributions to the LTGIR	Resulting Funding Deficit
Fully Funded	$33.8M	$7.9M	$25.9M
75%	$25.3M	$7.9M	$17.4M
50%	$16.9M	$7.9M	$9.0M

Each model has risks and benefits, as outlined below. The right model balances the burden placed between generations of residents while realizing the highest value from infrastructure assets.

Table 27: Risks and Benefits of Funding Models

Model	Potential Risks	Potential Benefits
Fully Funded	– Higher financial impact on taxpayers – Limited financial flexibility for other programs and services	– Avoid further accumulation of backlog – Potential long-term costs savings – High economic and social benefits, including ability to attract more investments and businesses – Less vulnerability to evolving provincial and federal policy and funding programs
75%	– Further accumulation of existing infrastructure backlog – Lower, overall levels of service – Potential safety implications – Higher indirect economic, social, and reputational risks resulting from infrastructure disrepair – Higher vulnerability to evolving provincial and federal policy and funding programs	– Lower impact on taxpayers – More budget flexibility for other programs and service
50%	– Further, more rapid accumulation of existing backlogs – Potentially high safety implications – Low service levels – Lower quality of life and potential loss of local economic activity – Higher reputational damage – High dependence on other sources of funding – High vulnerability to unexpected asset failures	– Lowest impact on taxpayers

Eliminating the Annual Deficit

In 2023, Port Coquitlam's property taxation revenues totaled $74,880,000. To eliminate the funding deficit, additional contributions are needed to the LTGIR. The following table outlines the tax increases required to support these additional contributions, depending on the funding model selected. In addition to these models, three phase-in periods are presented, allowing the City to achieve the desired funding goal between five and 20 years.

The City already increases annual contributions to the LTGIR by an additional 1% per year based on prior year's levy. As such, the rate increases presented for the three phase-in periods are over and above this preestablished mechanism.

Table 28: Tax Rate Increase Required to Achieve Funding Levels

Model	Overall Tax Rate Increase Required	5 Years	10 Years	15 Years	20 Years
Fully Funded	35%	↑5.11%	↑2.01%	↑1.00%	↑0.49%
75%	23%	↑3.27%	↑1.11%	↑0.40%	↑0.05%
50%	12%	↑1.29%	↑0.14%	↓0.24%	↓0.43%

As illustrated in Table 28, achieving full funding would require a one-time tax increase of 35%, or 5.11% per year over a five-year phase-in period, over and above the existing 1% annual increase. In contrast, a 50% funding model would see the City reduce tax rates over a 15-year phase in period. This option is not recommended.

As with funding models, phase-in periods also carry similar risk and benefits. Shorter time frames would reduce the pace of accumulating backlogs and help address infrastructure needs more quickly. However, they may place heavy burden on rate-payers. More protracted funding periods reduce rate-payer obligation, but may cause more rapid and further asset disrepair.

It is recommended that the City adopt the full-funding model over a 15-year phase-in period, with aim of meeting 100% of the $33.8 million annual requirements. This would require further increasing the LTGIR contribution by an additional 1.00% per year over the phase-in period, over and above the existing annual increase of 1%.

Drainage Utility Levy

The City should also consider the establishment of a drainage utility levy, coupled with the creation of a dedicated Long-Term Drainage Infrastructure Reserve Fund (LTDIR).

Several municipalities have established a drainage utility levy as the design and costs of drainage systems have changed significantly over the years. Contributing factors include:

i. climate change impacts (sea level rise, increased rainfall, higher intensity storms) driving the need for new or upgraded drainage infrastructure and flood protection;

ii. mitigation of environmental impacts and protection of watercourses driving the need for green infrastructure and enhancement projects;

iii. drainage infrastructure costing significantly more than water or sanitary infrastructure to construct and maintain;

iv. drainage assets currently being funded by General Revenue, which reduces the amount available for all of the other tax-funded assets.

