Peterborough County

Our History - Your Future

Asset Management Plan 2024

Non-Core Assets

February 2025

psdcitywide

This Asset Management Plan was prepared by:

psdcitywide

Empowering your organization through advanced asset management, budgeting & GIS solutions

Key Statistics

$270 m	2023 Replacement Cost of Non-Core Asset Portfolio
$7,108	Non-Core Replacement Cost of Infrastructure Per Household
50%	Percentage of Non-Core Assets in Fair or Better Condition
61%	Percentage of Non-Core Assets with Assessed Condition Data
3.30%	Target (Non-Core) Investment Rate
$8.9 m	Target Annual Capital Spending for Non-Core Assets

Table of Contents

1. Executive Summary

Municipal infrastructure delivers critical services that are foundational to the economic, social, and environmental health and growth of a community. The goal of asset management is to enable infrastructure to deliver an adequate level of service in the most cost-effective manner. This involves the ongoing review and update of infrastructure information and data alongside the development and implementation of asset management strategies and long-term financial planning.

1.1 Scope

This Asset Management Plan (AMP) identifies the current practices and strategies that are in place to manage public infrastructure and makes recommendations where they can be further refined. Through the implementation of sound asset management strategies, Peterborough County can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

This AMP include the following asset categories:

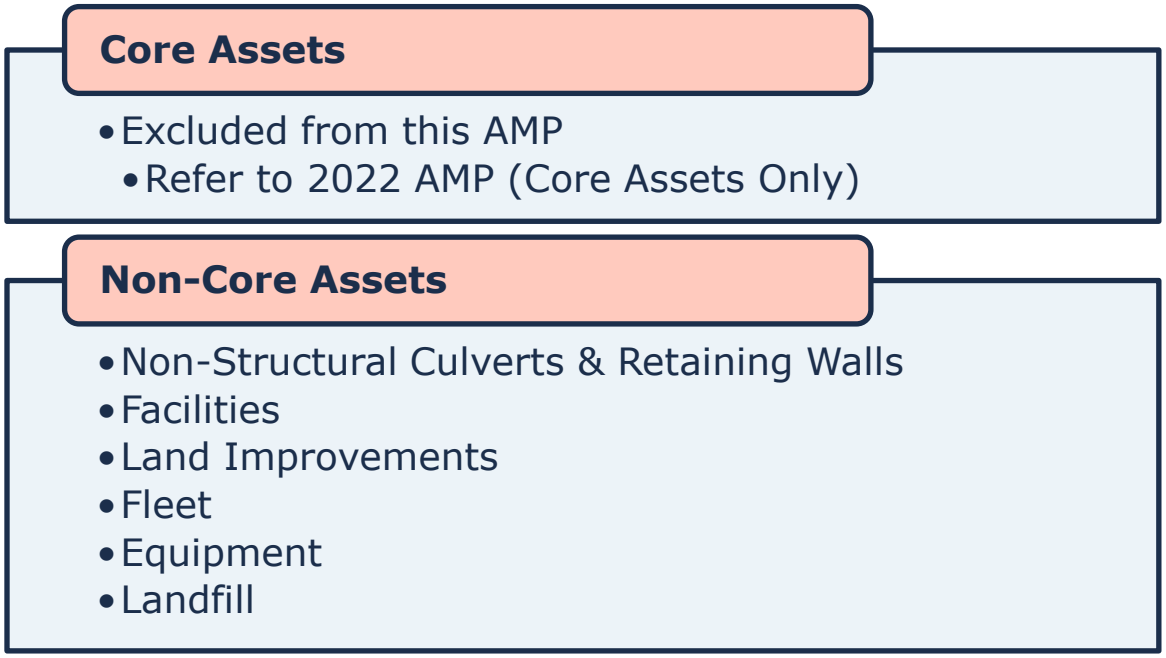

Figure 1 Core and Non-Core Asset Categories

1.2 Compliance

With the development of this AMP and in combination with their 2022 Core Assets AMP, Peterborough County has achieved compliance with July 1, 2024, requirements under O. Reg. 588/17. This includes requirements for levels of service and inventory reporting for all asset categories.

1.3 Findings

The overall replacement cost of the non-core asset categories included in this AMP totals $270 million. 50% of all assets analyzed in this AMP are in fair or better condition and assessed condition data was available for 61% of assets. For the remaining 39% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (paved roads) and replacement only strategies (all other assets) to determine the lowest cost option to maintain the current level of service.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the County's average annual capital requirement totals $8.9 million.

It is important to note that this AMP represents a snapshot in time and is based on the best available processes, data, and information at the County. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources.

2. Introduction & Context

2.1 Community Profile

Census Characteristic	Peterborough County	Ontario
Population 2021	147,681	14,223,942
Population Change 2016-2021	6.8%	5.8%
Total Private Dwellings	73,045	5,929,250
Population Density	39.1/km^2	15.9/km^2
Land Area	3,779.47 km^2	892,411.76 km^2

Table 1 Peterborough County Community Profile

Peterborough County is a two-tiered government county comprised of 8 separate municipalities. These municipalities include:

- Municipality of Trent Lakes
- Township of Selwyn
- Township of Otonabee-South Monaghan
- Township of North Kawartha
- Township of Havelock-Belmont-Methuen
- Township of Douro-Drummer
- Township of Cavan-Monaghan
- Township of Asphodel-Norwood

The County is located along Rice Lake to its south, with various bodies of water spread throughout the county.

The County has a steadfast dedication to growth and prosperity and has been able to embrace the land it inhabits, where its many lakes have been a boon to the County via tourism. Along with this, there are over 900 farms in the region, bolstering food supplies and revenues in a sustainable way. With investment and initiatives around the aerospace, clean tech, and manufacturing industries, the County is diversifying its place within the market and locking in its future.

The County has experienced consistent year-over-year population growth. Over the last decade, the County has seen a 6.8% increase in population. The County has a population skewed to an aging population with 25% of the population being 65+, which is above the approximate 19% proportion for the rest of Ontario.

The County generates a total revenue of $83 million from taxes and rates and has an annual capital and projects budget of $32.3 million as of 2023. The County's infrastructure priorities include Tourism, economic growth, and public service delivery.

2.2 Climate Change

Climate change can cause severe impacts on human and natural systems around the world. The effects of climate change include increasing temperatures, higher levels of precipitation, droughts, and extreme weather events. In 2019, Canada's Changing Climate Report (CCCR 2019) was released by Environment and Climate Change Canada (ECCC).

The report revealed that between 1948 and 2016, the average temperature increase across Canada was 1.7°C; moreover, during this time period, Northern Canada experienced a 2.3°C increase. The temperature increase in Canada has doubled that of the global average. If emissions are not significantly reduced, the temperature could increase by 6.3°C in Canada by the year 2100 compared to 2005 levels. Observed precipitation changes in Canada include an increase of approximately 20% between 1948 and 2012. By the late 21st century, the projected increase could reach an additional 24%. During the summer months, some regions in Southern Canada are expected to experience periods of drought at a higher rate. Extreme weather events and climate conditions are more common across Canada. Recorded events include droughts, flooding, cold extremes, warm extremes, wildfires, and record minimum arctic sea ice extent.

The changing climate poses a significant risk to the Canadian economy, society, environment, and infrastructure. The impacts on infrastructure are often a result of climate-related extremes such as droughts, floods, higher frequency of freeze-thaw cycles, extended periods of high temperatures, high winds, and wildfires. Physical infrastructure is vulnerable to damage and increased wear when exposed to these extreme events and climate variabilities. Canadian Municipalities are faced with the responsibility to protect their local economy, citizens, environment, and physical assets.

2.2.1 Peterborough County Climate Profile

Peterborough County is located in Southern Ontario around 60km away from Lake Ontario. The County is expected to experience notable effects of climate change which include higher average annual temperatures, an increase in total annual precipitation, and an increase in the frequency and severity of extreme events. According to Climatedata.ca – a collaboration supported by Environment and Climate Change Canada (ECCC) – the Peterborough County may experience the following trends:

Higher Average Annual Temperature:

- Between the years 1971 and 2000 the annual average temperature was 6.1ºC
- Under a high emissions scenario, the annual average temperatures are projected to increase by 8.7ºC by the year 2050 and over 12.6ºC by the end of the century.

Increase in Total Annual Precipitation:

- Under a high emissions scenario, Peterborough County is projected to experience a 12% increase in precipitation by the year 2080 and a 17% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

- It is expected that the frequency and severity of extreme weather events will change.

- In some areas, extreme weather events will occur with greater frequency and severity than others, especially those close to or on Rice Lake.

2.2.2 Integration Climate Change and Asset Management

Asset management practices aim to deliver sustainable service delivery - the delivery of services to residents today without compromising the services and well-being of future residents. Climate change threatens sustainable service delivery by reducing the useful life of an asset and increasing the risk of asset failure. Desired levels of service can be more difficult to achieve as a result of climate change impacts such as flooding, high heat, drought, and more frequent and intense storms.

In order to achieve the sustainable delivery of services, climate change considerations should be incorporated into asset management practices. The integration of asset management and climate change adaptation observes industry best practices and enables the development of a holistic approach to risk management.

2.3 Asset Management Overview

Municipalities are responsible for managing and maintaining a broad portfolio of infrastructure assets to deliver services to the community. The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio.

The acquisition of capital assets accounts for only 10-20% of their total cost of ownership. The remaining 80-90% comes from operations and maintenance. This AMP focuses its analysis on the capital costs to maintain, rehabilitate and replace existing municipal infrastructure assets.

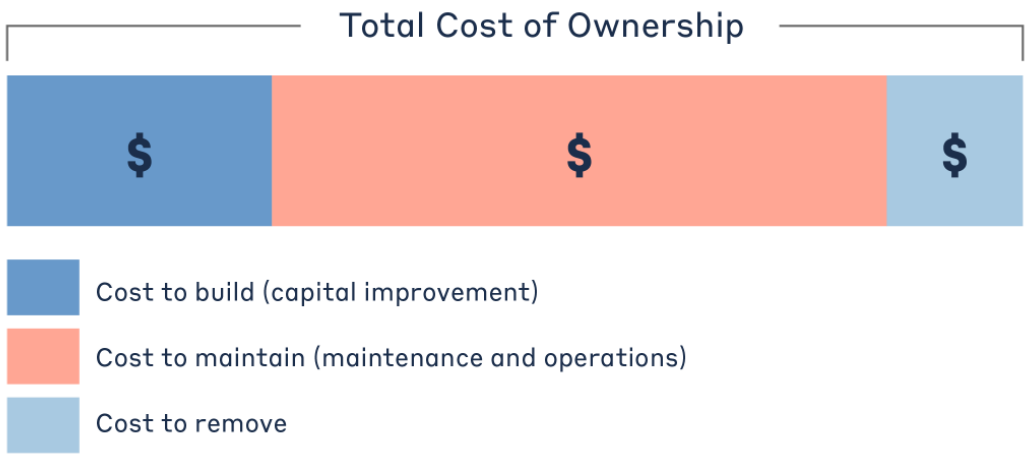

Figure 2 Total Cost of Asset Ownership

These costs can span decades, requiring planning and foresight to ensure financial responsibility is spread equitably across generations. An asset management plan is critical to this planning, and an essential element of broader asset management program. The industry-standard approach and sequence to developing a practical asset management program begins with a

Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.

This industry standard, defined by the Institute of Asset Management (IAM), emphasizes the alignment between the corporate strategic plan and various asset management documents. The strategic plan has a direct, and cascading impact on asset management planning and reporting.

2.3.1 Foundational Asset Management Documentation

The industry-standard approach and sequence to developing a practical asset management program begins with a Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan.

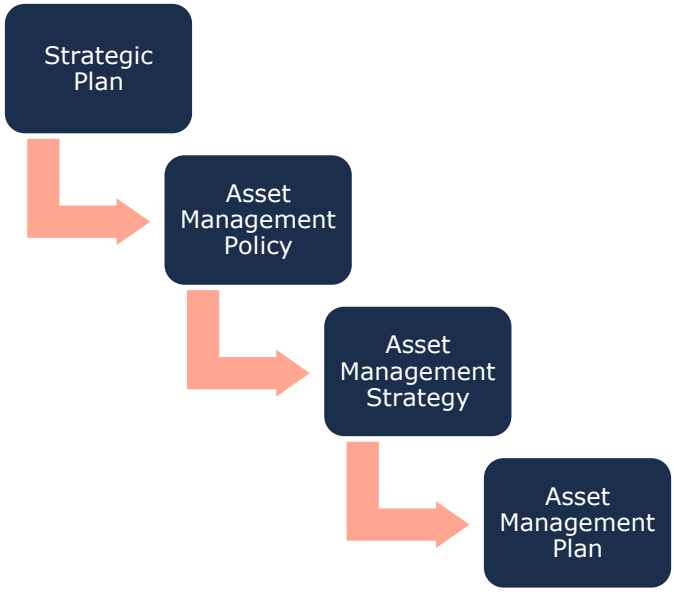

Figure 3 Foundational Asset Management Documents

This industry standard, defined by the Institute of Asset Management (IAM), emphasizes the alignment between the corporate strategic plan and various asset management documents. The strategic plan has a direct, and cascading impact on asset management planning and reporting.

Asset Management Policy

An asset management policy represents a statement of the principles guiding the County's approach to asset management activities. It aligns with the organizational strategic plan and provides clear direction to municipal staff on their roles and responsibilities as part of the asset management program.

Peterborough County adopted policy number FIN-32 "Strategic Asset Management Policy" in 2019, in accordance with Ontario Regulation 588/17. The County will implement best practices in asset management by considering the following principles:

- Regulatory Compliance
- Condition Sustainability
- Return on Investment
- Financial Integration
- Cross Asset and Jurisdiction Integration
- Master Plan Integration
- Climate Change

Asset Management Strategy

An asset management strategy outlines the translation of organizational objectives into asset management objectives and provides a strategic overview of the activities required to meet these objectives. It provides greater detail than the policy on how the County plans to achieve asset management objectives through planned activities and decision-making criteria.

The County's Asset Management Policy contains many of the key components of an asset management strategy and may be expanded on in future revisions or as part of a separate strategic document.

Asset Management Plan

The asset management plan (AMP) presents the outcomes of the County's asset management program and identifies the resource requirements needed to achieve a defined level of service. The AMP typically includes the following content:

- State of Infrastructure
- Asset Management Strategies
- Levels of Service
- Financial Strategies

The AMP is a living document that should be updated regularly as additional asset and financial data becomes available. This will allow the County to re-evaluate the state of infrastructure and identify how the organization's asset management and financial strategies are progressing.

2.3.2 Key Concepts in Asset Management

Effective asset management integrates several key components, including lifecycle management, risk & criticality, and levels of service. These concepts are applied throughout this asset management plan and are described below in greater detail.

Lifecycle Management Strategies

The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. Asset deterioration has a negative effect on the ability of an asset to fulfill its intended function, and may be characterized by increased cost, risk and even service disruption.

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation, and replacement. The following table provides a description of each type of activity and the general difference in cost.

Depending on initial lifecycle management strategies, asset performance can be sustained through a combination of maintenance and rehabilitation, but at some point, replacement is

required. Understanding what effect these activities will have on the lifecycle of an asset, and their cost, will enable staff to make better recommendations.

Lifecycle Activity	Cost	Typical Associated Risks
Maintenance Activities that prevent defects or deteriorations from occurring	**$**	• Balancing limited resources between planned maintenance and reactive, emergency repairs and interventions; • Diminishing returns associated with excessive maintenance activities, despite added costs; • Intervention selected may not be optimal and may not extend the useful life as expected, leading to lower payoff and potential premature asset failure;
Rehabilitation/ Renewal Activities that rectify defects or deficiencies that are already present and may be affecting asset performance	**$$$**	• Useful life may not be extended as expected; • May be costlier in the long run when assessed against full reconstruction or replacement; • Loss or disruption of service, particularly for underground assets;
Replacement/ Reconstruction Asset end-of-life activities that often involve the complete replacement of assets	**$$$$$**	• Incorrect or unsafe disposal of existing asset; • Costs associated with asset retirement obligations; • Substantial exposure to high inflation and cost overruns; • Replacements may not meet capacity needs for a larger population; • Loss or disruption of service, particularly for underground assets;

Table 2 Lifecycle Management: Typical Lifecycle Interventions

The County's approach to lifecycle management is described within each asset category outlined in this AMP. Staff will continue to evolve and innovate current practices for developing and implementing proactive lifecycle strategies to determine which activities to perform on an asset and when they should be performed to maximize useful life at the lowest total cost of ownership.

Risk & Criticality

Asset risk and criticality are essential building blocks of asset management, integral in prioritizing projects and distributing funds where they are needed most based on a variety of factors. Assets in disrepair may fail to perform their intended function, pose substantial risk to the community, lead to unplanned expenditures, and create liability for the municipality. In

addition, some assets are simply more important to the community than others, based on their financial 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.

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, (i.e. low, medium, high) or quantitative measurement (i.e. 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.

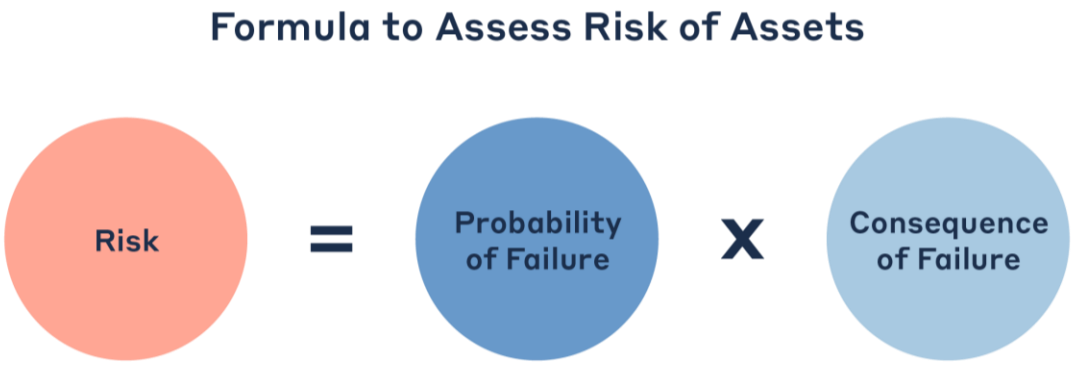

Figure 4 Risk Equations

The approach used in this AMP 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.

Probability of Failure

Several factors can help decision-makers estimate the probability or likelihood of an asset's failure, including its condition, age, previous performance history, and exposure to extreme weather events, such as flooding and ice jams—both a growing concern for municipalities in Canada.

Consequence of Failure

Estimating criticality also requires identifying the types of consequences that the organization and community may face from an asset's failure, and the magnitude of those consequences. Consequences of asset failure will vary across the infrastructure portfolio; the failure of some assets may result primarily in high direct financial cost but may pose limited risk to the community. Other assets may have a relatively minor financial value, but any downtime may pose significant health and safety hazards to residents.

Table 3 illustrates the various types of consequences that can be integrated in developing risk and criticality models for each asset category and segments within. We note that these consequences are common, but not exhaustive.

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 Municipality.
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.

Table 3 Risk Analysis: Types of Consequences of Failure

This AMP includes a preliminary evaluation of asset risk and criticality. Each asset has been assigned a probability of failure score and consequence of failure score based on available asset data. These risk scores can be used to prioritize maintenance, rehabilitation, and replacement strategies for critical assets.

These models have been built in Citywide for continued review, updates, and refinements.

Levels of Service

A level of service (LOS) is a measure of the services that the County is providing to the community and the nature and quality of those services. Within each asset category in this AMP, technical metrics and qualitative descriptions that measure both technical and community levels of service have been established and measured as data is available.

The County measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service. As this AMP covers only non-core asset categories, and O. Reg. 588/17 does not mandate specific LOS reporting for non-core assets, LOS metrics reflected in this AMP were selected by PSD and Peterborough County.

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives.

Technical Levels of Service

Technical levels of service are a measure of key technical attributes of the service being provided to the community. These include mostly quantitative measures and tend to reflect the impact of the County's asset management strategies on the physical condition of assets or the quality/capacity of the services they provide.

Current and Proposed Levels of Service

This AMP focuses on measuring the current level of service provided to the community. Once current levels of service have been measured, the County plans to establish proposed levels of service over a 10-year period, in accordance with O. Reg. 588/17.

Proposed levels of service should be realistic and achievable within the timeframe outlined by the County. They should also be determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals and long-term sustainability. Once proposed levels of service have been established, and prior to July 2025, the County must identify a lifecycle management and financial strategy which allows these targets to be achieved.

2.4 Scope & Methodology

2.4.1 Asset Categories for this AMP

The July 2024 deadline under the O.Reg. 588/17 regulation—the second of three AMPs—requires analysis of core and non-core asset categories. This asset management plan (for non-core assets only) for Peterborough County is to be read in combination with the County's 2022 Core Asset Management Plan, prepared by WSCS Consulting Incorporated.

