the Counties SDG
STORMONT · DUNDAS · GLENGARRY

2024

2024 Asset Management Plan Non-Core Assets

This Asset Management Plan was prepared by:

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

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Executive Summary

Municipal infrastructure provides the foundation for the economic, social, and environmental health and growth of a community through the delivery of services. The goal of asset management is to balance delivering critical services in a cost-effective manner. This involves the development and implementation of asset management strategies and long-term financial planning.

The overall replacement cost of the non-core asset categories owned by SDG Counties totals $49.8 million. 72% of the assets analysed are in fair or better condition. Where assessed condition data was not available, age was used to approximate condition – a data gap that exists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation.

The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. Using a combination of proactive lifecycle strategies and replacement only strategies to determine the lowest cost option to maintain the current level of service, a sustainable financial plan was developed.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, SDG Counties average annual capital requirement totals $2.5 million. Based on a historical analysis of sustainable capital funding sources, SDG Counties is committing approximately $1.6 million towards capital projects or reserves per year. As a result, SDG Counties is funding 64% percent of long-term annual capital requirements. This creates a total annual funding deficit of $897 thousand for the Counites buildings, machinery, equipment, and vehicles.

To address non-core capital deficits, it is recommended SDG Counties review the feasibility of implementing a 1.61% increase in revenues.

Risk frameworks and levels of service targets can then be used to prioritize projects and help select the right lifecycle intervention for the right asset at the right time—including replacement or full reconstruction. SDG Counties has developed preliminary risk models which are integrated with its asset register. These models can produce risk matrices that classify assets based on their risk profiles.

Most municipalities in Ontario, and across Canada, continue to struggle with meeting infrastructure demands. This challenge was created over many decades and will take many years to overcome. To this end, several recommendations should be considered, including:

- Continuous and dedicated improvement to SDG Counties infrastructure datasets, which form the foundation for all analysis, including financial projections and needs.
- Continuous refinements to the risk and lifecycle models as additional data becomes available. This will aid in prioritizing projects and creating more strategic long-term capital budgets.

- Development of key performance indicators for all infrastructure programs to meet Ontario Regulation 588/17 requirements, and to establish benchmark data to calibrate levels of service targets for 2025 regulatory requirements.

SDG Counties has taken important steps in building its asset management program, including developing a more complete and accurate asset register—a substantial initiative. Continuous improvement to this inventory will be essential in maintaining momentum, supporting long-term financial planning, and delivering the highest affordable service levels to SDG Counties community.

About this Document

SDG Counties Asset Management Plan for Non-Core Assets was developed in accordance with Ontario Regulation 588/17. It contains a comprehensive analysis of SDG Counties' non-core infrastructure portfolio. This is a living document that should be updated regularly as additional asset and financial data becomes available.

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). Along with creating better performing organizations, more livable 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.

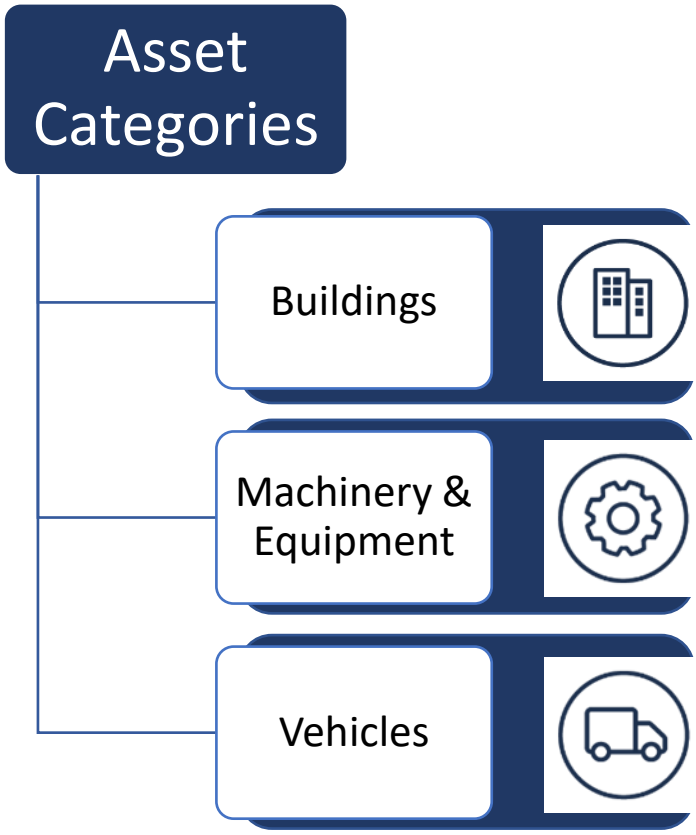
Table 1 Ontario Regulation 588/17 Requirements and Reporting Deadlines

Requirement	2019	2022	2024	2025
1. Asset Management Policy	●		●	
2. Asset Management Plans		●	●	●
State of infrastructure for core assets		●		
State of infrastructure for all assets			●	●
Current levels of service for core assets		●		
Current levels of service for all assets			●	
Proposed levels of service for all assets				●
Lifecycle costs associated with current levels of service		●	●	
Lifecycle costs associated with proposed levels of service				●
Growth impacts		●	●	●
Financial strategy				●

Scope

The scope of this document is to identify the current practices and strategies that are in place to manage public infrastructure and to make recommendations where they can be further refined. Through the implementation of sound asset management strategies, SDG Counties can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

The following asset categories are addressed in further sections:



Limitations and Constraints

The asset management program development required substantial effort by staff, it was developed based on best-available data, and is subject to the following broad limitations, constrains, and assumptions:

- The analysis is highly sensitive to several critical data fields, including an asset's estimated useful life, replacement cost, quantity, and in-service date. Inaccuracies or imprecisions in any of these fields can have substantial and cascading impacts on all reporting and analytics.
- User-defined and unit cost estimates, based typically on staff judgment, recent projects, or established through completion of technical studies, offer the most precise approximations of current replacement costs. When this isn't possible, historical costs incurred at the time of asset acquisition or construction can be inflated to present day. This approach, while sometimes necessary, can produce highly inaccurate estimates.
- In the absence of condition assessment data, age was used to estimate asset condition ratings. This approach can result in an over- or understatement of asset needs. As a result, financial requirements generated through this approach can differ from those produced by staff.
- The risk models are designed to support objective project prioritization and selection. However, in addition to the inherent limitations that all models face, they also require availability of important asset attribute data to ensure that asset risk ratings are valid, and assets are properly stratified within the risk matrix. Missing attribute data can misclassify assets.

These limitations have a direct impact on most of the analysis presented, including condition summaries, age profiles, long-term replacement and rehabilitation forecasts, and shorter term, 10-year forecasts that are generated from Citywide, SDG Counties' primary asset management system.

These challenges are quite common among municipalities and require long-term commitment and sustained effort by staff. As SDG Counties asset management program evolves and advances, the quality of future AMPs and other core documents that support asset management will continue to increase.

An Overview of Asset Management

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 and manage the associated risks; while maximizing the value and levels of service the community receives from the asset portfolio.

Lifecycle 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 the 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 (AMP).

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.

Foundational Documents

In the municipal sector, 'asset management strategy' and 'asset management plan' are often used interchangeably. Other concepts such as 'asset management framework', 'asset management system', and 'strategic asset management plan' further add to the confusion; lack of consistency in the industry on the purpose and definition of these elements offers little clarity. To make a clear distinction between the policy, strategy, and the plan see the following sections for detailed descriptions of the document types.

Official Plan

The goal of the 2018 Official Plan was to communicate the long-term goals and direction of SDG Counties. It includes a great amount of information about the future population projections and additional items around growth.

The population, housing, and employment forecasts for the County, based on studies by Hemson Consulting Ltd. from 2013 and updated in 2015, are intended to guide long-term growth and planning in the County and its Townships. The forecasts predict a population increase of 2,300 residents by 2036, reaching a total of 67,400. Housing units are expected to grow by 2,300, totaling 28,900 occupied units by 2036. However, employment is forecasted to decline by 2,400 jobs, resulting in 18,000 total jobs by 2036. The forecasts reflect an aging population, which will reduce average household size and contribute to the decline in employment. The forecasts will be reviewed and updated regularly to ensure they remain relevant for planning purposes.

Table 2 Housing & Population Forecasts

Projected Figures	2016	2021	2026	2031	2036
Population	67,634	67,981	69,231	70,093	70,058
Housing Units	26,592	27,372	28,018	28,595	28,872

Asset Management Policy

An asset management policy represents a statement of the principles guiding SDG Counties approach to asset management activities. It aligns with the organization and provides clear direction to municipal staff on their roles and responsibilities.

SDG Counties adopted their asset management policy 1-33 on April 15, 2019, in accordance with O. Reg. 588/17. The policy identifies the asset management vision is to proactively manage its assets to best serve SDG Counties.

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 SDG Counties can achieve its asset management objectives through planned activities and decision-making criteria.

Asset Management Plan

The asset management plan is often identified as a key output within a strategy. The AMP has a sharp focus on the current state of SDG Counties asset portfolio, and its approach to managing and funding individual service areas or asset groups. It is tactical in nature and provides a snapshot in time.

Key Technical Concepts

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

Asset Hierarchy and Data Classification

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

Table 3 Asset Classifications

CLASS	AM CATEGORY	AM SEGMENT
General Capital	Buildings	Administration Equipment Depot Office Building Radio Tower Salt Storage Storage Building
	Machinery & Equipment	General Machinery & Equipment Loader Mower Tractor Trailer
	Vehicles	General Vehicle Pick Up Truck Plow Truck

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. The two methodologies are:

- User-Defined Cost and Cost/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 cost of the asset is 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 SDG Counties incurred. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

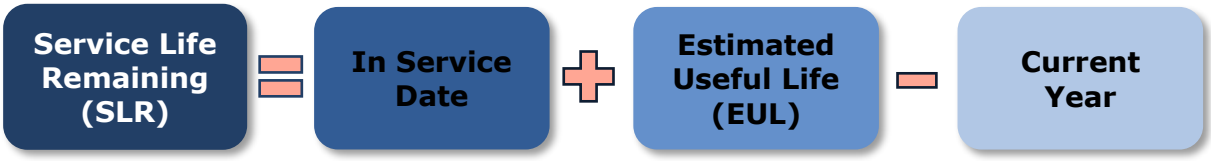
Estimated Useful Life and Service Life Remaining

The estimated useful life (EUL) of an asset is the period over which SDG Counties expects the asset to be available for use and remain in service before requiring replacement or disposal. The EUL for each asset 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 date and its EUL, SDG Counties can determine the service life remaining (SLR) for each asset. Using condition data and the asset's SLR,

SDG Counties can more accurately forecast when it will require replacement. The SLR is calculated as follows:

Figure 1 Service Life Remaining Calculation

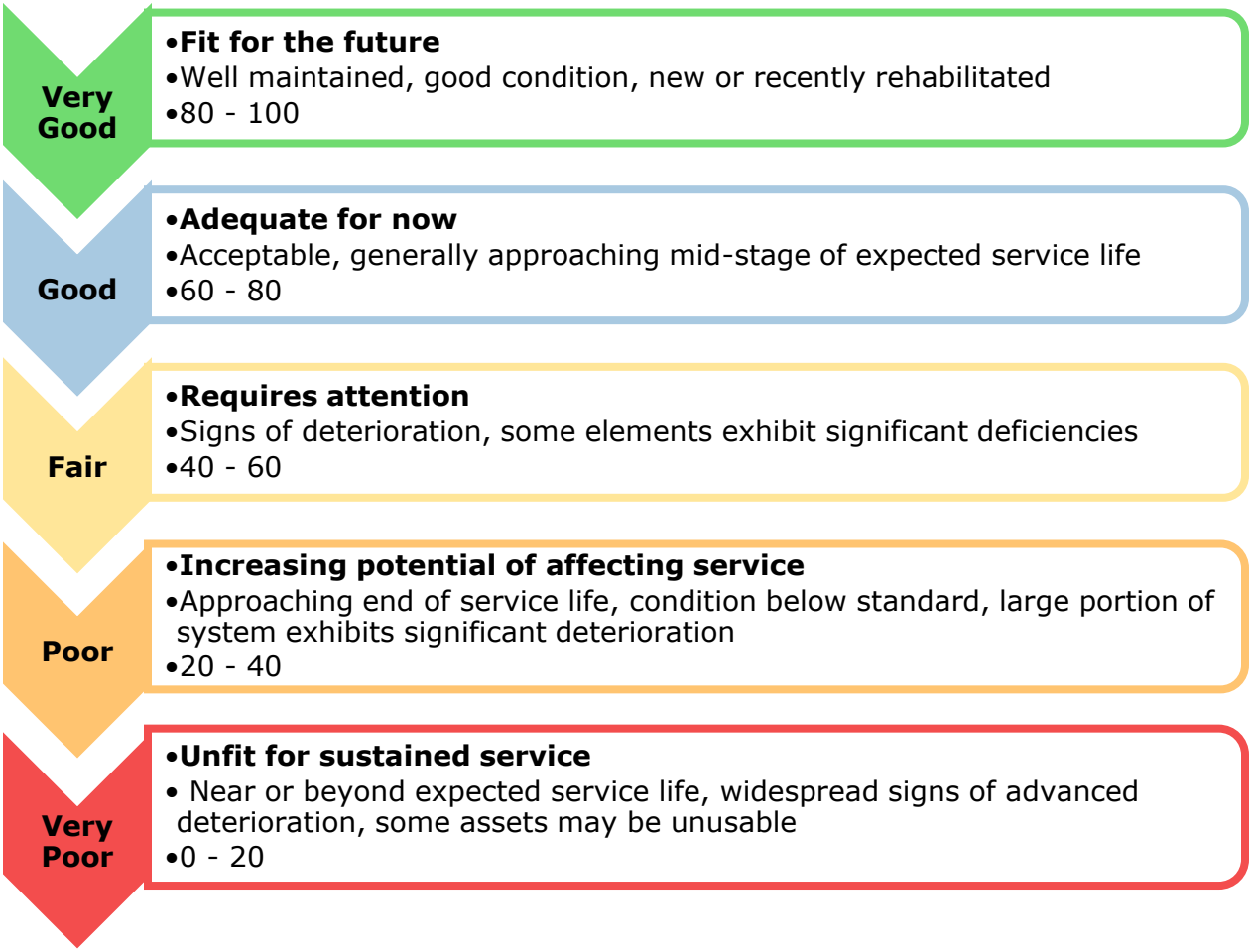


Asset Condition

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 SDG Counties asset portfolio. The table below outlines the condition rating system used 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.