If a Drainage Utility is established, a Long Term Drainage Infrastructure Reserve (LTDIR) would also be established with annual contributions funded through Drainage utility levies rather than property taxes.

Levy-Funded Service Areas

The analysis presented in this section includes Port Coquitlam's water and sanitary services, and is similar to the tax-funded service areas. The average annual requirements for the two levy -funded service areas total $8.8 million, against annual capital expenditures of $3.5 million. This creates an annual infrastructure deficit of $5.2 million.

Table 29: Comparing Average Annual Requirements Against Current Capital Reinvestments

Service Area	Average Annual Requirements	Current Capital Reinvestments	Annual Infrastructure Deficit
Water	$4,541,037	$2,034,200	$2,506,837
Sanitary	$4,214,139	$1,500,000	$2,714,139
Total	**$8,755,177**	**$3,534,200**	**$5,220,977**

As with tax-funded assets, the City contributes to long-term infrastructure reserves for both water and sanitary services, managed in the Long-Term Water Infrastructure Reserve (LTWIR) and the Long-Term Sanitary Infrastructure Reserve (LTSIR).

Based on the City's current contributions levels to the LTWIR and LTSIR, water services are currently meeting 25% of their average annual requirements, with sanitary at 20%. These funding levels create an annual capital funding deficit of $3.4 million each for water and sanitary services.

Table 30: Comparing Average Annual Requirements Against Annual Contributions to the LTWIR and LTSIR

Service Areas	Total Average Annual Requirements	Annual Contributions to LTWIR/LTSIR	Annual Capital Funding Deficit	Funding Level
Water	$4,541,037	$1,138,300	$3,402,737	25%
Sanitary	$4,214,139	$850,000	$3,364,139	20%
Total	**$8,755,177**	**$1,988,300**	**$6,766,877**	**23%**

As with the LTGIR, the City's contributions to both the LTWIR and LTSIR are increased each year by 1% of the prior year utility levy for each service area. At this growth rate, annual contributions to the LTWIR and LTSIR will become sufficient to fund current capital expenditures for each service area between 2029 and 2030. However, as current capital expenditures are below average annual requirements, the annual infrastructure gap will still persist beyond the 20-year horizon illustrated.