The AMP summarizes the state of the infrastructure for the County's non-core asset portfolio, establishes current levels of service and the associated technical and customer oriented key metrics, outlines lifecycle strategies for optimal asset management and performance, and provides 10-year financial plans for the asset categories listed below.

Tax Funded Assets

- Non-Structural Culverts & Retaining Walls
- Facilities
- Land Improvements
- Fleet
- Equipment
- Landfill

Rate Funded Assets

- None Included in this AMP

Figure 5 Tax Funded and Rate Funded Asset Categories

2.4.2 Data Effective Date

It is important to note that this plan is based on data as of **December 2023**; therefore, it represents a snapshot in time using the best available processes, data, and information at the County. Strategic asset management planning is an ongoing and dynamic process that requires continuous data updates and dedicated data management resources.

2.4.3 Deriving Replacement Costs

There are a range of methods to determine the replacement cost of an asset, and some are more accurate and reliable than others. This AMP relies on two methodologies:

User-Defined Cost and Cost Per Unit

Based on costs provided by municipal staff which could include average costs from recent contracts; data from engineering reports and assessments; staff estimates based on knowledge and experience.

Cost Inflation / CPI Tables

Historical costs of the assets are inflated based on Consumer Price Index or Non-Residential Building Construction Price Index.

User-defined costs based on reliable sources are a reasonably accurate and reliable way to determine asset replacement costs. Cost inflation is typically used in the absence of reliable replacement cost data. It is a reliable method for recently purchased and/or constructed assets where the total cost is reflective of the actual costs that the County incurred. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

2.4.4 Estimated Service Life & Service Life Remaining

The estimated useful life (EUL) of an asset is the period over which the County expects the asset to be available for use and remain in service before requiring replacement or disposal. The EUL for each asset in this AMP was assigned according to the knowledge and expertise of municipal staff and supplemented by existing industry standards when necessary.

By using an asset's in-service data and its EUL, the County can determine the service life remaining (SLR) for each asset. Using condition data and the asset's SLR, the County can more accurately forecast when it will require replacement. The SLR is calculated as follows:

Figure 6 Service Life Remaining Calculation

2.4.5 Reinvestment Rate

As assets age and deteriorate they require additional investment to maintain a state of good repair. The reinvestment of capital funds, through asset renewal or replacement, is necessary to sustain an adequate level of service. The reinvestment rate is a measurement of available or required funding relative to the total replacement cost.

By comparing the actual vs. target reinvestment rate the County can determine the extent of any existing funding gap. The reinvestment rate is calculated as follows:

Figure 7 Target Reinvestment Rate Calculation

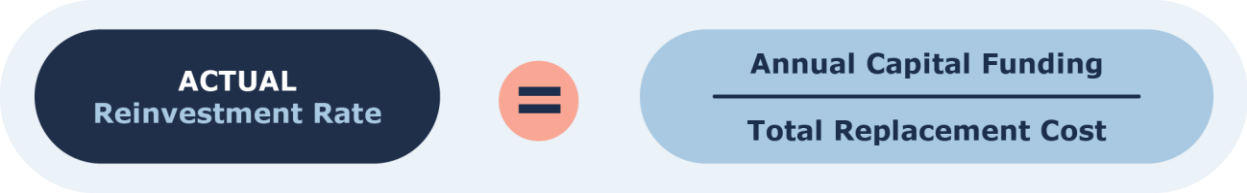

Figure 8 Actual Reinvestment Rate Calculation

2.4.6 Deriving Asset Condition

An incomplete or limited understanding of asset condition can mislead long-term planning and decision-making. Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life.

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the County's asset portfolio. The table below outlines the condition rating system used in this AMP to determine asset condition. This rating system is aligned with the Canadian Core Public Infrastructure Survey which is used to develop the Canadian Infrastructure Report Card. When assessed condition data is not available, service life remaining is used to approximate asset condition.

Condition	Description	Criteria	Service Life Remaining (%)
Very Good	Fit for the future	Well maintained, good condition, new or recently rehabilitated	80-100
Good	Adequate for now	Acceptable, generally approaching mid-stage of expected service life	60-80
Fair	Requires attention	Signs of deterioration, some elements exhibit significant deficiencies	40-60
Poor	Increasing potential of affecting service	Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration	20-40
Very Poor	Unfit for sustained service	Near or beyond expected service life, widespread signs of advanced deterioration, some assets may be unusable	0-20

Table 4 Standard Condition Rating Scale

The analysis in this AMP is based on assessed condition data only as available. In the absence of assessed condition data, asset age is used as a proxy to determine asset condition.

2.5 Ontario Regulation 588/17

As part of the Infrastructure for Jobs and Prosperity Act, 2015, the Ontario government introduced Regulation 588/17 - Asset Management Planning for Municipal Infrastructure (O. Reg 588/17)[1]. Along with creating better performing organizations, more liveable and sustainable communities, the regulation is a key, mandated driver of asset management planning and reporting. It places substantial emphasis on current and proposed levels of service and the lifecycle costs incurred in delivering them.

Figure 9 below outlines key reporting requirements under O. Reg 588/17 and the associated timelines.

[1] O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure https://www.ontario.ca/laws/regulation/170588

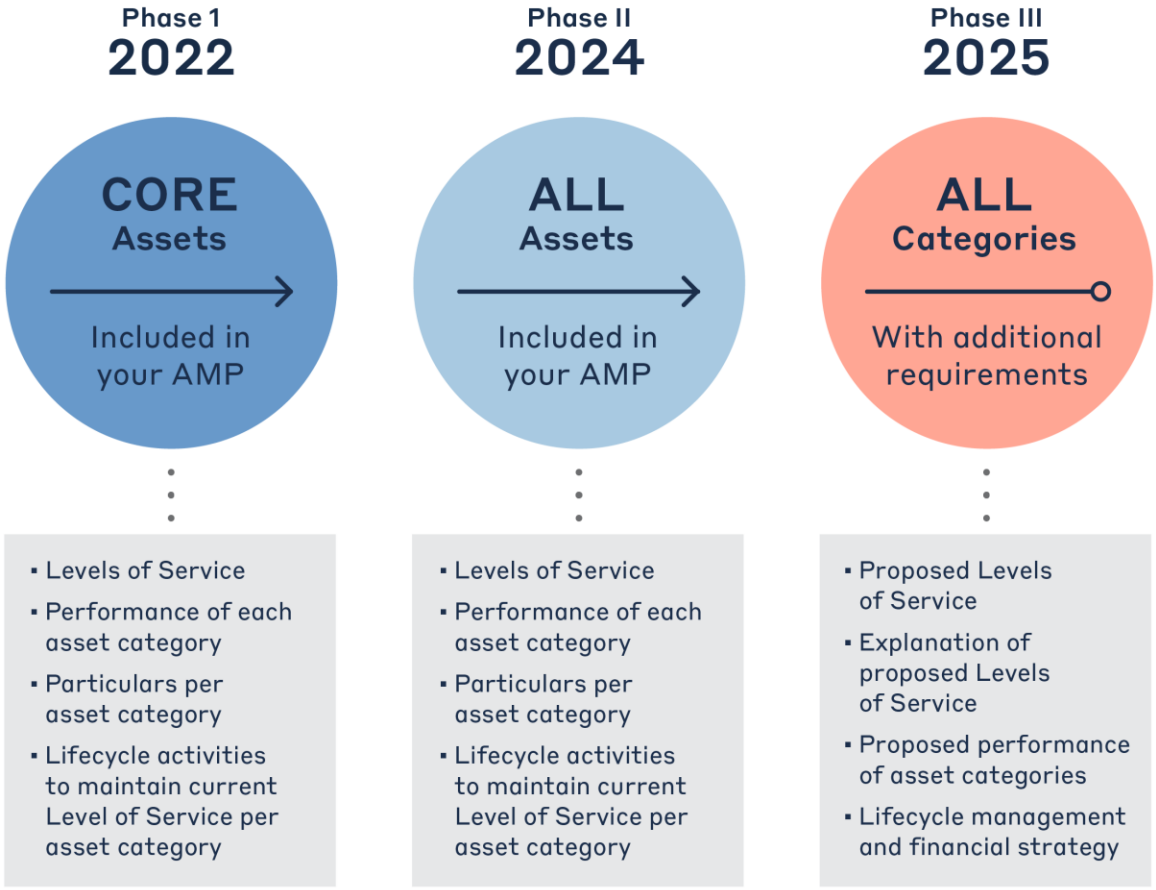

Figure 9 O. Reg. 588/17 Requirements and Reporting Deadlines

2.5.1 O. Reg. 588/17 Compliance Review

Requirement	O. Reg. 588/17 Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4.1 – 9.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4.1 – 9.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	4.3 – 9.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4.2 – 9.2	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4.4 – 9.4	Complete

Current levels of service in each category	S.5(2), 1(i-ii)	4.7 – 9.7	Complete
Current performance measures in each category	S.5(2), 2	4.7 – 9.7	Complete
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4.4 – 9.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix B	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	10.1 – 10.2	Complete

Table 5 O. Reg. 588/17 Compliance Review

Note: *The above compliance review is for non-core assets only, included within this AMP.*

3. Portfolio Overview – State of the Infrastructure

The state of the infrastructure (SOTI) summarizes the inventory, condition, age profiles, and other key performance indicators for the County's infrastructure portfolio. These details are presented for non-core asset categories only.

3.1 Asset Hierarchy & Data Classification

Asset hierarchy explains 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 interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Key category details are summarized at asset segment level.

Figure 10 Asset Hierarchy and Data Classification

3.2 Portfolio Overview

3.2.1 Total Replacement Cost of Asset Portfolio

The six asset categories analyzed in this Asset Management Plan have a total current replacement cost of $270 million. This estimate was calculated using user-defined costing, as well as inflation of historical or original costs to current date. This estimate reflects replacement

of historical assets with similar, not necessarily identical, assets available for procurement today. Figure 11 illustrates the replacement cost of each asset category; at 51% of the total non-core portfolio, non-structural culverts and retaining walls form the largest share, followed by facilities at 33%.

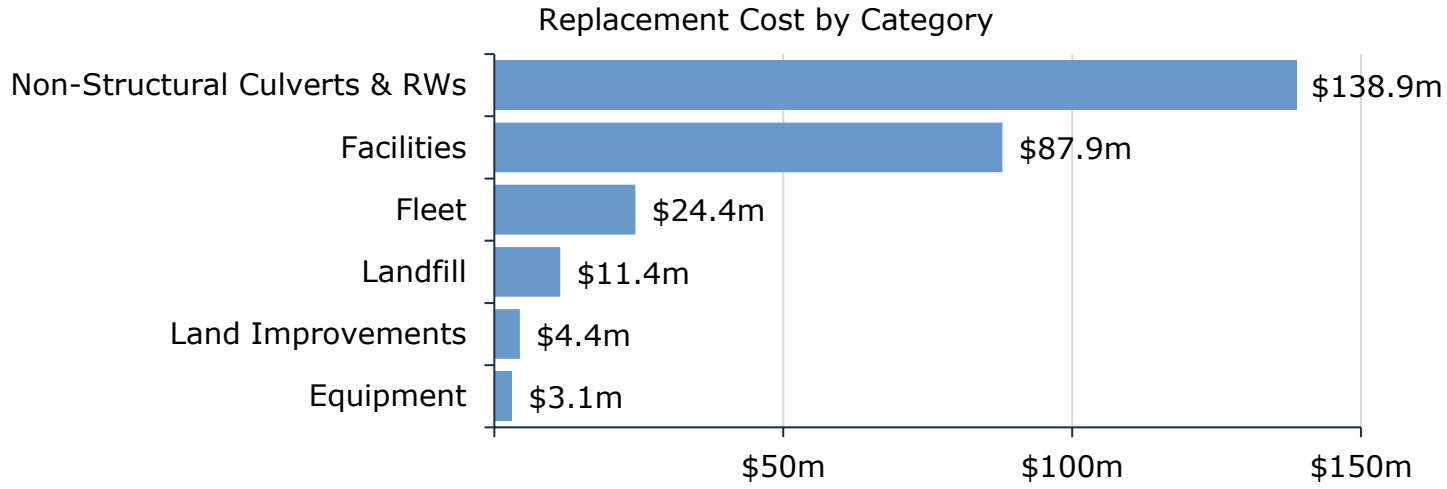

Figure 11 Current Replacement Cost by Asset Category[2]

3.2.2 Condition of Asset Portfolio

Figure 12 and Figure 13 summarize asset condition at the non-core portfolio and category levels, respectively. Based on both assessed condition and age-based analysis, 50% of the County's non-core infrastructure portfolio is in fair or better condition, with the remaining 50% in poor or worse condition. Typically, assets in poor or worse condition may require replacement or major rehabilitation in the immediate or short-term. Targeted condition assessments may help further refine the list of assets that may be candidates for immediate intervention, including potential replacement or reconstruction.

Similarly, assets in fair condition should be monitored for disrepair over the medium term. Keeping assets in fair or better condition is typically more cost-effective than addressing assets needs when they enter the latter stages of their lifecycle or decline to a lower condition rating, e.g., poor or worse.

Condition data was available for majority of the non-structural culverts & retaining walls, all facilities, and most land improvements. For all remaining assets, age was used as an approximation of condition for these assets. Age-based condition estimations can skew data and lead to potential under- or overstatement of asset needs.

Further, when assessed condition data was available, it was projected to current year-end (2023). This 'projected condition' can generate lower condition ratings than those established at the time of the condition assessment. The rate of this deterioration will also depend on lifecycle curves used to project condition over time.

[2] Landfill costs within the Portfolio Overview reflect 50% of the total replacement costs of landfill assets that the County is partially financially responsible for. Refer to the Landfill section for full details.

In instances where condition assessments were performed in 2024 (for example, building condition assessments), the most recent condition assessment rating was used.

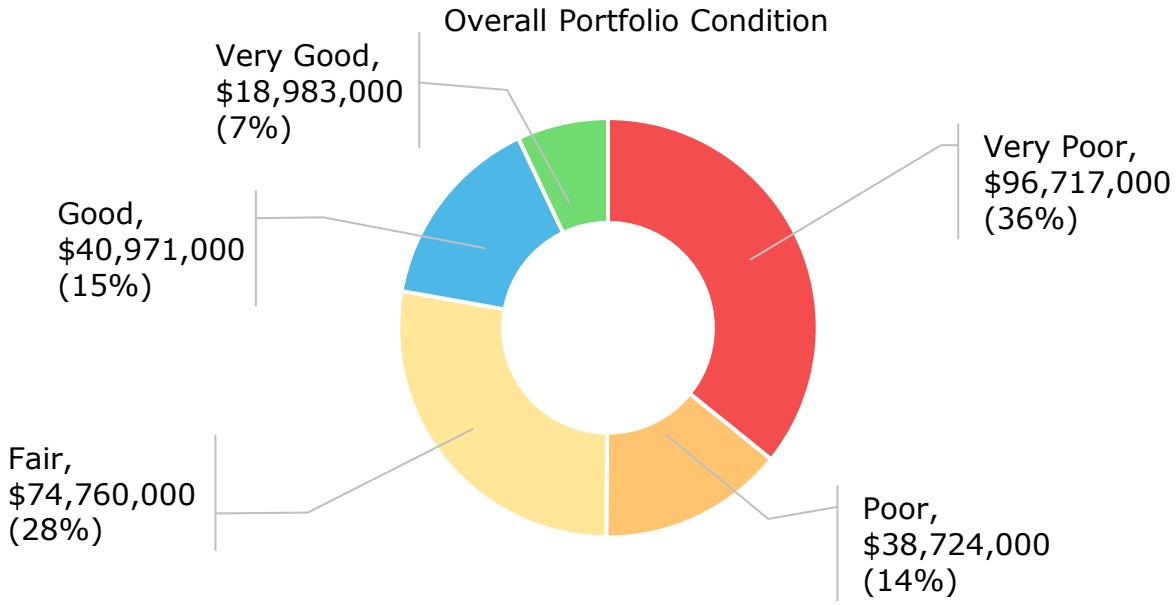

Figure 12 Asset Condition: Non-Core Portfolio Overview

As further illustrated in Figure 13 at the category level, there is a fairly even split between assets in good vs. poor conditions. See Table 6 for details on how condition data was derived for each asset segment.

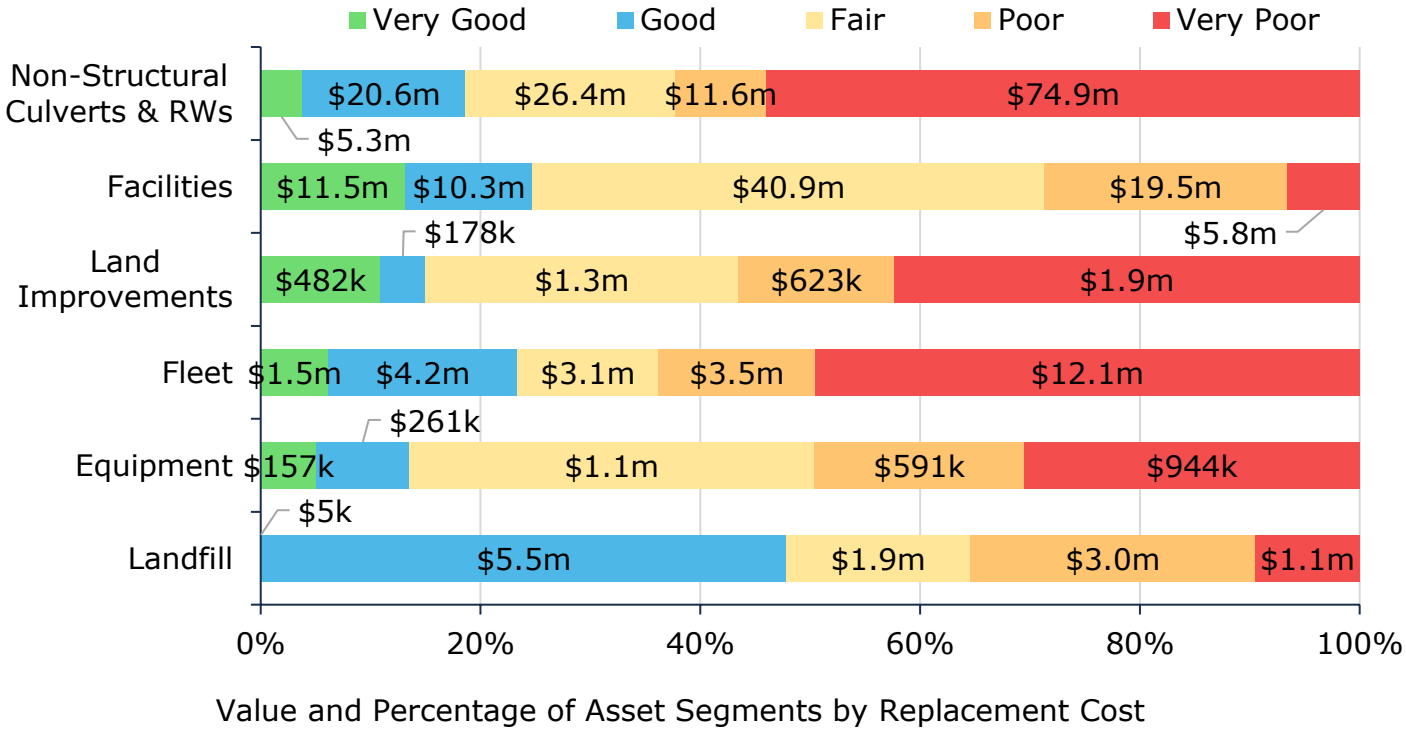

Figure 13 Asset Condition by Asset Category

Source of Condition Data

This AMP relies on assessed condition for 61% of assets, based on and weighted by replacement cost. For the remaining assets, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. Table 6 below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment(s)	% of Assets with Assessed Conditions	Source of Condition Data
Non-Structural Culverts & Retaining Walls	Cross Culverts	94%	Internal Staff
	Entrance Culverts	<1%	N/A
	Retaining Walls	100%	2023 OSIMs
Facilities	All	100%	2024 Building Condition Assessments
Land Improvements	All	23%	2024 Building Condition Assessments
Fleet	All	0%	N/A
Equipment	All	0%	N/A
Landfill	All	0%	All landfill asset conditions were provided by the City of Peterborough, based on asset age.

Table 6 Source of Condition Data

3.2.3 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 67% of the County's non-core assets will require replacement within the next 10 years. Refer to Appendix B – 10-Year Capital Requirements.