Figure 2 Standard Condition Rating Scale



The analysis 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. Appendix E: Condition Assessment Guidelines includes additional information on the role of asset condition data and provides basic guidelines for the development of a condition assessment program.

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.

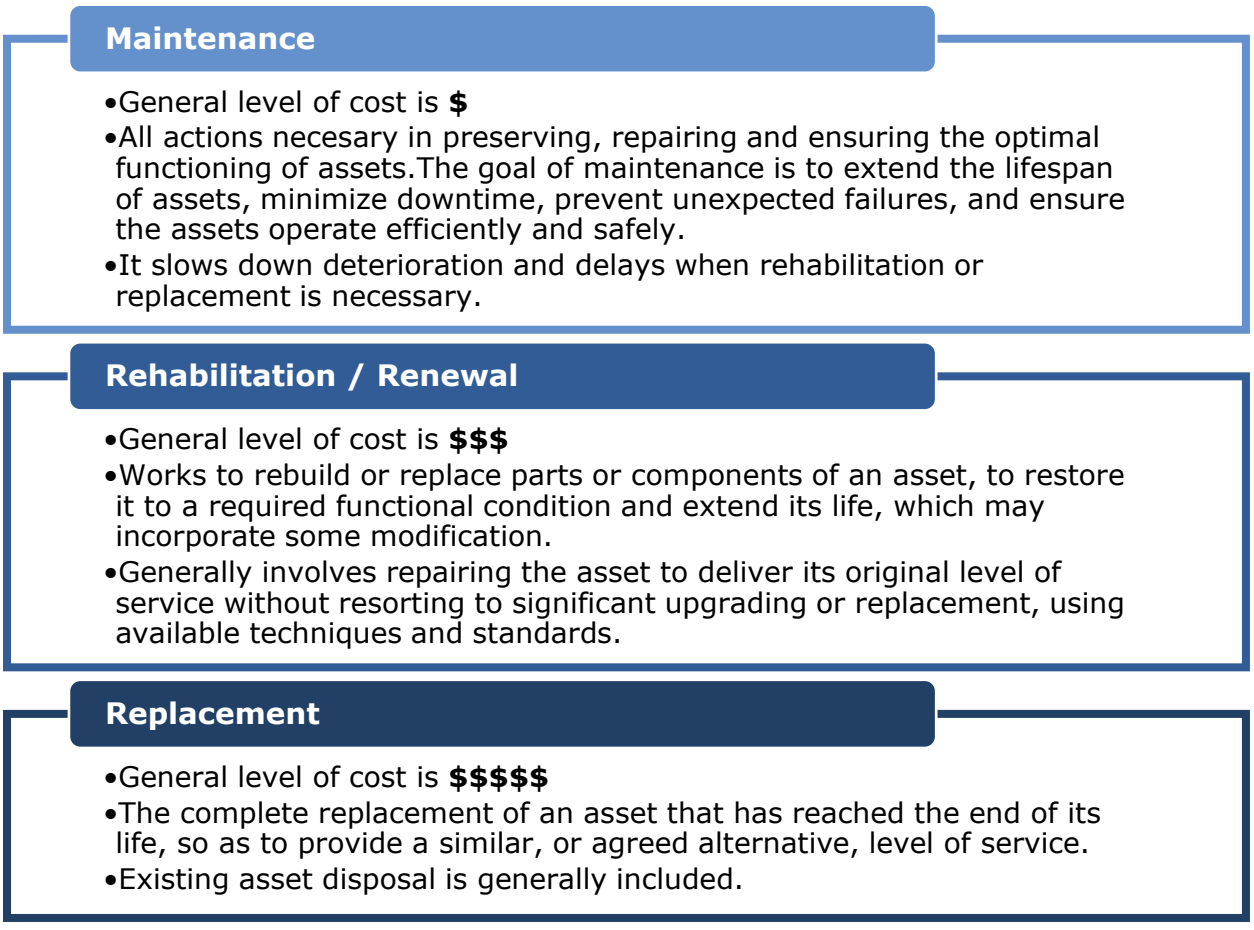
To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. There are several field intervention activities that are available to extend the life of an asset. These 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.

Figure 3 provides a description of each type of activity, the general difference in cost, and typical risks associated with each.

SDG Counties' approach to lifecycle management is described within each asset category. Developing and implementing a proactive lifecycle strategy will help staff 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.

Figure 3 Lifecyle Management Typical Interventions



Risk Management Strategies

Municipalities generally take a 'worst-first' approach to infrastructure spending. Rather than prioritizing assets based on their importance to service delivery, assets in the worst condition are fixed first, regardless of their criticality. However, not all assets are created equal. Some are more important than others, and their failure or disrepair poses more risk to the community. For example, a plow truck that provides a critical service keeping roads open and meeting maintenance standards poses a

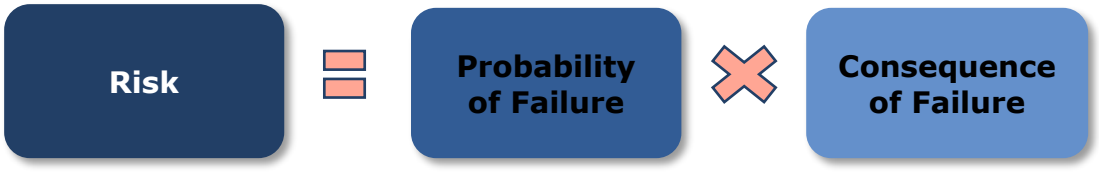
higher risk than a light duty pickup truck. These high-value assets should receive funding before others.

By identifying the various impacts of asset failure and the likelihood that it will fail, risk management strategies can identify critical assets, and determine where maintenance efforts, and spending, should be focused.

A high-level evaluation of asset risk and criticality was performed. 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.

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

Figure 4 Risk Equation



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. See Appendix D: Risk Rating Criteria for definitions and the developed risk models.

Levels of Service

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

At this stage, three strategic levels of service are measured for every asset category, and they are:

- Financial – this is a target reinvestment rate compared to the actual current reinvestment rate.
- Performance – this is the condition breakdown for the asset category.
- Risk – this is the risk profile for the asset category.

Only those LOS that are required under O. Reg. 588/17 for non-core asset categories are included in addition to the strategic LOS.

Community Levels of Service

Community LOS are a simple, plain language description or measure of the service that the community receives. For core asset categories, the Province through O. Reg. 588/17, has provided qualitative descriptions that are required. For non-core asset categories, SDG Counties must determine the qualitative descriptions that will be used by July 1, 2024. The community LOS can be found in the Levels of Service subsection within each core asset category section.

Technical Levels of Service

Technical LOS 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 SDG Counties asset management strategies on the physical condition of assets or the quality/capacity of the services they provide.

For core asset categories, the province, under O. Reg. 588/17, has mandated specific technical metrics. For non-core asset categories, SDG Counties must establish the technical metrics starting July 1, 2024. These metrics are detailed in the LOS subsection of each core asset category.

Current and Proposed Levels of Service

SDG Counties is focused on measuring the current LOS provided to the community. Once current LOS have been measured and trended SDG Counties plans to establish their proposed LOS 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 SDG Counties. 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 LOS have been established, and prior to July 2025, SDG Counties must identify lifecycle management and financial strategies which allow these targets to be achieved.

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 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. 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.

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 because of climate change impacts such as flooding, high heat, drought, and more frequent and intense storms.

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.

Impacts of 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 SDG Counties 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.

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 SDG Counties can determine the extent of any existing funding gap.

Portfolio Overview

Community Profile

SDG Counties is an upper tier municipality located along the St. Lawrence River in eastern Ontario, bordering the Province of Quebec. SDG Counties is comprised of six local municipalities: North Stormont, South Stormont, North Dundas, South Dundas, North Glengarry, and South Glengarry. Historically, the Counties of Stormont, Dundas and Glengarry were separate, but have unified under a United County in 1850.

SDG Counties reside in the Quebec City–Windsor Corridor and is the most densely populated and heavily industrialized region of Canada. This region provides local businesses access and exposure to large markets and opportunity. They pair their location with one of the lowest cost business environments in Ontario to attract businesses and assist them to prosper.

SDG Counties has experienced continued growth over the last 15 years. Around 24% of the population is above the age of 65, this is around 6% higher than for Ontario as a whole. SDG Counties generated a total revenue of $55.6 million from taxes in 2023 and had an annual capital budget of $24.8 million. SDG Counties' infrastructure priorities include maintaining the road network and delivering a variety of public services including but not limited to transportation services, land use planning, provincial offences court, economic development and tourism.

Table 4 SDG Counties & Ontario Census Information

Census Characteristic	SDG Counties	Ontario
Population 2021	66,792	14,223,942
Population Change 2016-2021	+2.2%	+5.8%
Total Private Dwellings	27,400	5,929,250
Population Density	20.6/km2	15.9/km2
Land Area	3,246 km2	892,411.76 km2

SDG Counties Climate Profile

SDG Counties is located in Eastern Ontario along the St. Lawrence River. SDG Counties are 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) – SDG Counties may experience the following trends:

1) Higher Average Annual Temperature
    - Between the years 1971 and 2000 the annual average temperature was 6 °C.

- Under a high emissions scenario, the annual average temperatures are projected to increase by 2.8ºC by the year 2050 and over 6.7 ºC by the end of the century.

2) Increase in Total Annual Precipitation
   - Under a high emissions scenario, SDG Counties are projected to experience a 12% increase in precipitation by the year 2050 and an 18% increase by the end of the century.
3) 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 on or near the many bodies of water in the area.

St. Lawrence River

Climate change poses several challenges to SDG Counties. Rising temperatures and changing precipitation patterns may lead to increased flooding risks along the riverbanks, threatening communities, agriculture, and infrastructure. Extreme weather events, such as heavy rain and storms, could accelerate erosion and sedimentation, impacting water quality and affecting navigation. Additionally, changing climatic conditions may alter local ecosystems, affecting biodiversity and putting stress on species that depend on the river. To mitigate these impacts, proactive planning, adaptation strategies, and investments in resilience will be essential for SDG Counties to protect their natural resources and communities.

Impacts of Growth

As per O. Reg. 588/17, prior to July 1, 2025, SDG Counties' 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. SDG Counties' strategic pillars are centered around sustainably supporting growth while maintaining services through optimization and intelligent decision making. The commitment to sustainable growth will be completed in a matter that maintains or enhances the natural environment and assets of SDG Counties. As growth-related assets are constructed or acquired, they should be integrated into SDG Counties AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, SDG Counties 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.