Figure 20: Annual Contributions to the LTWIR vs. Annual Capital Spending

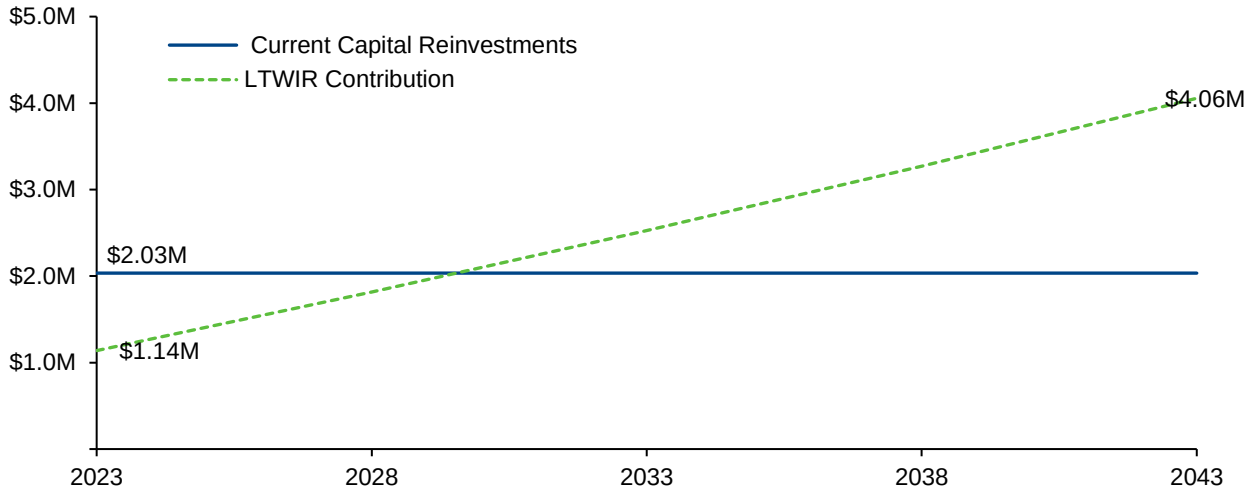
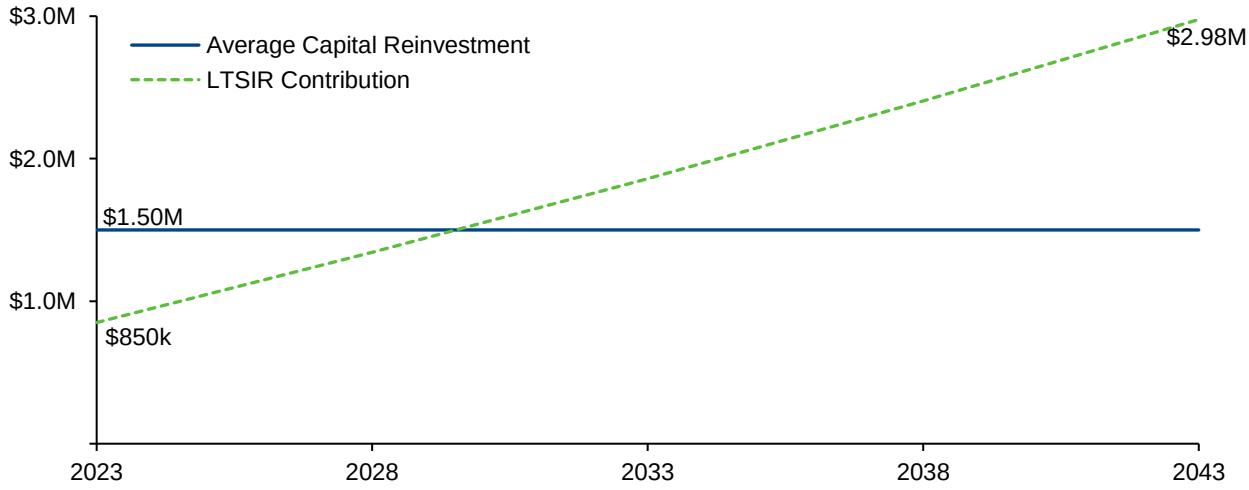


Figure 21: Annual Contributions to the LTSIR vs. Annual Capital Spending



These illustrations do not account for inflationary increase to annual capital expenditures or other market pressures, which would increase the gap between annual contributions and current reinvestments, and extend the timeline of fully funding capital spends through annual contributions. Similar to tax-funded assets, infrastructure spending can be supplemented by other streams; however, a more sustainable funding framework would see the City increase its fiscal capacity through own-source revenues, i.e., water and sanitary utility revenues.

Annual Deficits

Similar to tax-funded asset categories, the City faces two types of deficits. The first, illustrated in Table 29, is the gap between average annual requirements and actual current capital reinvestments.

The second, referred to as the annual capital funding deficit, is the gap between the same average annual requirements and annual contributions to the Long-Term Water Infrastructure Reserve and the Long-Term Sanitary Infrastructure Reserve. This gap, totaling $6.8 million, is illustrated in Table 30 for both water and sanitary services, and is the target of the financial strategy.

Funding Models

The funding models presented below outline funding goals, and how the annual deficit decreases with reductions in these targets. These deficit figures are used to calculate resulting levy increases to allow the City to close the annual contribution deficit for LTWIR and LTSIR.

At the full-funding level, the City would need to meet the full $8.8 million annual requirements for water and sanitary, and close the combined funding deficit of $6.8 million. Understanding that the financial impact on levy payers may be difficult, options to reduce the annual funding targets to a level of 75% and 50% of the AAR are included for both water and sanitary.