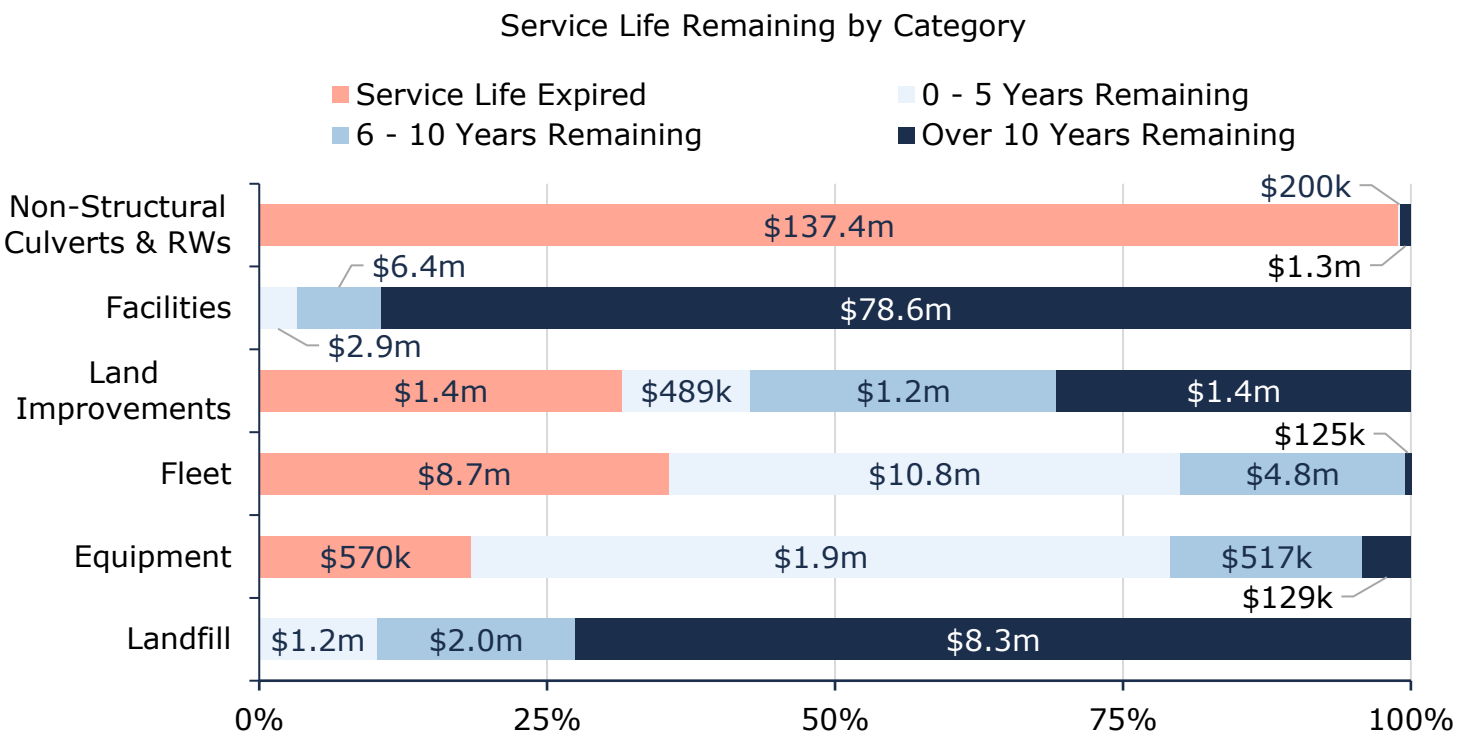

Figure 14 Service Life Remaining by Asset Category

3.2.4 Risk Matrix

Using the risk equation and preliminary risk models, Figure 15 shows how assets across the different asset categories are stratified within a risk matrix.

1 - 4 **Very Low** $83,413,466 (31%)	5 - 7 **Low** $92,916,139 (34%)	8 - 9 **Moderate** $17,523,477 (6%)	10 - 14 **High** $43,903,751 (16%)	15 - 25 **Very High** $32,397,075 (12%)

Figure 15 Risk Matrix: All Assets

The analysis shows that based on current risk models, approximately 12% of the County's non-core assets, with a current replacement cost of approximately $32 million, carry a risk rating of 15 or higher (red) out of 25. Assets in this group may have a high probability of failure based on available condition data and age-based estimates and were considered to be most essential to the County.

As new asset attribute information and condition assessment data are integrated with the asset register, asset risk ratings will evolve, resulting in a redistribution of assets within the risk matrix. Staff should also continue to calibrate risk models.

We caution that 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 with very high condition ratings can receive a moderate to high-risk rating despite a low probability of failure. These assets may be deemed as highly critical to the County 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.

3.2.5 Forecasted Capital Requirements

Aging assets require maintenance, rehabilitation, and replacement. Figure 16 below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for all asset categories analyzed in this AMP over a 100-year time horizon. On average, $8.9 million is required each year to remain current with capital replacement needs for the County's non-core asset portfolio (red dotted line). Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. This figure relies on age and available condition data.

The chart also illustrates a backlog of more than $76 million, comprising assets that remain in service beyond their estimated useful life. It is unlikely that all such assets are in a state of disrepair, requiring immediate replacements. This makes continued and expanded targeted and consistent condition assessments integral. Risk frameworks, proactive lifecycle strategies, and levels of service targets can then be used to prioritize projects, continuously refine estimates for both backlogs and ongoing capital needs, and help select the right treatment for each asset. In addition, more effective componentization of buildings will improve these projections, including backlog estimates.

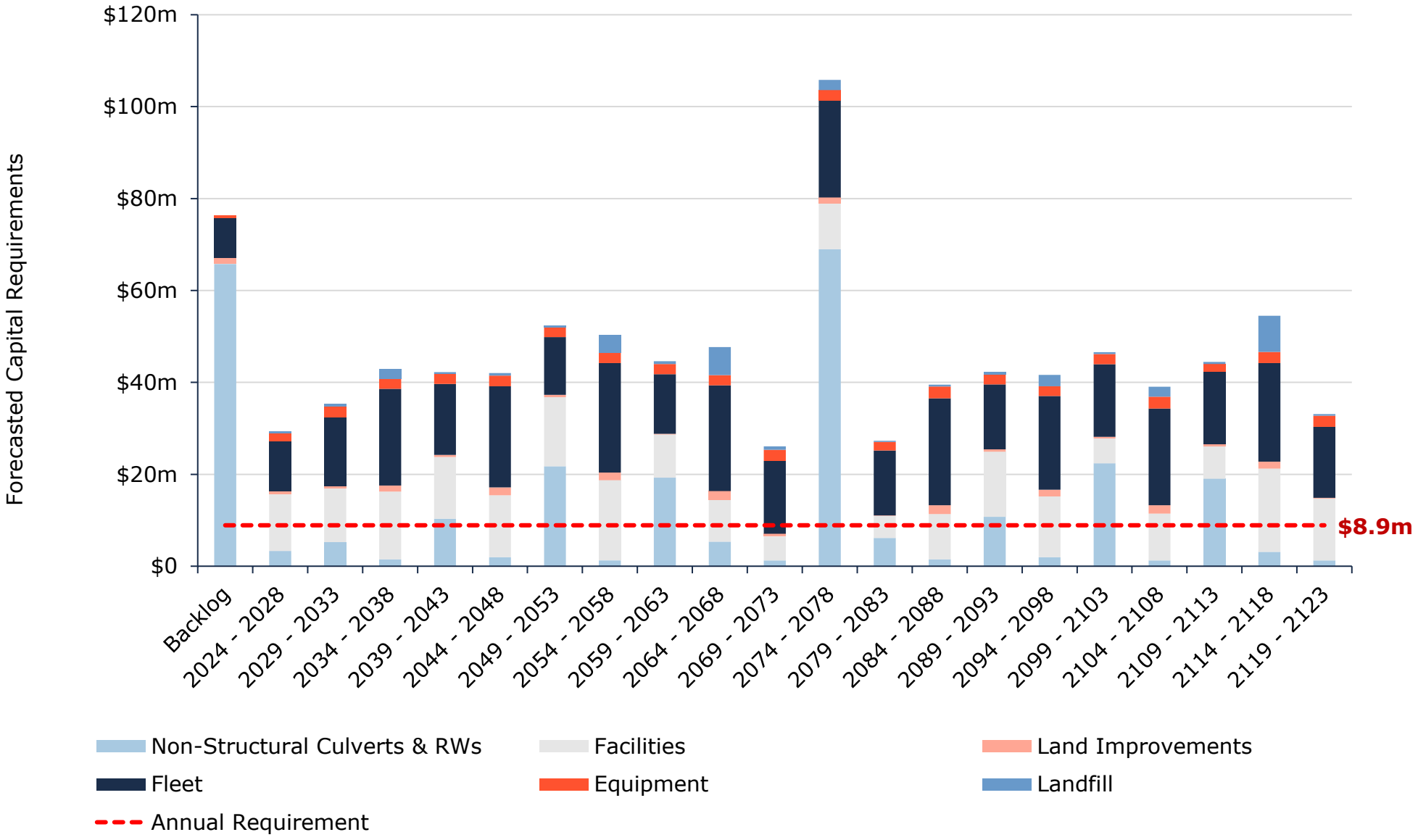

Figure 16 Capital Replacement Needs: Portfolio Overview 2024-2123

4. Non-Structural Culverts & Retaining Walls

The County's transportation network consists of roads and large bridges (both considered 'core' assets); however, it is also supported by smaller, non-structural culverts and retaining walls, with a current replacement cost of over $138 million.

4.1 Inventory & Valuation

Table 7 summarizes the quantity and current replacement cost of non-structural culverts and retaining walls. The County owns and manages 1,190 cross culverts, 4,295 entrance culverts, and two retaining walls.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Cross Culverts	1,190	Assets	$78,380,000	User-Defined
Entrance Culverts	4,295	Assets	$60,130,000	User-Defined
Retaining Walls	2	Assets	$350,000	User-Defined
TOTAL			**$138,860,000**	

Table 7 Detailed Asset Inventory: Non-Structural Culverts & Retaining Walls

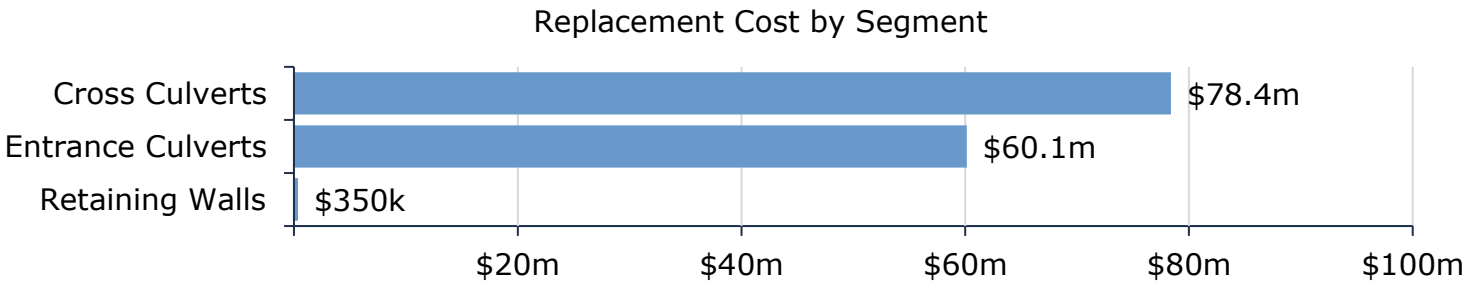

Figure 17 Portfolio Valuation: Non-Structural Culverts & Retaining Walls

4.2 Asset Condition

Figure 18 summarizes the replacement cost-weighted condition of the County's non-structural culverts and retaining walls. Based on a combination of County internal inspections and age-based projections, 38% of non-structural culverts are in fair or better condition. Some elements or components of these structures may be candidates for replacement or rehabilitation in the medium term and should be monitored for further degradation in condition. At 62% of the total non-structural culvert and retaining wall portfolio, assets in poor or worse condition may require

additional inspections to determine if replacement in the immediate or short term is actually required.

Note: *Entrance culverts do not have any assessed conditions associated with the 4,295 assets within Peterborough County's inventory, therefore their condition is projected based on age. This significantly skews the condition projection because entrance culverts have been input into their inventory with an in-service date of 1800 resulting in all entrance culverts reflecting 0% condition.*

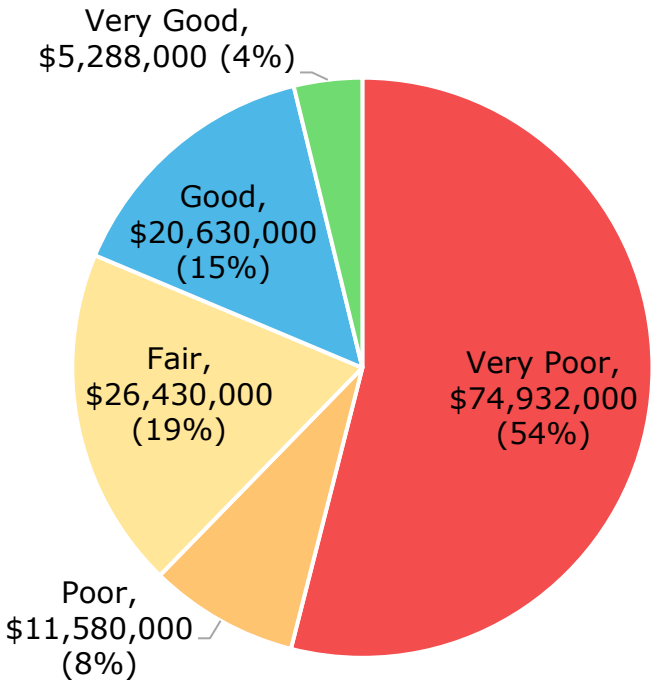

Figure 18 Asset Condition: Non-Structural Culverts & Retaining Walls Overall

As further detailed in Figure 19, based on a combination of in-field condition assessments and age-based condition projections, $86 million of culvert assets were assessed as being in poor or very poor condition. Assets with a poor or worse rating are not necessarily unsafe for regular use but should be monitored or scheduled for assessment.

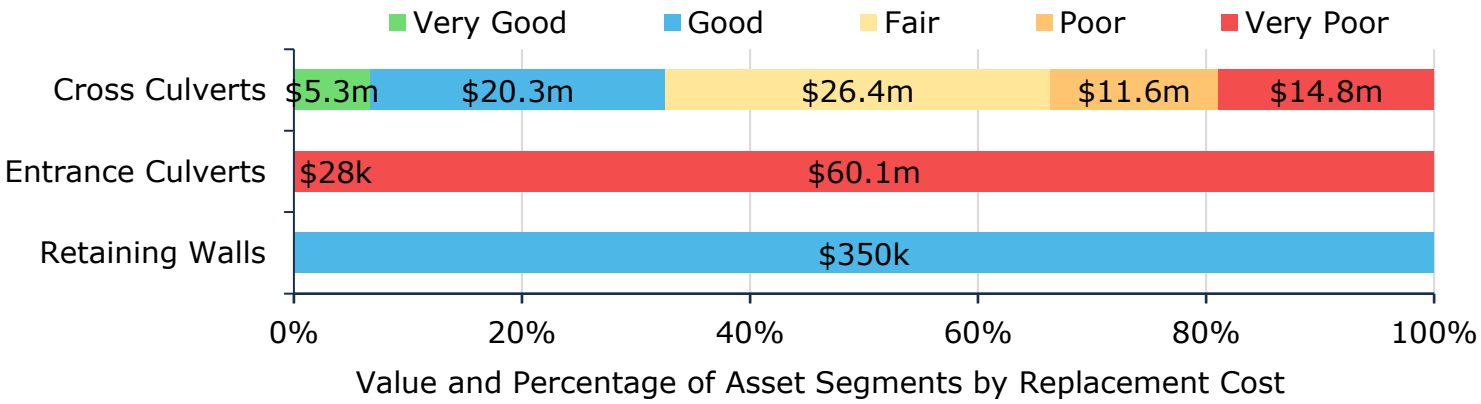

Figure 19 Asset Condition: Non-Structural Culverts & Retaining Walls by Segment

4.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 20 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

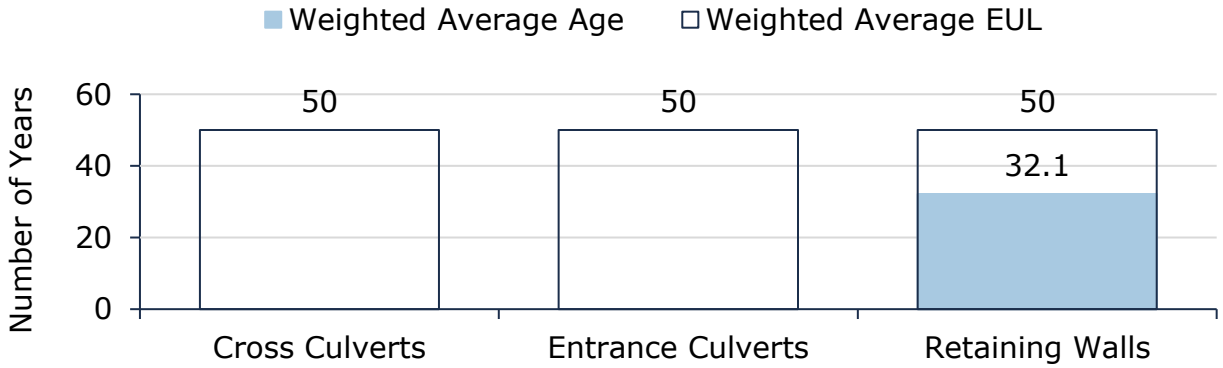

Figure 20 Estimated Useful Life vs. Asset Age: Non-Structural Culverts & Retaining Walls

***Note:** All Entrance Culvert assets were input into Citywide with an in-service date of 1800, and a majority of Cross Culvert assets with 1900, therefore age calculations are not available for the majority of assets in these segments.*

4.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the County's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Maintenance of culverts is typically reactive in nature including clearing blocked drainage paths or steaming of frozen culverts.
	Culverts in excellent or good condition require minimal action, with monitoring cycles of 8 years for regular culverts and 4 years for deep-fill culverts (>3.0m).
	Preventative measures like liners are considered for fair condition culverts to extend life expectancy without full replacement.
Rehabilitation / Replacement	During routine inspections culverts are assessed for opportunities for lining to extend the life expectancy without requiring replacement.
	Culverts in poor or failing condition are considered priorities for capital replacements. Consideration is also given to premature replacements when adjacent road upgrades are occurring.
	Replacement is strategically aligned with funded road reconstruction or rehabilitation projects to optimize budgets.
	For unfunded road sections, culverts requiring replacement are considered in the 5–10 year capital forecast or flagged for a new capital budget line.
Inspection	While bridges and structural culverts are inspected every 2 years, as per OSIM requirements, non-structural culverts are assessed by internal County staff every 3-4 years utilizing a scale of "excellent-good-fair-poor-failed".
	Deep-fill culverts (>3.0m) are inspected on a 4-year cycle to monitor conditions closely.
	Standard culverts are inspected on an 8-year cycle unless deemed unnecessary based on prior assessments.
	Results of inspections inform capital planning, ensuring culverts in poor or deteriorating condition are addressed in a timely manner.

Table 8 Lifecycle Management Strategy: Non-Structural Culverts & Retaining Walls

4.5 Forecasted Long-Term Replacement Needs

Figure 21 illustrates the cyclical short-, medium- and long-term infrastructure rehabilitation and replacement requirements for the County's non-structural culverts and retaining walls. This analysis was run until 2093 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the County's primary asset management system and asset register. The County's average annual requirements (red dotted line) for non-structural culverts and retaining walls total $3.1 million. 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.

These projections and estimates are based on asset replacement costs, age analysis, and condition data. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades. It is recommended to further investigate the conditions of these assets to more accurately project capital funding requirements in the coming decades.