State of the Infrastructure

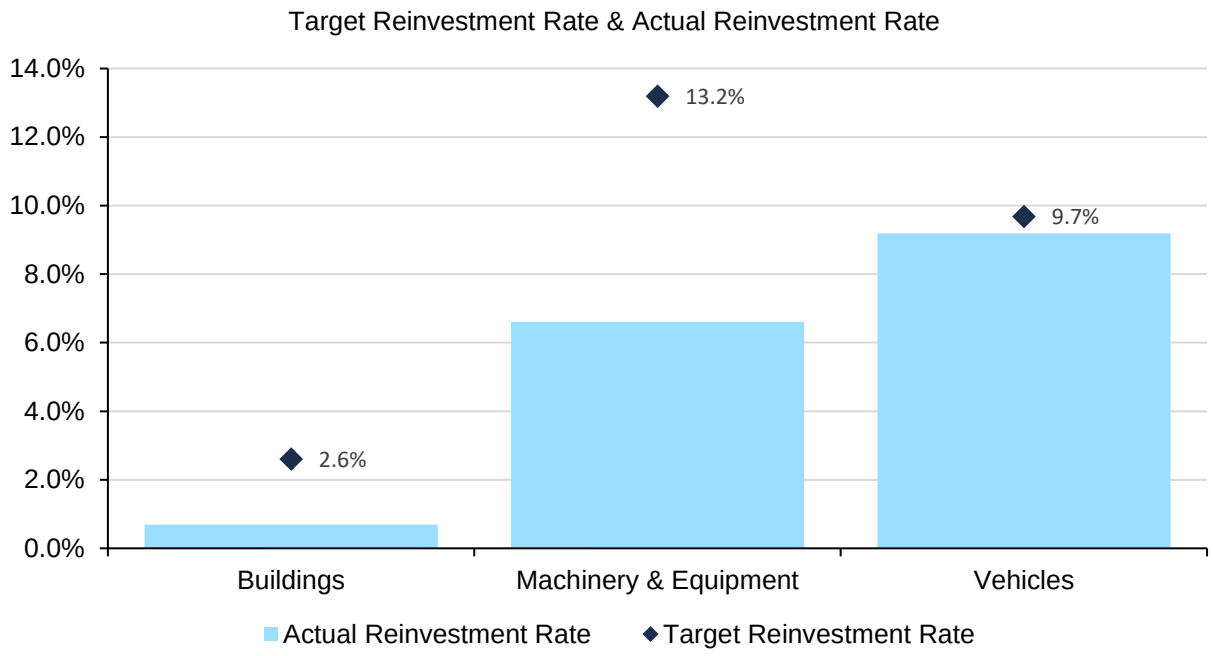
Table 5 SDG Counties State of the Infrastructure Summary

Asset Category	Replacement Cost	Asset Condition	Financial Capacity	
Buildings	$34,132,000	Fair (43%)	Annual Requirement:	$889,000
			Funding Available:	$235,000
			Annual Deficit:	**$654,000**
Machinery & Equipment	$2,700,000	Fair (51%)	Annual Requirement:	$358,000
			Funding Available:	$180,000
			Annual Deficit:	**$178,000**
Vehicles	$12,955,000	Fair (59%)	Annual Requirement:	$1,255,000
			Funding Available:	$1,190,000
			Annual Deficit:	**$65,000**
Overall	$49,808,000	Fair (48%)	Annual Requirement:	$2,502,000
			Funding Available:	$1,605,000
			Annual Deficit:	**$897,000**

Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, SDG Counties should be allocating approximately $2.5 million annually, for a target reinvestment rate of 5%.

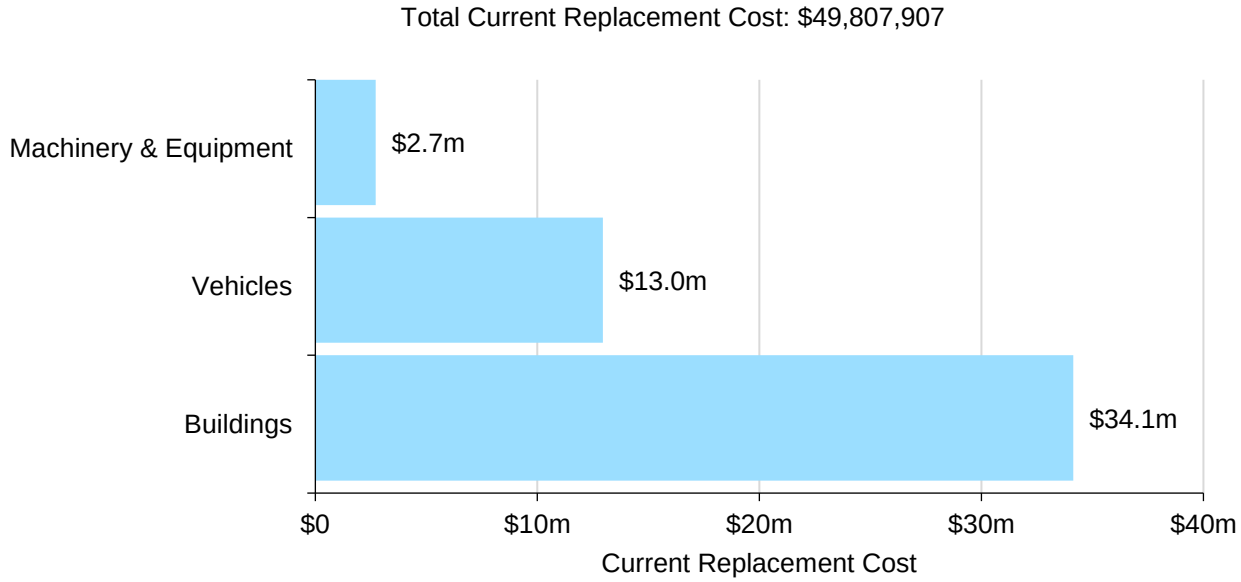
Figure 5 Target vs Actual Reinvestment Rates



Replacement Cost

Non-core asset categories have a total replacement cost of $49.8 million based on available inventory data. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.

Figure 6 Portfolio Replacement Value

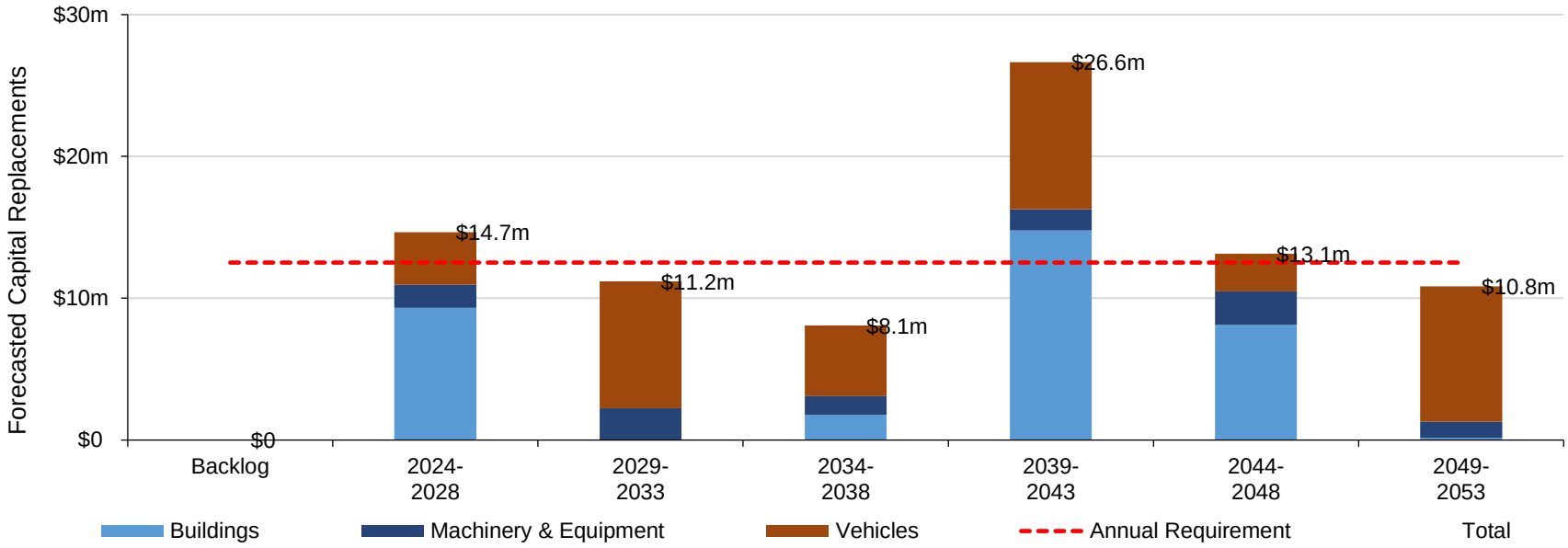


Forecasted Capital Requirements

Aging assets require maintenance, rehabilitation, and replacement. Figure 7 below illustrates the cyclical short-, medium- and long-term infrastructure replacement requirements for all asset categories analyzed. On average, $2.5 million is required each year to remain current with capital replacement needs for SDG Counties 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. Based on the current replacement cost of the portfolio, estimated at $49.8 million, this represents an annual target reinvestment rate of 5%.

Figure 7 Forecasted Capital Requirements



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.

Table 6 below summarizes the projected cost of lifecycle activities (capital activities only) that may need to be undertaken over the next 10 years to support current levels of service.

Table 6 Buildings, Machinery, Equipment, Vehicles 10-Year Capital Costs

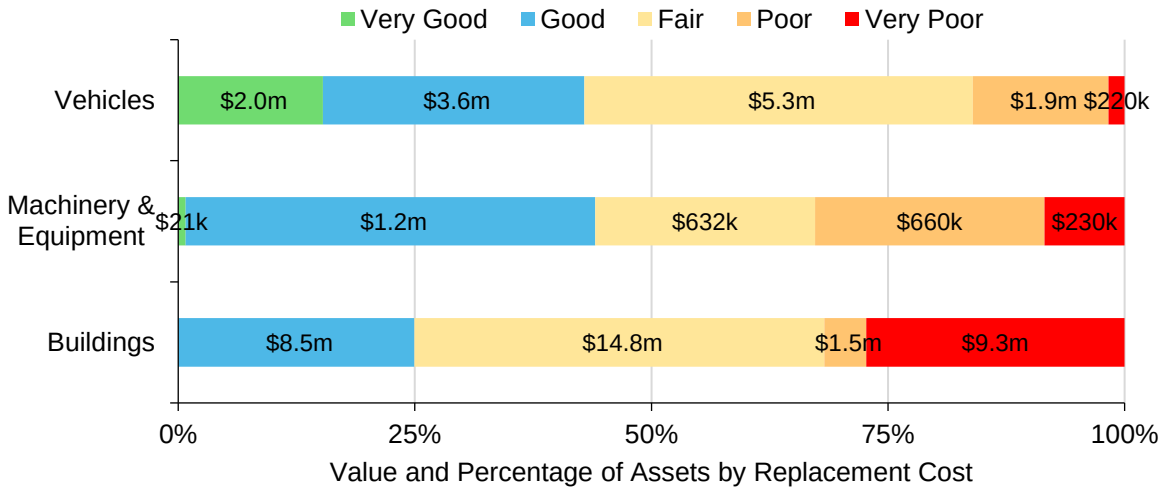
Category	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Buildings	$0	$0	$0	$9.3m	$0	$0	$0	$0	$0	$0
Machinery & Equipment	$175k	$480k	$400k	$209k	$385k	$0	$425k	$515k	$1.2m	$138k
Vehicles	$220k	$565k	$735k	$1.8m	$335k	$4.0m	$1.5m	$2.6m	$445k	$415k
Total	**$395k**	**$1.0m**	**$1.1m**	**$11.4m**	**$720k**	**$4.0m**	**$1.9m**	**$3.1m**	**$1.6m**	**$553k**

These projections are generated in Citywide and rely on the data available in the asset register, which was limited to asset age, replacement cost, and useful life.

Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, only 72% of assets included in this AMP are in fair or better condition. This estimate relies on field condition data for all assets.

Figure 8 Portfolio Condition Breakdown



Assessed condition data was available for all assets included in this AMP. 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 7 below identifies the source of condition data.

Table 7 Assessed Condition Data Sources

Asset Category	Assets with Assessed Condition	Source of Condition Data
Buildings	100%	Staff Assessments & Building Condition Reports (2018)
Machinery & Equipment	100%	Staff Assessments
Vehicles	100%	Staff Assessments

Service Life Remaining

Based on asset age and estimated useful life, 52% of SDG Counties non-core assets will require replacement within the next 10 years. Details of capital requirements are identified for each asset category in Table 6.