Table 31: Funding Levels and Resulting Funding Deficits: Water Services

Model	Funding Goal	Contributions to the LTWIR	Resulting Funding Deficit
Fully Funded	$4,541,037	$1,138,300	$3,402,737
75%	$3,405,777	$1,138,300	$2,267,478
50%	$2,270,518	$1,138,300	$1,132,219

Table 32: Funding Levels and Resulting Funding Deficits: Sanitary Services

Model	Funding Goal	Contributions to the LTSIR	Resulting Funding Deficit
Fully Funded	$4,214,139	$850,000	$3,364,139
75%	$3,160,604	$850,000	$2,310,605
50%	$2,107,069	$850,000	$1,257,070

In selecting the appropriate funding target, careful consideration of the risk and benefits of each need to be evaluated. See Table 27: Risks and Benefits of Funding .

Eliminating Annual Deficits

In 2023, Port Coquitlam's water and sanitary revenues totaled $13,120,000 and $9,560,000, respectively. To eliminate the funding deficit for each service area, additional contributions are needed to the LTWIR and LTSIR.

The following tables outlines the water and sanitary levy increases required to support these additional contributions, depending on the funding model selected. Similar to tax-funded assets, three phase-in periods are presented, allowing the City to achieve its desired funding levels between five and 20 years.

The City already increases annual contributions to each utility reserve by an additional 1% per year based on prior year's levy. As such, the rate increases presented for the three phase-in periods are over and above this preestablished goal.

Table 33: Utility Rate Increase Required to Achieve Funding Levels: Water

Model	Overall Water Levy Increase Required	5 Years	10 Years	15 Years	20 Years
Fully Funded	26%	↑3.72%	↑1.33%	↑0.55%	↑0.16%
75%	17%	↑2.24%	↑0.61%	↑0.07%	↓0.20%
50%	9%	↑0.67%	↓0.17%	↓0.45%	↓0.59%

Table 34: Utility Rate Increase Required to Achieve Funding Levels: Sanitary

Model	Overall Sanitary Levy Increase Required	5 Years	10 Years	15 Years	20 Years
Fully Funded	35%	↑5.22%	↑2.06%	↑1.03%	↑0.52%
75%	24%	↑3.42%	↑1.19%	↑0.45%	↑0.09%
50%	13%	↑1.50%	↑0.24%	↓0.17%	↓0.38%

As illustrated in Table 33, achieving full funding for water would require a one-time levy increase of 26%, or 3.72% per year over a five-year phase-in period, over and above the existing 1% annual increase. Similarly, achieving full funding for sanitary would require a one-time levy increase of 35%, or 5.22% per year over a five-year phase-in period, over and above the existing 1% annual increase.

In contrast, a 50% funding model would see the City reduce water levies over a 20-year phase-in period, and sanitary levies over the 15-year phase-in period. This option is not recommended.

Consistent with the approach for tax-funded service areas, it is recommended that the City adopt the full-funding model for both water and sanitary, with the aim of achieving 100% of the $8.8 million combined annual requirements over a 15-year phase-in period.

For water services, this would require further increasing contributions to the LTWIR by an additional 0.55% annually, over and above the existing annual increase of 1%. Similarly, for sanitary services, the LTSIR would see annual contributions increase by an additional 1.03%, over and above the existing 1% annual increase.

Infrastructure Backlogs

The models presented above would allow the City of Port Coquitlam to gradually increase its annual contribution to long-term infrastructure reserves for both tax- and levy -funded service areas. This strategy would address annual infrastructure deficits.

In addition to these deficits, most communities in Canada also have persistent infrastructure backlogs, accumulated over many decades. As projects are deferred, assets requiring replacements continue to remain in service beyond their design life and despite their poor condition ratings. Table 35 summarizes the infrastructure backlog for each service area.