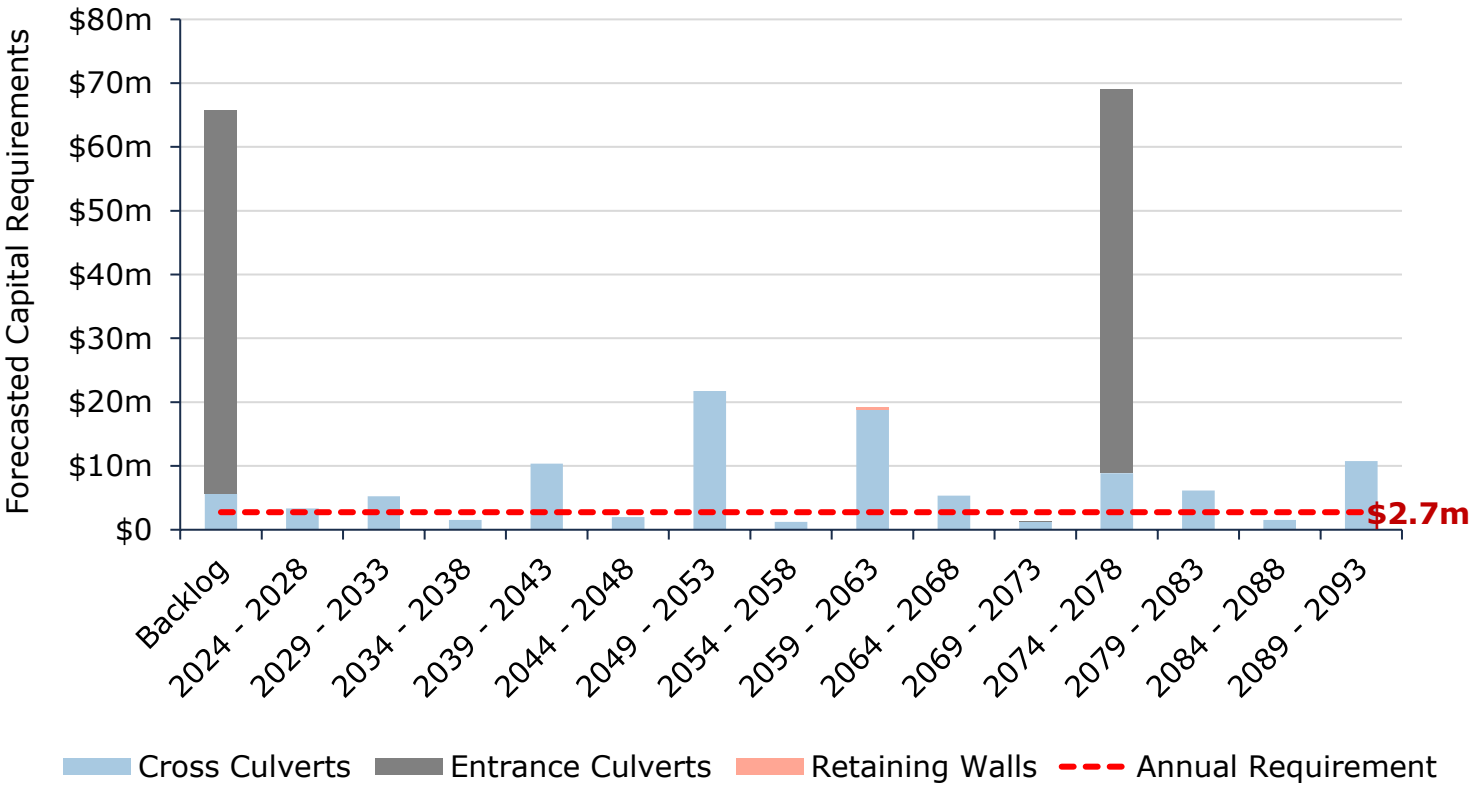

Figure 21 Forecasted Capital Replacement Needs: Non-Structural Culverts & Retaining Walls 2024-2093

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

4.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, replacement costs, and crossing type. The risk ratings for assets without useful attribute data were calculated using only condition, service life remaining, and their replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the County may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the County's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

1 - 4 **Very Low**	**5 - 7** **Low**	**8 - 9** **Moderate**	**10 - 14** **High**	**15 - 25** **Very High**
$61,478,000 (44%)	$76,932,000 (55%)	- (0%)	$450,000 (<1%)	- (0%)

Figure 22 Risk Matrix: Non-Structural Culverts & Retaining Walls

4.6.1 Qualitative Risks

The following section summarizes key trends, challenges, and risks to service delivery that the County is currently facing:

Aging Infrastructure
Historically, the lifecycle management strategy for bridges and structural culverts assets has been reactive. In recent years staff have focused on replacing poor condition structures but are still playing catch up on deferred lifecycle activities.

Climate Change & Extreme Weather Events
Flooding and extreme weather causes damage to multiple components of the County's bridges including the deck, superstructure, substructure, and approaches. The rising levels of freshwater and the increased frequency and intensity of precipitation events are likely to increase the deterioration of bridge components. Staff should identify and monitor effected bridges and culverts. The County also should prioritize infrastructure maintenance, rehabilitation, and replacement based on susceptibility to climate impacts.

Funding & Staff Capacity
The County has a large inventory of bridges & culvert assets which require regular maintenance and assessment. Staff capacity and expertise are sometimes insufficient to deploy optimal maintenance and assessment strategies. Major capital rehabilitation projects for bridges and culverts may also be deferred depending on the availability of grant funding opportunities. A long-term capital funding strategy can reduce dependency on grant funding and help prevent deferral of necessary capital works.

Growth
The County's growth will increase pressure on bridges and culverts, reducing their service lifespans and creating a need for additional assets. To meet future demands, the County is enhancing existing infrastructure, addressing vulnerabilities, and developing a long-term capital plan to support sustainable growth.

4.7 Levels of Service

The tables that follow summarize the County's current levels of service. There are no specifically prescribed KPIs under Ontario Regulation 588/17 for non-core assets, therefore the KPIs below represent performance measures that the County has selected for this AMP.

4.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description of the types of non-structural culverts infrastructure that the County manages	The County manages both cross culverts and entrance culverts throughout their road network to maintain drainage while ensuring uninhibited access on roadways and driveway entrances.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the Non-Structural Culverts & Retaining Walls	See Appendix C – Level of Service Maps & Photos

Table 9 O. Reg. 588/17 Community Levels of Service: Non-Structural Culverts & Retaining Walls

4.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Quality	Average condition for non-structural culverts in the County	48%[3] (Fair)
	Average condition for retaining walls in the County	75% (Good)
Performance	Target Capital Reinvestment Rate	2.0%

Table 10 O. Reg. 588/17 Technical Levels of Service: Non-Structural Culverts & Retaining Walls

[3] This figure reflects cross culverts only. Entrance culverts were listed as over 200 years old with only age-based condition projections available, dramatically skewing the average if included.

5. Facilities

The County's facilities portfolio includes buildings which support County administration and public works, Peterborough County-City Paramedics (PCCP), the County courthouse, and Lang Pioneer Village. The total current replacement of facilities is estimated at approximately $88 million.

5.1 Inventory & Valuation

Table 11 summarizes the quantity and current replacement cost of all buildings assets available in the County's asset register. The County's facilities underwent a comprehensive building condition assessment and inventory exercise in 2024 where buildings were separated into their components to better track maintenance tasks and project future capital requirements. The quantities listed represent the number of asset records currently available for each department.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Corporate	2 (439)	Buildings (Components)	$32,556,540	User-Defined
Lang Pioneer Village	4 (281)	Buildings (Components)	$11,374,650	User-Defined
PCCP	2 (278)	Buildings (Components)	$12,724,890	User-Defined
Public Works	19 (586)	Buildings (Components)	$31,284,531	User-Defined
TOTAL			**$87,940,611**	

Table 11 Detailed Asset Inventory: Facilities

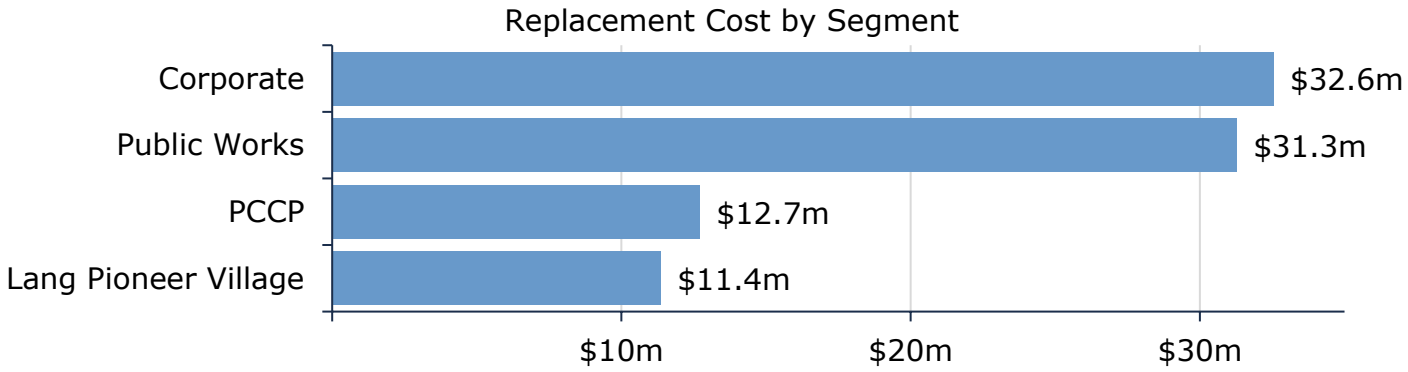

Figure 23 Portfolio Valuation: Facilities

5.2 Asset Condition

Figure 29 summarizes the replacement cost-weighted condition of the County's facilities portfolio. Based on building condition assessments completed in 2024, 71% of facilities assets are in fair or better condition; however, 29%, with a current replacement cost of more than $25 million are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

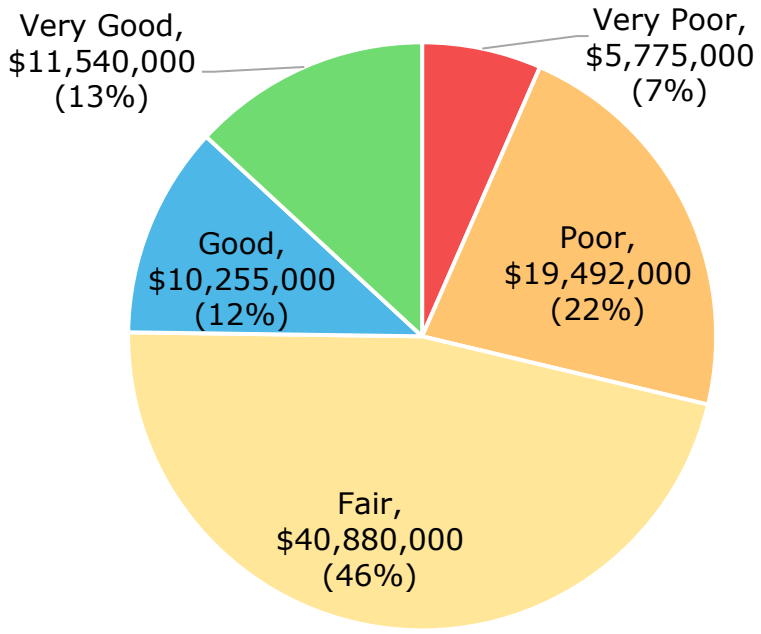

Figure 24 Asset Condition: Facilities Overall

Figure 25 summarizes the age-based condition of facilities by each department. A substantial portion of recreation assets and the majority of corporate and public works assets are in poor to worse condition.

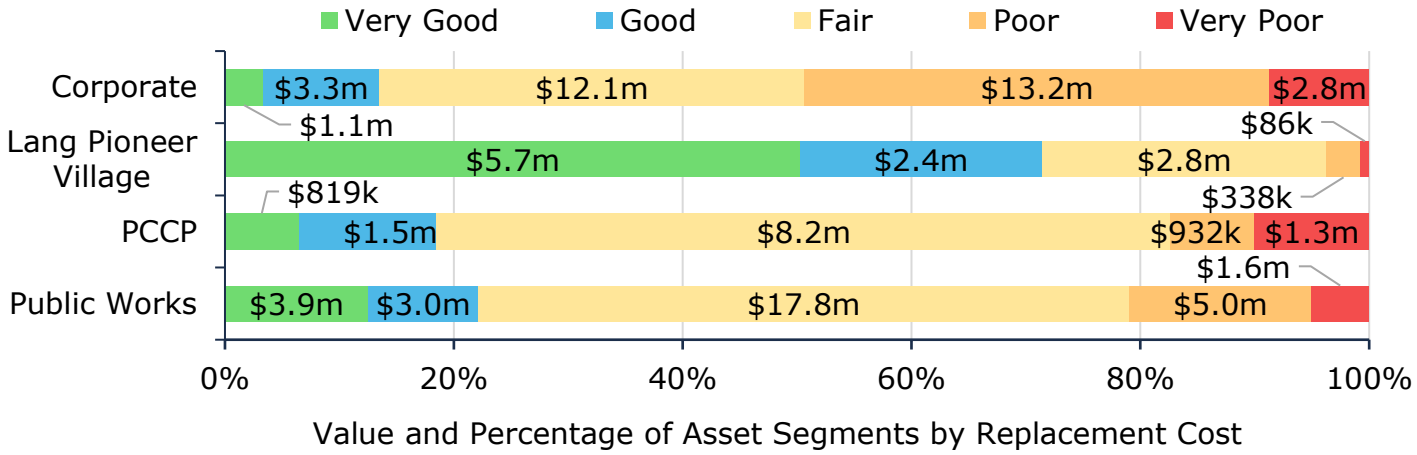

Figure 25 Asset Condition: Facilities by Segment

5.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 26 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

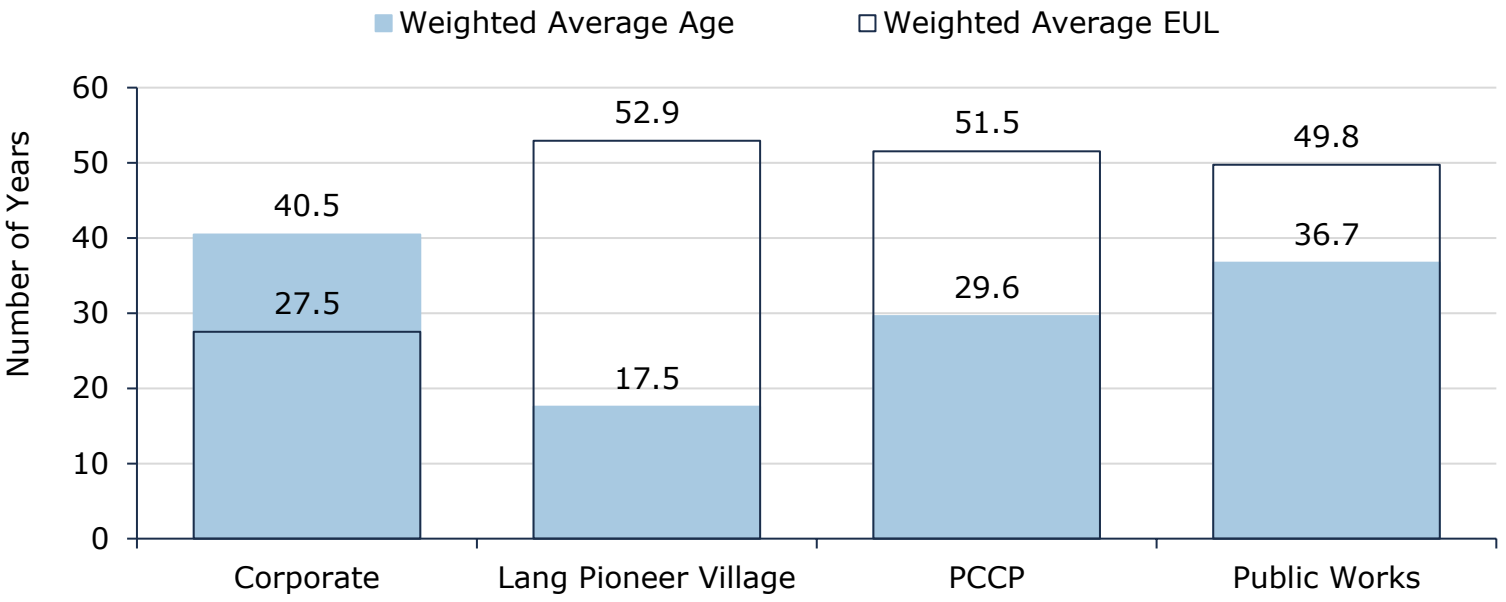

Figure 26 Estimated Useful Life vs. Asset Age: Facilities

Age analysis reveals that, on average, facilities assets are in the earlier stages of their serviceable life. However, based on acquisition years, corporate assets have surpassed their originally established useful life.

5.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

Table 12 outlines the County's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Maintenance is triggered by inspections idenfifying safety, accessibility, functionality, and structural issues.
	Routine/preventative maintenance is performed on assets such as HVAC equipment.
	All other maintenance activities are completed on a reactive basis when operational issues are identified through complaints and service requests.
Rehabilitation/ Replacement	Rehabilitations such as roof replacements or HVAC component replacements are considered on an as needed basis and are completed by a combination of County staff and external contractors.
	The primary considerations for asset replacement are asset failure, safety issues, and availability of grant funding.
	Replacements are considered in line with Building Condition Assessments or regulatory requirements.
Inspections	County buildings had Building Condition Assessments completed in 2024 to better understand the condition, replacement costs, and maintenance deficiencies of facilities assets.
	There is no prescribed schedule for the frequency of Building Condition Assessments.
	Mechanical systems inspections are completed regularly by certified inspectors to ensure routine maintenance is completed in a proactive manner.

Table 12 Lifecycle Management Strategy: Facilities

5.5 Forecasted Long-Term Replacement Needs

Figure 27 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the County's facilities portfolio. This analysis was run until 2123 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the County's primary asset management system and asset register. The County's average annual requirements (red dotted line) total $2.1 million for all facilities. 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.

Replacement needs are forecasted to rise consistently over the next 35 years, reaching almost $18 million between 2054 and 2058. These projections and estimates are based on current asset records, their replacement costs, and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

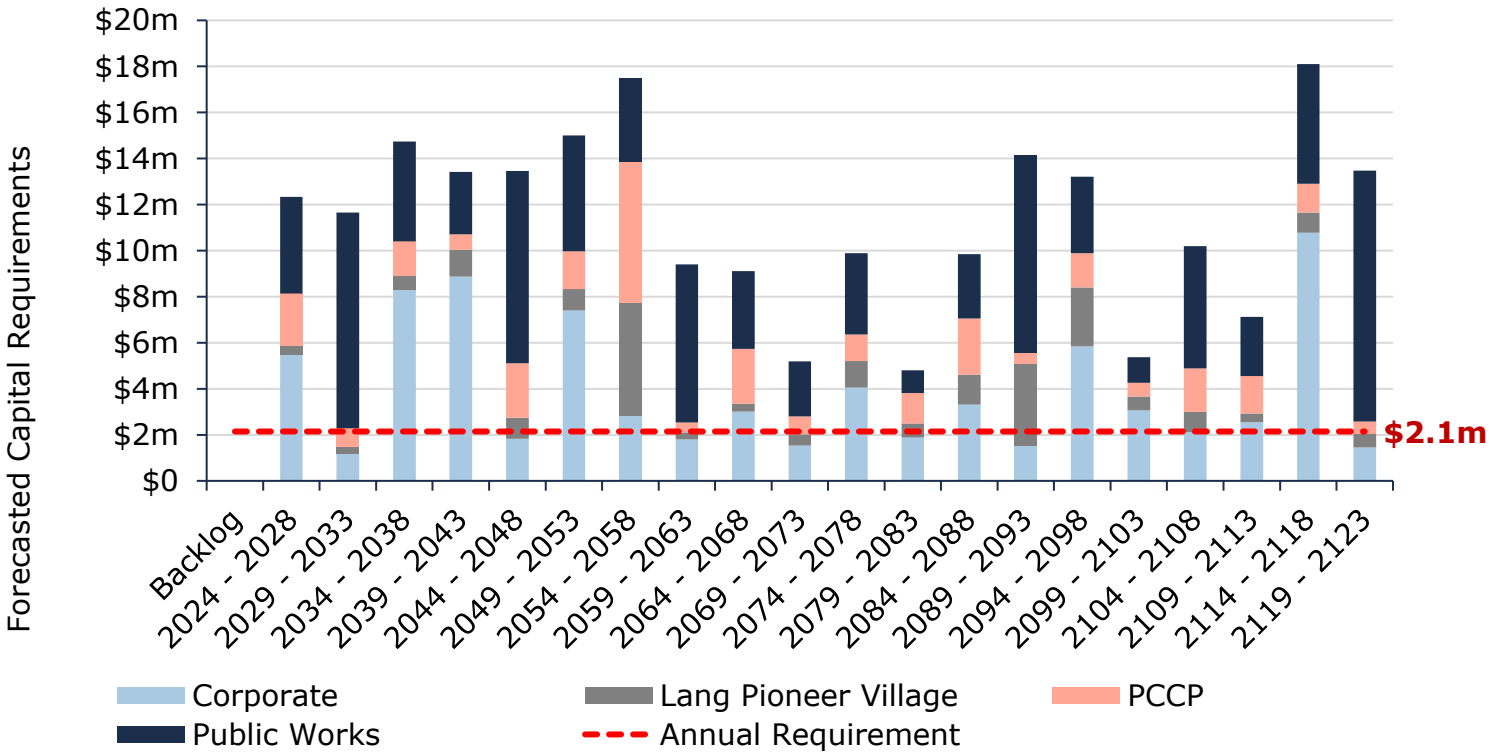

Figure 27 Forecasted Capital Replacement Needs Facilities 2024-2123

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. In addition, a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements. In the case of buildings and facilities, detailed componentization is necessary to develop more reliable lifecycle forecasts that reflect the needs of individual elements and components.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

5.6 Risk Analysis

The risk matrix below is generated using available asset data, including service life remaining, replacement costs, and building department. The risk ratings for assets without useful attribute data were calculated using only age, service life remaining, and their replacement costs.