Risk & Criticality

SDG Counties has noted key challenges and risks to service delivery that they are currently facing:

Funding

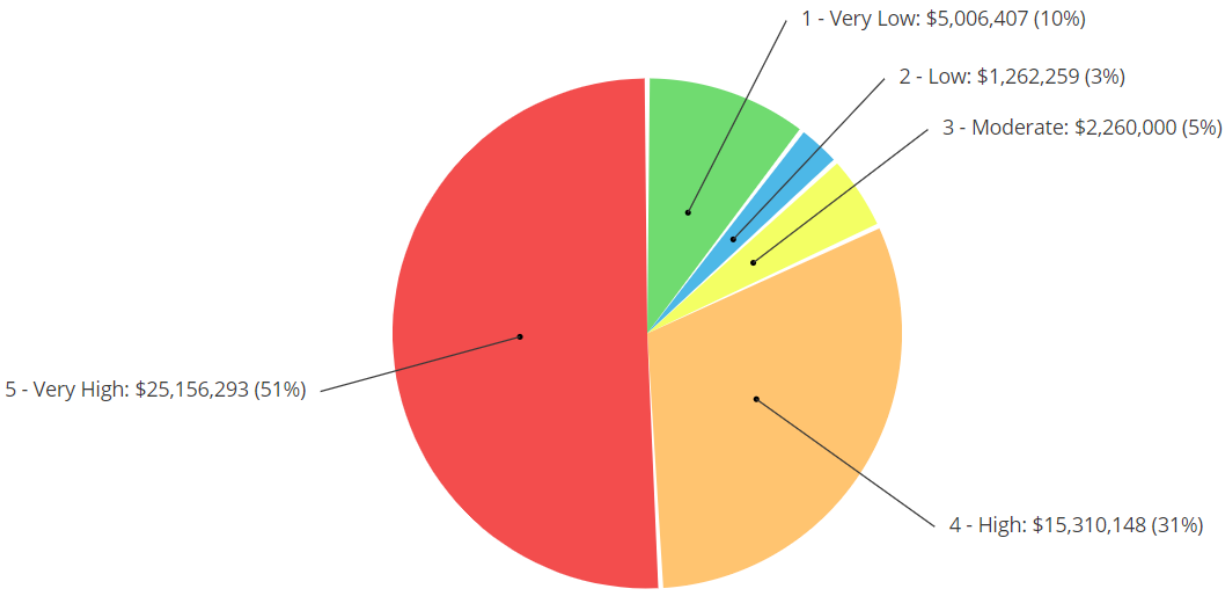
Funding for major capital rehabilitation projects (bridges and culverts in particular) is challenging considering rising construction costs and reduced federal and provincial funding.

Aging Infrastructure

Aging infrastructure poses a risk to service delivery due to increased likelihood of failure. SDG Counties addresses these risks with a combination of proactive maintenance, investment, and strategic planning.

The over all risk breakdown for SDG Counties non-core asset inventory is portrayed in the figure below.

Figure 9 Overall Asset Risk Breakdown



Reviewing the list of very high-risk assets to evaluate how best to mitigate the level of risk SDG Counties is experiencing will help advance SDG Counties asset management program.

Financial Strategy

Financial Strategy Overview

Each year, SDG Counties makes important investments in its infrastructure's maintenance, renewal, rehabilitation, and replacement to ensure assets remain in a state of good repair. However, spending needs typically exceed fiscal capacity. In fact, most municipalities continue to struggle with annual infrastructure deficits. Achieving full-funding for infrastructure programs will take many years and should be phased-in gradually to reduce burden on the community.

This financial strategy is designed for SDG Counties' existing non-core asset portfolio and is premised on two key inputs: the average annual capital requirements and the average annual funding typically available for capital purposes. The annual requirements are based on the replacement cost of assets and their serviceable life, and where available, lifecycle modeling. This figure is calculated for each individual asset and aggregated to develop category-level values.

The annual funding typically available is determined by averaging historical capital expenditures on infrastructure, inclusive of any allocations to reserves for capital purposes. For SDG Counties 2023 values were used to project available funding.

Only reliable and predictable sources of capital funding are used to benchmark funds that may be available on any given year. The funding sources include:

- Revenue from taxation allocated to reserves for capital purposes.
- The Canada Community Benefits Fund (CCBF), formerly the Federal Gas Tax Fund allocated to core infrastructure.
- The Ontario Community Infrastructure Fund (OCIF) allocated to core infrastructure.

Although provincial and federal infrastructure programs can change with evolving policy, CCBF, and OCIF are considered as permanent and predictable.

Annual Capital Requirements

The annual requirements represent the amount SDG Counties should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability. For most asset categories the annual requirement has been calculated based on a "replacement only" scenario, in which capital costs are only incurred at the construction and replacement of each asset.

Table 8 outlines the total average annual capital requirements for existing assets in each asset category. Based on a replacement cost of $49.8 million, annual capital requirements total more than $2.5 million for all the asset categories analysed.

Table 8 also illustrates the system-generated, equivalent target reinvestment rate (TRR), calculated by dividing the annual capital requirements by the total replacement cost of each category. The cumulative target reinvestment for these categories is estimated at 5%.

Table 8 Average Annual Capital Requirements

Asset Category	Replacement Cost	Annual Capital Requirements	Target Reinvestment Rate
Buildings	$34,132,000	$889,000	2.6%
Machinery & Equipment	$2,700,000	$358,000	13.3%
Vehicles	$12,955,000	$1,255,000	9.7%
Total	**$49,787,000**	**$2,502,000**	**5.0%**

Although there is no industry standard guide on optimal annual investment in infrastructure, the TRRs above provide a useful benchmark for organizations. In 2016, the Canadian Infrastructure Report Card (CIRC) produced an assessment of the health of municipal infrastructure as reported by cities and communities across Canada. The CIRC remains a joint project produced by several organizations, including the Federation of Canadian Municipalities (FCM), the Canadian Society of Civil Engineers (CSCE), the Canadian Network of Asset Managers (CNAM), and the Canadian Public Works Association (CPWA).

The 2016 version of the report card also contained recommended reinvestment rates that can also serve as benchmarks for municipalities. The CIRC suggest that, if increased, these reinvestment rates can "stop the deterioration of municipal infrastructure." The report card contains both a range for reinvestment rates that outlines the lower and upper recommended levels, as well as current municipal averages.

Current Funding Levels

Table 9 summarizes how current funding levels compare with funding required for each asset category. At existing levels, SDG Counties is funding 64% of its annual capital requirements for all assets analyzed in this AMP. This creates a total annual funding deficit of $897 thousand.

Table 9 Current Funding Position vs Required Funding

Asset Category	Annual Capital Requirements	Annual Funding Available	Annual Infrastructure Deficit	Funding Level
Buildings	$889,000	$235,000	$654,000	26%
Machinery & Equipment	$358,000	$180,000	$178,000	50%
Vehicles	$1,255,000	$1,190,000	$65,000	95%
Total	**$2,502,000**	**$1,605,000**	**$897,000**	**64%**

Closing the Gap

This section outlines how SDG Counties can close the annual funding deficits using own-source revenue streams, i.e., property taxation and without the use of additional debt for existing assets.

Full Funding Requirements Tax Revenues

In 2023, SDG Counties had a total annual tax revenue of $55,545,000, for the non-core assets included in this AMP $1,390,000 tax revenue was allocated. The calculated annual capital funding deficit is $897 thousand for non-core assets. Without consideration of any other sources of revenue or cost containment strategies, full funding would require a 1.61% tax rate increase to fully fund the deficit.

Funding 100% of annual capital requirements ensures that major capital events, including replacements, are completed as required. Under this scenario, projects are unlikely to be deferred to future years.

Recommendations and Key Considerations

Financial Strategies

Review the feasibility of adopting a full-funding scenario that achieves 100% of the average annual requirements for the asset categories analyzed. This involves:

- implementing a 1.61% tax increase and allocating the full increase in revenue towards capital funding.
- using risk frameworks and staff judgement to prioritize projects, particularly to aid in elimination of infrastructure backlogs.
- increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

NOTE: Although difficult to capture inflation costs, supply chain issues, and fluctuations in commodity prices will also influence capital expenditures.

Asset Data

1. Continuously review, refine, and calibrate lifecycle and risk profiles to better reflect actual practices and improve capital projections. In particular:
   - the timing of various lifecycle events, the triggers for treatment, anticipated impacts of each treatment, and costs.
   - the various attributes used to estimate the likelihood and consequence of asset failures, and their respective weightings.
2. Asset management planning is highly sensitive to replacement costs. Periodically update replacement costs based on recent projects, invoices, or estimates, as well as condition assessments, or any other technical reports and studies. Material and labour costs can fluctuate due to local, regional, and broader market trends, and substantially so during major world events. Accurately estimating the replacement cost of like-for-like assets can be challenging. Ideally, several recent projects over multiple years should be used. Staff judgement and historical data can help attenuate extreme and temporary fluctuations in cost estimates and keep them realistic.
3. Like replacement costs, an asset's established serviceable life can have dramatic impacts on all projections and analyses, including long-range forecasting and financial recommendations. Periodically reviewing and updating these values to better reflect in-field performance and staff judgement is recommended.

Risk and Levels of Service

1. Risk models and matrices can play an important role in identifying high-value assets, and developing an action plan which may include repair, rehabilitation, replacement, or further evaluation through updated condition assessments. As a result, project selection and the development of multi-year capital plans can become more strategic and objective. Initial models have been built into Citywide for all asset groups. As the data evolves and new attribute information is obtained, these models should also be refined and updated.
2. Although O. Reg. 588/17 requires reporting on specific, prescribed KPIs for SDG Counties' core assets, municipalities have discretion on the KPIs they select to track the performance of their non-core assets. KPIs should be established for all non-core asset groups to support regulatory compliance. Further, as available, data on current performance should be centralized and tracked to support any calibration of service levels ahead of O. Reg. 588/17's 2025 requirements on proposed levels of service.
3. Staff should monitor evolving local, regional, and environmental trends to identify factors that may shape the demand and delivery of infrastructure programs. These can include population growth, and the nature of population growth; climate change and extreme weather events; and economic conditions and the local tax base. This data can also be used to review service level targets.

Appendix A: Buildings

State of the Infrastructure

SDG Counties owns and maintains several facilities that provide key services to the community. These include:

- SDG Counties Administration building
- Patrol Yards: Winchester Springs, Finch, St. Andrews, and Green Valley
  - Office Buildings
  - Equipment Depots
  - Salt Storage Sheds
  - Storage Buildings
- Radio Tower

The state of the infrastructure for the buildings and facilities is summarized in Table 10.

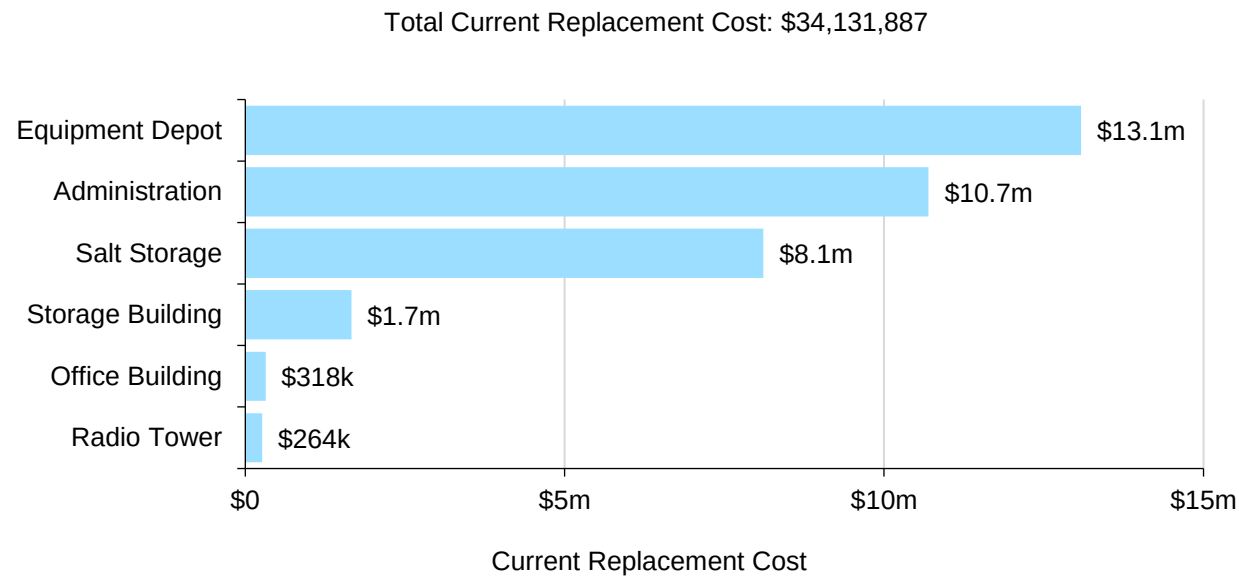
Table 10 Buildings State of Infrastructure Summary

Replacement Cost	Condition	Financial Capacity	
$34.1 million	Fair (43%)	Annual Requirement:	$889,000
		Capital Funding Available:	$235,000
		Annual Deficit:	$654,000

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in SDG Counties' buildings inventory.