Table 35: Age- and Condition-based Infrastructure Backlogs

Service Area	Infrastructure Backlog
Drainage	$162.1M
Transportation	$160.2M
Parks	$25.6M
Facilities	$29.8M
Fleet & Equipment	$24.2M
Information Services	$6.4M
Water	$109.7M
Sanitary	$99.5M
Total	**$617.4M**

Using Reserves

Addressing existing backlogs requires strategic use of funding sources and a risk-based prioritization of projects, to channel funding where they are needed most. Theoretically, the City can use existing long-term infrastructure reserves to partially tackle a portion of this backlog. However, Table 36 shows that even if long-term infrastructure reserves were fully depleted, less than 4% of the total infrastructure backlog would be eliminated. Of note, backlogs should be refined through regular in-field condition assessments and prioritized through risk and asset criticality assessments.

Table 36: Long-Term Infrastructure Reserves vs. Backlogs

Reserve	Forecasted Closing Balance, December 31, 2023	Infrastructure Backlog	Reserves to Backlog Ratio
General (Tax Funded)	$15.7M	$408.3M	3.8%
Water (Rate Funded)	$4.8M	$109.7M	4.4%
Sanitary (Rate Funded)	$3.6M	$99.5M	3.6%
Total	**$24.1M**	**$617.4M**	**3.9%**

To put this in perspective, a typical homeowner with a property value assessed at $969,000 would have $37,800 on hand for major home repairs. Although there is no scientific consensus on optimal reserve levels, whether a 3.9% ratio is sufficient will depend on individual (council) risk appetite, current asset conditions, and forecasted future needs.

Leveraging Development Cost Charges (DCC)

Port Coquitlam is also a growing city, and there is an opportunity to strategically leverage the City's DCC program to address existing asset backlogs. The City's current DCC program totals nearly $219 million, distributed over 20 years. Given their benefits to existing residents, the City would be required to contribute $117.8 million, or 53% of the total project cost estimates. This figure includes a 1% municipal assist factor for growth-related projects.

Table 37: Development Cost Charges (DCC) Program

Service Area	Total DCC Project Value	Port Coquitlam Contribution	DCC Recoverable
Drainage	$74,494,000	$47,196,403	$27,297,598
Transportation	$100,400,000	$43,283,930	$57,116,070
Water	$16,467,760	$9,478,459	$6,989,301
Sanitary	$27,547,840	$17,811,128	$9,736,712
Total	**$218,909,601**	**$117,769,920**	**$101,139,680**

Analysis shows that there is a significant overlap between projects slated to be completed as part of the DCC program (capacity upgrades to support growth) and assets that are currently in a backlog state (beyond their service life and due for replacement due to age/condition). As illustrated below, 56% of projects, by current cost estimates, will result in the replacement of assets currently considered in a backlog state. These replacements are designed to meet higher demand and usage, and will result in capacity upgrades and or higher functionality—resulting in higher overall service levels.

Table 38: Overlap Between DCC Program and Assets in Backlog State

Service Area	Total DCC Project Value	Projects Addressing Backlog ($)	Projects Addressing Backlog (%)	Port Coquitlam Contribution	DCC Recoverable
Drainage	$74,494,000	$39,636,026	53%	$23,748,706	$15,887,320
Transportation	$100,400,000	$60,900,000	61%	$30,107,040	$30,792,960
Water	$16,467,760	$11,407,760	69%	$7,522,109	$3,885,651
Sanitary	$27,547,840	$10,957,151	40%	$6,723,966	$4,233,185
Total	**$218,909,601**	**$122,900,937**	**56%**	**$68,101,820**	**$54,799,117**

Recommendations

Given the risks and benefits associated with different funding levels and phase-in period, the following approach is recommended to address annual infrastructure deficits.