The matrix classifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the County may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the County's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$18,364,115	$11,717,696	$9,566,720	$33,428,755	$14,863,325
(21%)	(13%)	(11%)	(38%)	(17%)

Figure 28 Risk Matrix: Facilities

5.6.1 Qualitative Risks

The following section summarizes key trends, challenges, and risks to service delivery that the County is currently facing as outlined in the asset management strategies questionnaire:

Asset Data & Information
There is a lack of confidence in the available inventory data and condition data. Staff plan to prioritize data refinement efforts to increase the accuracy and reliability of asset data and information. Once completed staff can confidently develop data-driven strategies to address infrastructure needs.

Lifecycle Management Strategies
The current lifecycle management strategy for all asset categories is considered more reactive than proactive. It is a challenge to find the right balance between maintenance, capital rehabilitation, and the replacement of assets. Staff hope to develop better defined strategies that will extend asset lifecycles and result in a lower total cost to the County. These strategies will require sustainable annual funding to minimize the deferral of capital works.

Organizational Capacity and Cognizance
Both short- and long-term planning requires the regular collection of infrastructure data to support asset management decision-making. Staff find it a continuous challenge to dedicate resources and time towards data collection and condition assessments to ensure that road condition and asset attribute data is regularly reviewed and updated. A standardized approach to data gathering and condition assessments with achievable goals can enable the County to regularly update their asset data and information

Climate Change & Extreme Weather
Asset deterioration is accelerated due to extreme weather, which in some cases can cause unexpected failures. Freeze-thaw cycles, ice jams, and surface flooding from extreme rainfall have been experienced by the County in recent years. These events make long-term planning difficult and can result in a lower level of service.

Infrastructure Reinvestment
The County has a substantial inventory of buildings that require regular maintenance and assessment. However, staff capacity and expertise are sometimes insufficient to implement optimal maintenance and assessment strategies. Major capital rehabilitation projects for buildings may also be deferred based on the availability of grant funding. Developing a long-term capital funding strategy can reduce reliance on grants and help prevent delays in essential capital works.

5.7 Levels of Service

The tables that follow summarize the County's current levels of service. There are no specifically prescribed KPIs under Ontario Regulation 588/17 for non-core assets, therefore the KPIs below represent performance measures that the County has selected for this AMP.

5.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Reliability	Description of lifecycle management strategies and assessment programs applied to Facilities assets	The County adopts a comprehensive lifecycle management strategy for Facilities assets that includes regular safety inspections and proactive maintenance and service. Reviews of critical Facilities assets are carried out in line with regulatory requirements for accessibility and community safety.
Accessibility	Description of the availability of Facilities assets	The County's Facilities assets are maintained at a high standard to ensure safe and reliable use. Facilities are available and ready for municipal staff to assist in service delivery. There is a constant push for additions to Facilities to increase their accessibility.

Table 13 Community Levels of Service: Facilities

5.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Quality	Average facility condition index value for facilities in the municipality	61% (Good)
	% of facilities assets in poor or worse conditions	29%
Performance	Target Capital Reinvestment Rate	2.4%

Table 14 Technical Levels of Service: Facilities

6. Land Improvements

The County's land improvements portfolio includes parking lots and parks assets. The total current replacement of land improvements is estimated at approximately $4.4 million.

6.1 Inventory & Valuation

Table 15 summarizes the quantity and current replacement cost of all land improvements assets available in the County's asset register. Parking lots account for the largest share of the land improvements asset group.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Parking Lots	28[4]	Assets	$3,041,712	CPI
Parks	1 (14)	Park (Components)	$1,367,250	User-Defined
TOTAL			**$4,408,962**	

Table 15 Detailed Asset Inventory: Land Improvements

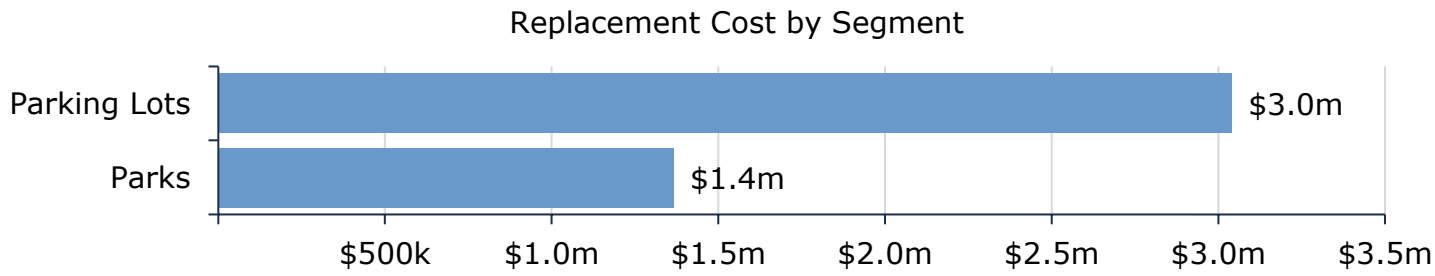

Figure 29 Portfolio Valuation: Land Improvements

6.2 Asset Condition

Figure 30 summarizes the replacement cost-weighted condition of the County's land improvements portfolio. Based on age data only, 43% of assets are in fair or better condition, the remaining 57% are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

[4] Parking Lot assets include facility parking lots (such as the Court House, Public Works Depots, etc.), as well as parking lot accessory assets (such as sidewalks leading to facilities).

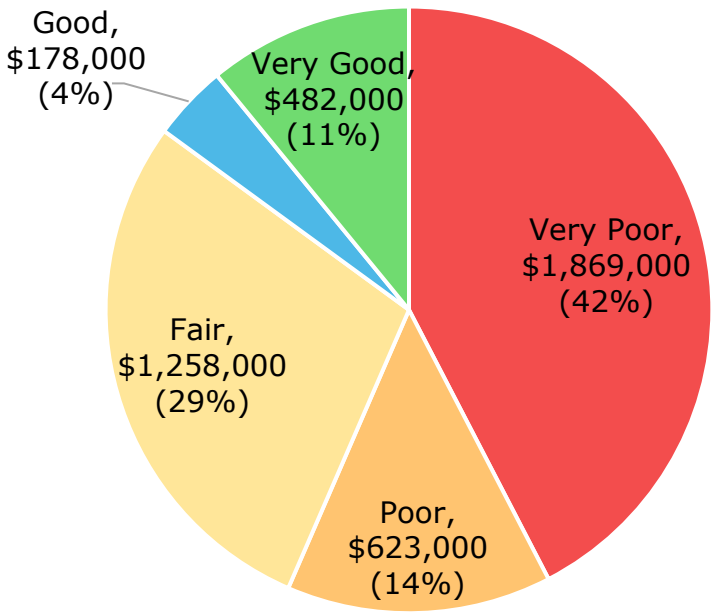

Figure 30 Asset Condition: Land Improvements Overall

Figure 31 summarizes the age-based condition of land improvements by each department. Assets in poor or worse condition are concentrated primarily in the parking lots segment.

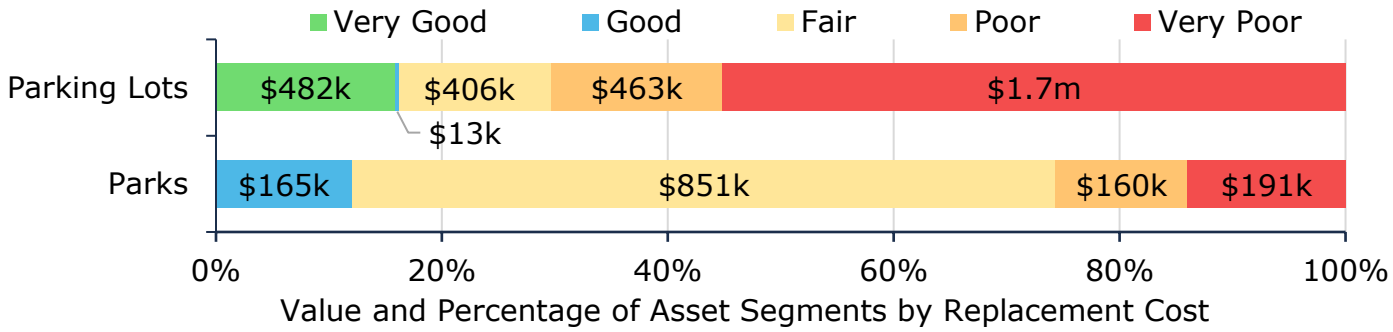

Figure 31 Asset Condition: Land Improvements by Segment

6.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 32 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

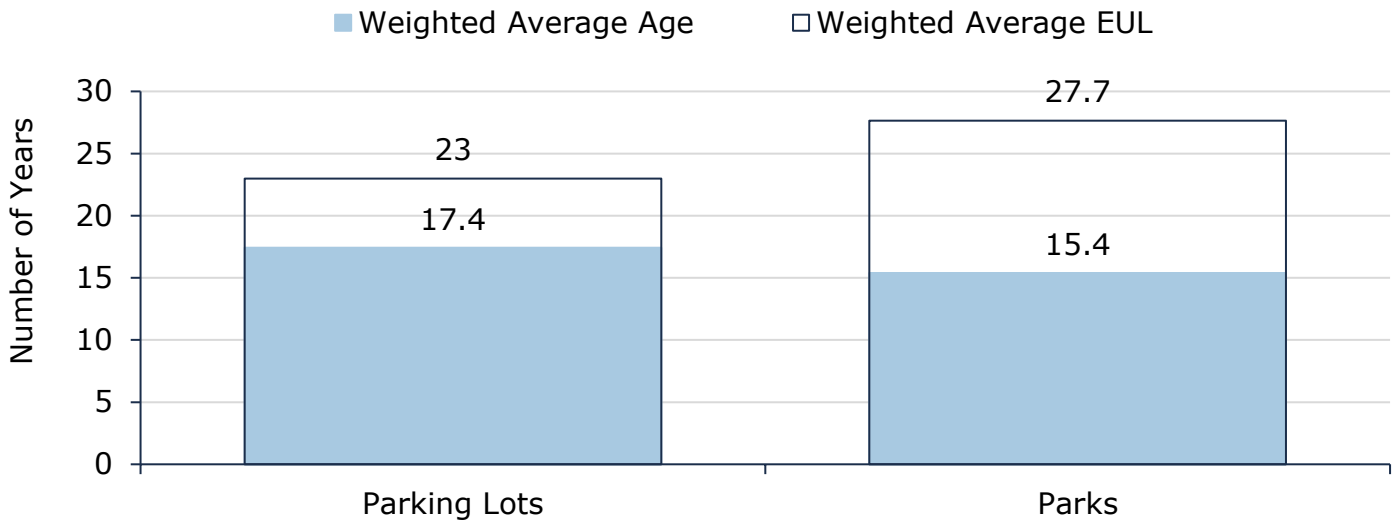

Figure 32 Estimated Useful Life vs. Asset Age: Land Improvements

Age analysis reveals that, on average, most parks and parking lot assets are in the moderate stages of their expected life.

6.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

Table 16 outlines the County's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Maintenance efforts are prioritized based on staff assessments and reported failures or signs of stress from the community.
Rehabilitation / Replacement	Replacement activities are conducted in line with assets estimated useful lives.
	Where applicable, assets under the scope of Building Condition Assessments are replaced as per report recommendations.
	Pavement parking lots are inspected on an ad-hoc basis to assess wear and tear, including cracks, potholes, and surface deterioration, ensuring safe and functional use.

Table 16 Lifecycle Management Strategy: Land Improvements

6.5 Forecasted Long-Term Replacement Needs

Figure 33 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the County's land improvements portfolio. This analysis was run until 2068 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the County's primary asset management system and asset register. The County's average annual requirements (red dotted line) total $203,000 for all land improvements. 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.

Replacement needs are forecasted to fluctuate over the 45-year time horizon, totaling $1.1 million in the next decade, and with peaks in 2044-2048 and 2064-2068 of $1.7 million and $1.9 million, respectively, as assets reach the end of their useful life. These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

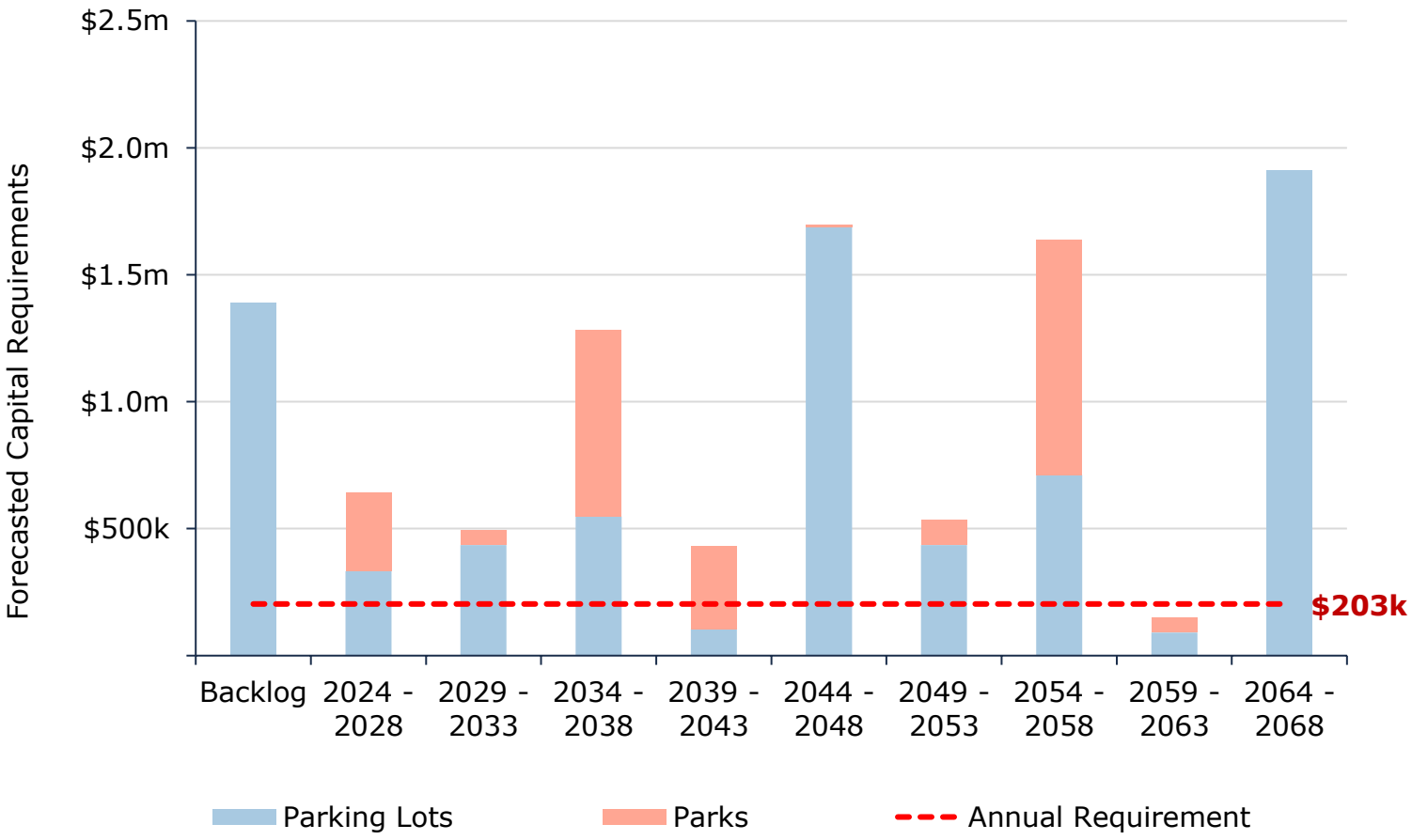

Figure 33 Forecasted Capital Replacement Needs: Land Improvements 2024-2068

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing

dedicated reserves. In addition, a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

6.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, and replacement costs. The risk ratings for assets without useful attribute data were calculated using only condition, service life remaining, and their replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the County may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the County's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

1 - 4 **Very Low**	5 - 7 **Low**	8 - 9 **Moderate**	10 - 14 **High**	15 - 25 **Very High**
$639,501 (15%)	$240,927 (5%)	$832,709 (19%)	$523,287 (12%)	$2,172,538 (49%)

Figure 34 Risk Matrix: Land Improvements

6.6.1 Qualitative Risks

The following section summarizes key trends, challenges, and risks to service delivery that the County is currently facing:

Climate Change & Extreme Weather
Asset deterioration is accelerated due to extreme weather, which in some cases can cause unexpected failures. Freeze-thaw cycles, ice jams, and surface flooding from extreme rainfall have been experienced by the County in recent years. These events make long-term planning difficult and can result in a lower level of service.

Capital Funding Strategies
Major capital rehabilitation and replacement projects are often entirely dependent on the availability of grant funding opportunities. When grants are not available, rehabilitation and replacement projects may be deferred. An annual capital funding strategy could reduce dependency on grant funding and help prevent deferral of capital works.

6.7 Levels of Service

The tables that follow summarize the County's current levels of service. There are no specifically prescribed KPIs under Ontario Regulation 588/17 for non-core assets, therefore the KPIs below represent performance measures that the County has selected for this AMP.

6.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description, which may include maps, of the land improvement assets that the County operated and maintains	The County maintains various parking lots throughout their jurisdiction, mainly relating to County owned facilities. Additionally, they are responsible for communication towers throughout the County, and park assets at Victoria Park.

Table 17 Community Levels of Service: Land Improvements

6.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Quality	Average condition of land improvement assets in the municipality	51% (Fair)
	% of land improvement assets in poor or worse conditions	57%
Performance	Target Capital Reinvestment Rate	4.6%

Table 18 Technical Levels of Service: Land Improvements

7. Fleet

The County's fleet portfolio includes 144 assets that support a variety of general and essential services, including public works, paramedic services (PCCP), corporate services, transit, and Lang Pioneer Village. The total current replacement of fleet is estimated at approximately $24 million.

7.1 Inventory & Valuation

Table 19 summarizes the quantity and current replacement cost of all fleet assets available in the County's asset register. Public works and PCCP account for the largest shares of the fleet portfolio.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Corporate	2	Assets	$121,598	User-Defined
Lang Pioneer Village	3	Assets	$80,788	User-Defined
PCCP	36	Assets	$6,242,430	User-Defined
Public Works - Heavy Equipment	39	Assets	$5,897,420	User-Defined
Public Works - Vehicles	62	Assets	$11,831,658	User-Defined
Transit	2	Assets	$265,160	User-Defined
TOTAL			**$24,439,054**	

Table 19 Detailed Asset Inventory: Fleet

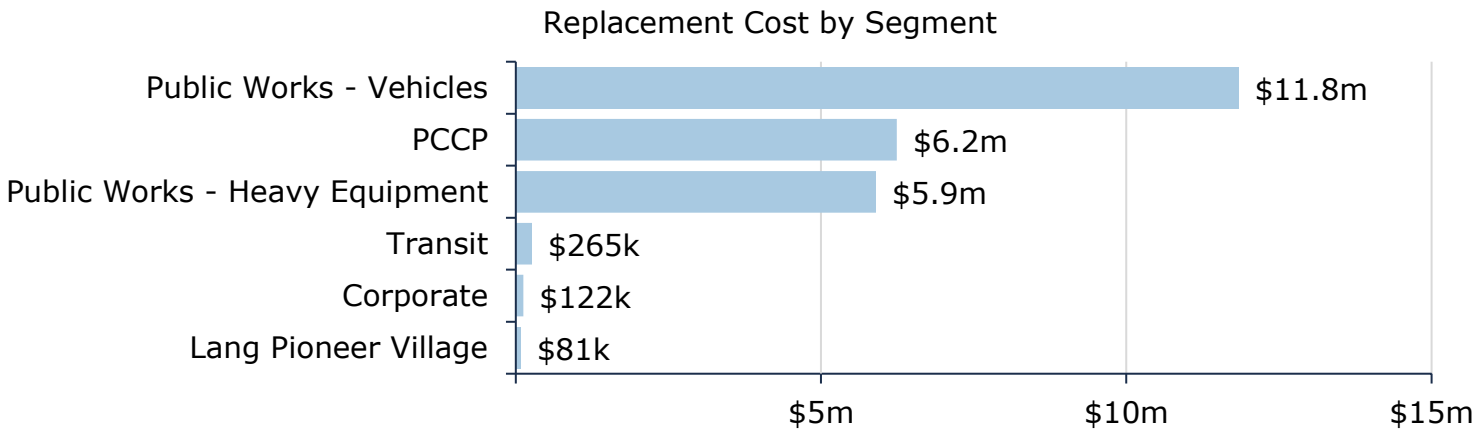

Figure 35 Portfolio Valuation: Fleet

7.2 Asset Condition

Figure 36 summarizes the replacement cost-weighted condition of the County's fleet portfolio. Based solely on age-based projections, 36% of the fleet are in fair or better condition, with the remaining 64% are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

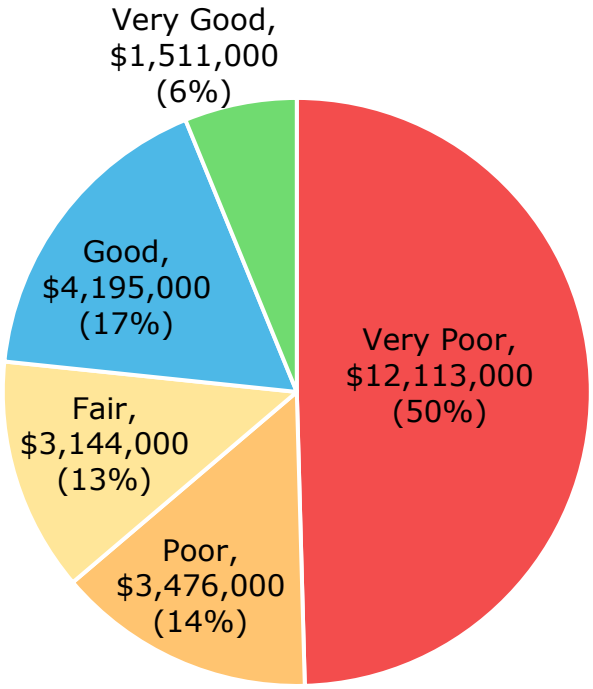

Figure 36 Asset Condition: Fleet Overall

Figure 37 summarizes the condition of fleet by each department. The distribution of fleet vehicles in good vs. poor condition is relatively even amongst departments, with no particular department standing out.