Figure 10 Buildings Replacement Cost

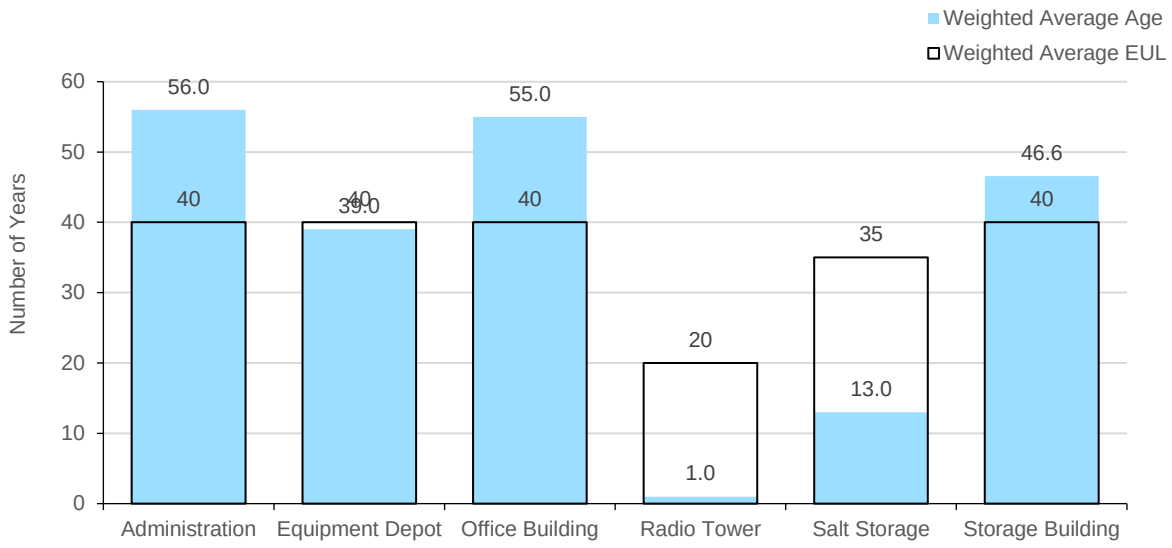


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

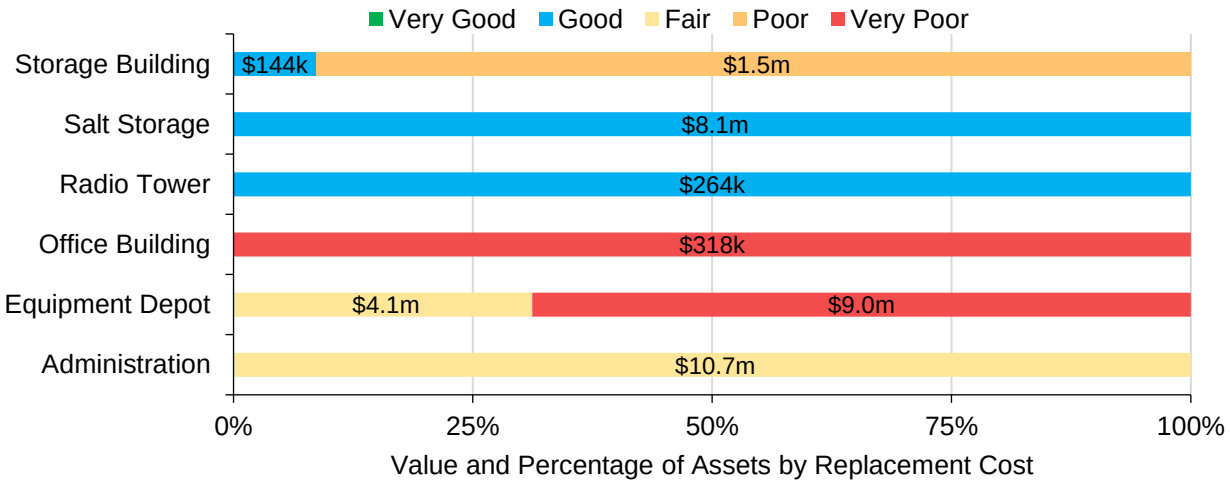
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 11 Buildings Average Age vs Average EUL



The graph below visually illustrates the average condition for each asset segment on a very good to very poor.

Figure 12 Buildings Condition Breakdown



To ensure that the municipal buildings continue to provide an acceptable level of service, SDG Counties should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the buildings.

Each asset's estimated useful life should also be reviewed to determine whether adjustments need to be made to better align with the observed service life.

Current Approach to Condition Assessment

Accurate and reliable condition data allow staff to determine the remaining service life of assets and identify the most cost-effective approach to managing them. Currently, the SDG Counties performs assessments on an as needed basis. The last assessment was completed in 2018 by an external consultant. The 2018 assessment procedures and documentation were conducted in general accordance with the ASTM E-2018-15 and were rated using FCI. Buildings are repaired as needed based on deficiencies identified.

Lifecycle Management Strategy

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 SDG Counties current lifecycle management strategy.

Figure 13 Buildings Current Lifecycle Strategy

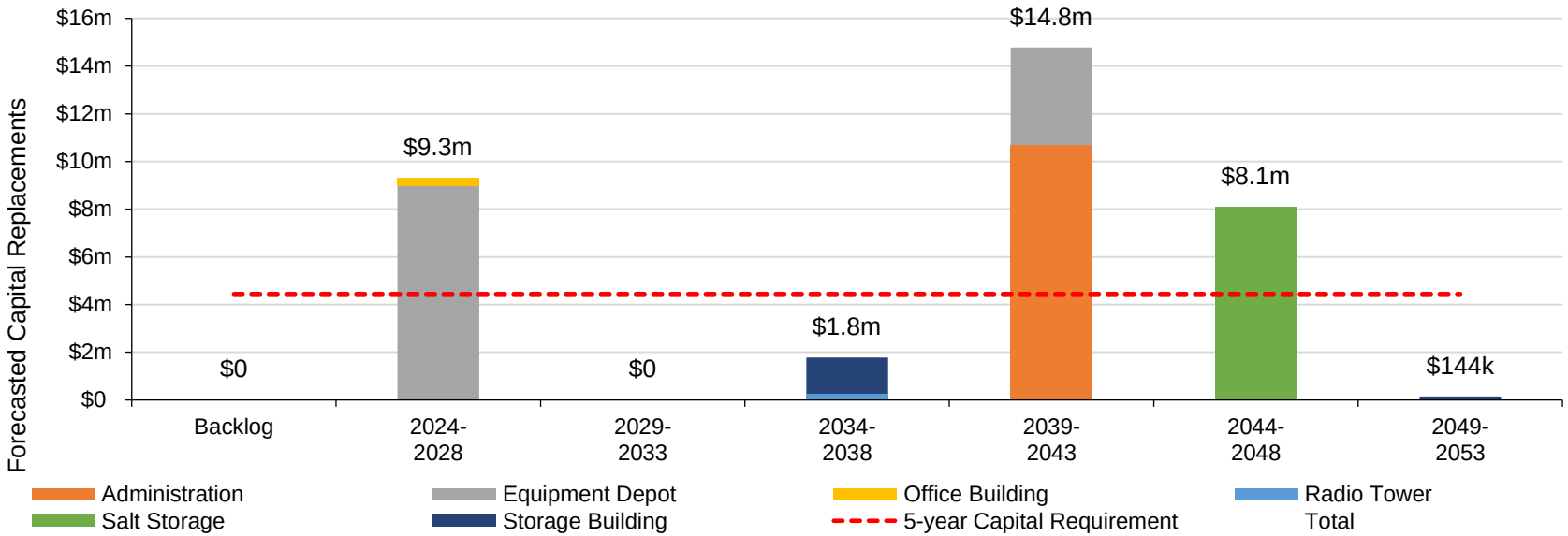
Maintenance / Rehabilitation / Replacement

- Annual servicing of overhead doors. HVAC, mechanical, and civil infrastructure maintained on as needed basis. Fire and elevator systems have scheduled testing and maintenance.
- Maintenance triggered by JHSC inspections or equipment failure.
- Typical rehabilitation strategies of buildings include roof, HVAC system, parking lot, window, and interior renovation and remodeling.
- Rehabilitation is completed based on budget approval.
- Replacement is considered when an asset's condition has deteriorated significantly, and maintenance and rehabilitation is no longer cost-effective.
- Assets critical to the continuation of government, and ability to provide essential services are prioritized.

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that SDG Counties should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 30 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $889 thousand or $4.4 million over a 5-year period.

Figure 14 Buildings Forecasted Capital Replacement Requirements



These projections are generated in Citywide and rely on the data available in the asset register, which was limited to asset age, replacement cost, and useful life.

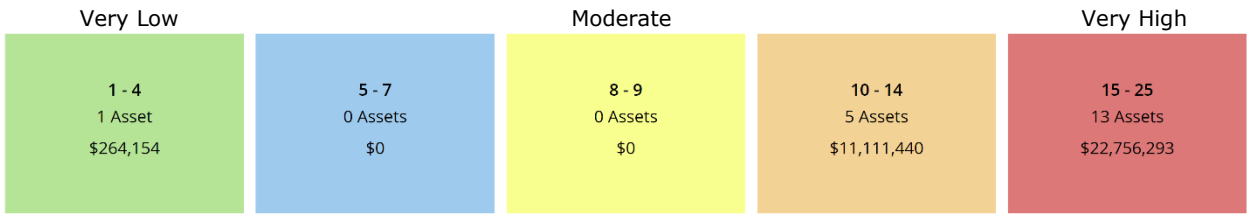
Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. Refer to Appendix D: Risk Rating Criteria - Table 19 Risk Rating Criteria and Table 20 Risk Frameworks that have been developed to determine the risk rating for all asset categories.

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows SDG Counties to determine risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

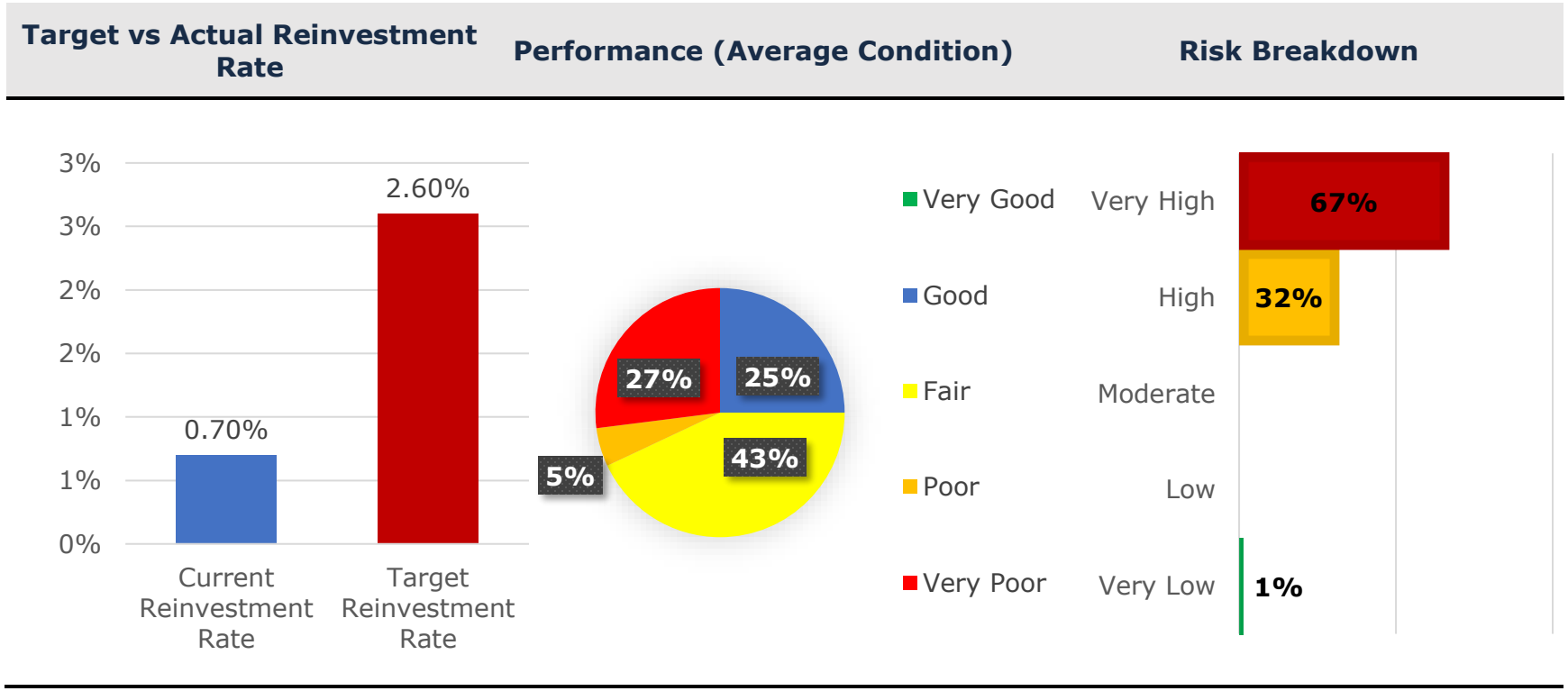
Figure 15 Buildings Risk Matrix



Levels of Service

Figure 16 Buildings Strategic Levels of Service below identify SDG Counties metrics to identify their current level of service for the buildings. By comparing the cost, performance (average condition) and risk year-over-year, SDG Counties will be able to evaluate how their services/assets are trending. SDG Counties will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Figure 16 Buildings Strategic Levels of Service



Community Levels of Service

Table 11 outlines the qualitative descriptions that determine the community levels of service provided by buildings.