Tax Funded Service Areas

- The City should endeavour to achieve full-funding for its tax-funded service areas, requiring $33.8 million on an annual basis to meet the replacement needs of its existing asset portfolio.

- To achieve this, a 15-year phase-in period is recommended to allow for an equitable distribution of financial burden between current and future residents.

- This would require further incrementally increasing the LTGIR contribution by an additional 1.00% of the budgeted prior year's taxation levy each year over the 15-year phase-in period, solely for the purpose of phasing in full funding for the tax funded assets. This is in addition to the existing annual increase of 1%.

This would increase individual property taxes by a further $21.30, based on a home assessed at $969,000. This increase would be over and above the higher taxes resulting from the 1% annual increase already implemented, and estimated at $21.35.

- The recommendations presented do not account for inflation. Staff should consider the impacts of inflation on both annual capital expenditures, and additional contributions required to the LTGIR to maintain fiscal strength.

- Should the City establish a drainage utility levy, the creation of a dedicated Long-Term Drainage Infrastructure Reserve Fund (LTDIR) should also be established. Annual contributions towards the LTDIR should then be funded through the newly established utility levy equivalent to the amount funded through property taxes. This would reduce the average annual requirements for tax-funded assets by 22%.

Levy-Funded Service Areas

- The City should endeavour to achieve full-funding for its water and sanitary service areas, requiring $8.8 million on an annual basis to meet the replacement needs of its existing asset portfolio.

- To achieve this, a 15-year phase-in period is recommended for both water and sanitary, consistent with tax-funded phase-in period, allowing for an equitable distribution of financial burden between current and future residents.

- For water services, this would require further incrementally increasing contribution to the LTWIR by an additional 0.55% of the budgeted prior year's utility levy each year over the 15-year phase-in period, solely for the purpose of phasing in full funding for water. This is in addition to the existing annual increase of 1%.

  This would increase individual water levies by a further $2.73. This increase would be over and above the higher water levies resulting from the 1% annual increase already implemented, and estimated at $4.98

- For sanitary services, the 15-year, full-funding model would require further incrementally increasing contribution to the LTSIR by an additional 1.03% of the budgeted prior year's utility levy each year over the 15-year phase-in period, solely for the purpose of phasing in full funding for water. This is in addition to the existing annual increase of 1%.

  This would increase individual sanitary levies by a further $3.71. This increase would be over and above the higher sanitary levies resulting from the 1% annual increase already implemented, and estimated at $3.60.

- The recommendations presented do not account for inflation. Staff should consider the impacts of inflation on both annual capital expenditures, and additional contributions required to the LTWIR and LTSIR to maintain fiscal strength.

- Addressing the infrastructure backlog requires the strategic use of reserves and the City's DCC program. In addition, asset criticality and risk analysis should be used to prioritize projects.

As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. This periodic funding should not be incorporated into an AMP unless there are firm commitments in place. However, it can be used to help close the infrastructure gap more quickly, or lower the long-term impact on tax and utility levies. It should be noted that the above recommendations do not include the use of reserves or debt. Depending on the urgency of projects and the impact on levels of services, reserves and debt can be viable, supplemental options.

Next Steps

Asset management does not stop with the completion of asset management plans. An asset management program is an ongoing effort to responsibly manage City assets from procurement, through their full lifecycle, to replacement. The work completed with the asset management plans sets a strong foundation for the City to move forward in this regard, and is intended to be refined and built on with future work.

Future work includes items outlined in the City's asset management strategy, such as:

- Developing 10-20 year capital plans for each asset portfolio using the high risk assets identified in each plan to prioritize projects
- Reconciling assets updated in the Citywide asset register with the PSAB asset register used for financial reporting
- Training staff on the Citywide asset management software and keeping the database up to date
- Working with staff in each asset group to update asset inventories, complete condition assessments, update replacement value estimates, refine risk assessments, and periodically review lifecycle activities and service levels
- Considering natural assets and climate change in the City's asset management program