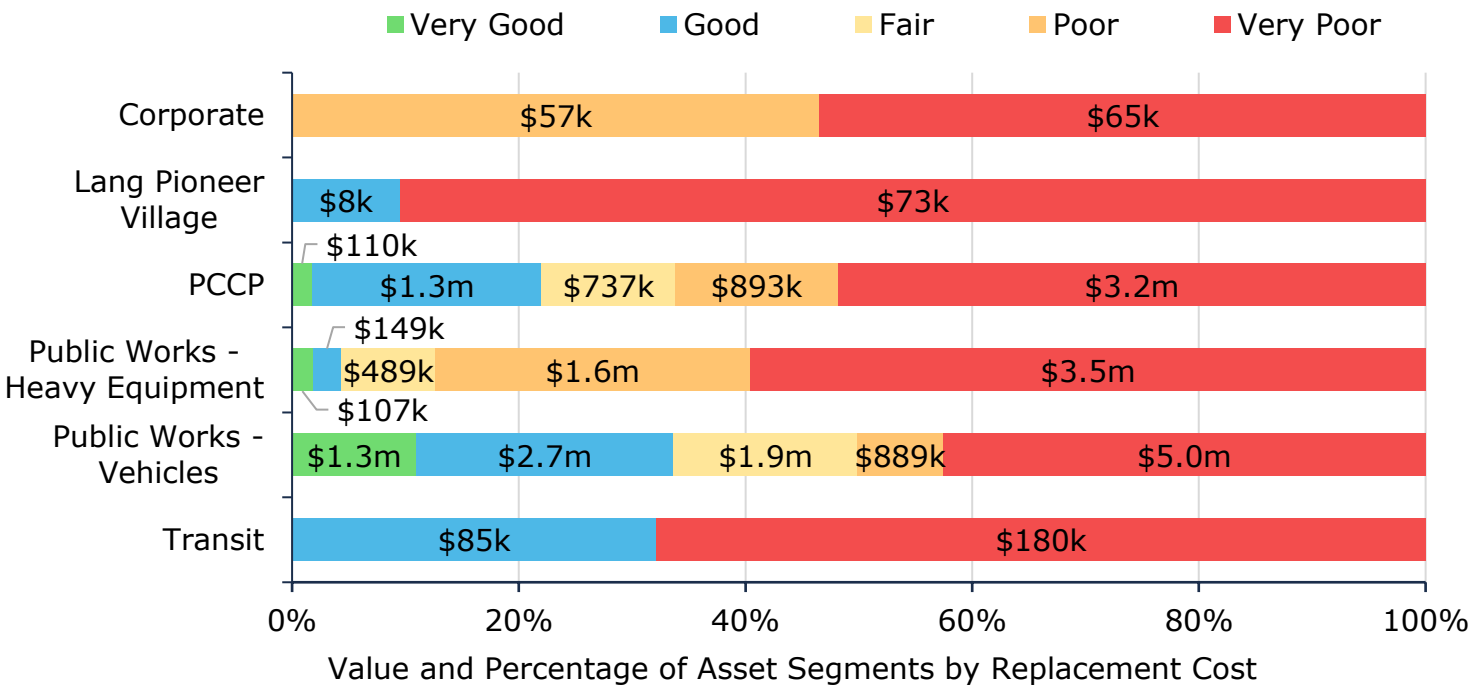

Figure 37 Asset Condition: Fleet by Segment

7.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data (if available), an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 38 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

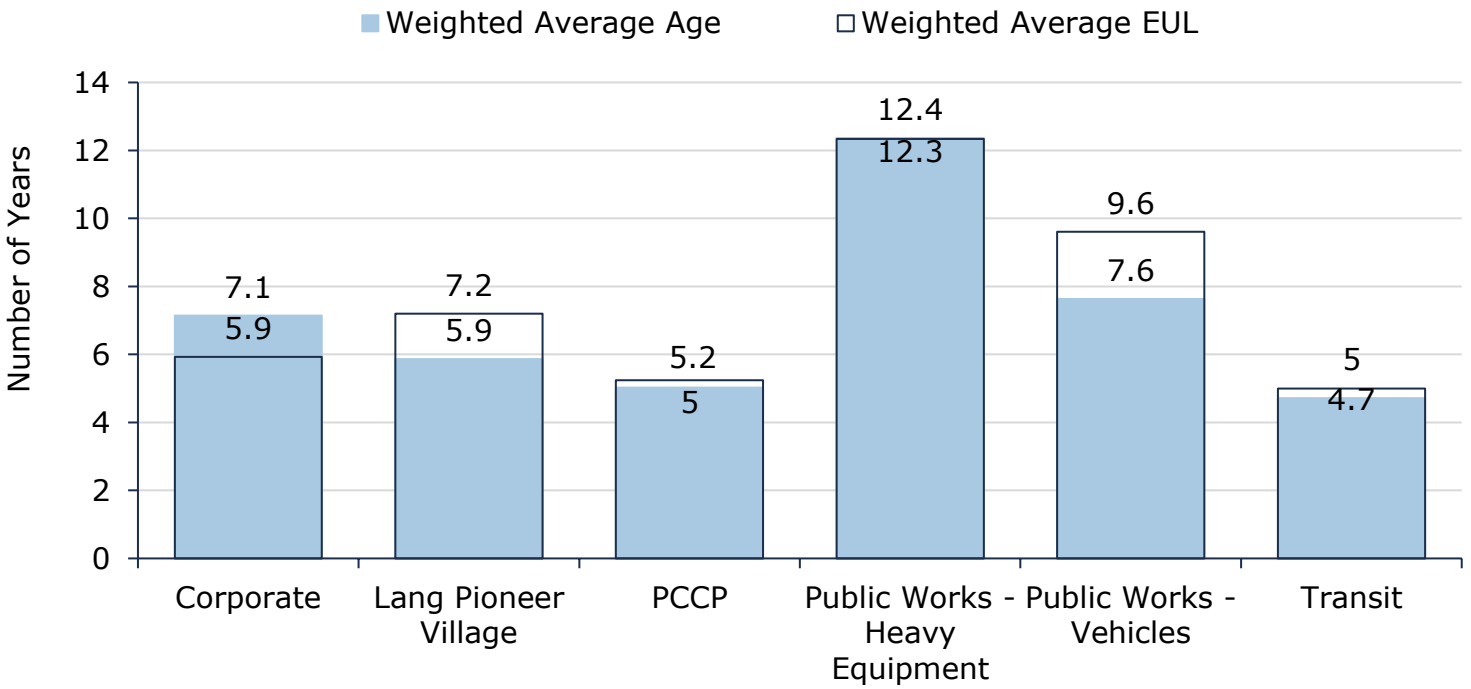

Figure 38 Estimated Useful Life vs. Asset Age: Fleet

Age analysis reveals that, on average, most vehicles are in the latter stages of their expected life. Assets in corporate services have remained in service beyond their established useful life.

7.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the County's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Oil changes and routine maintenance is completed as per manufacturer recommendations. The majority of maintenance is completed by in-house mechanics.
	Other maintenance activities are completed on a reactive, as-needed basis when operational issues are identified (e.g., mechanical breakdown, deficiencies identified during daily inspections)
Rehabilitation/ Replacement	Rehabilitation events such as a transmission or engine replacement is completed on an as-needed basis. Internal staff conduct a cost-benefit analysis of major rehabilitations vs. replacement.

	Fleet assets are replaced in line with a 5-20 year schedule, dependent on vehicle type. Despite a defined replacement schedule, fleet supervisors often flex this schedule to minimize the cost of maintenance attributed to problematic vehicles.
	When a fleet asset's target replacement year is approaching, staff consider a variety of factors to determine replacement timing and strategies including maintenance costs, service level changes, new technologies, and legislation changes.
Inspections	Fleet vehicles and heavy equipment are informally assessed by the operator daily before use.
	Licensed vehicles are inspected annually in line with Ministry of Transportation standards. As with inspections of non-licensed vehicles, any identified deficiencies are prioritized in the vehicle's maintenance schedule. These inspections do not currently provide AM usable condition ratings.

Table 20 Lifecycle Management Strategy: Fleet

7.5 Forecasted Long-Term Replacement Needs

Figure 39 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the County's fleet portfolio. This analysis was run until 2043 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the County's primary asset management system and asset register. The County's average annual requirements (red dotted line) total $3.0 million for all fleet vehicles. 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.

Replacement needs are forecasted to rise considerably in the next 15 years, peaking at $21 million by 2034 as vehicles reach the end of their useful life. These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

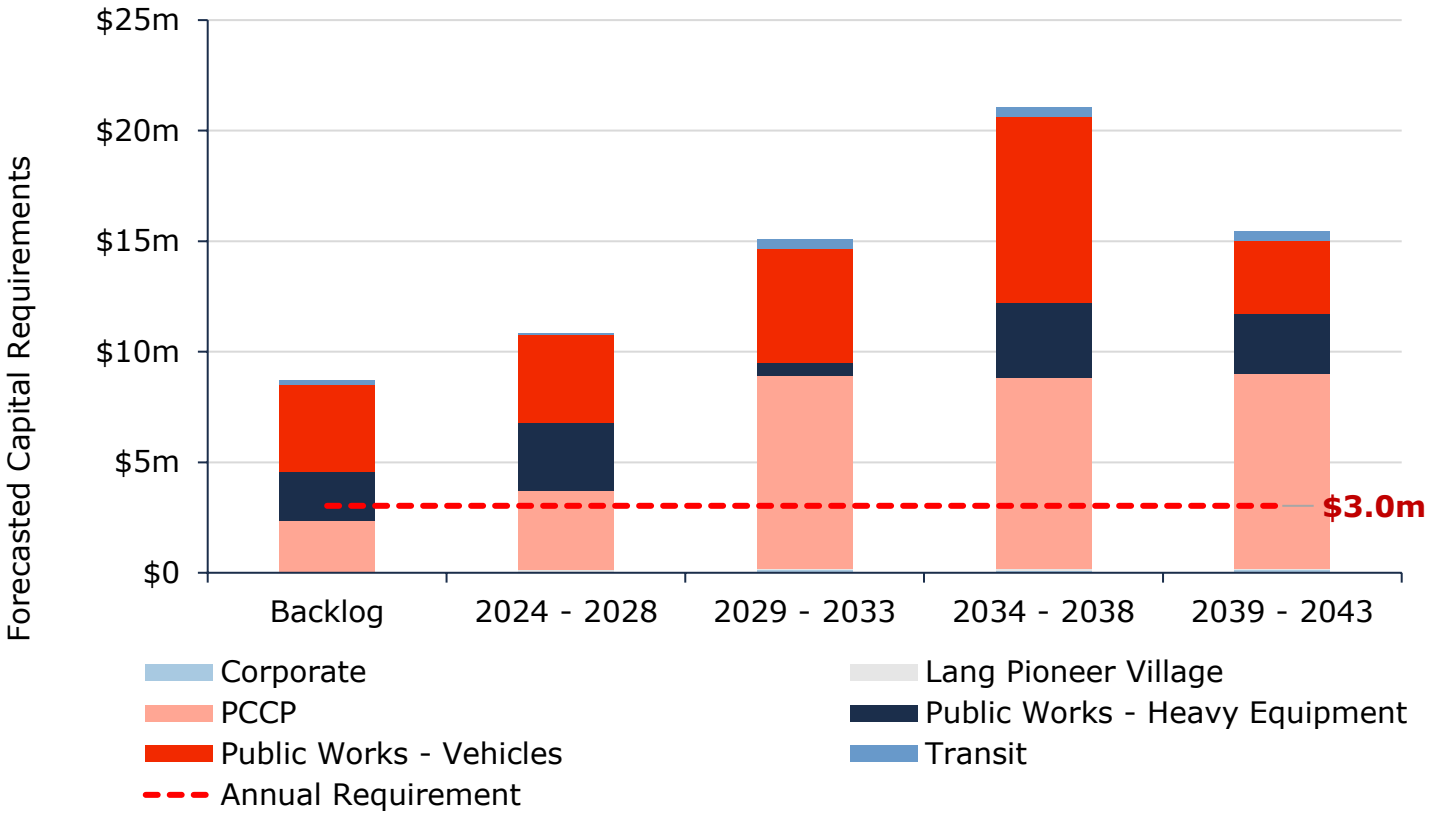

Figure 39 Forecasted Capital Replacement Needs: Fleet 2024-2043

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. In addition, a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

7.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, replacement costs, and department or service area. The risk ratings for assets without useful attribute data were calculated using only condition, service life remaining, and their replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the County may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the County's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

1 - 4 **Very Low** $2,017,524 (8%)	5 - 7 **Low** $2,284,524 (9%)	8 - 9 **Moderate** $2,083,681 (9%)	10 - 14 **High** $5,813,977 (24%)	15 - 25 **Very High** $12,239,348 (50%)

Figure 40 Risk Matrix: Fleet

7.6.1 Qualitative Risks

The following section summarizes key trends, challenges, and risks to service delivery that the County is currently facing as outlined in the asset management strategies questionnaire:

Aging Infrastructure & Funding Strategies
Current funding levels are sufficient in addressing fleet assets' lifecycle requirements and maintain operations. However, as these assets age, they are likely to incur higher O&M costs to remain functional and compliant with standards. While the current funding strategy is sufficient, this balance could be impacted by shifting council priorities, unforeseen expenses, or other funding pressures in the future.

Asset Data & Information
There is a lack of confidence in the available inventory data and condition data. Staff plan to prioritize data refinement efforts to increase the accuracy and reliability of asset data and information. Once completed staff can confidently develop data-driven strategies to address infrastructure needs.

7.7 Levels of Service

The tables that follow summarize the County's current levels of service. There are no specifically prescribed KPIs under Ontario Regulation 588/17 for non-core assets, therefore the KPIs below represent performance measures that the County has selected for this AMP.

7.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Scope	Description of the availability of Fleet assets to Public Works	The County's Fleet assets are maintained at a high standard to ensure safe and reliable use. Services are available and ready for municipal staff to assist in service delivery.
Reliability	Description of lifecycle management strategies and assessment programs applied to Fleet assets	The County adopts a comprehensive lifecycle management strategy for Fleet assets that includes regular safety inspections and proactive maintenance and service. Reviews of critical fleet assets are carried out in line with regulatory requirements.

Table 21 Community Levels of Service: Fleet

7.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Quality	Average condition of fleet assets	30% (Poor)
	% of fleet assets in poor or worse condition	64%
Performance	Target Capital Reinvestment Rate	12.4%

Table 22 Technical Levels of Service: Fleet

8. Equipment

The County's equipment portfolio includes 84 assets that support a variety of general and essential services, including I.T., Paramedics Services (PCCP), public works, and Lang Pioneer Village. The total current replacement of equipment is estimated at approximately $3.1 million.

8.1 Inventory & Valuation

Figure 41 summarizes the quantity and current replacement cost of all equipment assets available in the County's asset register.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Corporate	1	Assets	$12,569	CPI
IT	13	Assets	$519,268	CPI
Lang Pioneer Village	5	Assets	$139,672	CPI
PCCP	47	Assets	$1,669,767	CPI
Public Works	18	Assets	$753,240	CPI
TOTAL			**$3,094,516**	

Table 23 Detailed Asset Inventory: Equipment

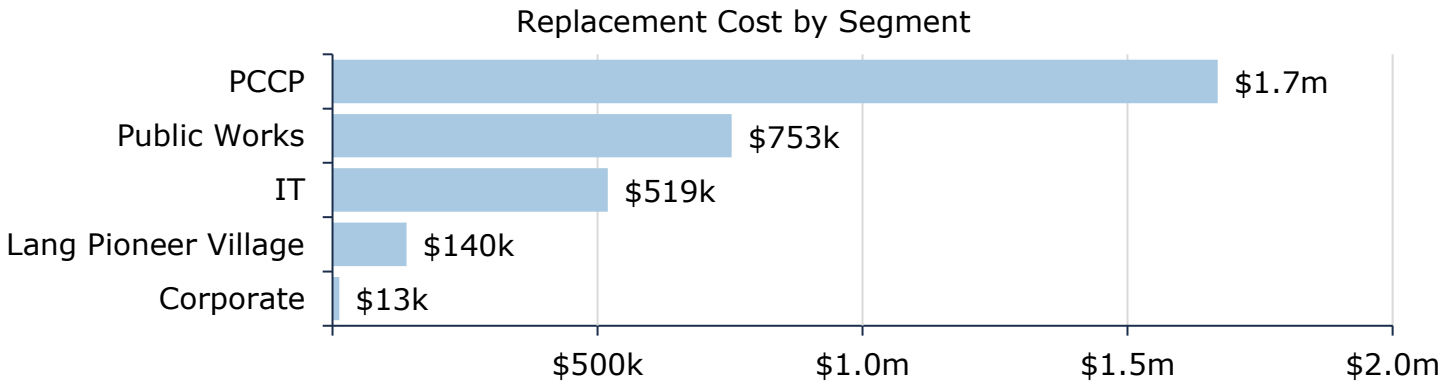

Figure 41 Portfolio Valuation: Equipment

8.2 Asset Condition

Figure 42 summarizes the replacement cost-weighted condition of the County's equipment portfolio. Based only on age data, 50% of assets are in fair or better condition; the remaining 50% are in poor or worse condition. These assets may be candidates for replacement in the short term; similarly, assets in fair condition may require rehabilitation or replacement in the medium term and should be monitored for further degradation in condition.

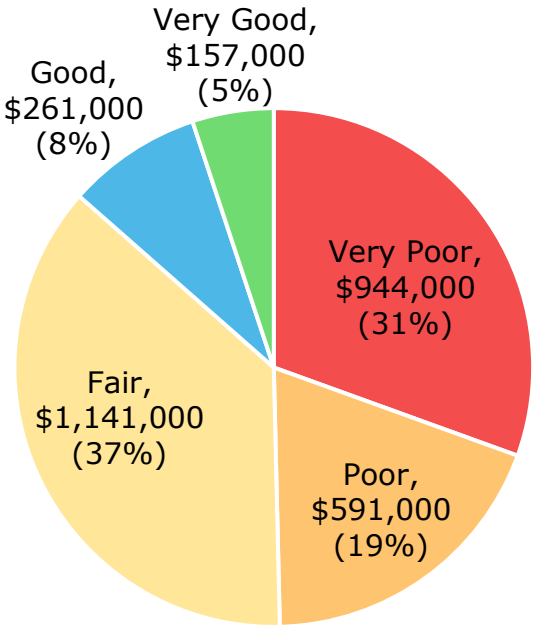

Figure 42 Asset Condition: Equipment Overall

Figure 43 summarizes the age-based condition of equipment by each department. The majority of assets that support PCCP are in fair or better condition. Assets in poor or worse condition are concentrated primarily in corporate services and I.T.