Table 11 Ontario Regulation 588/17 Buildings Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Sustainable	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on municipal facilities	See Figure 13 Buildings Current Lifecycle Strategy
Safe & Regulatory	Description of the current condition of municipal facilities and the plans that are in place to maintain or improve the provided level of service	See Current Approach to Condition Assessment

Technical Levels of Service

Table 12 outlines the quantitative metrics that determine the technical level of service provided by SDG Counties buildings.

Table 12 Ontario Regulation 588/17 buildings Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Sustainable	Annual capital reinvestment rate	0.7%
Safe & Regulatory	% of facility assets at moderate to very low risk of failure	23%
	% of facility assets at high or very high risk of failure	77%
	% of facilities that are in fair or better condition	68%
	% of facilities that are in poor or very poor condition	32%

Appendix B: Vehicles

State of the Infrastructure

Vehicles enable staff to efficiently deliver municipal services. SDG Counties' vehicles are mainly used for public works operations or administrative purposes.

The state of the infrastructure for the vehicles is summarized in Table 13.

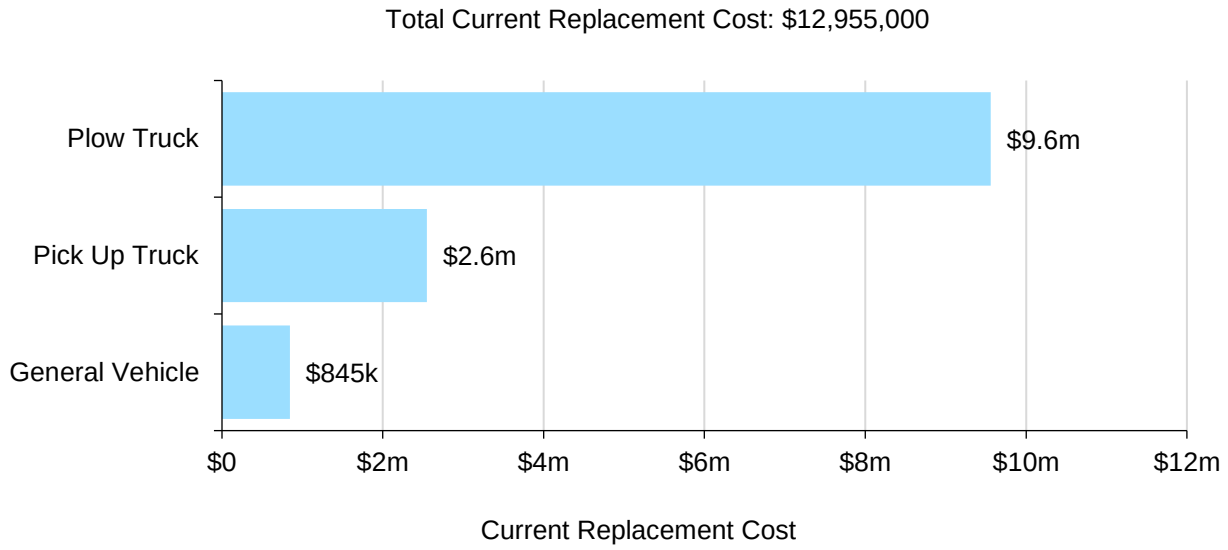
Table 13 Vehicles State of Infrastructure Summary

Replacement Cost	Condition	Financial Capacity	
$13.0 million	Fair (59%)	Annual Requirement:	$1,255,000
		Capital Funding Available:	$1,190,000
		Annual Deficit:	$65,000

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in the vehicle inventory.

Figure 17 Vehicle Replacement Costs

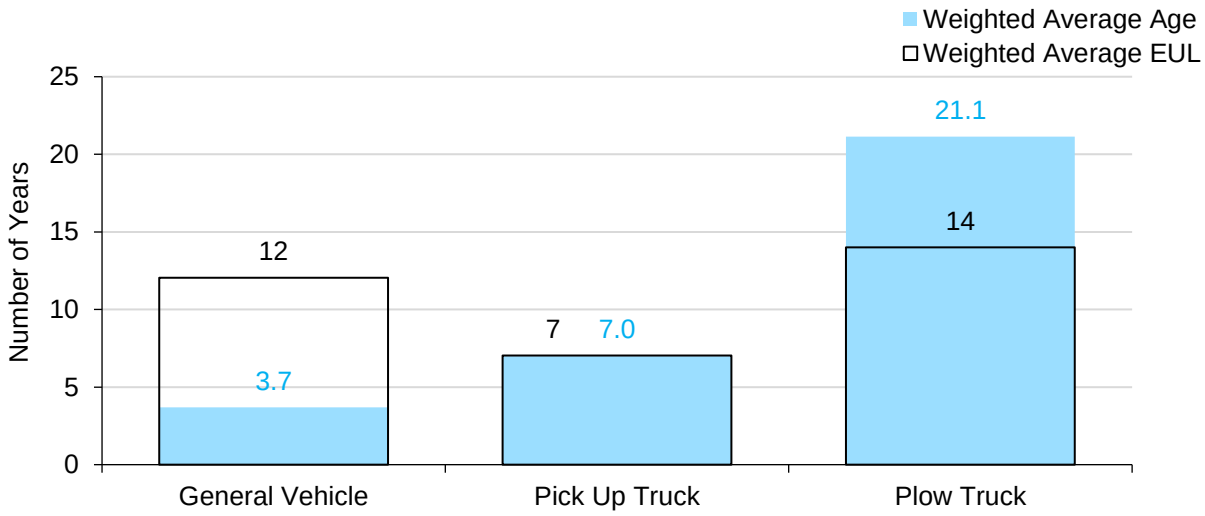


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

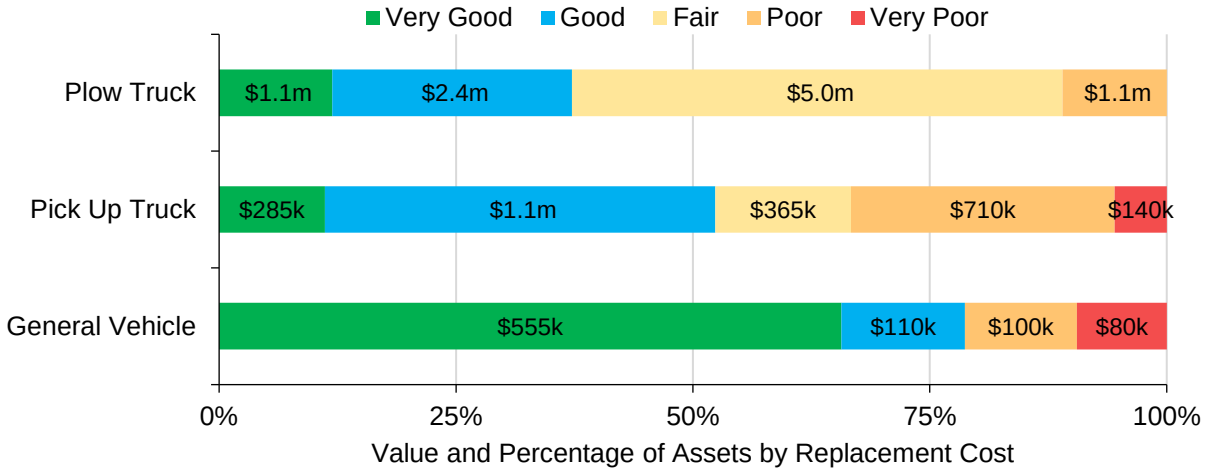
Figure 18 Vehicles Average Age vs Average EUL



Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

Figure 19 Vehicles Condition Breakdown



To ensure that SDG Counties vehicles continue to provide an acceptable level of service, SDG Counties should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the vehicles.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. SDG Counties current approach involves an annual safety performed on heavy duty vehicles and inspections performed on all other vehicles during routine maintenance (i.e. oil changes / greasing). Daily circle check inspections are also completed on all vehicles before use.

Lifecycle Management Strategy

The condition or performance of assets will deteriorate over time. To ensure vehicles are performing as expected, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

Figure 20 Vehicles Current Lifecycle Strategy

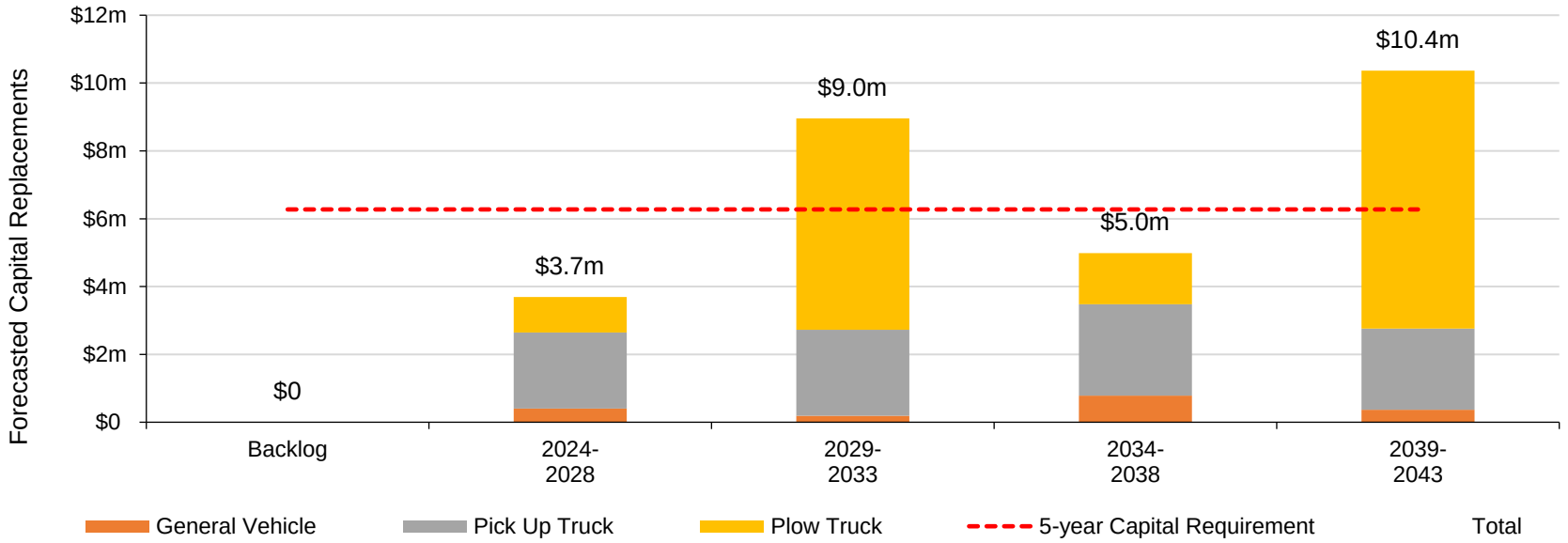
Maintenance / Rehabilitation / Replacement

- Routine maintenance activities include inspections, minor repairs, and services.
- Maintenance is triggered by inspections identifying safety and mechanical issues.
- Rebuild or replacement of vehicles or components when feasible.
- All vehicles receive the same prioritization when replacements are required. Replacements are based on a schedule that is forecasted 10 years into future.

Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that SDG Counties should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 20 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $1.25 million or $6.3 million over a 5-year period.

Figure 21 Vehicle Forecasted Capital Replacement Requirements



These projections are generated in Citywide and rely on the data available in the asset register, which was limited to asset age, replacement cost, and useful life.

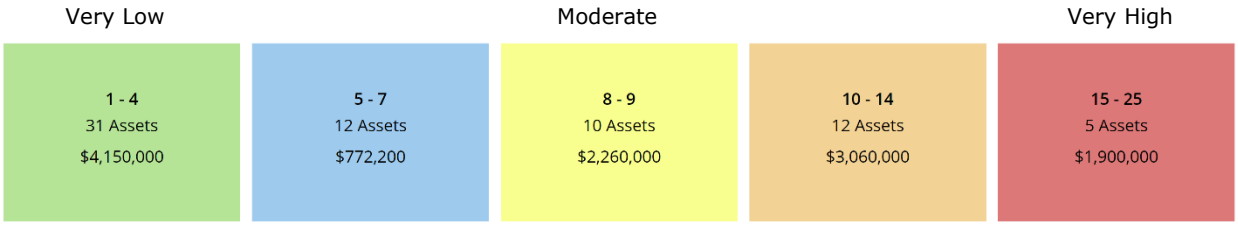
Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. Refer to Appendix D: Risk Rating Criteria - Table 19 Risk Rating Criteria and Table 20 Risk Frameworks that have been developed to determine the risk rating for all asset categories.

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows SDG Counties to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

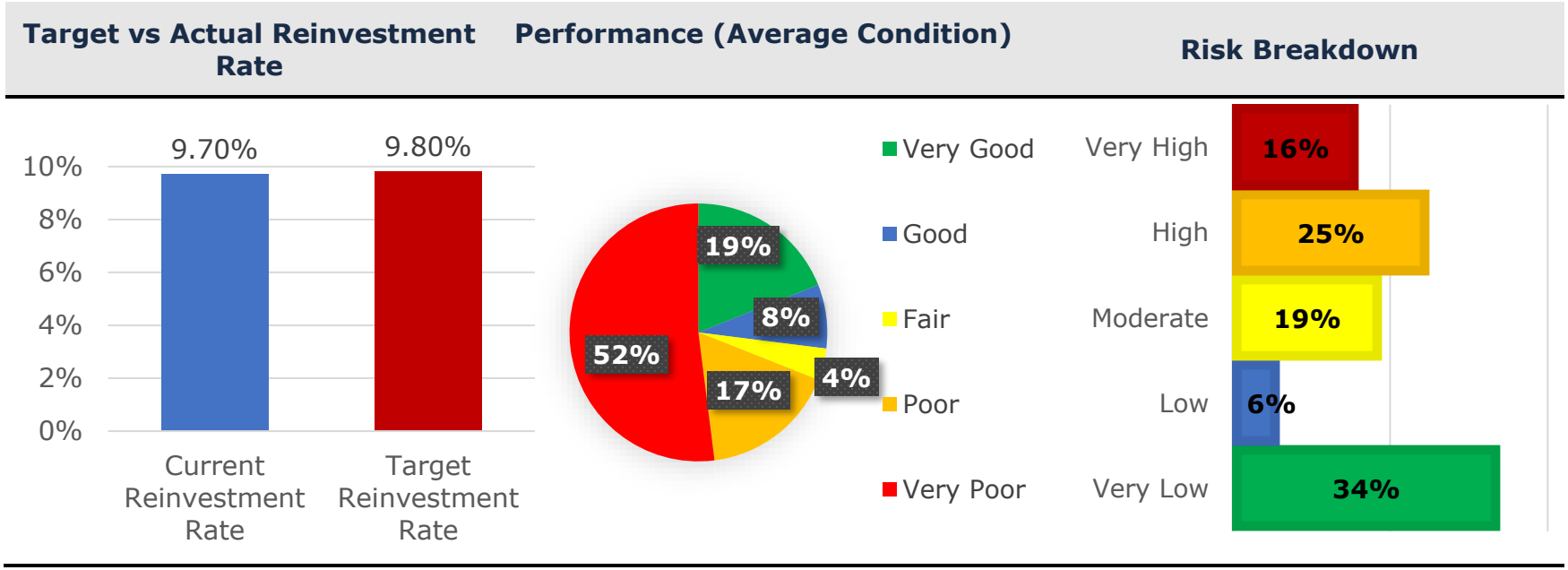
Figure 22 Vehicles Risk Matrix



Levels of Service

Figure 23 Vehicles Strategic Levels of Service identify SDG Counties metrics to identify their current level of service for the vehicles. By comparing the cost, performance (average condition) and risk year-over-year, SDG Counties will be able to evaluate how their services/assets are trending. SDG Counties will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Figure 23 Vehicles Strategic Levels of Service



Community Levels of Service

Table 14 outlines the qualitative descriptions that determine the community levels of service provided by vehicles.

Table 14 Ontario Regulation 588/17 Vehicles Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Sustainable	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on vehicles	See Figure 20 Vehicles Current Lifecycle Strategy
Safe & Regulatory	Description of the current condition of vehicles and the plans that are in place to maintain or improve the provided level of service	See Current Approach to Condition Assessment

Technical Levels of Service

Table 15 outlines the quantitative metrics that determine the technical level of service provided by SDG Counties vehicles.

Table 15 Ontario Regulation 588/17 Vehicles Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Sustainable	Annual capital reinvestment rate	9.2%
Safe & Regulatory	% of vehicles at moderate to very low risk of failure	59%
	% of vehicles at high or very high risk of failure	41%
	% of vehicles that are in fair or better condition	84%
	% of vehicles that are in poor or very poor condition	16%

Appendix C: Machinery & Equipment

State of the Infrastructure

Machinery & equipment enables SDG Counties to maintain infrastructure and deliver services. This includes:

- Heavy machinery and maintenance equipment for operational needs.
- Light-duty equipment for landscaping and general maintenance needs.

The state of the infrastructure for equipment is summarized in Table 16.

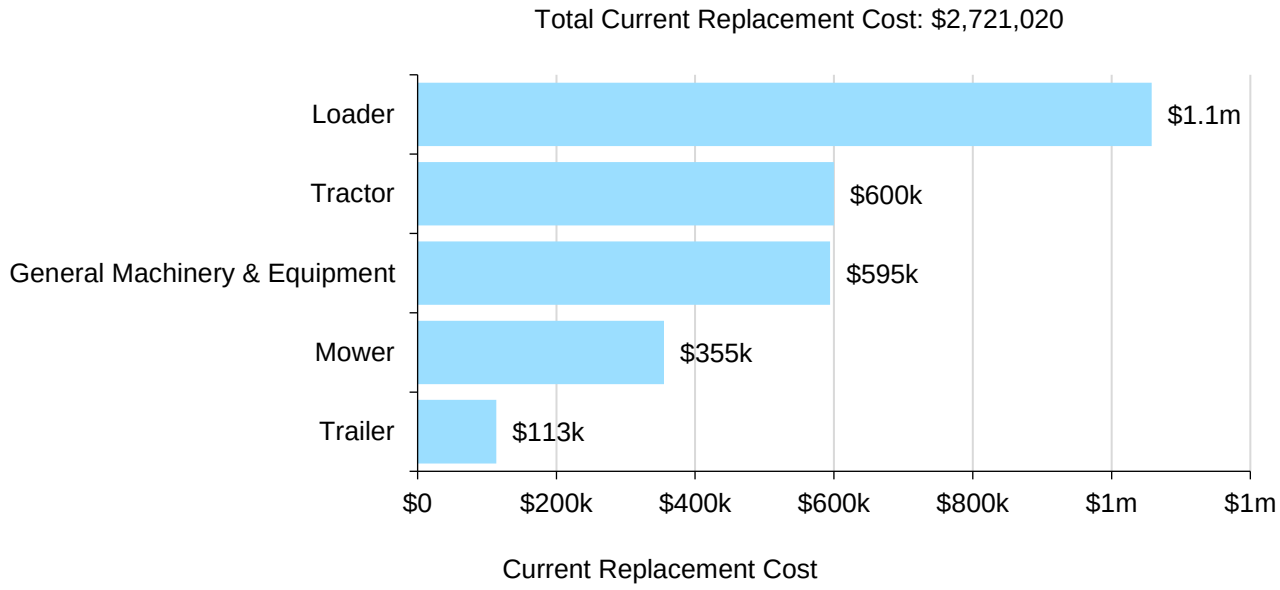
Table 16 Machinery & Equipment State of Infrastructure Summary

Replacement Cost	Condition	Financial Capacity	
$2.7 million	Fair (51%)	Annual Requirement:	$358,000
		Funding Available:	$180,000
		Annual Deficit:	$178,000

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in SDG Counties equipment inventory.

Figure 24 Machinery & Equipment Replacement Costs

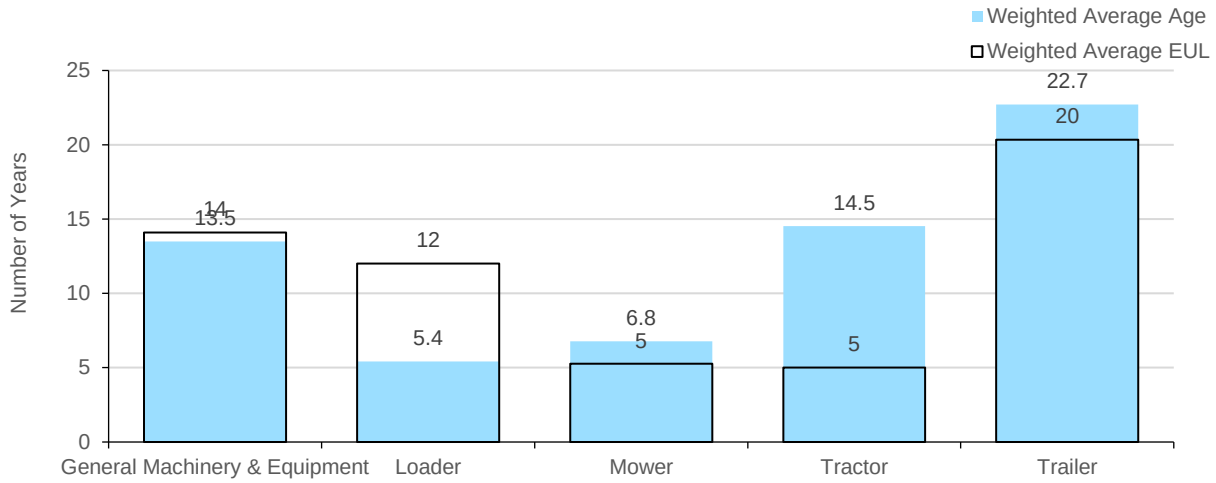


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent capital requirements.

Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

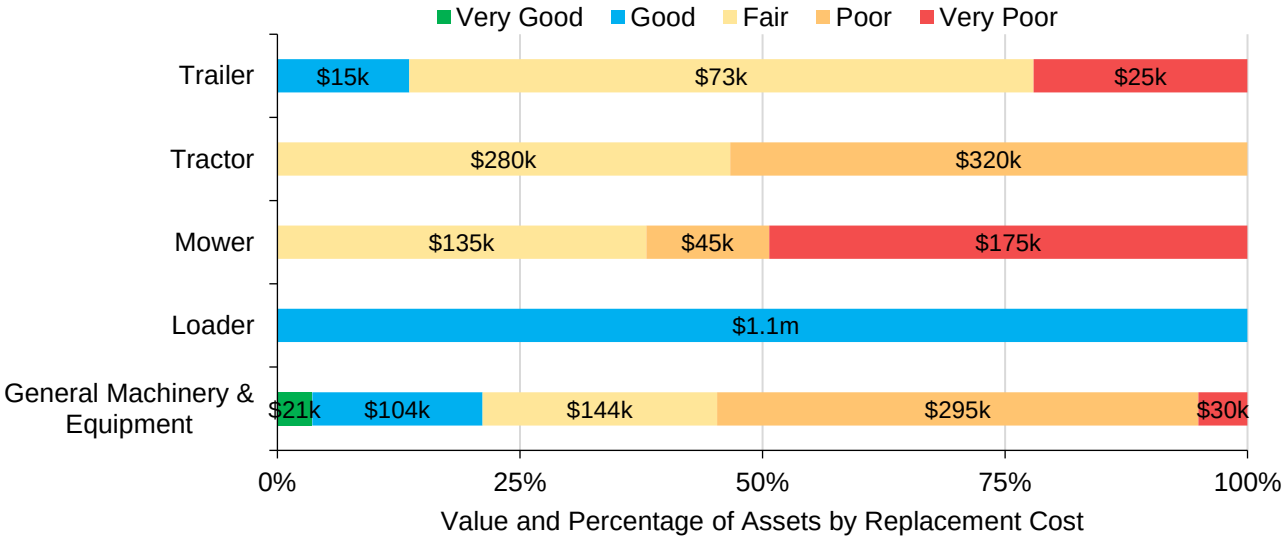
Figure 25 Machinery & Equipment Average Age vs Average EUL



Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

Figure 26 Machinery & Equipment Condition Breakdown



To ensure that SDG Counties equipment continues to provide an acceptable level of service, SDG Counties should continue to monitor the average condition. If the average condition declines, staff should re-evaluate their lifecycle management

strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. SDG Counties current approach involves an annual safety performed on heavy machinery and inspections performed on all other equipment during routine maintenance (i.e. oil changes / greasing). Daily circle check inspections are also completed on all machinery and equipment before use.