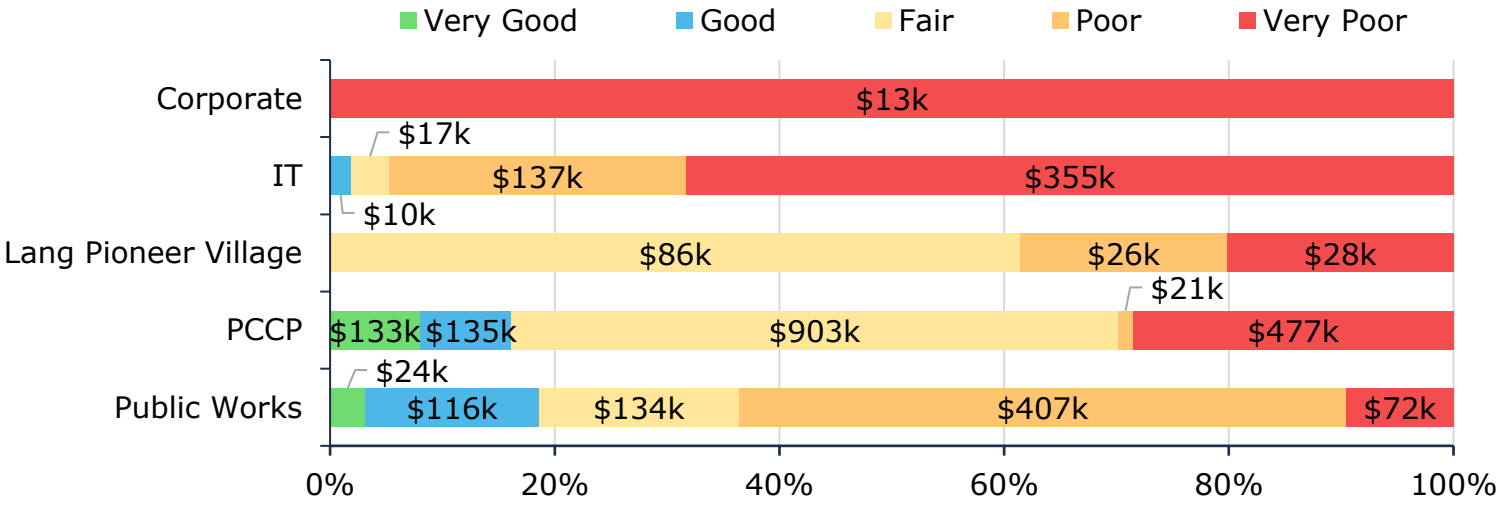

Figure 43 Asset Condition: Equipment by Segment

8.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 44 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

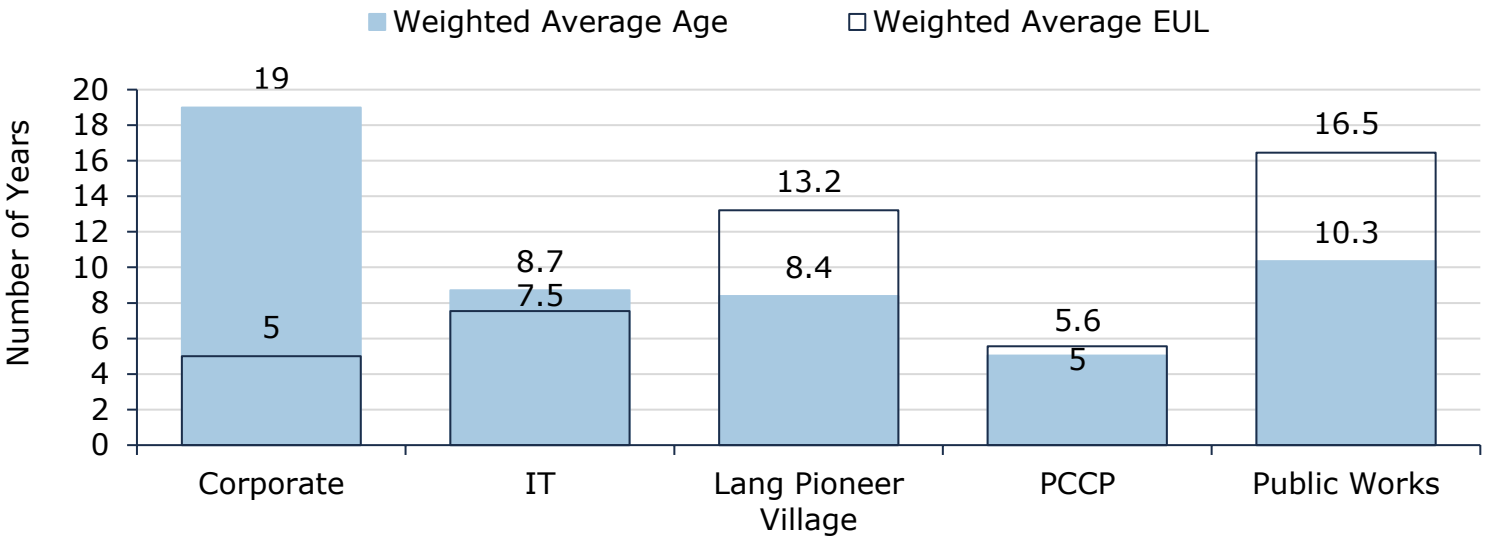

Figure 44 Estimated Useful Life vs. Asset Age: Equipment

Age analysis reveals that, on average, with the exception of Lang Pioneer Village and Public Works, most equipment assets are in the latter stages of their expected life or have well surpassed the originally intended lifespan.

8.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the County's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Maintenance activities are generally completed on a reactive basis when operational issues are identified (e.g., mechanical breakdown, deficiencies identified during daily inspections)
Replacement	Without the availability of up-to-date condition assessment information replacement activities are purely reactive in nature
Inspections	Equipment is inspected by staff before use, however, these inspections identify deficiencies but do not provide overall condition ratings

Table 24 Lifecycle Management Strategy: Equipment

8.5 Forecasted Long-Term Replacement Needs

Figure 45 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for the County's equipment portfolio. This analysis was run until 2043 to capture at least one iteration of replacement for the longest-lived asset in Citywide Assets, the County's primary asset management system and asset register. The County's average annual requirements (red dotted line) total $444,000 for all equipment. 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.

Replacement needs are forecasted to remain relatively consistent over the 20-year projection period, peaking at $2.2 million in the latter half of this decade. These projections and estimates are based on asset replacement costs and age analysis. They are designed to provide a long-term, portfolio-level overview of capital needs and should be used to support improved financial planning over several decades.

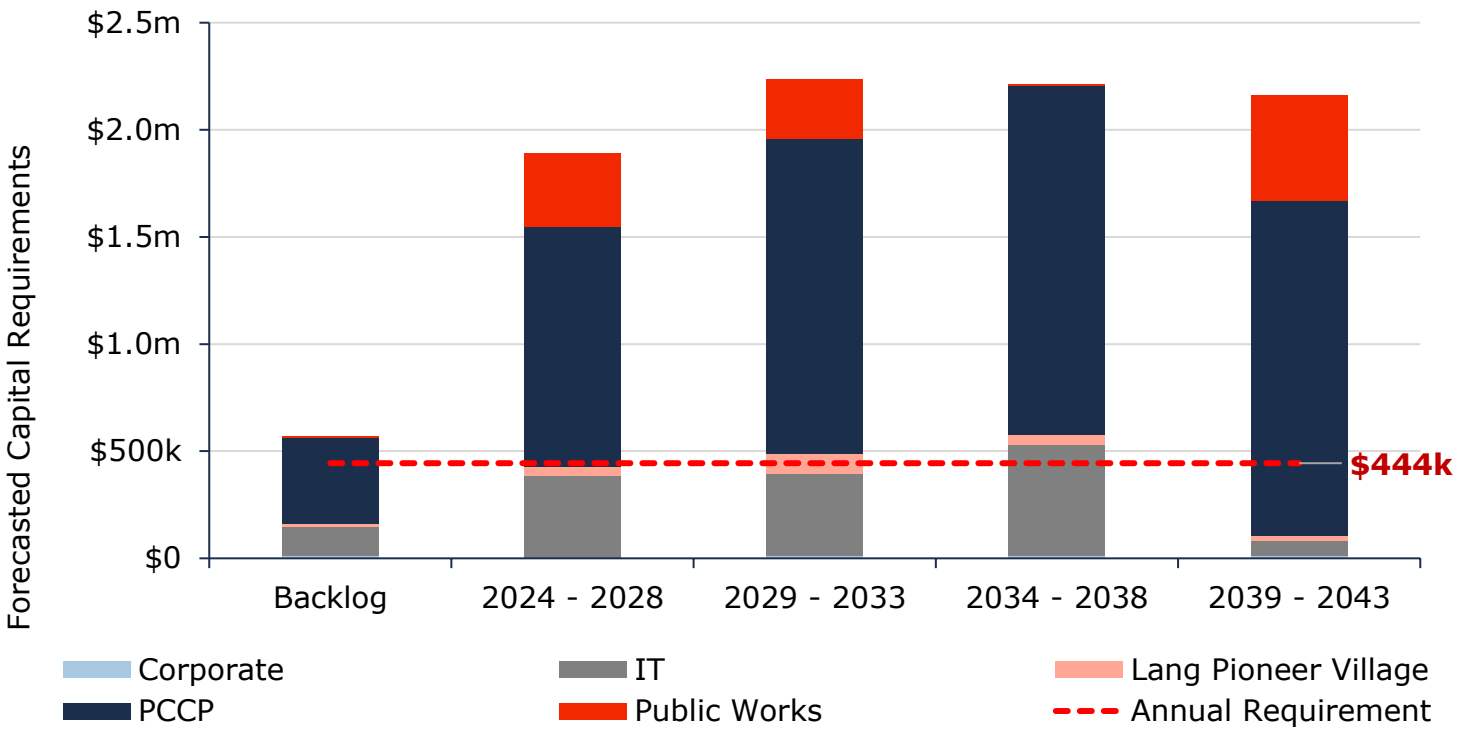

Figure 45 Forecasted Capital Replacement Needs: Equipment 2024-2043

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves. In addition, a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including replacements.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

8.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, replacement costs, and service criticality. The risk ratings for assets without useful attribute data were calculated using only condition, service life remaining, and their replacement costs.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the County may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the County's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

1 - 4 Very Low $481,084 (16%)	5 - 7 Low $1,089,036 (35%)	8 - 9 Moderate $229,888 (7%)	10 - 14 High $420,213 (14%)	15 - 25 Very High $874,295 (28%)

Figure 46 Risk Matrix: Equipment

8.6.1 Qualitative Risks

The following section summarizes key trends, challenges, and risks to service delivery that the County is currently facing as outlined in the asset management strategies questionnaire:

Organizational Capacity and Cognizance
Short- and long-term planning across departments relies on the regular collection of infrastructure data to support effective asset management decisions. However, the ability to dedicate time and resources to data collection and condition assessments varies by department, making it challenging to ensure that asset condition and attribute data are consistently reviewed and updated. Implementing a standardized, goal-oriented approach to data gathering and condition assessments can help the County maintain up-to-date and reliable asset information across all departments.

8.7 Levels of Service

The tables that follow summarize the County's current levels of service. There are no specifically prescribed KPIs under Ontario Regulation 588/17 for non-core assets, therefore the KPIs below represent performance measures that the County has selected for this AMP.

8.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Reliability	Description of lifecycle management strategies and assessment programs applied to Equipment assets	The County utilizes a lifecycle management strategy for Equipment assets that includes availability assurance and time-based assessments. Reviews of safety critical assets are carried out in line with regulatory requirements and staff advisement.

Table 25 Community Levels of Service: Equipment

8.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Quality	Average condition of equipment assets	34% (Poor)
	% of equipment assets in poor or worse condition	50%
Performance	Target Capital Reinvestment Rate	14.4%

Table 26 Technical Levels of Service: Equipment

9. Landfill

The landfill category is slightly different than other categories presented in this AMP. The landfill itself is jointly funded by both Peterborough County and the City of Peterborough, with the City being the managing partner. While there are additional capital components the landfill outside of those listed in this section, the County is only responsible for 50% of costs of landfill fleet and land improvement assets. The analysis presented below represents analysis of the entirety of the asset segments for which the County has a vested interest, unless otherwise noted.

Note: *All asset data presented in this category was provided courtesy of the City of Peterborough and is not actively managed by the County*.

9.1 Inventory & Valuation

Table 27 summarizes the quantity and current replacement cost of all landfill assets available in the County's asset register.

Segment	Quantity	Unit of Measure	Replacement Cost	Primary RC Method
Landfill Fleet	2	Assets	$80,819	Provided by City
Landfill Land Improvement	80	Assets	$22,740,708	Provided by City
TOTAL			**$22,821,527**	
County Portion (50%)			**$11,410,764**	

Table 27 Detailed Asset Inventory: Landfill

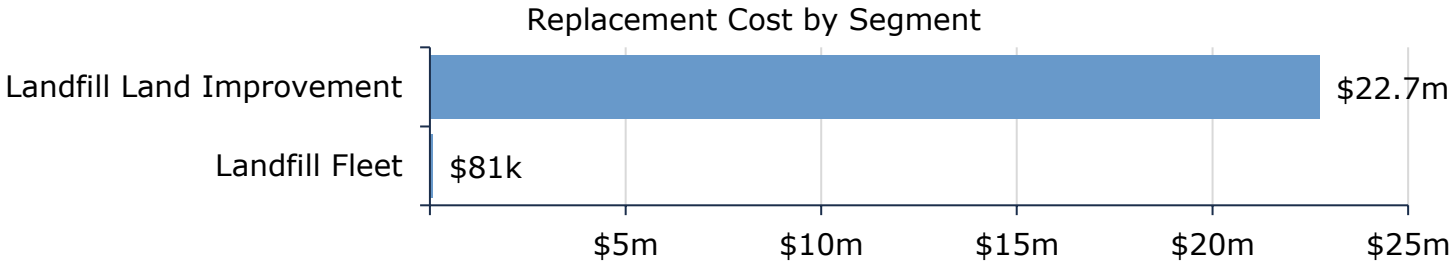

Figure 47 Portfolio Valuation: Landfill

9.2 Asset Condition

Figure 48 summarizes the replacement cost-weighted condition of the County's landfill assets. Based on age data only, approximately 35% of assets are in poor to very poor condition.

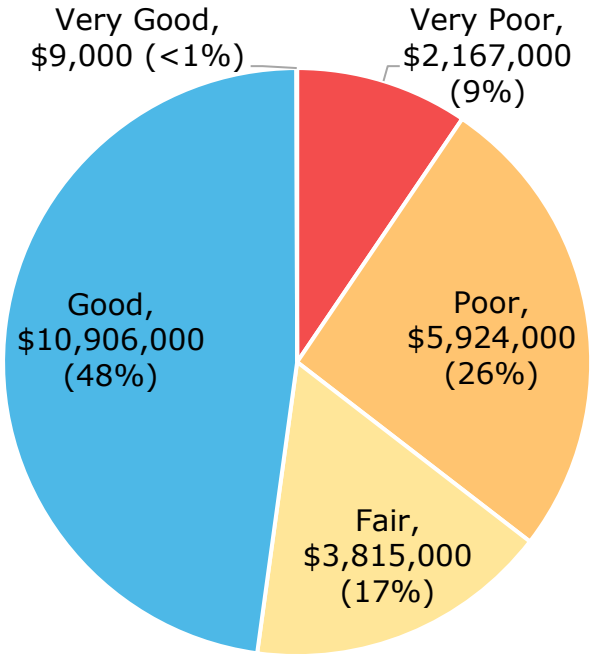

Figure 48 Asset Condition: Landfill Overall

Figure 49 summarizes the age-based condition of landfill assets. The analysis illustrates that the majority of the landfill fleet is in very poor condition. This metric is likely skewed by the lack of assessed condition data for fleet vehicles. 35% of landfill land improvements, with a current replacement cost of $8.1 million, are indicated to be in poor or worse condition.

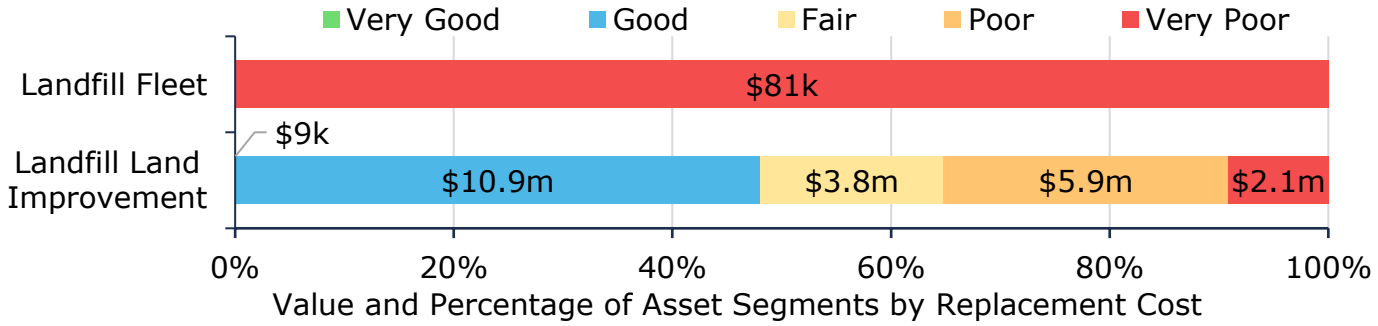

Figure 49 Asset Condition: Landfill by Segment

9.3 Age Profile

An asset's age profile comprises two key values: estimated useful life (EUL), or design life; and the percentage of EUL consumed. The EUL is the serviceable lifespan of an asset during which it

can continue to fulfil its intended purpose and provide value to users, safely and efficiently. As assets age, their performance diminishes, often more rapidly as they approach the end of their design life.

In conjunction with condition data, an asset's age profile provides a more complete summary of the state of infrastructure. It can help identify assets that may be candidates for further review through condition assessment programs; inform the selection of optimal lifecycle strategies; and improve planning for potential replacement spikes.

Figure 50 illustrates the average current age of each asset type and its estimated useful life. Both values are weighted by the replacement cost of individual assets.

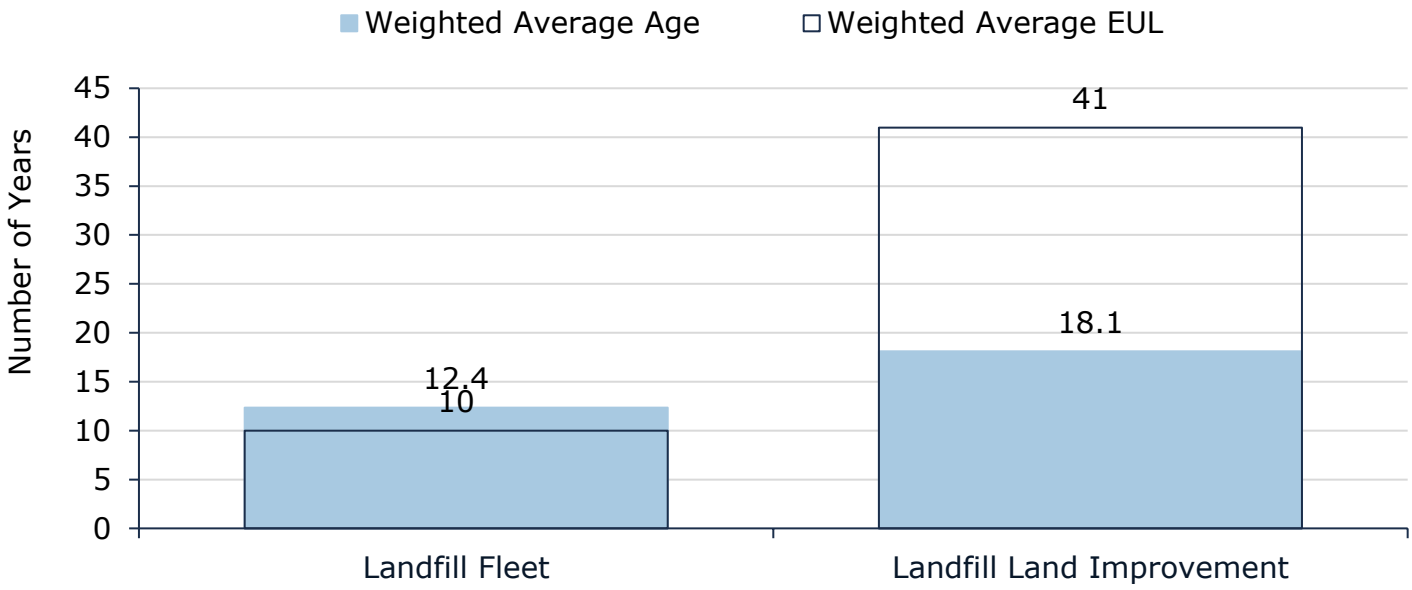

Figure 50 Estimated Useful Life vs. Asset Age: Landfill

Age analysis reveals that on average, landfill land improvement assets are in moderate stages of their estimated useful lives.

9.4 Current Approach to Lifecycle Management

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the current lifecycle management strategy the City of Peterborough follows (referenced from the City's 2024 Asset Management Plan).