Lifecycle Management Strategy

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

Figure 27 Machinery & Equipment Current Lifecycle Strategy

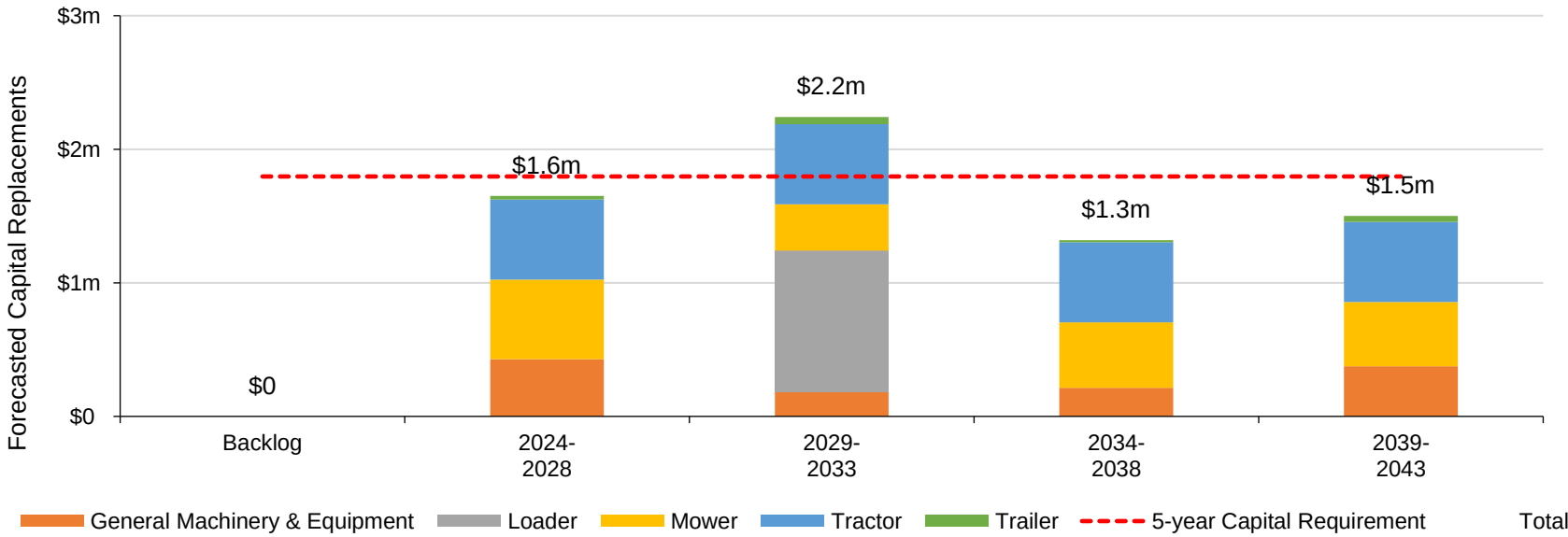
Maintenance / Rehabilitation / Replacement

- Routine maintenance activities include inspections, minor repairs, and services.
- Maintenance is triggered by inspections identifying safety and mechanical issues.
- Rebuild or replacement of equipment components are considered when feasible.
- All machinery and equipment receive the same prioritization when replacements are required. Replacements are based on a schedule that is forecasted 10 years into future.

Forecasted Capital Requirements

Figure 28 Machinery & Equipment Forecasted Capital Replacement Requirements below identifies capital requirements over the next 20 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins and the trend line represents the average annual capital requirements at $358 thousand or $1.8 million over a 5-year period.

Figure 28 Machinery & Equipment Forecasted Capital Replacement Requirements



These projections are generated in Citywide and rely on the data available in the asset register, which was limited to asset age, replacement cost, and useful life.

Risk & Criticality

The risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on available inventory data. Refer to Appendix D: Risk Rating Criteria - Table 19 Risk Rating Criteria and Table 20 Risk Frameworks that have been developed to determine the risk rating for all asset categories.

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

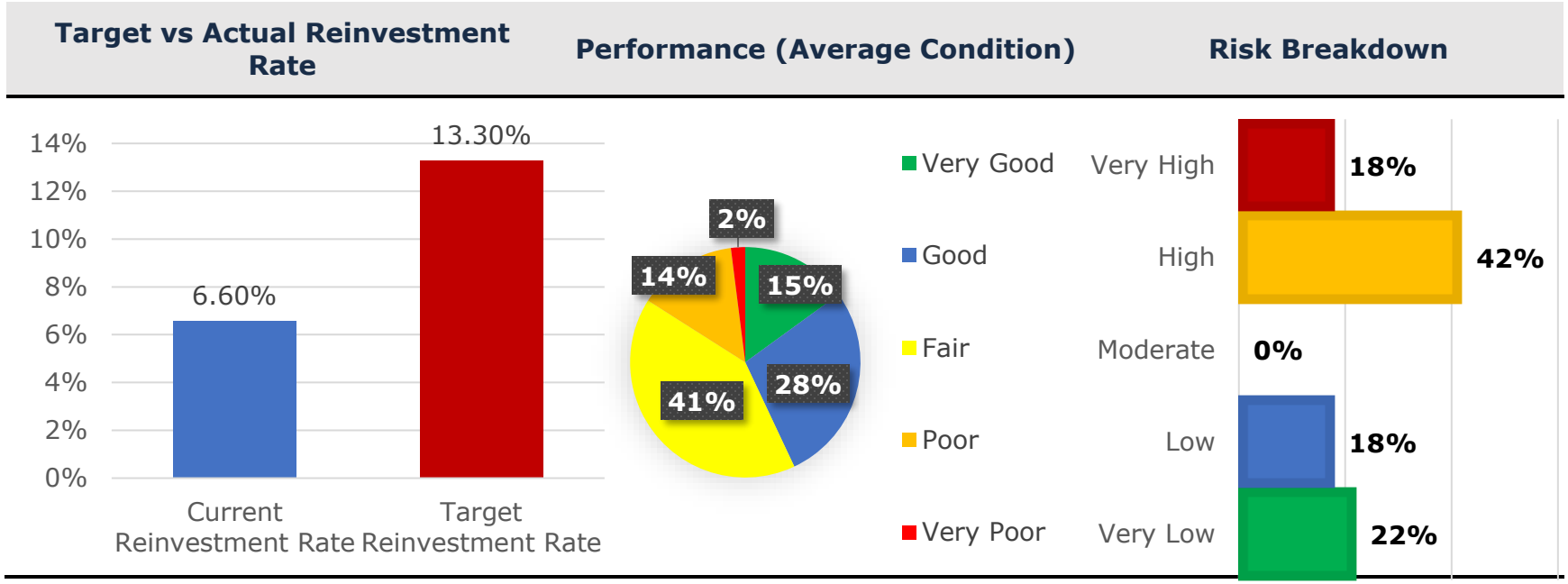
The identification of critical assets allows SDG Counties to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Figure 29 Machinery & Equipment Risk Matrix

Levels of Service

Figure 30 Machinery & Equipment Strategic Levels of Service below identify SDG Counties metrics to identify their current level of service for machinery and equipment. By comparing the cost, performance (average condition) and risk year-over-year, SDG Counties will be able to evaluate how their services/assets are trending. SDG Counties will use this data to set a target level of service and determine proposed levels for the regulation by 2025.

Figure 30 Machinery & Equipment Strategic Levels of Service



Community Levels of Service

Table 17 outlines the qualitative descriptions that determine the community levels of service provided by machinery and equipment.

Table 17 Ontario Regulation 588/17 Machinery & Equipment Community Levels of Service

Service Attribute	Qualitative Description	Current LOS
Sustainable	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on machinery & equipment	See Figure 27 Machinery & Equipment Current Lifecycle Strategy
Safe & Regulatory	Description of the current condition of machinery & equipment and the plans that are in place to maintain or improve the provided level of service	See Current Approach to Condition Assessment

Technical Levels of Service

Table 18 outlines the quantitative metrics that determine the technical level of service provided by machinery and equipment.

Table 18 Ontario Regulation 588/17 Machinery & Equipment Technical Levels of Service

Service Attribute	Technical Metric	Current LOS
Sustainable	Annual capital reinvestment rate	6.7%
Safe & Regulatory	% of machinery & equipment at moderate to very low risk of failure	60%
	% of machinery & equipment at high or very high risk of failure	40%
	% of machinery & equipment that are in fair or better condition	67%
	% of machinery & equipment that are in poor or very poor condition	33%

Appendix D: Risk Rating Criteria

Table 19 Risk Rating Criteria

Risk	Integrating a risk management framework into your asset management program requires the translation of risk potential into a quantifiable format. This will allow you to compare and analyze individual assets across your entire asset portfolio. Asset risk is typically defined using the following formula: **Risk = Probability of Failure (POF) x Consequence of Failure (COF)**
Probability of Failure (POF)	The probability of failure relates to the likelihood that an asset will fail at a given time. The current physical condition and service life remaining are two commonly used risk parameters in determining this likelihood.
POF - Structural	The likelihood of asset failure due to aspects of an asset such as load carrying capacity, condition or breaks
POF - Functional	The likelihood of asset failure due to its performance
POF - Range	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
Consequences of Failure (COF)	The consequence of failure describes the overall effect that an asset's failure will have on an organization's asset management goals. Consequences of failure can range from non-eventful to impactful: a small diameter water main break in a subdivision may cause several rate payers to be without water service for a short time. However, a larger trunk water main may break outside a hospital, leading to significantly higher consequences.
COF - Economic	The monetary consequences of asset failure for the organization and its customers
COF - Social	The consequences of asset failure on the social dimensions of the community
COF - Environmental	The consequence of asset failure on an asset's surrounding environment
COF - Operational	The consequence of asset failure on the Town's day-to-day operations
COF - Health & safety	The consequence of asset failure on the health and well-being of the community
COF - Strategic	The consequence of asset failure on strategic planning
COF - Range	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe

Risk Frameworks

Table 20 Risk Frameworks – Buildings, Machinery & Equipment, Vehicles

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
All Assets		COF	Economic	100%	Replacement Cost	100%	0 – 50,000 50,000 – 100,000 100,000 - 250,000 250,000 – 500,000 >500,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
		POF	Condition	100%	Assessed Condition	100%	>80 60 - 80 40 - 60 20 - 40 0 – 20	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Appendix E: Condition Assessment Guidelines

The foundation of good asset management practice is accurate and reliable data on the current condition of infrastructure. Assessing the condition of an asset at a single point in time allows staff to have a better understanding of the probability of asset failure due to deteriorating condition.

Condition data is vital to the development of data-driven asset management strategies. Without accurate and reliable asset data, there may be little confidence in asset management decision-making which can lead to premature asset failure, service disruption and suboptimal investment strategies. To prevent these outcomes, SDG Counties condition assessment strategy should outline several key considerations, including:

- The role of asset condition data in decision-making
- Guidelines for the collection of asset condition data
- A schedule for how regularly asset condition data should be collected

Role of Asset Condition Data

The goal of collecting asset condition data is to ensure that data is available to inform maintenance and renewal programs required to meet the desired level of service. Accurate and reliable condition data allows municipal staff to determine the remaining service life of assets, and identify the most cost-effective approach to deterioration, whether it involves extending the life of the asset through remedial efforts or determining that replacement is required to avoid asset failure.

In addition to the optimization of lifecycle management strategies, asset condition data also impacts SDG Counties risk management and financial strategies. Assessed condition is a key variable in the determination of an asset's probability of failure. With a strong understanding of the probability of failure across the entire asset portfolio, SDG Counties can develop strategies to mitigate both the probability and consequences of asset failure and service disruption. Furthermore, with condition-based determinations of future capital expenditures, SDG Counties can develop long-term financial strategies with higher accuracy and reliability.

Guidelines for Condition Assessment

Whether completed by external consultants or internal staff, condition assessments should be completed in a structured and repeatable fashion, according to consistent and objective assessment criteria. Without proper guidelines for the completion of condition assessments there can be little confidence in the validity of condition data and asset management strategies based on this data.

Condition assessments must include a quantitative or qualitative assessment of the current condition of the asset, collected according to specified condition rating criteria, in a format that can be used for asset management decision-making. As a result, it is important that staff adequately define the condition rating criteria that

should be used and the assets that require a discrete condition rating. When engaging with external consultants to complete condition assessments, it is critical that these details are communicated as part of the contractual terms of the project.

There are many options available to SDG Counties to complete condition assessments. In some cases, external consultants may need to be engaged to complete detailed technical assessments of infrastructure. In other cases, internal staff may have sufficient expertise or training to complete condition assessments.

Developing a Condition Assessment Schedule

Condition assessments and general data collection can be both time-consuming and resource intensive. It is not necessarily an effective strategy to collect assessed condition data across the entire asset inventory. Instead, SDG Counties should prioritize the collection of assessed condition data based on the anticipated value of this data in decision-making. The International Infrastructure Management Manual (IIMM) identifies four key criteria to consider when making this determination:

- Relevance: every data item must have a direct influence on the output that is required
- Appropriateness: the volume of data and the frequency of updating should align with the stage in the assets life and the service being provided
- Reliability: the data should be sufficiently accurate, have sufficient spatial coverage and be appropriately complete and current
- Affordability: the data should be affordable to collect and maintain