Activity Type	Description of Current Strategy
Maintenance	Contractors apply an approved preventative maintenance program for equipment.
	Scales are calibrated and checked twice a year.
	Landfill inspections trigger maintenance program changes at landfill.
	Hours of operations are tracked and trigger preventative maintenance activities.
	Leachate collection system maintained based on Environmental Compliance Approval (ECA) requirements.
Rehabilitation	Ad Hoc renewals at hazardous waste depot.
	Recycling centre rehabilitations managed by the City Facility Manager.
	Rental properties maintained by City Facility Manager.
	Pumps in leachate system are rebuilt.
	Completed based on review of records gathered from operating/maintenance activities. If issues are identified by O&M activities, then the asset is scheduled for renewal/rehabilitation
Replacement	Replacement of landfill equipment is determined by age of the asset, the number of hours in service and the cost of continued maintenance.
	Fleet is replaced based on the age of the assets.
	Service truck is traded in when replaced.
	Facility assets are replaced based on actual findings and recommendations from building condition assessments or during in-field inspections by staff during maintenance activities.
Disposal/ Abandonment	Dispose of assets when cost of maintenance is greater than value or replacement parts are no longer available.
	Compost site at Harper Road was to be abandoned in 2019 based on ECA.
	Landfill once closed will be maintained by the City for environmental purposes for 175 years.
	Landfill will be retired once capacity has been reached.
	Rental properties sold/removed based on cost to maintain vs. revenue from rental generated.

Table 28 Lifecycle Management Strategy: Landfill[5]

[5] All Lifecycle strategy details were provided by the City of Peterborough.

9.5 Forecasted Long-Term Replacement Needs

Figure 51 illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for landfill assets. This analysis was run until 2088 to capture at least one iteration of replacement for the longest-lived asset. The total average annual requirements (red dotted line) are $672,000 for all assets in the landfill. The County's portion of these costs would be approximately $336,000 annually. 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.

As landfill assets are managed by the City of Peterborough, is it essential that management and financial personnel at the County maintain regular communication with their City counterparts to ensure informed budgeting can take place.

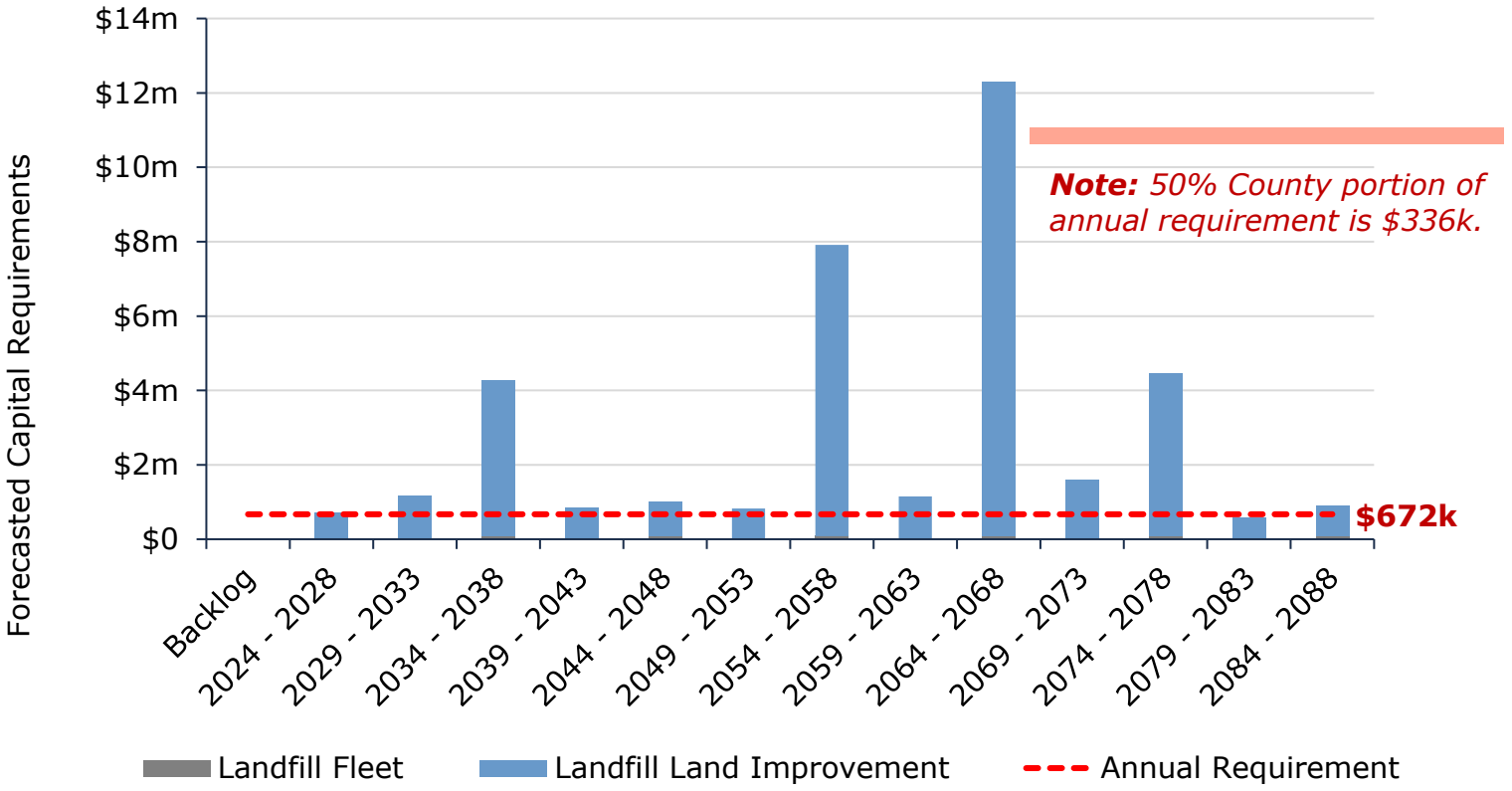

Figure 51 Forecasted Capital Replacement Needs Landfill 2024-2088

Often, the magnitude of replacement needs is substantially higher than most municipalities can afford to fund. In addition, most assets may not need to be replaced. However, quantifying and monitoring these spikes is essential for long-term financial planning, including establishing dedicated reserves.

A summary of the 10-year replacement forecast can be found in Appendix B – 10-Year Capital Requirements.

9.6 Risk Analysis

The risk matrix below is generated using available asset data, including condition, service life remaining, and replacement costs. As no attribute data was available for storm assets, the risk ratings for assets were calculated using only these required, minimum asset fields.

The matrix stratifies assets based on their individual probability and consequence of failure, each scored from 1 to 5. Their product generates a risk index ranging from 1-25. Assets with the highest criticality and likelihood of failure receive a risk rating of 25; those with lowest probability of failure and lowest criticality carry a risk rating of 1. As new data and information is gathered, the County may consider integrating relevant information that improves confidence in the criteria used to assess asset risk and criticality.

These risk models have been built into the County's Asset Management Database (Citywide Assets). See *Risk & Criticality* section for further details on approach used to determine asset risk ratings and classifications.

1 - 4 **Very Low**	5 - 7 **Low**	8 - 9 **Moderate**	10 - 14 **High**	15 - 25 **Very High**
$866,483 (4%)	$1,303,912 (6%)	$9,620,957 (42%)	$6,535,038 (29%)	$4,495,137 (20%)

Figure 52 Risk Matrix: Landfill[6]

9.6.1 Qualitative Risks

The following section summarizes key trends, challenges, and risks to service delivery that the County is currently facing as outlined in the asset management strategies questionnaire:

Asset Data & Information
The available condition data for the landfill requires further refinement to ensure comprehensive and accurate information. Staff should prioritize efforts to gather and enhance this data, which will support the development of informed, data-driven strategies to address infrastructure needs effectively.

Organizational Capacity and Cognizance
Both short- and long-term planning requires the regular collection of infrastructure data to support asset management decision-making. Staff find it a continuous challenge to dedicate resources and time towards data collection and condition assessments to ensure that road condition and asset attribute data is regularly reviewed and updated. A standardized approach to data gathering and condition assessments with achievable goals can enable the County to regularly update their asset data and information

[6] All risk ratings were provided by the City of Peterborough.

Climate Change & Extreme Weather
Climate change poses significant risks to landfills, with extreme weather accelerating asset deterioration and increasing the likelihood of failures. Intensified freeze-thaw cycles, heavy rainfall, and surface flooding can compromise infrastructure, affecting stability, containment, and overall functionality. These challenges complicate long-term planning and increase the risk of environmental impacts, highlighting the need for resilience strategies

9.7 Levels of Service

The tables that follow summarize the County's current levels of service with respect to prescribed KPIs under Ontario Regulation 588/17 as well as any additional performance measures that the County has selected for this AMP.

9.7.1 Community Levels of Service

Service Attribute	Qualitative Description	Current LOS (2023)
Availability	Description of the availability/accessibility of the landfill to County users	The landfill hours are: Monday to Friday 8:00am – 4:45pm Saturday from 8:00am – 3:45pm (exceptions on statutory holidays) The landfill accepts a variety of waste including residential garbage and recyclables, freon items, tires, asbestos items, mattresses, cover soil and contaminated soil.

Table 29 O. Reg. 588/17 Community Levels of Service: Landfill

9.7.2 Technical Levels of Service

Service Attribute	Technical Metric	Current LOS (2023)
Quality	Average condition of landfill assets	51% (Fair)
	% of landfill assets in poor or worse condition	35%
Performance	Target Capital Reinvestment Rate	2.9%

Table 30 O. Reg. 588/17 Technical Levels of Service: Landfill

10. Growth

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the County to plan for new infrastructure more effectively, and the upgrade or disposal of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

10.1 Growth Assumptions

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the County to more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

10.1.1 Peterborough County Growth Analysis Report (2022)

The County of Peterborough sought out a growth analysis report in 2022 as they seek to update their official plan. Hamson Consulting provided this report on March 28th, 2022, and presented the findings on April 6th, 2022. The growth analysis report had a 30-year horizon, predicting growth to the year 2051.

The plan was prepared with the following considerations added to best fit the context of the county. First, the large amount of second homes in the area, and the process and trends around these second homes becoming primary residences. Also, the growth of the City of Peterborough, and how that impacts the financials and rate of growth for the County. Finally, the plan included the County's ability to meet density and intensification targets.

The report identified population movement from the Greater Toronto Area to be a major driver of population growth for the County. The plan highlighted how young home buyers have and will move into the region in search of affordable housing. This population movement is also fueled by older generations transitioning their second homes in the area into permanent residences. Due to this, the expected growth in the County will occur in the areas closest to the Greater Toronto Area and the City of Peterborough. This is apparent in the plans estimate that 71% of the County's growth will occur in the Townships closest to the large metropolitan areas, including the Townships of Cavan Monaghan, Selwyn, and Asphodel-Norwood.

10.1.2 Peterborough County Official Plan (2022)

The County of Peterborough adopted a new Official Plan on June 29, 2022, to guide land use planning and development for the next 30 years, extending to 2051. This plan serves as the primary planning document for the County and seven of its local municipalities, aligning with provincial legislation such as the Growth Plan for the Greater Golden Horseshoe and the Provincial Policy Statement.

Key considerations in the plan include the County's unique rural character, the protection of agricultural land, and the integration of environmental conservation policies, including natural heritage preservation and climate resilience. Growth management was a primary focus, with

projections identifying an anticipated population of 82,000 and employment reaching 26,000 by 2051. The plan highlights that 71% of this growth is expected to be concentrated in the Townships of Cavan Monaghan, Selwyn, and Asphodel-Norwood.

The plan directs the most growth toward municipally serviced settlement areas, such as Millbrook, Norwood, Lakefield, and Havelock, ensuring efficient land use and infrastructure deployment. It also includes strategies for economic development, housing diversity, transportation infrastructure, and Indigenous consultation.

Implementation will be carried out through local zoning by-laws, development agreements, and site-specific policies, ensuring that growth aligns with the County's long-term vision of sustainability, economic vitality, and community well-being.

10.2 Impact of Growth on Lifecycle Activities

By July 1, 2025, the County's asset management plan must include a discussion of how the assumptions regarding future changes in population and economic activity informed the preparation of the lifecycle management and financial strategy.

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated into the County's AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the County will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

Appendices

Appendix A – Infrastructure Report Card

Asset Category	Replacement Cost	Average Condition	Financial Requirements	
Non-Structural Culverts & Retaining Walls	**$154.2 m**	**Poor**	Annual Requirement:	$3,054,000
Facilities	**$87.8 m**	**Good**	Annual Requirement:	$2,144,000
Land Improvements	**$5.0 m**	**Poor**	Annual Requirement:	$273,000
Fleet	**$24.4 m**	**Poor**	Annual Requirement:	$3,030,000
Equipment	**$ 3.1 m**	**Poor**	Annual Requirement:	$444,000
Landfill	**$9.7 m**	**Poor**	Annual Requirement:	$1,068,000

Appendix B – 10-Year Capital Requirements

The tables below summarize the projected cost of lifecycle activities (rehabilitation and replacements) that may be undertaken over the next 10 years to support current levels of service.

These projections are generated in Citywide software and rely on the data available in the County's asset listing. Assessed condition data and replacement costs were used to assist in forecasting replacement needs for roads. For all remaining assets, only age was used to determine forthcoming replacement needs.

The projections can be different from actual capital forecasts. Consistent data updates, particularly condition, replacement costs, and regular upkeep of lifecycle models, will improve the alignment between the system generated expenditure requirements, and the County's capital expenditure forecasts.

Non-Structural Culverts & Retaining Walls

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Cross Culverts	$5.6m	$300k	$180k	$2.8m	-	$100k	$60k	-	$5.1m	-	$120k
Entrance Culverts	$60.1m	-	-	-	-	-	-	-	-	-	-
Retaining Walls	-	-	-	-	-	-	-	-	-	-	-
Structural Culverts under 3m	-	-	-	-	-	-	-	-	-	-	-
Total	**$65.7m**	**$300k**	**$180k**	**$2.8m**	**-**	**$100k**	**$60k**	**-**	**$5.1m**	**-**	**$120k**

Table 31 System Generated 10-Year Capital Replacement Forecast: Non-Structural Culverts & Retaining Walls

Facilities

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Corporate	-	$25k	$4.2m	$538k	$474k	$201k	$619k	$2k	$492k	$18k	$37k
Lang Pioneer Village	-	$5k	$99k	$169k	$8k	$84k	$36k	$4k	$114k	$12k	$133k
PCCP	-	$155k	$1.3m	$524k	$83k	$270k	$140k	$8k	$367k	$277k	$22k
Public Works	-	$431k	$2.4m	$587k	$682k	$81k	$739k	$6.2m	$2.0m	$357k	$28k
Total	**-**	**$616k**	**$8.0m**	**$1.8m**	**$1.2m**	**$636k**	**$1.5m**	**$6.2m**	**$3.0m**	**$664k**	**$220k**

Table 32 System Generated 10-Year Capital Replacement Forecast: Facilities

Land Improvements

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Parking Lots	$1.4m	-	$85k	-	$237k	$10k	-	$12k	$424k	-	-
Parks	-	-	$309k	-	-	-	$53k	-	$5k	-	-
Towers	$306k	-	-	-	-	-	$306k	-	-	-	-
Total	**$1.7m**	**-**	**$394k**	**-**	**$237k**	**$10k**	**$358k**	**$12k**	**$429k**	**-**	**-**

Table 33 System Generated 10-Year Capital Replacement Forecast: Land Improvements

Fleet

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Corporate	$65k	-	-	$57k	-	-	$65k	-	-	-	$57k
Lang Pioneer Village	-	$73k	-	-	-	-	$58k	$8k	-	-	-
PCCP	$2.3m	$870k	$987k	$737k	$883k	$110k	$5.6m	$1.3m	$737k	$908k	$110k
Public Works - Heavy Equipment	$2.2m	$528k	$770k	$329k	$856k	$613k	$49k	$68k	$20k	$474k	-
Public Works - Vehicles	$4.0m	$651k	$420k	$650k	$239k	$2.0m	$1.3m	$220k	$496k	$2.4m	$691k
Transit	$180k	-	-	-	$85k	-	$360k	-	-	$85k	-
Total	**$8.7m**	**$2.1m**	**$2.2m**	**$1.8m**	**$2.1m**	**$2.7m**	**$7.5m**	**$1.6m**	**$1.3m**	**$3.9m**	**$858k**

Table 34 System Generated 10-Year Capital Replacement Forecast: Fleet

Equipment

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Corporate	$13k	-	-	-	-	-	$13k	-	-	-	-
IT	$136k	$219k	-	$17k	$137k	$12k	$39k	-	$332k	$12k	-
Lang Pioneer Village	$13k	$15k	-	$26k	-	-	-	-	$6k	$86k	-
PCCP	$401k	$67k	$20k	$884k	-	$147k	$487k	$78k	$874k	$34k	-
Public Works	$8k	-	$64k	-	$150k	$131k	$134k	$134k	-	$11k	-
Total	**$570k**	**$301k**	**$85k**	**$927k**	**$287k**	**$289k**	**$673k**	**$212k**	**$1.2m**	**$142k**	**-**

Table 35 System Generated 10-Year Capital Replacement Forecast: Equipment

Landfill

Segment	Back-log	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Landfill Fleet	-	-	-	$24k	-	-	-	-	-	-	$36k
Landfill Land Improvements	$3.9m	-	-	-	-	-	$3.9m	-	-	-	$924k
Total	**$3.9m**	**-**	**-**	**$24k**	**-**	**-**	**$3.9m**	**-**	**-**	**-**	**$960k**

Table 36 System Generated 10-Year Capital Replacement Forecast: Landfill

Appendix C – Level of Service Maps & Photos

Image of Culvert in Good Condition

Name: COUNTY ROAD 30 BELMONT BRIDGE – 003741

Date Inspected: 2023-12-22

Image of Culvert in Good Condition

Name: CN RAIL OVERPASS, LOT 5/6, CONC II - 002003

Date Inspected: 2023-12-22

Image of Culvert in Good Condition

Name: COUNTY ROAD 23 (FORMERLY 507) CULVERT – 001423

Date Inspected: 2023-12-22

Appendix D – Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Culverts	Condition	100%	4.1 - 5	1
			3.1 - 4	2
			2.1 - 3	3
			1.1 - 2	4
			0 - 1	5
Facilities	Condition	100%	4 - 5	1
			3 - 3.9	2
			2 - 2.9	3
			1 - 1.9	4
			0 - 0.9	5
Fleet	Condition	100%	80 - 100	1
			60 - 79	2
			40 - 59	3
			20 - 39	4
			0 - 19	5
Equipment	Condition	100%	80 - 100	1
			60 - 79	2
			40 - 59	3
			20 - 39	4
			0 - 19	5
Land Improvements	Condition	100%	80 - 100	1
			60 - 79	2
			40 - 59	3

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
			20 - 39	4
			0 - 19	5
Landfill (Parameters provided by City of Peterborough)	Condition	100%	4.1 - 5	1
			3.1 – 4	2
			2.1 - 3	3
			1.1 - 2	4
			0 - 1	5

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Culverts	Economic (100%)	Replacement Cost (100%)	$0 - $100,000	1
			$100,000 - $250,000	2
			$250,000 - $500,000	3
			$500,000 - $1,000,000	4
			$1,000,000+	5
Facilities	Economic (60%)	Replacement Cost (100%)	$0 - $50,000	1
			$50,000 - $100,000	2
			$100,000 - $250,000	3
			$250,000 - $500,000	4
			$500,000+	5
	Health & Safety (40%)	AMP Segment (100%)	Lang Pioneer Village	1
			Corporate	3
			Public Works	3
			PCCP	4
Equipment (General Equipment)	Economic (60%)	Replacement Cost (100%)	$0 - $50,000	1
			$50,000 - $100,000	2
			$100,000 - $250,000	3

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
			$250,000 - $500,000	4
			$500,000+	5
	Operational (40%)	AMP Segment (100%)	Lang Pioneer Village	1
			Corporate, IT	2
			Public Works	3
			PCCP	4
Fleet	Economic (85%)	Replacement Cost (100%)	$0 - $25,000	1
			$25,000 - $50,000	2
			$50,000 - $250,000	3
			$250,000 - $500,000	4
			$500,000+	5
	Health & Safety (15%)	AMP Segment (100)%)	Lang Pioneer Village	1
			Corporate	2
			Public Works - Vehicles	2
			Public Works – Heavy Equipment Transit	3
			PCCP	4
Land Improvements	Economic (100%)	Replacement Cost (100%)	$0 - $25,000	1
			$25,000 - $50,000	2
			$50,000 - $250,000	3
			$250,000 - $500,000	4
			$500,000+	5
Landfill (Parameters provided by City of Peterborough)	Operational (100%)	City Consequence Score (100%)	5	1
			4	2
			3	3
			2	4
			1	5